केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान, कोचीन

Central Marine Fisheries Research Institute, Cochin

अनुसंधान परियोजनायें १९९३ - ९४

Research Projects 1993-'94

भारतीय कृषि अनुसंधान परिषद्

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

RESEARCH PROJECTS FOR 1993-94

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RESEARCH PROJECT 1993-'94

1. Institute Code No.FSS/FRA/1.1 2. ICAR Code No.

3. Name and Address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin-31

4. Title of Project : Assessment of exploited marine fishery resources.

5. Title of Sub-project : Assessment of exploited marine fishery resources.

6. Name and Designation of Project Leader : K.Balan, Scientist SG

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.Balan	Scientist SG	30	As per technical programme

Technical Assistance:

S.S.Dan, G.Balakrishnan, Varughese Philipose, P.K.Mahadevan Pillai, V.Rajendran, Varughese Jacob, K.C.Yohannan, G.Krishnankutty Nair, P.Sivaraman, V.P.Annam, P.Karunakaran Nair, Abhakant, Joseph Andrews, S.Haja Najeemudeen, C.J.Prasad, P.L.Ammini, K.Remani, D.Pugazhendi, M.B.Seynudeen, M.R.Beena, P.P.Pavithran, K.P.George, P.T.Mani, M.Ramachandran, K.Anandan, Lata L.Khambadker, G.Subbaraman and 102 Field Staff posted at different centres.

8. Location of the Research Project : Cochin

9. (a) Objectives: To estimate the marine fish production in India and fishing effort expended and to assess the resource-wise/gear-wise components in the total production.

(b) Practical Utility: Data generated and the information obtained there from are essential inputs to assess the current status of marine fishery resources and also for studying the dynamics of the fish stocks exploited. The results would go as inputs for other important research projects of the Institute as well.

10. Technical Programme: 1) Planning the Sample Survey 2) Execution of field observation. 3) Co-ordination of field work and supervision 4) Processing of survey data 5) Analysis of the results.

Work done: Survey following a multistage stratified random sampling design was carried out for estimating marine fish production in the country during 1992.

Work envisaged: Sample survey for estimating marine fish production in the country during 1993 will be undertaken.

11. Date of start : 1-4-1991

12. Likely date of completion : 31-3-1995

13. Estimated man-months : 1270 Man months/year

14. Facilities required : Nil

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

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

(a) Name of the financing organisation.
(b) Title of the project.

16. Approximate cost:

(a)	Salary of Scientific staff :	38,000/-
(b)	Salary of Technical staff :	33,40,000/-
(c)	Salary of supporting staff :	
(d)	Casual labour cost, if any :	
(e)	Cost of equipment, facility etc. :	
(f)	Contingencies, such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc. :	5,000/-
	Maintanence of the computer system :	
(g)	T.A. :	9,88,000/-
	Total cost :	43,71,000/-

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-'94

1. Institute Code No.FSS/FRA/1.3 2. ICAR Code No.

3. Name and Address of Research Institute/Centre. : Central Marine Fisheries Research Institute, Cochin-31

4. Title of Project : Assessment of exploited marine fishery resources.

5. Title of Sub-project : Stock Assessment Techniques in Fisheries Research and Management

6. Name and Designation of Project Leader : K.Alagaraja, Principal Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.Alagaraja	Principal Scientist	30	As per technical programme
	K.Balan	Scientist SG	25	
	T.V.Sathianandan	Scientist	25	
	K.Vijayalekshmi	Scientist	25	
	K.S.Sćariah	Senior Scientist	25	

Technical Assistance: Nil

8. Location of the Research Project: Cochin

9. (a) Objectives: To review the existing models and improve/ develop suitable models for marine fish stock assessment and management.

(b) Practical Utility: Assessment of exploited fish stocks and effect of fishing and einvrionmental factors on them is essential for their rational exploitation and judicious management.

10. Technical Programme:

i. Development of methods for stock assessment based on length frequency data using growth models other than Bertalanffy's model.

ii. Robustness of estimates of growth and mortality rates with reference to length class interval.

iii. Selection of appropriate method of estimation of modes.
iv. Determination of suitable sampling procedure for obtaining representative samples of exploited fish stocks for stock assessment studies.

Work done: Suitability of Gompert's growth model for stock assessment studies has been tested. Simulation studies to see the effect of class interval size on the parameter estimates is in progress for oil sardine.

Work envisaged: As per the technical programme.

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11. Date of start : 1-4-1991

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12. Likely date of completion : 31-3-1995

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13. Estimated man-months : 15.6 Man months/year

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14. Facilities required : Nil

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

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

(a) Name of the financing organisation.
(b) Title of the project.

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16. Approximate cost:

(a) Salary of Scientific staff	:	Rs.1,00,300/-
(b) Salary of Technical staff	:	
(c) Salary of supporting staff	:	
(d) Casual labour cost, if any	:	
(e) Cost of equipment, facility etc.	:	
(f) Contingencies, such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:	Rs. 9,600/-
Maintanence of the computer system	:	
(g) T.A.	:	
Total cost	:	Rs.1,09,900/-

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17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-'94

1. Institute Code No.FSS/FRA/1.19 2. ICAR Code No

3. Name and Address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin-31

4. Title of Project : Assessment of exploited marine fishery resources.

5. Title of Sub-project : Evaluation of change in the pattern of catch and composition of marine fishery resources in India.

6. Name and Designation of Project Leader. : K.S.Scariah, Senior Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.S.Scariah	Senior Scientist	25	As per technical programme
	K.Vijayalekshmi	Scientist	50	

Technical Assistance:
G.Krishnankutty Nair, Joseph Andrews, M.R.Beena and Latha Kambdedkar.

8. Location of the Research Project : Cochin

9. (a) Objectives: The project aims at evaluating the changes that have taken place in the catch and composition of marine fishery resources in India vis-a-vis the technological changes that have tkaen place over the yeams.

(b) Practical Utility: The resulting information would be useful in better management of the marine fishery resources of the country in the context of technological innovations, introduced in the marine capture fisheries.

10. Technical Programme: The data collected through the sample survey on exploited marine fishery resources in the maritime states of Karnataka and Goa during the past three decades will be critically studied.

Work done: The evaluation on the changing pattern of catch composition, effort and methods of harvest of the past three decades of marine fishery resources have been completed in respect of Tamil Nadu and Kerala. The work in respect of Karnataka is in progress.

Work envisaged: As per the technical programme.

11. Date of start : 1-4-'91

12. Likely date of completion : 31-3-'95

13. Estimated man-months : 9 Man months/year

14. Facilities required

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

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

(a) Name of the financing organisation.
(b) Title of the project.

16. Approximate cost:

(a)	Salary of Scientific staff	:	Rs. 74,000/-
(b)	Salary of Technical staff	:	Rs. 4,000/-
(c)	Salary of supporting staff	:	
(d)	Casual labour cost, if any	:	
(e)	Cost of equipment, facility etc	:	
(f)	Contingencies, such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:	Rs. 12,000/-
	Maintanence of the computer system	:	
(g)	T.A.	:	
	Total cost	:	Rs. 90,000/-

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-'94

1. Institute Code No.FSS/FRA/ST.1 2. ICAR Code No.

3. Name and Address of Research Institute/Centre. : Central Marine Fisheries Research Institute, Cochin-31.

4. Title of Project : Assessment of exploited marine fishery resources.

5. Title of Sub-project : Management Information Systems in Marine Fisheries

6. Name and Designation of Project Leader. : T.V.Sathianandan, Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	T.V.Sathianandan	Scientist	50	As per technical programme
	K.Alagaraja	Principal Scientist	25	
	K.Balan	Scientist SG	25	
	K.S.Scariah	Senior Scientist	25	
	K.Vijayalekshmi	Scientist	25	

Technical Assistance: Varughese Jacob, G.Krishnankutty Nair, V.P.Annam, P.Sivaraman, P.L.Ammini, K.C.Yohannan, S.Haja Najeemudeen, Joseph Andrews, C.J.Prasad, P.Karunakaran Nair, K.Remani, D.Pugazhendi, P.P.Pavithran, M.B.Seynudeen, K.P.George, M.Ramachandran, K.Anandan, G.Subbaraman, P.T.Mani, M.R.Beena and Lata L.Khambadkar.

8. Location of the Research Project. Cochin

9. (a) Objectives: Establishment and management of marine living resources information system.

(b) Practical Utility: Provides computer aided in-depth analysis of marine fisheries data and acts as a store house of a wide range of information on marine fisheries essential for Research and Development.

10. Technical Programme: 1) To develop suitable software for marine fishery information system. 2) Provide facilities for analysis of data on fishery biology, environmental, economic and other related aspects. 3) Storage of primary data collected by the Institute in appropriate formats. 4) Dissemination of relevant information to the end users.

Work done: Software for storage and retrieval of information and for statistical analysis of data have been developed. Computer facility has been extensively used for data analysis, retrieval and dissemination of information on marine fishery resources. New software for storage, analysis and retrieval of biological data pertaining to different Research Centres of CMFRI have been developed and tested. Creation of data base is in progress.

Work envisaged: Software development, in-depth analysis of data, storage and retrieval of information on marine fishery resources and dissemination to end users. Storage of data collected by other Divisions and Computerisation of the same.

11. Date of start : April 1992

12. Likely date of completion : March 1995

13. Estimated man-months : 15.6 Man months/year

14. Facilities required : Nil

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

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

(a) Name of the financing organisation.
(b) Title of the project.

16. Approximate cost:

(a)	Salary of Scientific staff	:	Rs. 1,00,300/-
(b)	Salary of Technical staff	:	Rs. 3,05,000/-
(c)	Salary of supporting staff	:	
(d)	Casual labour cost, if any	:	
(e)	Cost of equipment, facility etc.	:	Rs.1,00,000/- (software)
(f)	Contingencies, such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:	Rs. 30,000/-
	Maintanence of the computer system.	:	Rs.2,00,000/-
(g)	T.A.	:	
	Total cost	:	Rs.7,35,300/-

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. **Institute Code No.** PF/RE/1.1 2. **I.C.A.R. Code No**

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

4. Title of Project : Investigations on clupeoid fishes

5. Title of Sub-Project : Fishery and Resource characteristics of Sardines (Sardinella spp.)

6. Name and Designation of Project Leader : A.A. Jayaprakash, Scientist (S.G.)

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Karwar	K. Preetha	S	40	1-7
Mangalore	Prathibha Rohit	S	40	1-7
Calicut				
Cochin	A.A. Jayaprakash	S(SG)(PL)	50	1-7
Tuticorin	P. Sam Bennet	S(SG)(APL)	50	1-7
Madras	N.S. Radhakrishnan	S(SG)	50	1-7
Visakhapatnam				

Technical Assistance: V.M. Dhareshwar (Karwar), Uma S. Bhat (Mangalore), V.K. Janaki (Calicut), V.R. Arunachalam, G. Sampath Kumar (Cochin), G. Arumugham (Tuticorin), G. Srinivasan (Madras), K. Divakar (Visakhapatnam)

8. Location of the Research Project : Karwar, Mangalore, Calicut, Cochin, Tuticorin, Madras, Visakhpatnam

9. a) Objectives: 1. To assess the magnitude of the exploited resources. 2. To study the relative composition and specieswise abundance of the group in major gears. 3. To study the biological characteristics of the different species. 4. To interpret the fluctuations in abundance with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource along the west and east coasts of India.

b) Practical Utility: Estimated annual average catches of 176,900 tonnes of oil sardine and 86,360 tonnes of lesser sardines are obtained along the Indian coast (1991). The project aims at understanding the effect of exploitation on the stock to enable proper management of the resource. Further, knowledge of the fluctuations in abundance with reference to environmental characteristics will throw light on the movements/availability of the resource in the fishing grounds.

10. Technical Programme: 1. Collection and analysis of data on effort, catch and species composition from different gears along the west and east coasts of India. 2. Collection of data on length of different species from different gears. 3. Estimation of growth by studying hard parts of body and mortality parameters. 4. Collection of data on the juvenile and young fish component in the different gears. 5. To correlate the fluctuations in abundance with reference to environmental characteristics. 6. Collection of information on price structure of the dominant species at the centre. 7. Analysis of the data collected on the above aspects, and submission of the periodical reports.

11. Date of start: April '92 12. Likely date of completion: March '96

13. Estimated man-months : 27 man months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.402000
b)	Salary of technical staff :	" 159000
c)	Salary of supporting staff :	"
d)	Casual labourer cost, if any :	
e)	Cost of equipment, facility etc. :	
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. :	" 34800
g)	TA/DA :	" 15000
h)	Total cost :	6,10,800

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. **Institute Code No.** PF/RE/1.2 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on clupeoid fishes

5. Title of Sub-Project : Fishery and Resource characteristics of Anchovies

6. Name and Designation of Project Leader : N.S. Radhakrishnan, Scientist Selection Grade

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Bombay	M. Zaffar Khan,	S(SG)	40	1-7(Coilia)
Mangalore	Prathibha Rohit,	S	30	1-7(Whitebaits)
Cochin	A.A. Jayaprakash,	S(SG)	50	1-7(")
Vizhinjam	G. Gopakumar	S(SG)(APL)	30	1-7(")
Madras	N.S. Radhakrishnan	S(SG)(PS)	50	1-7(")

Technical Assistance: J.D. Sarang (Bombay), Vaman Naik (Mangalore), M.N.K.Ebayathu (Cochin), A.K. Velayudhan (Vizhinjam), G. Srinivasan (Madras)

8. Location of the Research Project : Bombay, Mangalore, Cochin, Vizhinjam, Madras, Karwar

9. a) Objectives: 1. To assess the magnitude of the exploited resources. 2. To study the relative composition and specieswise abundance of the group in major gears. 3. To study the biological characteristics of the different species. 4. To interpret the fluctuations in abundance with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource.

b) Practical Utility: Estimated annual catches of 86,000 t (1991) of Anchovies are obtained along the Indian coasts. The project aims at understanding the effect of exploitation on the stock to enable proper management of the resource. Further, knowledge of the fluctuations in abundance with reference to environmental characteristics will throw light on the movements/availability of the resource in the fishing grounds.

10. Technical Programme: 1. Collection and analysis of data on effort, catch and species composition from different gears. 2. Collection of data on length of different species from different gears. 3. Estimation of growth and mortality parameters. 4. Collection of data on the juvenile and youngfish component in the different gears. 5. To correlate the fluctuations in abundance with reference to environmental characteristics. 6. Collection of information on price structure of the dominant species at the centre. 7. Analysis of the data collected on the above aspects, and submission of the periodical reports.

11. Date of start : April '92 12. Likely date of completion: March '96

13. Estimated man-months : 2½ man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.261800
b)	Salary of Technical staff :	" 122000
c)	Salary of supporting staff :	
d)	Casual labourer cost, if any:	
e)	Cost of equipment, facility etc. :	
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. :	" 22000
g)	TA/DA :	" 11000
h)	Total cost :	" 416800

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PF/RE/2.1 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on Scombroid fishes

5. Title of Sub-Project : Fishery & Resource characteristics of Seerfishes

6. Name and Designation of Project Leader : C. Muthiah, Scientist Selection Grade

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Veraval	K.P. Said Koya,	S	30	1-7
Bombay	Alexander Kurian,	Sr.S	30	1-7
Mangalore	C. Muthiah,	Sr.S(PL)	40	1-7
Calicut				
Cochin	N.G.K. Pillai,	Sr.S	45	1-7
Tuticorin	H. Mohamed Kasim,	Sr.S(APL)	30	1-7
Madras	R. Thiagarajan	S(S.G)	30	1-7

Technical Assistance: H.K. Dhokia (Veraval), J.D. Sarang (Bombay), Alli C. Gupta (Mangalore), K.K. Balasubramaniam (Calicut), M.N.K. Elayathu (Cochin), T.S. Balasubramaniam (Tuticorin), P.K. Mahadevan Pillai (Technical Officer, Madras).

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

9. a) Objectives: 1. To assess the magnitude of the exploited resources. 2. To study the relative composition and specieswise abundance of the group in major gears. 3. To study the biological characteristics of the different species. 4. To interpret the fluctuations in abundance with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource. 6. Impact of ring seine in the exploitation of juveniles.

b) Practical Utility: Estimated annual average catches of 36239 tonnes of seerfishes are obtained along the Indian coast during 1991. The project aims at understanding the effect of exploitation on the stock to enable proper management of the resource. Further, knowledge of the fluctuations in abundance with reference to environmental characteristics will throw light on the movements/availability of the resource in the fishing grounds.

10. Technical Programme: 1. Collection and analysis of data on effort, catch and species composition from different gears along the west and east coasts of India. 2. Collection of data on length of different species from different gears such as drift gillnets, tralwers and hooks and lines. 3. Estimation of growth and mortality parameters. 4. Collection of data on the juvenile and youngfish component in the different gears. 5. To correlate the fluctuations in abundance with reference to environmental characteristics. 6. Collection of information on price structure of the dominant species at the centre. 7. Analysis of the data collected on the above aspects and submission of the periodical reports.

11. Date of start : April '92 12. Likely date of completion: March '96

13. Estimated man-months : 25 man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff	:	Rs. 186,900
b)	Salary of technical staff	:	" 120,000
c)	Salary of supporting staff	:	
d)	Casual labourer cost, if any	:	
e)	Cost of equipment, facility etc.		
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc.	:	" 24,600
g)	TA/DA	:	" 12,000
h)	Total cost	:	" 343500

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PF/RE/2.2 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on Scombroid fishes

5. Title of Sub-Project : Fishery & Resource characteristics of tunas and billfishes

6. Name and Designation of Project Leader : P.P. Pillai, Principal Scientist

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Veraval	K.P. Said Koya	S	40	1-7
Bombay	M. Zaffar Khan	S(SG)	30	1-7
Mangalore	C. Muthiah	Sr.S	40	1-7
Calicut				
Cochin	P.P. Pillai	PS(PL)	50	1-7
	N.G.K. Pillai	Sr.S (APL)	30	1-7
Vizhinjam	G. Gopakumar	S(SG)	40	1-7
Tuticorin	H. Mohamed Kasim	Sr.S	40	1-7
Madras	R. Thiagarajan	S(SG)	40	
Minicoy	M. Sivadas	S	50	1-8
"	A.K.V. Nasser	S	25	8

Technical Assistance: H.K. Dhokia (Veraval), J.D. Sarang (Bombay), S. Kemparaju (Mangalore), K.K. Balasubramaniam (Calicut), M.N.K. Elayathu (Cochin), P. Sadasiva Sharma (Vizhinjam), T.S. Balsubramaniam (Tuticorin), S. Kandasamy (Madras), A. Anasu Koya, A. Kunhikoya (Minicoy)

8. Location of the Research Project : Veraval, Bombay, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Madras, Minicoy

9. a) Objectives: 1. To assess the magnitude of the exploited resources of tunas, billfishes and baitfishes. 2. To study the relative composition and specieswise abundance of the groups in major gears. 3. To study the biological characteristics of the different species of tunas. 4. To interpret the fluctuations in abundance of tunas and baitfishes with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource of tunas in all islands in Lakshadweep.

b) Practical Utility: Potential for the development of tuna fishery and its industrial applications is great in India. Species such as the long tail tuna and yellow fin tuna have considerable export potential. Skipjack tuna form the mainstay of the economy of Lakshadweep. Other species of tunas also have good internal market. Estimation of the resource potential of these species is a prerequisite for suggesting developmental programmes. Information on the resources will be useful while expanding the fisheries.

10. Technical Programme: 1. Collection and analysis of data on effort, catch and species composition of tunas, billfishes and baitfishes from different gears along the west and east coasts of India. 2. Collection of data on length of different species of tunas from different gears. 3. Estimation of growth and mortality parameters of tunas/ ... by studying hard parts. 4. Collection of data on the juvenile and youngfish component of tunas in the different gears. 5. To correlate the fluctuations in abundance with reference to environmental characteristics. 6. Collection of information on price structure of the dominant species at the centre. 7. Analysis of the data collected on the above aspects and submission of the periodical reports. 8. Monitor tuna catch along the northern islands of Lakshadweep by periodical visits.

11. Date of start : April '92 12. Likely date of completion: March '96

13. Estimated man-months : 43 man-months

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.41,5800
b)	Salary of technical staff :	" 16,6000
c)	Salary of supporting staff :	
d)	Casual labourer cost, if any :	
e)	Cost of equipment, facility etc. :	" 5000
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. :	" 43,600
g)	TA/DA :	" 45,000
h)	Total cost :	Rs.675,400

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PF/RE/2.3 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations of Scombroid fishes

5. Title of Sub-Project : Fishery and resource characteristics of mackerel

6. Name and Designation of Project Leader : G. Gopakumar, Scientist (SG)

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

Centre	Name & Designation		Time to be spent (%)	Work to be done
Karwar	K. Preetha	S	30	1-7
Mangalore	Prathibha Rohit	S	30	1-7
Calicut				
Cochin	P.P. Pillai	PS(APL)	25	1-7
	P.N.R. Nair	Sr.S	40	1-7
Vizhinjam	G. Gopakumar	S(SG)(PL)	30	1-7
Tuticorin	H. Mohamed Kasim	Sr.S.	30	1-7
Mandapam	V. Gandhi	S(SG)	25	1-7
Visakhapatnam	G. Luther	PS	25	1-7

Technical Assistance: V.M. Dhareshwar (Karwar), Alli C. Gupta (Mangalore), K.K. Balasubramaniam (Calicut), M. Abdul Nizar, V.R. Arunachalam (Cochin) A.K. Velayudhan (Vizhinjam), T.S. Balasubramaniam (Tuticorin), N. Ramamurthy (Mandapam), V.A. Abbulu (Kakinada), M.S. Sumithrudu (Visakhapatnam)

8. Location of the Research Project : Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Mandapam, Visakhapatnam

9. a) Objectives: 1. To assess the magnitude of the exploited resources. 2. To study the relative composition and specieswise abundance of the group in major gears. 3. To study the biological characteristics of the different species. 4. To interpret the fluctuations in abundance with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource.

b) Practical Utility: Estimated catch of 124,000 tonnes of Indian mackerel are landed along the Indian coast. The proposed research on the mackerel stocks of India will lead to an understanding of the characteristics of the resource which in turn will help in developing suitable policies for the effective management of this resource. Further the project also leads to interpretation of the effect of environmental characteristics on the movement/availability of the resource in the fishing grounds along the east coast of India also.

10. Tehnical Programme: 1. Collection and analysis of data on effort, catch and species composition from different gears. 2. Collection of data on length of different species from different gears such as purse seiners, trawlers and ring seines. 3. Estimation of growth and mortality parameters. 4. Collection of data on the juvenile and young fish component in the different gears especially by ring seine and other nets. 5. To correlate the fluctuations in abundance with reference to environmental characteristics. 6. Collection of information on price structure of the dominant species at the centre. 7. Analysis of the data collected on the above aspects and submission of the periodical reports.

11. Date of start : April '92 12. Likely date of completion: March '96

13. Estimated man-months : 31 man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.	2,87,700
b)	Salary of technical staff :	"	1,59,000
c)	Salary of supporting staff :		
d)	Casual labourer cost, if any :		
e)	Cost of equipment, facility etc. :		
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc :	"	28,200
g)	TA/DA :	"	12,000
h)	Total cost :		486,900

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PF/RE/3 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on Bombay duck

5. Title of Sub-Project : Fishery and resource characteristics of Bombay duck

6. Name and Designation of Project Leader : Alexander Kurian, Senior Scientist

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Veraval	K.P. Said Koya	S	30	1-9
Bombay	Alexander Kurian	Sr.S(PL)	40	1-9

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

8. Location of the Research Project : Veraval, Bombay

9. a) Objectives: 1. To assess the relative abundance of Bombay duck in space and time. 2. To monitor the characteristics of the resource such as size and age composition, spawning cycle, growth rate and mortality. 3. To interpret the fluctuations of Bombay duck with reference to environmental characteristics. 4. To study the effect of fishery on the population in relation to stock size.

b) Practical Utility: Bombay duck forms an important fishery in India. As there are indications of the resources being subjected to heavy fishing a detailed monitoring and assessment of the stocks is necessary for the proper management of the stocks.

10. Technical Programme: 1. Accurate resources data especially on catch and effort will be collected from the landing centres and from the survey vessels. 2. Collection of data on gear-wise and depth-wise catches. 3. Biological aspects such as size distribution, age and growth, food and feeding habits, maturity, sex ratio, spawning and mortality will be studied. 4. Collection of average auction price per tonne at landing centre. 5. Collection of data on average mesh size of the gear employed in the fishery. 6. Collection of data on the juvenile and young fish component in different gears. 7. Study of the resources data for stock assessment. 8. To correlate the fluctuations in abundance with reference to environmental characteristics. 9. Analysis of the data collected on the above aspects, and submission of the periodical reports.

11. Date of start : April '92 12. Likely date of completion: March '96

13. Estimated man-months : 10 man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.	76,100
b)	Salary of technical staff :	"	32,000
c)	Salary of supporting staff :		
d)	Casual labourer cost, if any :		
e)	Cost of equipment, facility etc. :		
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. :	"	9,600
g)	TA/DA :	"	12,000
h)	Total cost :	Rs.	129,700

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PF/RE/4 2. I.C.A.R. Code No.

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

4. Title of Project : Fishery and Resource characteristics of Ribbon fishes

5. Title of Sub-Project :

6. Name and Designation of Project Leader : P.N.R. Nair, Senior Scientist

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

Centre	Name & Designation		Time to be spent (%)	Work to be done (Tech. Programme)
Veraval	K.K. Joshi,	S	25	1-8
Bombay	M.Z. Khan,	S(SG)	30	1-8
Karwar	K. Preetha,	S	30	1-8
Cochin	P.N.R. Nair,	Sr.S(PL)	30	1-8
Tuticorin	P. Sam Bennet	S(SG)	50	1-8
Madras	R. Thiagarajan	S(SG)(APL)	30	1-8
Kakinada	A. Raju	S(SG)	30	1-8
Vizhinjam	S. Lazarus	Sr.S.	25	1-8.

Technical Assistance: H.K. Dhokia (Veraval), J.D. Sarang (Bombay), N. Chennappa Gowda (Karwar), V.R. Arunachalam (Cochin), R. Rajapackiam (Tuticorin), S. Kandasamy (Madras), V.A. Abbulu (Kakinada), A.K. Velayudhan (Vizh)

8. Location of the Research Project : Veraval, Bombay, Karwar, Cochin, Tuticorin, Madras, Kakinada, Vizhinjam

9. a) Objectives: 1. To assess the magnitude of the exploited resources. 2. To study the relative composition and specieswise abundance of the group in major gears. 3. To study the biological characteristics of the different species. 4. To interpret the fluctuations in abundance with reference to environmental characteristics. 5. To understand the effect of exploitation on the resource.

b) Practical Utility: Estimated annual catch of 78,000 tonnes of ribbon fish forming 8% of the pelagic fish catch is landed from the Indian seas. The proposed research on the ribbon fish will lead to an understanding of the characteristics of the resource which in turn will help in developing suitable policies for the effective management of this resource. Further the project leads to interpretation of the effect of environmental characters on the movement/availability of the resource in the fishing grounds.

10. Technical Programme: 1. Collection and analysis of data on effort, catch and species composition from different gears. 2. Collection of data on length of different species from different gears. 3. Study of the other aspects of biology of dominant species. 4. Estimation of growth and mortality parameters. 5. Collection of data on the juvenile and youngfish component in the different gears. 6. To correlate the fluctuations in abundance with reference to environmental characteristics. 7. Collection of information on price structure of the dominant species at the centre. 8. Analysis of the data collected on the above aspects and submission of the periodical reports.

11. Date of start: April '92 12. Likely date of completion: March '96

13. Estimated man-months : 25 man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost:

a)	Salary of scientific staff	:	Rs. 29,8000
b)	Salary of technical staff	:	" 14,6000
c)	Salary of supporting staff	:	
d)	Casual labourer cost, if any	:	
e)	Cost of equipment, facility etc.	:	
f)	Contingencies such as chemicals: fertilisers, seed, animals, feeds, sprayers etc.	:	" 30,400
g)	TA/DA	:	" 11,000
h)	Total cost	:	" 485,400

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993- 94

1. Institute Code No. PF/RE/5 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on the Fishery and Resource characteristics of Tuna live-baits in Lakshadweep

5. Title of Sub-Project :

6. Name and Designation of Project Leader : M. Sivadas, Scientist

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

Centre	Name & Designation		Time to be spent (%)	Work to be done
Minicoy	M. Sivadas,	S	50	As per technical programme (Minicoy)
"	A.K.V. Nasser	S	75	All other islands

Technical Assistance: A. Kunhikoya and A. Anasu Koya (Minicoy)

8. Location of the Research Project : Minicoy (Lakshadweep)

9. a) Objectives: 1. To monitor the tuna live-bait fishery in all islands in Lakshadweep. 2. To analyse samples for their biology with emphasis on population parameters. 3. To monitor the ecology of live-bait fishing grounds. 4. To formulate plans for future research, and management and development of live-baits at Lakshadweep.

b) Practical Utility: The success of pole and line tuna fishing depends on the availability of adequate quantities of live-baits. Optimal utilisation of this resource is therefore necessary to enhance and maintain the tuna fishery of Lakshadweep.

10. Technical Programme: 1. Studies on the live-bait fishery at Minicoy, Agatti, Bitra, Suheli, Kavaratti, Kalpeni and Chetlat Islands and also in other islands where active tuna fishing by pole and line (live-bait) fishery is being practised; also to investigate the species composition of live-baits, utilisation of live-baits in the fishery and time involved in the collection of baits. 2. Food and feeding, reproduction and other biological parameters relevent in the understanding the population will be collected. 3. Destruction of the coral ecosystem by live-bait fishing, if any, and general hydrography of bait grounds will be monitored. 4. The data collected will be analysed and suitable management options will be recommended for the live-bait fishery. 5. Preparation of tuna live-bait atlas.

11. Date of start: April 1993 12. Likely date of completion: April 1996

13. Estimated man-months : 18 man-months/year

14. Facilities required:

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of financing organisation :

b) Title of project :

16. Approximate cost:

a)	Salary of scientific staff :	Rs.	1,80,000
b)	Salary of technical staff :	"	85,000
c)	Salary of supporting staff :		
d)	Casual labourer cost, if any:	"	16,000
e)	Cost of equipment, facility: etc.	"	25,000
f)	Contingencies, such as chemicals, fertilisers, seed, animals, feeds sprayers, etc :	"	16,000
g)	TA/DA :	"	25,000
h)	Total cost :	"	347,000

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

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

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

4. Title of Project :: Investigations on the characteristics of major exploited demersal finfish resources for judicious management.

5. Title of Sub-project : Studies on the resources and biology of elasmobranchs

6. Name and Designation of Project Leader : P. Devadoss, Senior Scientist.

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Veraval	G. Mohanraj, S (SG)	30	1 - 5
Bombay	S.G. Raje, S (SG)	45	1 - 5
Calicut			
Cochin	Grace Mathew, S, S2	40	1 - 5
Mandapam	V. Gandhi, S (SG)	25	1 - 5
Tuticorin	K.M.S.A. Hamsa, S (SG)	40	1 - 5
Madras	P. Devadoss, SS	45	1 - 5

Technical Assistance : H.K. Dhokia, B.B. Chavan, K.M. Venugopalan, M. Badrudeen, M. Rajapackiam and P. Ramadoss.

9. Location of the Research project : Veraval, Bombay, Calicut, Cochin, Mandapam, Tuticorin and Madras.

9. (a) Objectives: To assess the effect of exploitation on the resource and to understand the relationship between the environment and the fluctuations in the abundance of important species.

(b) Practical Utility: (1) An estimated annual average of 53,000 tonnes of elasmobranchs are landed in India. The project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics so that suitable predictions can be made.

10. Technical Programme: (1) Collection of data on effort catch and species composition from different gears. (2) Collection of data on length of sharks, skates and rays. (3) Samples to be examined for study of biology. (4) Correlation and interpretation of resource abundance with reference to environmental parameters. (5) Analysis and interpretation of the data.

11. Date of start : 1992-'93 12. Likely date of completion: 1995-'96

13. Estimated man-months : 32

14. Facilities required:

i) Land	:	v) Fish ponds	:
ii) Labour	:	vi) Foreign exchange	:
iii) Special requirement	:	vii) Other items	:
iv) Animal shed	:	viii) Total estimated cost	:

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost :

a)	Salary of Scientific Staff	:	Rs.	2,15,000
B)	Salary of Technical Staff	:	Rs.	60,000
c)	Salary of Supporting Staff	:		
d)	Casual labourer cost, if any	:		
e)	Cost of equipment, facility etc.	:		
f)	Contingencies such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:	Rs.	15,000
g)	T.A. / D.A.	:	Rs.	15,000
h)	Total cost	:	Rs.	3,05,000

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No: DF/RE/2. 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on the characteristics of major exploited demersal finfish resources for judicious management

5. Title of Sub-project : Studies on the biology and fisheries of major perches (Serranids, Lutjanids, Lethrinids etc).

6. Name and Designation of Project Leader : S. Lazarus, Senior Scientist

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Cochin	Grace Mathew, S, S2	35	1 - 5
Vizhinjam	S. Lazarus, SS	50	1 - 5
Tuticorin	K.M.S.A. Hamsa, S (SG)	35	1 - 5
Mandapam	V. Gandhi, S (SG)	25	1 - 5

Technical Assistance : K.M. Venugopalan, S.G. Vincent, M. Rajapackiam and M. Badrudeen.

8. Location of the Research Project : Cochin, Vizhinjam, Tuticorin and Mandapam.

9. (a) Objectives: To assess the effect of exploitation on the resources and to understand the relationship between environment and the resource fluctuations in space and time.

(b) Practical Utility : (1) An estimated annual average of 36,500 tonnes of perches are landed in India. The project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics so that suitable predictions can be made.

10. Technical programme : (1) Collection and analysis of data on effort, catch and species composition of snappers, Rock cods and pigface bream from different gears. (2) Collection of data on length and other aspects of biology of different species. (3) Analysis of data for stock assessment. (4) Correlation and interpretation of resource abundance with reference to environmental characteristics. (5) Analysis and interpretation of data.

11. Date of start : 1992-'93 12. Likely date of completion : 1995-'96

13. Estimated man-months : 18

14. Facilities required :

i)	Land :	v)	Fish ponds
ii)	Labour :	vi)	Foreign exchange
iii)	Special requirement :	vii)	Other items
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost :

a)	Salary of Scientific Staff :	Rs.	1,20,000
b)	Salary of Technical Staff :	Rs.	30,000
c)	Salary of Supporting Staff :		
d)	Casual labourer cost, if any :		
e)	Cost of equipment, facility etc.:		

f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc.	:	Rs. 10,000
g)	T.A./D.A.	:	Rs. 8,000
h)	Total cost	:	Rs. 1,68,000

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. DF/RE/3 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on the Characteristics of major exploited demersal finfish resources for judicious management

5. Title of Sub-project : Studies on the biology and resource management of Catfishes

6. Name and Designation of Project Leader : N.G. Menon, Senior Scientist.

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

Centre	Name and Designation	Time to be spent %)	Work to be done
Veraval	G. Mohanraj, S (SG)	40	1 - 5
Bombay	S.G. Raje, S (SG)	30	1 - 5
Karwar	P. Livingston, S (SG)	30	1 - 5
Mangalore	P.U. Zachariah, S	40	1 - 5
Calicut	M. Feroz Khan, S	25	1 - 5
Cochin	N.G. Menon, SS	60	1 - 5
Mandapam	P. Jayasankar, S	30	1 - 5
Madras	E. Vivekanandan, SS	30	1 - 5
Visakhapatnam	Y. Appanna Sastry, S (SG)	50	1 - 5

Technical Assistance: H.K. Dhokia, B.B. Chavan, V.M. Dhareshwar, Y. Muniappa, K. Nandakumaran, K. Balachandran, A.C. Sekhar, V. Narayana Rao.

8. Location of the Research Project : Veraval, Bombay, Karwar, Mangalore, Calicut, Cochin, Mandapam, Madras and Visakhapatnam.

9. (a) Objectives : (1) To assess the effect of exploitation on the resources and to understand the relationship between the environment and the resource fluctuations in space and time.

(b) Practical Utility: (1) An estimated annual average of 50,000 tonnes of Catfishes are landed in India. The project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics.

10. Technical Programme : (1) Collection of effort, catch and species composition data from different gears such as trawl net, gill net, purse seines. (2) Collection of biological data on major constituent species. (3) Estimation of stock and sustainable yield. (4) Correlation of resource abundance with environmental parameters. (5) Estimation of juvenile, spawners and brooders catfish destruction from the exploited zone.

11. Date of start : 1992-'93

12. Likely date of Completion : 1995-'96

13. Estimated man-months : 41

14. Facilities required :

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange:
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation:

b) Title of the Project :

16. **Approximate cost :**

a)	Salary of Scientific Staff	:	Rs.	2,55,000
b)	Salary of Technical Staff	:	Rs.	1,00,000
c)	Salary of Supporting Staff	:	Rs.	
d)	Casual labour cost, if any	:		
e)	Cost of equipment, facility etc.	:		
f)	Contingencies such as chemicals, fertilizers, seeds, animals, feeds, sprayers etc.	:	Rs.	10,000
g)	T.A. / D.A	:	Rs.	25,000
h)	Total cost	:	Rs.	3,90,000

17. **Signatures of :**

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. DF/RE/4 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on the characteristics of major exploited demersal finfish resources for judicious management

5. Title of Sub-project : Stock assessment of Threadfin breams and Silver bellies

6. Name and Designation of Project Leader : E. Vivekanandan, Senior Scientist.

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Veraval	P.P. Manoj Kumar, S	30	1 - 6
Bombay	S.K. Chakraborty, SS	40	1 - 6
Mangalore	P.U. Zacharias, S	50	1 - 6
Cochin	N.G. Menon, SS	40	1 - 6
Mandapam	V. Gandhi, S (SG)	25	1 - 6
Tuticorin	V.S. Rangaswamy, S	25	1 - 6
Madras	E. Vivekanandan, SS	45	1 - 6
Kakinada	A. Raju, S (SG)	40	1 - 6
Visakhapatnam	R. Sarvesan, S (SG)	40	1 - 6

Technical Assistance : Takur Das, Ali. C. Gupta, R. Reghu, M. Shahrudeen, M. Rajapackiam, S. K. Balakumar, A.C. Sekhar, P. Ramalingam and C.V. Seshagiri Rao.

8. **Location of the Research Project** : Bombay, Mangalore, Cochin, Mandapam, Tuticorin, Madras, Kakinada, Visakhapatnam. and Veraval.

9. (a) Objectives : To assess the effect of exploitation on the resources and to understand the relationship between environment and the fluctuations.

(b) Practical Utility: (1) An estimated annual average of 90,000 tonnes of threadfin bream and Silverbellies are landed in India. The Project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics so that suitable predictions can be made.

10. Technical Programme: (1) Collection of data on effort, catch and species composition of threadfin breams and Silver bellies. (2) Collection of length data on 6 dominant species of Silver bellies, (4) Collection of other biological data. (5) Stock assessment of the above species. (6) Correlation of environmental data with resource abundance.

11. Date of start : 1992-'93

12. Likely date of completion: 1995-'96

13. Estimated man-months : 38

14. Facilities required :

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

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

a) Name of financing organisation :

b) Title of Project :

16. Approximate cost:

a)	Salary of Scientific Staff	:	Rs.	2,40,000
b)	Salary of Technical Staff	:	Rs.	1,00,000
c)	Salary of Supporting Staff	:		
d)	Casual labourer cost, if any	:		
e)	Cost of equipment, facility etc.	:		
f)	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	Rs.	20,000
g)	T.A. /D. A.		Rs.	25,000
h)	Total cost		Rs.	3,85,000

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. DF/RE/5 2. I.C.A.R. Code No.

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

4. Title of Project : Investigations on the characteristics of major exploited demersal finfish resources for judicious management

5. Title of Sub-project : Stock assessment of Croakers

6. Name and Designation of Project Leader : S.K. Chakraborty, Senior Scientist

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Veraval	P.P. Manoj Kumar, S	40	1 - 5
Bombay	S.K. Chakraborty, SS	60	1 - 5
Karwar	P. Livingston, S (SG)	10	1 - 5
Mangalore	C. Muthiah, S (SG)	20	1 - 5
Calicut	M. Feroz Khan, S	25	1 - 5
Cochin	S. Sivakami, SS	30	1 - 5
Tuticorin	V.S. Rengaswami, S	25	1 - 5
Mandapam	P. Jayasankar, S	40	1 - 5
Madras	P. Devadoss, SS	30	1 - 5
Kakinada	A. Raju, S (SG)	35	1 - 5
Visakhapatnam	Y. Appanna Sastry, S (SG)	50	1 - 5

Technical Assistance : H.K. Dhokia, Takur Das, V.M. Dhareshwar, Ali C. Gupta, K. Nandakumaran, P.K. Seetha, M. Rajapackiam, P. Ramadoss, P. Ramalingam, C.V. Seshagiri Rao.

8. Location of the Research Project : Veraval, Bombay, Karwar, [illegible], Mangalore, Calicut, Cochin, Tuticorin, Mandapam, Madras, Kakinada and Visakhapatnam.

9. (a) Objectives : To assess the effect of exploitation on the resources and to understand the relationship between environment and their fluctuations in abundance.

(b) Practical Utility: (1) An estimated annual average of 107,000 tonnes of croakers are landed in India. The Project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics.

10. Technical Programme : (1) Collection and analysis on fishing effort, catch and species composition. (2) Collection and analysis of biological data on the major constituent species. (3) Estimation on growth, mortality rates and yield per recruits. (4) Correlation of environmental characteristics with fluctuations in abundance. (5) Collection of similar data on "Ghol", "Koth", etc.

11. Date of start : 1992-'93

12. Likely date of Completion : 1995-'96

13. Estimated man-months : 50

14. Facilities required :

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

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

a) Name of financing organisation :

b) Title of project :

16. **Approximate cost :**

a)	Salary of Scientific Staff	: Rs.	2,70,000
b)	Salary of Technical Staff	: Rs.	1,10,000
c)	Salary of Supporting Staff	:	
d)	Casual labourer cost, if any	:	
e)	Cost of equipment, facility etc	: Rs.	15,000
f)	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	: Rs.	15,000
g)	T.A. / D.A	: Rs.	20,000
h)	Total cost	: Rs.	4,15,000

17. Signatures of :

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No. DF/RE/6 2. I.C.A.R. Code No.

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

4. Title of Project : Minor demersal finfish resources assessment

5. Title of Sub-project : Biology and resources characteristics of lizard fishes, Polynemids and flat heads

6. Name and Designation of Project Leader : S. Sivakami, Senior Scientist

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Veraval	P.P. Manoj Kumar, S	30	1- 4
Bombay	S.G. Raje, S (SC)	25	1- 4
Calicut	M. Feroz Khan, S	25	1- 4
Cochin	S. Sivakami, PS	50	1- 4
Tuticorin	V.S. Rengaswami, S	25	1- 4
Madras	J.C. Chenamuthu, S (SG) until August and E. Vivekanandan, SS thereafter	25	1- 4

Technical Assistance: H.K. Dhokia, B.B. Chavan, K. Nandakumaran, P. K. Seetha, M. Rajapackiam, S.K. Balakumar and K. Narayana Rao.

8. Location of the Research Project : Veraval, Bombay, Calicut, Cochin, Tuticorin and Madras.

9. (a) Objectives: To assess the effect of exploitation on the resources and to understand the relationship between environment and the fluctuations in their abundance.

(b) Practical Utility : (1) The Project aims at understanding the effect of exploitation of lizard fishes, threadfin and flat heads, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics.

10. Technical Programme: (1) Collection and analysis of data on effort, catch and species composition of the 3 groupers from different gears. (2) Collection and analysis of biological data. (3) Estimation of growth and other parameters. (4) Interpretation of resource abundance with environmental parameters.

11. Date of start : 1992-'93

12. Likely date of completion : 1995-'96

13. Estimated man-months : 22

14. Facilities required :

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange :
iii)	Special requirements :	vii)	Other items :
iv)	Animal feeds :	viii)	Total estimated cost :

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

a) Name of financing organisation :

b) Name of Project :

16. Approximate cost :

a)	Salary of Scientific Staff	:	Rs.	1,30,000
b)	Salary of Technical Staff	:	Rs.	80,000
c)	Salary of Supporting Staff	:		
d)	Casual labourer cost, if any	:		
e)	Cost of equipment, facility etc.	:		
f)	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	Rs.	12,000
g)	T.A. / D.A	:	Rs.	15,000
h)	Total cost			2,37,000

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. DF/RE/7 2. I.C.A.R. Code No.

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

4. Title of Project : Minor demersal finfish resources assessment

5. Title of Sub-Project : Biology and fishery of flat fishes, Goat fishes and White fish

6. Name and Designation of Project Leader : P. Bensam, Principal Scientist

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Veraval	G. Mohanraj, S (SG)	30	1 - 4
Karwar	P. Livingston, S (SG)	30	1 - 4
Mangalore	P.U.Zacharia, S	30	1 - 4
Calicut	M. Feroz Khan, S	25	1 - 4
Cochin	P. Bensam, PS	25	1 - 4
	Grace Mathew, S.S2	25	1 - 2
Vizhinjam	S. Lazarus, SS	25	1 - 4
Tuticorin	K.M.S.A. Rumsa, S (SG)	25	1 - 4
Mandapam	P. Jayasankar, S	30	1 - 4
Madras	P. Devadoss, SS	25	1 - 4

Technical Assistance: H.K. Dhokia, V.M. Dhareshwar, C. Muniyappa, K. Nandakumaran, T. Narayanaswamy, K.M. Venugopalan, S.G. Vincent, M. Rajapackiam and P. Remadoss.

8. Location of the Research Project : Veraval, Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Mandapam and Madras.

9. (a) Objectives : To assess the effect of exploitation on the resources and to understand the relationship between environment and resource fluctuations in space and time.

(b) Practical Utility: (1) The project aims at understanding the effect of exploitation, so that suitable regulatory measures can be suggested. (2) The study helps in understanding the variations in abundance with reference to environmental characteristics.

10. Technical Programme: (1) Collection of data on effort, catch and species composition of (a) goat fish (b) flat fish (c) White fish from different gears. (2) Collection of biological data of main constituent species. (3) Estimation of growth and mortality rates. (4) Correlation and interpretation of data on environmental characteristics with fluctuations in abundance.

11. Date of start : 1992-'93 12. Likely date of completion: 1995-'96

13. Estimated man-months : 33

14. Facilities required :

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

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

a) Name of financing organisation :

b) Title of Project :

16. Approximate cost :

a) Salary of Scientific Staff	:	Rs.	2,00,000
b) Salary of Technical Staff	:	Rs.	1,30,000
c) Salary of Supporting Staff	:		
d) Casual labourer cost, if any	:		
e) Cost of equipment, facility etc.	:		
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	Rs.	15,000
g) T.A. / D.A	:	Rs.	20,000
h) Total cost	:	Rs.	3,65,000

17. Signatures of :

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. DF/CJL/3. 2. I.C.A.R. Code No.

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

4. Title of Project : Fin fish seed production

5. Title of Sub-project : Induced breeding and seed production of Seabass

6. Name and designation of Project Leader : P. Nammalwar, Senior Scientist.

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

Centre	Name and Designation	Time to be spent (%)	Work to be done
Mandapam	P. Nammalwar, SS	100	i - vii
Tuticorin	R. Marichamy, PS	25	i - ii
	V.S. Rengaswamy, S	25	i - ii

Technical Assistance: M. R. Arputharaj, N. Palanichamy, S. Rajapackiam and two more personnel, one each at Mandapam and Tuticorin, to be assigned by the Officer-in-Charge.

8. Location of the Research Project : Mandapam and Tuticorin

9. (a) Objectives: To produce the seeds of the Seabass by induced breeding so as to pave the way for commercial culture.

(b) Practical Utility: Seabass is a prime quality fish successfully bred and cultured in Thailand, Singapore and Philippines. Successful breeding would go a long way for providing the seeds of this fish for commercial culture.

10. Technical Programme: (i) Collection of mature specimens/ spawners at Mandapam and Tuticorin areas for maintenance of brood stock in ponds and net cages. (ii) Acclimatisation, conditioning and transportation of the specimens for induced breeding experiments from the various centres to the laboratory at Mandapam. (iii) Establishment of infrastructure facilities for induced breeding, larval rearing and nurseries, including sea water supply, water aeration etc. (iv) Establishment of larval food facilities (rotifers, Cladocera, Artemia) and microalgal food for the larval food. (v) Induced breeding experiments. (vi) Larval rearing and feeding in indoor tanks and nursery rearing and feeding in indoor and outdoor tanks. (vii) Fingerling rearing and feeding.

11. Date of start : 1992-93

12. Likely date of Completion : 1993-'94

13. Estimated man-months : 18

14. Facilities required:

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

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

a) Name of financing Organisation :

b) Title of Project :

16. Approximate cost :

a)	Salary of Scientific Staff :	Rs.	1,30,000
b)	Salary of Technical Staff :	Rs.	1,00,000
c)	Salary of Supporting Staff :	Rs.	50,000
d)	Casual labourer cost, if any :	Rs.	60,000
e)	Cost of equipment, facility etc. :		
f)	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc. :	Rs.	15,000
g)	T.A. /D.A. :	Rs.	15,000
h)	Total cost :	Rs.	3,70,000

17. Signatures of :

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT-1993-94

1. Institute Code No. CF/RE/1.11 — 2. I.C.A.R.Code No.

3. Name and address of Research Institute : C.M.F.R. Institute, Cochin-31.

4. Title of Project : Investigations on the exploitation, management and conservation of penaeid prawn resources of west coast of India.

5. Title of Sub-project : Nil

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

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Veraval	K.K.Philippose	S	40	i,ii,iii,vi
Bombay	V.D.Deshmukh	Sr.Sci.	25	i,ii,iii,vi
	M.Aravindakshan	S	50	i,ii,iii,vi
Karwar	V.S.Kakati	Sr.Sci.	50	i,ii,iii,vi
Cochin	C.Suseelan	Sr.Sci.	40	i,iv,v,vi
	K.N.Rajan	SG	100	i,ii,iii,vi
	K.R.Manmadhan Nair	SG	50	i,ii,iii,v, vi
	Mary K.Manissery	SG	50	i,ii,iii,vi
	P.E.Sampson Manickam	SG	35	i,ii,iii,vi
	Gopalakrishnan	SG	100	i, V, VI

Technical Assistance: B.P.Thumber (Veraval), A.D.Sawant, A.Y. Mestry (Bombay), C.K.Dinesh (Karwar), Sreedhara B., Y.Muniappa (Mangalore), K.Koumudi Menon, S.Lekshmi (Calicut), K.N.Gopalakrishnan, C.Nalini, K.Chellappan, P.K.Baby (Cochin), K.Sasidharan Pillai (Vizhinjam).

8. Location of the Research Project : Veraval, Bombay, Karwar, Mangalore, Calicut, Cochin.

9. (a) Objectives:

i. To study the distribution pattern, abundance and population characteristics of important species of penaeid prawns in space and time along the west coast of India.

ii. To assess the trend of production, sustainable yield levels and the effect of operation of different fishing gears on the resource.

iii. To study the stock-recruitment relationship and identify conservation needs of important species.

(b) Practical Utility:

The study will help in better management and conservation of the penaeid prawn resource which forms the back bone of the seafood export industry of the country. The data generated would form a strong scientific base to settle disputes between the mechanised and artisanal sectors involved in the exploitation of penaeid prawns and other management problems arising in different regions of the west coast.

10. Technical Programme:

i. Collection of gear-wise data on catch, effort and species composition of penaeid prawn fishery at selected centres along the west coast of India separately for mechanised, motorised and non-motorised sectors including nursery areas.

ii. Collection of data on mesh sizes and other gear particulars.

iii. Collection of data on various biological aspects of the constituent species in the fishery.

iv. Collection of depthwise information on abundance and population characteristics of major species by conducting experimental shrimp trawling using 'Cadalmin'.

v. Analysis of pelagic and midwater collections of shrimps taken during the past exploratory surveys.

vi. Comprehensive analysis of all the above data for writing reports/scientific papers and other purposes.

Work done: Data on catch, effort and biological aspects of important species have been collected from some of the centres in the past and partly analysed and the status of the fishery studied from time to time.

Work envisaged in the current year:

As per the technical programmes

11. Date of start : 1992-93 12. Likely date of completion : 1997-98

13. Estimated man-months : ~~325~~ X Man months/year : ~~65~~ 67

14. Facilities required:

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

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

16. Approximate Cost:

a)	Salary of scientific staff	....	~~564000~~ 57450
b)	Salary of technical staff	....	~~249600~~ 2[illegible]
c)	Salary of supporting staff		
d)	Casual labourer cost, if any.		
e)	Cost of equipment, facility etc.	....	120000 [illegible]
f)	Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	....	~~72000~~ 40,70
g)	T. A.	....	66000 6630
h)	Total cost	....	1071600 [illegible]

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT-1993-94

1. Institute Code No. CF/RE/1.12 — 2. I.C.A.R.Code No.

3. Name and address of Research Institute : C.M.F.R. Institute, Cochin-31.

4. Title of Project : Investigations on the exploitation, management and conservation of penaeid prawn resources of east coast of India.

5. Title of Sub-project : Nil

6. Name and designation of Project Leader : Dr.G.Sudhakara Rao, Senior Scientist.

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Visakhapatnam	G.Sudhakara Rao	Sr.Sci.	100	i to v
Madras	V.Thangaraj Subramanian	SG	75	i to v
Mandapam	G.Maheswarudu	S	25	i to v
Tuticorin	M. Rajamani	Sr.Sci.	50	i to v
Kakinada	K.N.Saleela	S	75	i to v

Technical Assistance:

P.V.K.Rao (Puri), J.B.Varma (Visakhapatnam), K.Dhanaraju (Kakinada) S.Mohan, P.Thirumilu, K.Shahul Hameed, V.Selvaraj, M.M.Sultan and K.S.Krishnan (Madras), A.Ramakrishnan (Mandapam), M.Manickaraja (Tuticorin).

8. Location of the Research Project : Visakhapatnam, Madras, Mandapam Tuticorin, Kakinada.

9. (a) Objectives:

1. To study the distribution pattern, abundance and population characteristics of important species of penaeid prawns in space and time along the east coast of India.

2. To assess the trend of production, sustainable yield levels and the effect of operation of different fishing gears on the resource.

3. To study the stock recruitment relationship and identify conservation needs of important species.

(b) Practical Utility:

The study will help in better management and conservation of the penaeid prawn resource which forms the back bone of the seafood export industry of the country. The data generated would form a strong scientific base to settle disputes between the mechanised and artisanal sectors involved in the exploitation of penaeid prawns and other management problems arising in different maritime states of east coast of India.

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10. Technical Programme:

i. Collection of gear-wise data on catch, effort and species composition of penaeid prawn fishery at selected centres along the east coast of India separately for mechanised, motorised and non-motorised sectors including nursery areas.

ii. Collection of data on mesh sizes and other gear particulars.

iii. Collection of data on various biological aspects of the constituent species in the fishery.

iv. Collection of depthwise information on abundance and population characteristics of major species.

v. Comprehensive analysis of all the above data for writing reports/scientific papers and other purposes.

Work done:

Data on catch, effort and biological aspects of important species have been collected from some of the centres in the past and partly analysed and the status of the fishery studied from time to time.

Work envisaged in current year:

As per the technical programmes.

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11. Date of start : 1992-93 12. Likely date of completion : 1997-98

13. Estimated man-months : 205 Man-months/year : 41

14. Facilities required:

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

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

16. Approximate cost:

a.	Salary of scientific staff	....	308800
b.	Salary of technical staff	....	172800
c.	Salary of supporting staff		
d.	Casual labourer cost, if any		
e.	Cost of equipment, facilities etc.		
f.	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	....	96000
g.	T.A.	....	28800
h.	Total cost	....	606400

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT-1993-94

1. Institute Code No.CF/RE/1.13 2. I.C.A.R. Code No.

3. Name and address of Research Institute : C.M.F.R.Institute, Cochin-31.

4. Title of Project : Investigations on the exploitation, management and conservation of non penaeid prawn resources of north west coast of India.

5. Title of Sub-project : Nil

6. Name & designation of Project Leader : V.D.Deshmukh, Senior Scientist.

7. Name(s)&designation(s) of project leader and project associates together with time proposed to be spent and work to be done.

Centre	Name	Desig-nation	Time to be spent (%)	Work to be done
Veraval	K.K.Philippose	S	35	i - iv
Bombay	V.D.Deshmukh	Sr.Sci.	50	i - iv
	M.Aravindakshan	S	50	i - iv

Technical Assistance:

B.P.Thumber (Veraval), A.Y.Mestry, A.D.Sawant (Bombay)

8. Location of the Research Project : Veraval, Bombay.

9. (a) Objectives

1. Assessment of the magnitude of exploited resources and potential stocks of various non-penaeid prawn species along the Gujarat and Maharashtra coasts.
2. Study of the population characteristics of important species in space and time.
3. Study of the stock-recruitment relationship and conservation needs of the resource.

(b) Practical Utility: Non-penaeid prawns support a major fishery along Gujarat and Maharashtra coasts. Continuous monitoring of the level of exploitation and assessment of stocks are of vital importance for proper management and conservation of the resource.

10. Technical Programme:

i) Collection of data on catch, effort and species composition of the nonpenaeid prawn landings of major gears at selected centres.
ii) Collection of data on mesh sizes and other gear particulars.
iii) Collection of data on various biological aspects of the constituent species in the fishery.
iv) Comprehensive analysis of the data collected for writing reports/scientific papers and for other purposes.

Work done: Data on catch, effort and biological aspects of important species have been collected in the past and partly analysed and status of the fishery studied from time to time.

Work envisaged in the current year: As per technical programme.

11. Date of start : 1992-93 12. Likely date of completion : 1997-98

13. Estimated man-months : 80 Man months/year : 16

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

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

16. Approximate cost:

a.	Salary of scientific staff	....	134400
b.	Salary of technical staff	....	57600
c.	Salary of supporting staff	....	
d.	Casual labourer cost, if any		
e.	Cost of equipment, facility etc.		
f.	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	....	6000
g.	T. A.		39600
h.	Total cost	....	237600

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT-1993-94

1. Institute Code No.CF.RE/1.14 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin-31.

4. Title of Project : Studies on exploitation, management and conservation of lobster and crab resources of Indian coast.

5. Title of Sub-project : Nil

6. Name and designation of Project Leader : N.Neelakanta Pillai, Senior Scientist.

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Veraval	K.K.Philippose	S	25	i-vii
Bombay	V.D.Deshmukh	Sr.Sci.	25	i-vii
Karwar	V.S.Kakati	Sr.Sci.	25	iv-viii
Cochin	N.Neelakanta Pillai	Sr.Sci.	25	i & vii
	C.Suseelan	Sr.Sci.	25	i-iii & vii
	Mary K.Manisseri	SG	25	iv-vii
Tuticorin	M.Rajamani	Sr.Sci.	25	vi-vii
	D.B.James	Sr.Sci	25	i-iii&vii
Mandapam Camp	G.Maheswarudu	S	25	i-vii
Madras	V.Thangaraj Subramanian	SG	25	i-vii
Kakinada	K.N.Saleela	S	25	1-vii

Technical Assistance:

B.P.Thumber (Veraval), A.D.Sawant, A.Y.Mestry (Bombay), C.K. Dinesh (Karwar), B.Shreedhara, Y.Muniappa (Mangalore), K.Koumudi Menon, S.Lakshmi (Calicut), K.Chellappan, P.K.Baby, C.Canili (Cochin), K.Sasidharan Pillai (Vizhinjam), M.Manickaraja (Tuticorin),

A.Ramakrishnan (Mandapam Camp), S.Mohan, P.Thirumilu, K.Shahul Hameed, V.Selvaraj, M.M.Sultan, K.S.Krishnan (Madras), K. Dhanaraju (Kakinada), P.V.Krishna Rao)Puri).

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8. Location of the Research Project : Veraval, Bombay, Tuticorin and Madras for lobsters.

Veraval, Bombay, Calicut, Cochin, Mandapam and Madras for Crabs.

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9. (a) Objectives:

1. To collect resources data on shallow water lobsters and commercially important crabs.

2. To elucidate the important biological aspects such as age and growth, food, seasonal abundance, reproduction, spawning migration and recruitment and assess the stock of commercially important species of crabs and lobsters.

(b) Practical Utility:

Lobsters has an important export market and forms one of the export commodities among crustacean landings in India. Crabs also form an important component of the crustacean landings in India contributing mainly to the internal market. Production and biological characteristics of these resources have to be fully determined and the rate of exploitation closely watched in order to avoid overfishing and to implement efficient management measures.

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10. Technical Programmes:

i. Data on catch and effort (gear-wise) of shallow water lobster to be collected.

ii. Data on mesh size and other particulars of the gear used and the price structure of the lobsters (head-on and head-less) to be recorded regularly.

iii. Detailed studies on species composition and sex-ratio-size distribution (sex-wise) and maturity stages/ ovigerous conditions in the population of the constituent species to be carried out.

iv. Data on catch and effort (gear-wise) of commercially important crabs to be collected.

v. Data on mesh size and other particulars of the gear used and the price structure of the commercially important crabs to be recorded regularly.

vi. Studies on species composition and sex-ratio, size-distribution (sex-wise) and maturity stages of the constituent species to be carried out.

vii. Detailed analysis of data collected on the above aspects for stock assessment and other studies, and preparation of reports and scientific papers.

viii. Brachiuran larval studies based on past exploratory survey collections.

Work done:

Data on the fishery and biology of shallow water lobsters and commercially important crabs have been collected at some of the centres. Studies on the various aspects of biology have been partly completed for P.polyphagus.

Work envisaged in the current year:

All the work as per technical programmes will be carried out.

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11. Date of start : 1992-93 12. Likely date of completion : 1997-98

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13. Estimated man months : 165 Man months/year : 33

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14. Facilities required:

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

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

16. Approximate cost:

a)	Salary of scientific staff	...	270000
b)	Salary of technical staff	...	420000
c)	Salary of supporting staff		
d)	Casual labourer cost, if any		
e)	Cost of equipment, facility etc.		
f)	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	...	36000
g)	T. A.	...	108000
h)	Total cost	...	834000

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT-1993-94

1. Institute Code No.CF/CUL/1.8 2. I.C.A.R.Code No.

3. Name and address of Research Institute : C.M.F.R.Institute, Cochin-31.

4. Title of Project : Hatchery production of monosex (Females) prawns

5. Title of Sub-project : Feminization of Penaeus semisulcatus by hormonal treatment and induction of triploidy by thermal manipulation

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

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Mandapam Camp	E.V.Radhakrishnan	Sr.Sci.	35	T.P. 1-5
	G.Maheswarudu	S	25	T.P. 1-5
Technical Assistance				
	M.K.Arputharaj		25	
	A.Ramakrishnan		25	

8. Location of the Research Project : Mandapam Camp.

9. (a) Objectives: Females of penaeid prawns such as P.monodon and P.semisulcatus are known to attain higher weight than males in a given period of time. So, in commercial farming monosex culture of females or sterilized males will be more profitable than mixed culture. The objective of the project is to produce monosex (females) and sterilized (Triploid) males of the prawn in the hatchery by hormonal/ thermal treatment.

(b) Practical Utility: Production of all-females stocks is of considerable importance because of its potential as a management tool in aquaculture. Since female prawns acquire higher weight than the males, monosex farming of females will not only help in shortening the culture period considerably but will also boost the production. In this

ntext, development of technology for successful feminization/ erilization of seeds produced in the hatchery by hormonal/ ermal manipulation will be of significant economic benefit to the mmercial shrimp farmers.

). Technical programme:

1. Breeding of P.semisulcatus in the hatchery.
2. Immersion treatment of fertilized eggs or sexually undifferentiated larvae in different concentrations of mammalian steroid hormones (Estradiol-17) or ecdysteroids at varying exposure periods to induce sex reversal.
3. Rearing of larvae (both treated and untreated) to post-larvae and juvenile size under captive conditions and evaluate the sex ratio to estimate the success of the treatment.
4. Administration of steroids through diet to induce feminization.
5. Application of heat, cold or pressure shock to eggs/larvae to induce triploidy and compare the growth of sterilized males with that of normal males.

resent status: Induced sex reversal by indirect (genetic) and irect (using sex steroids) methods are successfully carried out in any fishes. On the otherhand, crustaceans are relatively genetically unexplored. The dramatic sexual dimorphic growth in important penaeids like P.monodon and P.semisulcatus can be xploited by culturing the fast growing females in ponds to achieve igher production. It may be possible to cross a sex-reversed phenotypic male (female genotype, XX) with a normal female to produce a monosex (100 % female) progeny. It is not known whether mammalian sexual streoids can induce feminization in prawns; but ttempts can be made by immersion treatment, a technique which was successfully used in fishes. Sexual steroids are also present in crustaceans (Sandor, 1980) and their involvement in reproduction is also understood to a certain extent (R.G.Adiyodi, In: The Biology of Crustacea, Vol.9, Estrogenic activity was reported in the ovary of Panulirus argus and the oviposited eggs of Homarus americanus (Donahue, 1948). Further more, the ovaries of Portunus trituberculatus have been shown to convert (4^{14}) progesterone to 17 C-hydroxyprogesterone, testosterone and deoxycorticosterone which means that enzyme systems for the hydroxylation and that involved in cleavage of the progesterone side chain are present in the ovary (Teshima and Kanazava, 1971). Keeping the available information on the background, the project will explore the possibilities of feminization of P.semisulcatus by hormonal treatment. Efforts also will be made to induce triploidy and thereby sterilization in males by thermal/pressure shocks. Such sterilized males may improve their growth rate by channeling all their energy to somatic growth.

Work envisaged in the current year: As in technical programme.

11. Date of start : 1992-93 12. Likely date of completion : 1993-94

13. Estimated man-months : 16 Man-months/year : 8

14. Facilities required:

i. Land : Nil
ii. Labour : Nil
iii. Special equipment : Nil
iv. Animal sheds -

a) Fibreglass tanks - 1 tonne cap. (6 nos)
b) Outdoor cement tanks - 5 tonne cap. (2 nos)
c) Refrigerator - 235 l. cap. (1 No)

v. Fish ponds - 3 nos for rearing to adult
vi. Foreign exchange : Nil
vii. Other items - Existing hatchery facilities will be used
viii. Total estimated cost : Institute's Budget

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

16. Approximate cost:

	Rs
a) Salary of scientific staff	50400
b) Salary of technical staff	24600
c) Salary of supporting staff	9600
d) Casual labour costs if any	
e) Cost of equipment, facility etc.	152400
f) Contingencies such as chemicals, feed, animals etc.	123000
g) Total cost	360000

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT-1993-94

1. Institute Code No. CF/CUL/1.9 2. I.C.A.R Code No.

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

4. Title of Project : Seed production, experimental farming and tagging of marine prawns.

5. Title of Sub-project : Nil

6. Name and designation of Project Leader : N.Neelakanta Pillai, Senior Scientist.

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	N.Neelakanta Pillai	Sr.Sci.	35	3,6,7,8,9,10,11
	K.R.Manmadhan Nair	SG	50	3,6,10
	P.E.Sampson Manickam	SG	40	3,6,7,8,9,10,11
	N.Sridhar	S	25	5
Karwar	V.S.Kakati	Sr.Sci.	25	11
Tuticorin	M.Rajamani	Sr.Sci.	25	6
Mandapam Camp	E.V.Radhakrishnan	Sr.Sci.	40	1,2,3,4,5
	G.Maheswarudu	S	25	1,2,3,4,5,7,8,9
Minicoy	P.T.Sarada	S	50	10

Technical Assistance:

K.N.Gopalakrishnan, K.Chellappan (Cochin), M.Manickaraja (Tuticorin) M.R.Arputharaj, A.Ramakrishnan (Mandapam Camp).

8. Location of the Research Project : Mandapam Camp, Tuticorin, Cochin, Karwar, Minicoy.

9. (a) **Objectives:**

i. To develop a viable technology for the broodstock management of penaeid prawns.

ii. To carry out transportation trials for survival of eggs and nauplii of penaeid prawns.

iii. To provide consultancy service in hatchery technology and farming of prawns.

iv. To carry out tagging experiments with hatchery reared prawns and monitor their growth and movements.

v. To carry out cage culture of prawns in open sea.

vi. To conduct experimental hatchery operations on penaeid prawns at Minicoy as part of the live feed development for tuna fishery.

vii. To carry out experiments on the farming of certain marine prawns.

viii. To study the availability of [illegible] at Minicoy and attempting to rear [illegible]

(b). **Practical Utility:**

1. As breeders of penaeid prawns are difficult to obtain at the appropriate time a continuous hatchery operation for penaeid prawns become difficult. To overcome this it is essential to have a brood stock of prawns maintained in the hatchery.

2. In the absence of proper broodstock facility attached to the hatchery, the only alternative is to obtain them from wild which is often difficult in all places. Further transportation of spawner is expensive and it leads to abortion or premature spawning of the breeder due to stress factors. To overcome this it is planned to spawn them at the place of collection, and then transport egg/nauplii to the hatchery site. This would be cheaper and more convenient. The project is aimed at standardising the transportation procedure of egg/nauplii.

3. The technology perfected by CMFRI is being sought after by private sector for farming of penaeid prawns. To provide proper guidance though consultancy to carry out farming is one of the aim of the Institute.

4. CMFRI has perfected a technology for the hatchery rearing of penaeid prawn, suited to Indian condition. With the guidance of CMFRI, this technology was adopted by MATSYAFED in establishing a hatchery at Cannanore which is succesfully

operating to cater to the needs of local prawn farmers. To More enquiries from various parties are forth coming. meet this demand consultancy service in the hatchery technology has to be pursuid.

5. The farming prospects of Penaeus merguiensis need detailed study with a view to introduce them as candidate species for culture in the northwest coast of India-from Konkan coast to Saurashtra coast.

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10. Technical programme:

1. Breeding of P.semisulcatus and rearing of larvae to postlarval stage.

2. Nursery rearing of postlarvae to stockable size.

3. Tagging and releasing of juvenile P.semisulcatus.

4. Monitoring of tagged prawns.

5. Maintain commercially important penaeid prawns in brood-stock tanks. Induce them to breed in captivity as well as to hasten ovarian development within a short time through eye stalk ablation, injection of certain peptides ~~and ovarian extract and~~ feed

6. Penaeus sp. collected from the wild will be allowed to spawn at Tuticorin centre. Eggs/nauplii will be transported to Cochin under oxygen packing. ~~At Cochin~~ the survival and development of egg/nauplii will be studied by rearing them under controlled conditions.

7. Consultancy in prawn farming will be taken up as and when request is received and approved by the Institute.

8. Sanctioned consultancy programmes for establishing penaeid prawn hatchery using CMFRI technology will be implemented.

9. Cage culture of lab reared juveniles and adults in open sea.

10. Establishing of temporary hatchery at Minicoy for prawns.

~~11.~~ Monitoring of P.merguiensis farming along the Karnataka-Konkan coast will be carried out from Karwar.

Work done:

1. A viable technology for the maintenance of brood stock, induced maturation, larval rearing, nursery rearing and farming of P.semisulcatus have been perfected. 3715 lakhs of seeds of P.semisulcatus were produced dyring 1989-93 period of which 13.99 lakhs have been sea ranched.

2. P.semisulcatus was induced to mature under controlled conditions. Domestication experiments carried out were also successful.

3. Rearing experiments in the farm revealed that P.semisulcatus recorded an average growth rate of 1.5 mm/day during the first 30 days, which appears to be sufficient to yield economic results in commercial culture for the species.

4. During this period, hatchery produced and farm reared P. semisulcatus were tagged and released into the Palk Bay area twice to study the survival, growth and migration, and effect of sea ranching on recruitment to the commercial fishery. As many as 2964 tagged prawns were released during the last quarter of 1990. From these, 37 tagged prawns (more than 1 % of the number released) were recovered from the fishing grounds in the Palk Bay by the commercial vessels, within a period of 53 days. Some of them have migrated to 30 kilometres from the site of release and have registered a growth rate of 1.3 mm/day and attained sexual maturity. A total of 6342 tagged prawns ranging in size 40-90 mm TL were released in Palk Bay in February 1992.

5. During this period, the scientists of this division have given consultancy services in site selection, design and establishment of a prawn hatchery, for Kerala Govt.(MATSYAFED at Kannur), based on the technology perfected by CMFRI. The staff of the said hatchery were also trained in all aspects of hatchery management and production. This hatchery with a capacity to produce one million seed of Penaeus indicus per hatchery run is functioning successfully for the last 3 seasons.

Work envisaged in the current year:

As shown in the technical programme.

11. Date of start : 1984-85

12. Likely date of completion : ~~1993-94~~ 1994-95

13. Estimated man months : 41

Man months/year : ~~41~~ 35

14. Facilities required:

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

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

16. Approximate cost:

a.	Salary of scientific staff	3,12,000
b.	Salary of technical staff	96,000
c.	Salary of supporting staff	
d.	Casual labourer cost, if any	~~2,400~~
e.	Cost of equipment, facility etc.	~~2,40,000~~
f.	Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	~~2,40,000~~
g.	T.A.	~~20,000~~
h.	Total cost	~~9,10,400~~

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. MF/RE/1 2. ICAR Code No.

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

4. Title of Project : Molluscan Fishery Resources

5. Title of Sub-Project : Investigation on the resource characteristics of cephalopods

6. Name and Designation of Project Leader : M.M. Meiyappan, Scientist (SG).

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

Centre	Name	Desig-nation	Time to be spent (%)	Work to be done
Veraval	K.K. Joshi	Sci.	50	1-3
Bombay	Kuber Vidyasagar	Sr.Sci.	50	1-3
Mangalore	Sunilkumar Mohamed	Sci.	25	1-3
Calicut	G.P.K. Achary	Sci.(SG)	25	1-3
Cochin	K.Prabhakaran Nair	Sci.(SG)	50	1-3
	V. Kripa	Sci.	25	1-3
Vizhinjam	N. Ramachandran	Sci.(S-2)	50	1-3
Tuticorin	D. Sivalingam	Sci.(S-2)	25	1-3
Mandapam	A.P. Lipton	Sr.Sci.	25	1-3
Madras	M.M.Meiyappan	Sci.(SG)	50	1-3
Kakinada	G. Syda Rao	Sci.(SG)	25	1-3
Visakhapatnam	R. Sarvesan	Sci.(SG)	50	1-3

Technical Assistance: Mangalore: D. Nagaraja, T-I-3; Calicut: V.G. Surendranathan, T-2, Vizhinjam: T.A. Omana, T-I-3; Tuticorin: M. Enose, T-1; Madras: G. Sreenivasan, T-I-3; Kakinada: K.R. Somayajulu, T-2; Visakhapatnam: M. Prasada Rao, T-2.

To be provided: Veraval, Bombay, Cochin, Mandapam

8. Location of the Research Project: Veraval, Bombay, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Mandapam, Madras, Kakinada, Visakhapatnam.

9. (a) Objectives: To assess the exploited stocks of squid, cuttlefish and octopus of commercial importance, to estimate the potential in the presently exploited fishing grounds and to study their biological characteristics in relation to fisheries.

(b) Practical utility: Recently the squids, cuttlefishes, and of late, the octopus, have gained greater significance because of their increasing demand in the export market. Though the present production of cephalopods is almost entirely as by-catch, it has increased substantially in recent years. The results of these investigations will indicate the present level of exploitation and its pressure on potential stocks so as to take proper management measures. Since there is very little knowledge on octopus which is emerging as a new resource, the investigations will provide information on its biology, ecology and fishery.

10. Technical programme: 1) Collection of catch and effort data and monitoring of cephalopod landings and fishery characteristics at major fishing centres. 2) Collection of data on important species of squid and cuttlefish for investigating the relevant biological characteristics. 3) Collection of octopus samples for identification and for studying the biological characteristics.

11. Date of start : 1992-93 12. Likely date of completion : 1994-95

13. Estimated man-months : 54

14. Facilities required:

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

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

a) Number of financing organisations : No

b) Title of Project :

16. Approximate cost:

a) Salary of scientific staff	:	Rs. 4,84,500
b) Salary of Technical staff	:	1,15,600
c) Salary of Supporting staff	:	-
d) Casual Labourer cost, if any	:	-
e) Cost of equipment, facility etc.		-
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers, etc. and TA	:	95,400
g) Total cost	:	6,95,500

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. MF/RE/2 2. ICAR Code No.

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

4. Title of Project : Molluscan Fishery Resources

5. Title of Sub-Project : Investigations on the resource characteristics of bivalves and gastropods

6. Name and Designation of Project Leader : P.S. Kuriakose, Scientist S-3

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

Centre	Name	Desig-nation	Time to be spent (%)	Work to be done
Veraval	K.K. Joshi	Scientist	25	a-e,1-4
Bombay	K. Sundaram	Sci.(SG)	50	a,c,1-4
Karwar	P.K.Asokan	Scientist	50	a,b,c,1-5
Mangalore	Sumilkumar Mohamed	"	25	a,c,1-5
Calicut	P.S.Kuriakose	Sci.(S-3)	25	b,1-4
	K.K.Appukuttan	Sci.(SG)	25	c,1-4
	G.P.K.Achary	Sci.(SG)	25	a,1-5
Cochin	V. Kripa	Sci.	50	a,b,1-5
Vizhinjam	N. Ramachandran	Sci.(S-2)	25	a,b,1-3
Tuticorin	K. Ramadoss	Sci.(SG)	50	a,c,d,e,1-6
Mandapam	A.P. Lipton	Sr.Sci.	50	d,e,1-4,6
Madras	P.V.Sreenivasan	Sr.Sci.	50	a,c,e,1-5
	P. Natarajan	Sci.(SG)	50	b,d,1-4
Kakinada	G. Syda Rao	Sr.Sci.	25	a,d,e,1-5
Visakhapatnam	R. Sarvesan	Sci.(SG)	25	a,e,1-5

Technical Assistance: Karwar: M.M. Bhaskaran, T-1; Mangalore: D. Nagaraja, T-I-3; Calicut: V.G. Surendranathan, T-I-3, Vizhinjam: K. Ramakrishnan Nair, T-5, K.T. Thomas, T-I-3, Tuticorin: C.T. Rajan, T-5, A. Dasman Fernando, T-I-3, F. Soosai V. Rayan, T-I-3; P. Poovannan, T-I-3, Madras: R. Thangavelu, T-II-3, V. Selvaraj, T-II-3; Kakinada: K. Ramasomayajulu, T-II-3, P. Achayya, T-1.

To be provided: Veraval, Bombay, Cochin, Mandapam.

8. Location of the Research Project : Veraval, Bombay, Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Mandapam, Madras, Kakinada, Visakhapatnam.

9. (a) Objectives:

At present we have no estimates of the annual production of important molluscan resources like clam, mussel, oyster and gastropods on an all-India basis, except for some localised areas. This project aims at estimating the production and stock position of different resources and studying their marketing and utilization, and also elucidating information on growth and migration of chanks by mark-recovery studies.

(b) Practical Utility:

1. Since there are no estimate of the production of different bivalve and gastropod resources, this study will provide the resource characteristics and annual production estimates on a national level.
2. Resources like chank and mussels are subjected to heavy fishing pressures in some areas due to increasing demand. The results of this project will enable us to suggest suitable management measures.
3. Quarrying of subfossil shell deposits in some estuaries is adversely affecting the molluscan resources. The present study will indicate the extent of this damange and suggest remedial measures for the conservation of living resources.
4. The mark-release and recovery studies will provide the information on the growth and migrating patterns of the sacred chank which is the most important marine gastropod resource.

10. Technical programme: The following groups of molluscs are to be studied: (a) Clam (b) mussels (c) oysters (d) chank (e) other gastropods and bivalves of commercial importance. (1) To monitor the catch and effort for studying the annual production and stock position on all India basis. (2) To gather information on marketing and utilization. (3) To study the seed availability and exploitation, if any, affecting the natural populations. (4) To monitor the environmental parameters in relation to the distribution and abundance of the resources. (5) To study the effect of quarrying subfossil deposits, if any, on the natural clam resources. (6) To study the growth and migration of chank by mark release experiments.

11. Date of start: 1989-90 12. Likely date of completion : 1994-95

13. Estimated man-months : 66

14. Facilities required:

i. Land: v. Fish ponds

ii. Labour: vi. Foreign exchange:

iii. Special equipment: vii. Other items:

iv. Animal shed: viii. Total estimated cost:

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

a) Number of financing organisation : No

b) Title of Project :

16. Approximate cost:

a) Salary of scientific staff	: Rs.	4,32,000
b) Salary of Technical staff	:	1,64,600
c) Salary of Supporting staff	:	-
d) Casual Labourer cost, if any	:	-
e) Cost of equipment, facility etc.	:	20,000
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	
T.A.	:	1,74,600
g) Total cost	:	7,91,200

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. MF/CUL/4 2. ICAR Code No.

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

4. Title of Project : Seed production and sea-ranching of molluscs

5. Title of Sub-Project : Development of hatchery technology for experimental/ mass production of the seed of clams, mussel, edible oyster and pearl oysters, and sea-ranching of clams and pearl oysters.

6. Name and Designation of Project Leader : K.A. Narasimham
Principal Scientist

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

Centre	Name	Designation	Time to be spent (%)		Work to be done
Cochin	K.A. Narasimham	Prin.Sci.	50	a	7,8
	T.S. Velayudhan	Sci.(SG)	25	a	7,8
Tuticorin	*M.E. Rajapandian	Sci.(SG)	25	b	1-6,8
	Rani Palaniswamy	Scientist	50	b	1-6,8
	K. Ramadoss	Sci.(SG)	25	b	1-6,8
	*D. Sivalingam	Sci.S-2	75	a	1-5,7,8
	*A.C.C.Victor	Sr.Sci.	25	c,d	1-8
	A. Chellam	Sci.(SG)	25	c,d	1-8
	S. Dharmaraj	"	25	c,d	1-8
Calicut	* P.S. Kuriakose	Sci.S-3	50	e	1-5,8,9
	G.P.K. Achary	Sci.(SG)	50	e	1-5,8,9
	K.K. Appukuttan	"	50	e	1-5,8,9

* Associate Project Leaders

Technical Assistance: Tuticorin: D. Sundararajan, T-I-3, C.T. Rajan, T-5, A.A.P. Mudaliar, T-4, S.M. Sathakkathulla, T-1, P. Athipandian, T-1, K. Srinivasagam, T-I-3, N.Jesuraj, T-2, K. Shanmugasundaram, T-1, J.X.Rodrigo, T-II-3,(FEMD), K. Jayabalan, T-1, A. Dasman Fernando, T-I-3, F. Soosai V. Rayan, T-I-3, P. Muthukrishnan, T-2; Calicut: V.G. Surendranathan, T-I-3.
Two Senior Research Fellows for MPEDA-funded clam hatchery programme

8. Location of the Research Project: Tuticorin and Calicut

9. (a) Objectives: 1) To develop appropriate technology for the production of seed of commercially important clams, mussel and blacklip pearl oyster. 2) To standardise the techniques in various phases of hatchery system for mass production of seed of edible oyster and Indian pearl oyster and to work out the economics of seed production. 3) To meet the oyster seed requirements of the project partly funded by the NABARD, and the pearl oyster seed requirements of the pearl culture project. 4) Through funding from MPEDA, hatchery technology to be upgraded for mass production of the seed of Paphia malabarica and ranch the seed in the natural grounds of Ashtamudi area. 5) Sea-ranching of pearl oyster seed.

(b) Practical Utility: While a moderate level of proficiency has been achieved in the controlled breeding and mass production of the seed of Crassostrea madrasensis and Pinctada fucata, the hatchery techniques required for the production of seed of a number of clam and mussel species are either wanting or are in an early stage of development. The results achieved in this project would help to meet the seed requirements of culture operations and also to initiate/intensify sea-ranching of several commercial molluscs leading to enhancement of natural stocks.

10. Technical Programme: The following species are identified for implementing the technical programme:

a) Paphia malabarica, b) Crassostrea madrasensis,
c) Pinctada fucata, d) P. margaritifera and
e) Perna viridis

1) Collection, transportation and maintenance of broodstock.
2) Conditioning induced maturation and spawning.
3) Larval rearing and spat production.
4) Study of survival of spat, factors influencing it and evaluation of production cost of seed.
5) Nursery rearing in hatchery/field of juveniles to stockable size.
6) To standardise the techniques for mass production of seed of pearl oyster and edible oyster and to supply seed for NABARD-funded project and pearl culture project.
7) Sea-ranching of hatchery-produced seed of clams and pearl oysters. Pens to be erected if necessary. Monitoring of the environmental parameters, growth, survival, and effects, if any, of sea-ranching on natural populations.
8) Planning, execution, analysis and interpretation of results and preparation of reports.
9) To maintain stock cultures of micro-algae and to produce them on mass scale.

11. Date of start: 1989-90 12. Likely date of completion: 1994-95

MPEDA-funded clam hatchery project: 1993-94

13. Estimated man-months: 57

14. Facilities required:

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

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

a) Name of financing organisation: Marine Products Export Development Authority

b) Title of Project:

16. Approximate cost: * For MPEDA funded clam hatchery programme

a) Salary of scientific staff:	4,56,000	
b) Salary of Technical staff/ SRF :	1,73,800 +	48,000*
c) Salary of Supporting staff:	33,000	
d) Casual Labourer cost, if any :	82,500 +	12,000*
e) Cost of equipment, facility etc. :	5,50,000 +	1,57,000*
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc. and TA :	2,70,000 +	34,500*
:	15,65,300	2,51,500*
g) Total cost :	18,16,800	

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No.MF/CUL/8 2. ICAR Code No.

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

4. Title of Project : Mariculture of molluscs

5. Title of Sub-Project: Selection of suitable sites for bivalve culture

6. Name and Designation of Project Leader : K. Satyanarayana Rao, Principal Scientist.

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Bombay	K.S. Sundaram	Sci.(SG)	50	a 1-4
Karwar	P.K.Asokan	Sci.	50	a,c 1-4
Mangalore	Sunilkumar Mohamed	Sci.	50	a,c 1-4
Calicut	P.S. Kuriakose	Sci.(S-3)	25	a,b,c 1-4
	K.K. Appukuttan	Sci.(SG)	25	a,b,c 1-4
Cochin	T.S. Velayudhan	Sci.(SG)	50	a,b,c 1-4
	V. Kripa	Sci.	50	a,b,c 1-4
Vizhinjam	N. Ramachandran	Sci.(S-2)	25	a,c 1-4
Tuticorin	A. Chellam	Sci.(SG)	25	b 1-4
	S. Dharmaraj	Sci.(SG)	25	b 1-4
Madras	K.Satyanarayana Rao	PS	50	a,c 1,2,4
	P.V.Sreenivasan	Sr.Sci.	50	a,c 1,2,4
	P. Natarajan	Sci.(S-2)	50	a,c 1,2,4
	M. Rajagopal (FEMD)	Sr.Sci.	25	3
Kakinada	G. Syda Rao	Sci.(SG)	50	a,c 1-4

Technical Assistance: Karwar: M.M. Bhaskaran, T-1; Mangalore: D. Nagaraja, T-I-3; Calicut: V.G. Surendranathan, T-I-3; Vizhinjam: K. Ramakrishnan Nair, T-5; K.T.Thomas, T-I-3; Tuticorin: K. Srinivasagam, T-I-3, N. Jesuraj, T-2; P. Muthukrishnan, T-2, K. Shanmugasundaram, T-1; Madras: V. Selvaraj, T-II-3, R. Thangavelu, T-II-3; P. Poovannan, T-I-3; L. Jayasankar, T-I-3; Kakinada: K.R. Somayajulu, T-II-3; P. Achayya, T-1.

To be provided: Bombay and Cochin

8. Location of the Research Project : Bombay, Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Madras, Kakinada

9. (a) Objectives: The technologies of oyster culture, pearl culture and clam culture have been developed by CMFRI but most of the work has been concentrated at Tuticorin (edible and pearl oyster) Vizhinjam (pearl oyster and brown mussel) Calicut (green mussel) and Kakinada (blood clam). As mariculture is area-specific, it is necessary to identify suitable localities where bivalve farming could be carried out. With this objective in view, oyster culture experiments were taken up in 1991-92 at Madras, Kakinada and Karwar and these are giving encouraging results. In addition to continuing the oyster culture for one more year at these centres, the project aims at studying the suitability of more centres for the culture of edible oyster, pearl oyster and clams.

(b) Practical Utility: The results will help to identify areas on both the coasts of India suitable for culture of edible oyster, pearl oyster, and clams, thereby to attract coastal fisherfolk to take up these as spare time or full-time occupation for employment and income generation and to attract entrepreneurs to venture on commercial scale.

10. Technical programme: (1) Stocking of seed of (a) edible oyster, (b) pearl oyster and (c) clams (Paphia/Villorita/Meretrix) by collecting from wild, if available, or by transporting them from the Shellfish Hatchery at Tuticorin; (2) Rearing the seed and monitoring the growth, survival and other relevant aspects; (3) Monitoring of environmental parameters; (4) Analysis of data and preparation of periodic and final reports.

11. Date of start: 1991-92

12. Likely date of completion: Oyster culture at Madras, Kakinada and Karwar - 1993-94; All the rest - 1995-96.

13. Estimated man-months : 72

14. Facilities required:

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

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

a) Name of financing organisation: No

b) Title of Project :

16. Approximate cost:

a) Salary of scientific staff	: Rs.	5,02,500
b) Salary of Technical staff	:	1,60,000
c) Salary of Supporting staff	:	-
d) Casual Labourer cost, if any	:	1,80,000
e) Cost of equipment, facility etc.		2,40,000
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc. and TA	:	70,000
g) Total cost	:	11,52,500

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No.MF/CUL/9 2. ICAR Code No.

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

4. Title of Project : Pilot project on oyster culture

5. Title of Sub-Project : Semi-commercial production of edible oyster

6. Name and Designation of Project Leader : M.E. Rajapandian, Scientist (SG).

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

Centre	Name	Desig-nation	Time to be spent (%)	Work to be done
Tuticorin	M.E. Rajapandian	Scientist(SG)	50	1-8
	K. Ramadoss	"	25	"
	Rani Palaniswamy	Scientist	50	"

Technical Assistance:

A.A.P. Mudaliar, T-4, D. Sundararajan, T-I-3,
S.M. Sathakathulla, T-1, R. Athipandian, T-1.

8. Location of the Research Project : Tuticorin

9. (a) Objectives: To determine the techno-economic feasibility of oyster culture through upgradation of the present experimental-scale technology for semicommercial production of oysters.

(b) Practical Utility: The project will demonstrate the commercial feasibility of oyster farming. The techno-economic results obtained in the project will be beneficial to entrepreneurs interested in conducting oyster farming commercially.

10. Technical Programme:

1. Nursery rearing of oyster seed supplied from CMFRI hatchery.
2. Transfer of seed from nursery and stocking them in farms.
3. Maintenance of farm, including control of foulers and predators.
4. Monitoring of growth and condition factor of oysters.
5. Monitoring of environmental parameters.
6. Harvesting of oysters when they grow to marketable size.
7. Depuration of harvested oysters.
8. Analysis and interpretation of data and preparation of report.

11. Date of start: 1991-92 12. Likely date of completion: 1993-94

13. Estimated man-months : 15

14. Facilities required:

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

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

a) Name of financing organisation : 75% of contingencies Financed by National Bank for Agricultural and Rural Development (NABARD)

b) Title of Project : Pilot project on oyster culture

16. Approximate cost:

a) Salary of Scientific staff	:	Rs. 1,05,000
b) Salary of Technical staff	:	56,000
c) Salary of Supporting staff	:	26,200
d) Casual Labourer cost, if any	:	1,54,000
e) Cost of equipment, facility etc.	:	-
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc. and T.A.	:	1,36,300
g) Total cost	:	4,77,500

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No. MF/CUL/10 2. ICAR Code No.

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

4. Title of Project : Mariculture of molluscs

5. Title of Sub-Project : Upgradation, location testing and transfer of technology of pearl culture

6. Name and Designation of Project Leader : A.C.C. Victor Sr. Scientist (

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	A.C.C. Victor	Sr.Scientist	50	1-4
	A. Chellam	Sci.(SG)	50	1-4
	S. Dharmaraj	Sci.(SG)	50	1-4

Technical Assistance:
K. Srinivasagan, T-I-3, K. Shanmugasundaram, T-1,
A. Dasman Fernando, T-I-3, F. Soosai V. Rayan, T-I-3,
N. Jesuraj, T-2, P. Muthukrishnan, T-2.

8. Location of the Research Project : Tuticorin

9. (a) Objectives:

1. Location testing of pearl culture technology at Valinokkam.
2. Upgradation of the technology to suit the selected area.
3. Production of cultured pearls.
4. Transfer of technology to the fishfarmers of the area by involving them in the pearl culture programme.

(b) Practical Utility: The project will acquaint fish-farmers with pearl culture technology and enable them to participate actively in pearl production.

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10. Technical Programme:
1. Maintenance of farm and production of cultured pearls involving the fishfarmers. 2. Training the fishfarmers nucleus implantation, farm maintenance etc.
3. Pearl harvest and sharing of the cultured pearls.

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11. Date of start: 1991-92 12. Likely date of completion : 1993-94

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13. Estimated man-months : 18

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14. Facilities required:

i. Land:
ii. Labour:
iii. Special equipment:** Yes (Farm)
iv. Animal shed:
v. Fish ponds
vi. Foreign exchange:
vii. Other items
viii. Total estimated cost:

** Pearl processing machinery

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

a) Name of financing organisation:
b) Title of Project :

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16. Approximate cost:

a) Salary of Scientific staff	:	Rs. 1,44,000
b) Salary of Technical staff	:	60,800
c) Salary of Supporting staff	:	-
d) Casual Labourer cost, if any	:	25,000
e) Cost of equipment, facility etc.	:	30,000
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc. and T.A.	:	20,000
g) Total cost	:	2,79,800

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17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No: PNP/35 2. ICAR Code No.

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

4. Title of Project : Fish and Shellfish Nutrition

5. Title of Sub Project : Evaluation of farm performance of compounded feeds for prawns

6. Name and Designation of Project Leader : R.Paul Raj, Sr. Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Madras	R.Paul Raj	Sr.Scientist	75	Planning of experiments and Technical programmes 1-6
	M.Vijayakumaran	Sr.Scientist	75	Technical Programmes 2-6
Tuticorin	D.C.V.Easterson	Scientist(SG)	50	-do-
	D.Kandasami	Scientist(SG)	50	-do-
Cochin	Manpal Kaur	Scientist	75	1 to 6
	Vijaya Gopal	Scientist	75	-do-

Technical Assistance

Madras: V.Selvaraj, Shahul Hameed, Kamal Basha, Vairamani (all part-time)

Cochin: V.Suresh

Tuticorin: To be posted

8. Location of the Research Project : Madras, Tuticorin, Cochin.

9. a) Objectives: i) To evaluate the efficacy of different compounded feeds for semi-intensive and extensive prawn culture. ii) To evolve practical feeding strategies for prawn culture systems. iii) To study the physico-chemical characteristics, hydrostability and digestibility of feeds. iv) To assess the impact of feed on water quality, plankton production and diseases. v) To develop new feed formulations and test their efficacy.

b) Practical utility:

Feed is the major operational input in prawn culture systems. Depending upon the intensity of culture system, feed costs vary from 30 to 60% of the operational costs. Besides, studies carried out by the Central Marine Fisheries Research Institute, in Nellore District of Andhra Pradesh have shown that apart from affecting growth and production of prawns, the water and soil characteristics are significantly affected by the quality and quantity of feed supplied. The proposed study would help to improve the existing feed formulation and to develop new least-cost and water-stable diets for prawn culture. The study would also help in evolving appropriate feeding strategies (ration to be offered, feeding schedule, feed dispensing methods) to maximise prawn growth, production, feed efficiency and profits, and to minimise feed wastage and feed-based water pollution in prawn culture systems.

10. Technical Programme: 1) Determination of the physico-chemical characterstics, water-stability and digestibility of feeds. 2) Evaluation of farm performance of farm-made feeds for captive use, indigenous and imported commercial feeds in selected farms in Nellore (Andhra Pradesh), Chidambaranar (Tamil Nadu) and Ernakulam (Kerala) districts. 3) Assessment of growth, production, feed efficiency and economics. 4) Assessment of environmental factors affecting feed efficiency. 5) Assessment of the impact of feeds and feeding on water quality. 6) Development of new feed formulations and improvement of existing formulations.

Work done: 1) A survey was made covering several prawn farms in Nellore District of Andhra Pradesh to understand the existing prawn culture practices with reference to feeds feeding management and water quality. 2) Factors affecting prawn growth, production and FCR of the feed were studied in selected farms in Nellore District. 3) Diel variations in water quality parameters (pH, ammonia, dissolved oxygen, salinity and temperature) were studied in 6 ponds for one complete crop period (about 5 months). 4) A feed evaluation experiment was conducted to improve the FCR of feeds. 5) Preliminary study has been made to compare the efficicacy of indigenous and imported feeds. 6) Technical advice was given to prawn farmers on feeds, feeding, disease problems and water management.

Work envisaged: As per Technical programme

11. Date of start : 1990-91 12. Likely date of completion : 1994-95

13. Estimated man-months : 48 man-months

14. Facilities required: i) Feed preparation facilities
ii) transport facilities
iii) ponds - farmer's ponds will be utilised.

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

16. Approximate cost :

a)	Salary of scientific staff	: Rs.2,65,000/-
b)	Salary of technical staff	: Rs. 60,000/-
c)	Salary of supporting staff	: Rs. 12,000/-
d)	Casual labour, if any	: Rs. 7,500/-
e)	Cost ofequipment and maintenance of ponds	:
f)	Contingencies:	
	Chemicals	: Rs. 25,000/-
	Glasswares	: Rs. 15,000/-
	T.A.	: Rs. 15,000/-
	Miscellaneous	: Rs. 20,000/-
g)	Total cost	: Rs.4,19,500/-

17. Signature of:

sd/-	sd/-	sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. PNP/39 2. I.C.A.R.Code No.

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

4. Title of Project : Reproductive physiology of prawns.

5. Title of Sub Project : Endocrinological factors influencing maturation in some penaeid prawns.

6. Name and Designation of Project leader : N. Sridhar, Scientist

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

Centre	Name	Designation	Time to be spent %	Work to be done
Cochin	N.Sridhar	Scientist	50%	Tech. programm 1 to 6
Cochin	Mohan.K.Zachariah	"	100%	1 to 6
Technical Assistance:				

8. Location of the Research Project : Cochin

9. (a) Objectives: 1. To test the crude and partially purified fractions obtained from the eyestalk and thoracic ganglion of mature female prawns in triggering the maturation of the ovary. 2. To test the effect of the ovary extract (lipid) and some steroid hormones in the development of the gonad of the female prawns.

(b) Practical utility: Results of the present investigation may identify the protein fraction, the ovarian fraction and the steroid hormones involved in including gonadal maturation to evolve the technology for brood stock development of prawns.

10. Technical Programme:

1. Setting up a recirculatory sea water system for conducting the bio-assay experiments.
2. Accumulation and partial purification of eyestalk, thoracic ganglia extracts and ovarian extract from mature female prawns.
3. Injections of crude and partially purified protein fractions to adult female prawns.
4. Administration of ovarian extract to adult female prawns.
5. Administration through injections and feeding of ovarian extract and some of the reproductive steroid hormones.
6. Administration by injections of various combinations of the extracts stated in the technical programmes 3, 4, and 5.

Work done: Crude and partially purified protein fractions from the eyestalk and thoracic ganglia from mature female prawns were prepared and their protein content was determined. Ovarian extract was also prepared from repeated extractions from two different solvent systems and the total lipid content was determined.

Work envisaged: As per technical programme.

11. Date of start: 1989

12. Likely date of completion : 1994

13. Estimated man-months : 18 man-months

14. Facilities required:

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

15. If financed by an Organisation other than the Institution.	NA
(a) Name of the financing organisation.	
(b) Title of Project	

16. Approximate cost:

		(Rs.)
(a)	Salary of Scientific staff	93,000
(b)	Salary of Technical staff:	
(c)	Salary of supporting staff:	
(d)	Casual Labourer cost, if any:	
(e)	Cost of equipment, Facility etc. :	20,000
(f)	Contigencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. :	40,000
(g)	Total Cost	1,53,000

17. Signature of :

sd/-
Project Leader

sd/-
Head of Division.

sd/-
Director.

REASEARCH PROJECT 1993-94

1. Institute Code No : PNP/41 2. ICAR Code No:

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

4. Title of Project : Finfish and Shellfish Genetics

5. Title of Sub-Project : Identification of genetic stocks in Indian Mackerel (Rastrelliger kanagurta)

6. Name and Designation of Project Leader : M.K.George Senior Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	M.K.George	Senior Scientist	25	1-5
	P.C.Thomas	Senior Scientist	100	1-5
	I.D.Gupta	Scientist	100	1-5
	N.K.Verma	Scientist	50	1-5

8. Location of the Research Project : Cochin

9. (a) Objectives: (1) To study biochemical genetic polymorphism in populations of different locations. (2) To identify distinct genetic stocks sustaining the fishery using population genetic analysis.

(b) Practical utility: The information on genetic constitution of Rastrelliger kanagurta is in its infancy. The present study will help in explaining the genetic make up of the species and it would be possible to assess whether the fishery is constituted by more than one genetic stock. The information on stock composition is essential for effective management and may help in forecasting the fluctuations.

10. Technical Programme:

1. To standardise electrophoretic techniques to resolve and separate different enzyme systems and general proteins.
2. To screen population samples to discover polymorphic enzyme system.
3. To work out allelic frequencies of selected polymorphic enzyme systems in population samples collected from west and east coast.
4. To study the electrophoretic patterns of DNA in Indian Mackerel populations.
5. To compare statistically the gene frequencies between populations and between regions to identify the genetic stocks sustaining the fishery.

Work done: The project work progressed as per technical programme and activity milestone. Experimental conditions were standardised to separate and resolve electrophoretic patterns of LDH, IDH, Est. G-6 PD, ADH, SDH, XDH and PO enzyme systems. Then sample populations from different regions were tested to detect polymorphic enzyme systems like Est, G-6 PD, ADH, XDH and PO. Preliminary estimate of gene frequency values for Est, G-6 PD, ADH, SDH, XDH and PO was also done for Cochin, Calicut, Mandapam, Wedge Bank, Mangalore and Thottapally populations.

Work envisaged: Final screening of different population samples to estimate allelic frequencies and to draw a conclusion on the population genetic structure of the species.

11. Date of start : 1990

12. Likely date of completion: 1994

13. Estimated man-months : 33 man-months

14. Facilities required:

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

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

a) Name of the Financing Organisation :

b) Title of the Project :

16. Approximate cost:

		(Rs)
a) Salary of Scientific staff	:	2,15,000
b) Salary of Technical staff	:	35,000
c) Salary of supporting staff	:	
d) Casual labourer cost if any	:	
e) Cost of equipment, facility etc	:	25,000
f) Contingencies such as chemicals, feeds, sprayers etc	:	75,000
g) TA/DA	:	10,000
h) Total cost		3,60,000

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No : PNP/44 2. ICAR Code No :

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

4. Title of Project : Physiology of Marine organisms

5. Title of Sub-Project : Tolerance limits of certain environmental factors affecting physiological behaviour of some cultivable organisms

6. Name and Designation of Project Leader : M.Peer Mohamed
Principal Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	M.Peer Mohamed	Principal Scientist	25	1-4
	D.C.V.Easterson	Scientist (SG)	50	1-2
	D.Kandasami	Scientist (SG)	50	2-3
Cochin	N.Sridhar	Scientist	25	5
Technical Assistance :		P. Sigamani (Tuticorin)		

8. Location of the Research Project : Mandapam, Tuticorin and Cochin

9. a) Objectives: To find out the tolerance limits of temperature, salinity and ambient oxygen in selected cultivable marine organisms- Penaeus indicus, pearl oyster, edible oyster/clam and sea cucumber- with reference to ecophysiological behaviour.

b) Practical Utility: The results of the study will elucidate, (i) the behaviour of the test animals to different levels of temperature, salinity and ambient oxygen, and (ii) the optimum levels of these environmental factors to achieve better growth and survial.

10. Technical programme:

1. Temperature tolerance in the test species at different salinities and high ambient oxygen.
2. Salinity tolerance of the test species at different temperatures and high ambient oxygen.
3. Low lethal oxygen level in the test species at different temperatures and salinities.
4. Behaviour of the test animals under various experimental conditions (1,2 & 3 of the T.P)
5. Changes induced in the tissue enzyme profile by various stress factors (1,2 & 3)
6. Histological studies in selected organs (brain, liver, kidney, gill etc) of the test animals subjected to the stress factors (1,2 & 3)

11. Date of start : April 1992

12. Likely date of completion: March 1994

13. Estimated man-months : 24 man-months

14. Facilities required:

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

15. If financed by an organisation other than the Institute	:	Not Applicable

16. Approximate cost:

			(Rs)
a)	Salary of Scientific Staff	:	2,80,000
b)	Salary of Technical Staff	:	43,200
c)	Salary of Supporting Staff	:	31,200
d)	Casual labour cost if any	:	10,000
e)	Cost of equipment, facility etc	:	
f)	Contingencies such as chemicals, fertilisers, seed, animals, feeds, sprayers etc	:	30,000
g)	TA/DA		
h)	Total cost		3,94,400

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute code No: PNP/45 2. ICAR Code No.

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

4. Title of Project : Marine Biotechnology

5. Title of sub-project : Studies on Cryopreservation of gametes and embryos of certain cultivable marine shell fishes.

6. Name and Designation of Project Leader : A.D.DIWAN, Scientist S-3.

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

Centre	Name	Designation	Time to be spent (%)	Work to be spent
Cochin	A.D.DIWAN	S-3	50	1-6
	Technical Assistance:	A. Nanda Kumar (Cochin)		

8. Location of Research Project : Cochin

9. Objectives:

a) The first objective of this study is to evolve suitable techniques for cryopreservation and storage of gametes (spermatophores) of certain cultivable marine shell fishes (Penaeid and non-Penaeid prawns and crabs) for shorter and longer duration and further to assess the virility and viability of the sperms by acrosome formation and fertilising riped eggs.

b) The second objective is to evolve suitable technique of cryppreservation of embryos for shorter and longer duration and test the viability by studying embryonic development.

Practical Utility: The success of the production of animals primarily depends upon the availability of spawners and brooders. In our acquaculture system one of the major constrains is the non availability of sufficient number of spawners at desired time and in case they are available brood stock maintanance and management is difficult and expensive affair. Therefore to ease this problem it is felt to evolve suitable methods of cryopreservation and storage of spermatophores and create a gamete bank so that stored spermatophores can be used for production of seed at any time of the year by artificial insemination or invitro fertilization. If the method proved to be successful it may help in propagation of animals for the development of acquaculture.

Another constrain that we encounter in our culture system is large scale mortality of the prawn seed during transportation from hatchery site to the remote rural areas where the prawn farming is being done. Hence there is a urgent need to innovate suitable techniques of preservation of embryos and larvae under low freezing temperature to ensure their safe transformation without much damage.

10. Technical Programme:

1. Collection of matured spawners and berried females from the wild and maintain them in the laboratory.
2. Removal of spermatophores from matured males by application of electric shock and study the viability of sperms by standard methods.
3. Collection of developing embryos from the female prawns and crabs and study normal embryonic development in the laboratory condition. Then evolve suitable medium/media for cryopreservation of embryos and assess the effect of medium and low temperature on the development in relation to preservation time.
4. Evolve suitable methods of cryopreservation of spermatophores for shorter and longer duration and assess the viability.
5. Study the biochemical changes (Protein, aminoacids, lipid and carbohydrates etc) of spermatophores in normal and cryopreserved condition.
6. Histology and EM studies of spermatophores.

11. Date of start : 1993 12. Likely date of completion : 1996

13. Estimated man months : 60 man months

14. Facilities required:

1. Land 2. Labour 3. Special equipment
4. Animal shed 5. Fish ponds 6. Foreign exchange
7. Other items 8. Total estimated cost

15. If financed by an organisation other than the Institute

a) Name of the financing organisations :
b) Title of the Project :

16. Approximate cost (One year)

			(Rs)
a)	Salary of Scientific Staff	:	48,000
b)	Salary of Technical Staff	:	8,000
c)	Salary of Supporting Staff	:	
d)	Casual of labourer cost if any	:	4,000
e)	Cost of equipment facility	:	
f)	Contingencies such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:	50,000
g)	TA/DA	:	20,000
h)	Total cost	:	1,30,000

17. Signature of :

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. FEM/ES/1 2. ICAR Code No.

3. Name and address of Research Institute : CMFR Institute Cochim

4. Title of the project: Investigation on environmental parameters in inshore waters in relation to fisheries

5. Title of Sub-project:

6. Name and Designation of Project Leader : M.S. Rajagopalan, Principal Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Bombay	V.V. Singh	Scientist	100	2,3,4,6,7
Karwar	P.K. Krishnakumar	"	50	2,3,4,6,7
Calicut	V.Narayana Pillai	Pri. Sci.	25	1,2,3,4, 6,7
Cochin	C.V. Mathew	Scientist	50	2,3,4,6
	M.S. Rajagopalan	Pri. Sci.	25	2,3,4,6,7
	C.P. Gopinathan	Sr. Sci	50	2, 3
	K. Rengarajan	"	50	3
	G.S. Daniel Selvaraj	Sci. SG	50	2,3,4
	K.G. Girijavallabhan	-do-	100	1,2a,3,4
	V. Chandrika	Sr. Sci.	75	5a, 5b
	S. Muthusamy	"	75	2, 3, 4
	T.S. Naomi	Scientist	50	-do-
	M.P. Molly	"	40	2,3,4,6
Vizhinjam	P. Kaladharan	"	75	-do-
	P.A. Thomas	Sr. Sci.	50	1,2,3,4,6,7
	S. Jasmin	Scientist	50	2,3,4
Mandapam	S. Krishna Pillai	Sci. SG	100	2,3,4,6,7
Madras	M. Rajagopalan	-do-	50	-do-
Visakhapatnam	K.Vijayakumar	Scientist	50	2,3,4,6
Minicoy	P.T. Sarada	Scientist	50	2,3,4,6
Kakinada	B.S.Ramachandrudu	T7	50	-do-

Technical Assistance: V.K. Balachandran, N.P. Kunhikrishnan, M.P. Sivadasan, A. Kanagam, L.R. Khambadkar, K.N.Pushkaran, V.K. Suresh, T.N. Ananthalakshmi (Cochin), R. Vasanthakumar (Vizhinjam), J.X. Rodrigo, M. Selvaraj(Tuticorin), L.Jaya-sankaran, A. Vairamani (Madras), K.P. Viswanathan (Calicut), K. Diwakar, K. Chittibabu (Visakhapatnam), K. Muniyandi (Mandapam), G.S. Bhat (Mangalore), (Kakinada)

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8. Location of the Research Project: Bombay, Karwar, Calicut, Cochin, Minicoy, Vizhinjam, Tuticorin, Mandapam, Madras, Visakhapatnam, Mangalore, Karwar

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9. a) Objectives: 1) To assess the role of physical, chemical and biological characteristics of inshore waters in relation to fluctuation and abundance of fish catches; 2) to correlate climatic factors such as atmosphere temperature, pressure, rainfall etc. with seawater characteristics and fish abundance.

   b) Practical utility: Continuous monitoring of sea water characteristics and biological productivity in relation to climatic and other factors will help in understanding the causes of fluctuation in major groups constituting the inshore fisheries.

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10. Technical Programme: 1) Wherever Cadalmin series of boats are operating the Officers-in-Charge of the respective Centre will draw up in advance a monthly programme of participation of all Scientists and Technical staff in Cadalmin trips on a rotation basis. 2) Basic hydrographic factors such as temperature, salinity, dissolved oxygen content should be collected from the inshore fishing grounds thrice a week. 3) Estimation of phytoplankton production and zooplankton biomass to be made weekly. 4) Collection and analysis on nutrients wherever equipment facilities are there. 5.a) Estimation of bacterial production and growth rate off Cochin. 5.b) Estimation of microflora and microfauna in the sediments in backwater and inshore waters. 6) Collection and analysis of meteorological data. (7) All data to be entered and maintained in a common register at each centre and at Headquarters.

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11. Date of start: 1989 12. Likely date of completion: Continuing

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13. Estimated man-months : 132 man months/year

14. Facilities required:

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

15. If financed by an organisation other than the Institute
    a) Name of financing organisation
    b) Title of project

16. Approximate cost

a) Salary of scientific staff	: Rs	4.50 lakhs
b) Salary of technical staff	: Rs	2.00 "
c) Salary of supporting staff	:	
d) Casual labourer cost, if any		
e) Cost of equipment, facility etc.	: Rs	2.00 "
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	: Rs	1.00 "
T.A.	: Rs	2.00 "
g) Total cost	: Rs	11.50 lakhs

17. Signature of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. FEM/ES/5 2. ICAR Code No.

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

4. Title of Project : Environmental ecology of coastal zone and mapping of potential sites for seafarming.

5. Title of Sub-project:

6. Name and Designation of Project Leader : M.S. Rajagopalan, Principal Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Cochin	M.S. Rajagopalan	Pri. Sci.	25	1,2,3,5
	R.N. Misra	Sci. SG	50	1,4
	G.S. Daniel Selvaraj	-do-	50	1,3,5
	M.P. Molly	Scientist	30	1,3
Madras	M. Rajagopalan	Sci. SG	50	1,3
Calicut	C.V. Mathew	Sci. SG	50	1,3
Kakinada	B.S.Ramachandrudu	T7	50	1,4

: Technical Assistance K.S. Leela Bai, A. Kanagam, M.P. Sivadasan, R.Anilkumar (Cochin), A.A.Kamal Basha, A. Vairamani (Madras) P.Swarnalatha (Calicut) / V.K. Suresh

8. Location of the Research Project: Cochin, Madras, Calicut, and Kakinada

9. a) Objectives: 1) To understand the environmental ecology of the coastal zone and its influence on the coastal marine resources. 2) To identify potential sites for mariculture/sea farming.

b) Practical utility: The coastal zone is an important base for artisanal fisheries and also for coastal aquaculture and sea farming. The extent of coastal waterbodies, nursery grounds, coastal vegetation like mangroves and the connected ecological parameters have profound influence on the local inshore fisheries. The project aims at understanding some of these aspects.

10. Technical programme: 1. Systematic survey of the coastal zone for mapping coastal waterbodies, lagoons and potential sites for seafarming including use of Remote sensing data.
2. Ecological studies on the coastal mangroves, the resident and migratory fauna of the mangroves ecosystems.
3. Diurnal studies on physico-chemical factors and plankton in the coastal waterbodies.
4. Soil sediment characteristics in the coastal waterbodies and in the vicinity of hatcheries; studies on beach profile, tidal rhythms and other coastal feature. 5. Consolidation of information collected so far and publication of results.

11. Date of start : 1987 12. Likely date of completion: 1994

13. Estimated man-months : 42 man months/year

14. Facilities required

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

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

a) Name of the financing organisation

b) Title of project

16. Approximate cost

a) Salary of scientific staff	: Rs 1.5 lakhs
b) Salary of technical staff	: Rs 0.5 lakhs
c) Salary of supporting staff	:
d) Casual labourer cost, if any	:
e) Cost of equipment, facility etc.	: Rs 0.1 lakh
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	: Rs 0.2 lakhs
T.A.	: Rs 0.3 lakhs
g) Total cost	: Rs 2.6 lakhs

17. Signatures of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. FEM/MP/1 — 2. ICAR Code No.

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

4. Title of Project : Marine Pollution

5. Title of Sub-Project : Monitoring marine pollution in relation to protection of liveing resources

6. Name and designation : V.Kunjukrishna Pillai, Senior Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	V.Kunjukrishna Pillai	Sr.Sci.	75	1, 2, 4.
	R.N. Misra	Sci. SG	50	1
	C.P. Gopinathan	Sr. Sci.	50	1 & 2
Karwar	P.K.Krishnakumar	Scientist	50	1 & 2
Tuticorin	Peer Mohamed	Pri.Sci.	25	1 & 3
	D. Kandaswami	Sci. SG	25	1 & 3
Vizhinjam	P. Kaladharan	Scientist	25	1
Visakhapatnam	K.Vijayakumaran	"	25	1

Technical Assistance: V.K. Suresh
V.K. Balachandran, K.S. Leela Bai, K.K. Valsala (Cochin)
P. Paul Sigmani (Tuticorin)

8. Location of the Research Project: Cochin, Karwar, Tuticorin, Vizhinjam and Visakhapatnam

9. a) Objectives: 1) To identify major sources of pollutants in the inshore areas and to assess their levels and effects on living resources. (2) Heavy metal levels in the aquatic environment and their build up in the organisms will be monitored and investigated. 3) Effect of thermal plant discharges into the marine environment will be investigated.

b) Practical utility: In recent years there has been a world awareness on the problems of marine pollution and its effects on the living resources. In India, on a national level, priority has been assigned to pollution monitoring and control measures. Information on the causes of fish kills, levels of pollutants like heavy metals in water, animals and sediment and also its short

and long-term effects will help to assess the effects of pollution. To understand the effect of deteriorating water quality on cultivable organisms in identified areas of pollution in the coastal waters. Hence studies on marine environmental damage by different sources becomes an obvious necessity to evaluate the present level of pollution in our coastal waters.

10. Technical Programme: 1. Regular monitoring of environmental parameters at identified stations to study the level of pollution in respective areas due to sewage, industrial effluents etc.
2. Laboratory experiments to evaluate lethal and sublethal effects of pollution on marine organisms/cultivable species.
3. Directed studies to evaluate level of pollution due to discharge of thermal water, fly ash and other chemicals at Tuticorin.
4. Fish kills due to pollution will be investigated as and when such phenomena happens.

11. Date of start: 1982 12. Likely date of completion: 1995

13. Estimated man-months : 48 man months/year

14. Facilities required:

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

15. If financed by an organisation other than the Institute: Nil
a) Name of financing organisation
b) Title of project

16. Approximate cost

a) Salary of scientific staff	:Rs	2,96,000
b) Salary of technical staff	:Rs	1,05,000
c) Salary of supporting staff	:Rs	24,000
d) Casual labour cost, if any	:Rs	25,000
e) Cost of equipment, facility etc.	:Rs	2,00,000
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers, etc.	:Rs	50,000
T.A.	:Rs	50,000
g) Total cost	:Rs	7,50,000

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1993-94

1. Institute Code No. FEM/SW/1 2. ICAR Code No.

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

4. Title of Project : Seaweed Investigations

5. Title of Sub-project: Resources assessment of seaweeds and their culture

6. Name and designation of Project Leader : V.S.K. Chennubhotla, Principal Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Minicoy	V.S.K. Chennubhotla	Pri. Sci.	50	1,2,3
Mandapam	N. Kaliaperumal	Sr. Sci.	75	1,2,3,5,6,7
	Reeta Jayasankar	Scientist	100	3,4,5,6

Technical Assistance:
S.Kalimuthu, J.R. Ramalingam, K.Muniyandi, N.Ramamurthy (Mandapam, P. Anasukoya (Minicoy)

8. Location of the Research Project: Mandapam and Minicoy

9. a) Objectives: 1) To assess the natural seaweed resources of Lakshadweep and Andaman & Nicobar Islands. 2) To augment the seaweed resources through outdoor and field culture practices.

b) Practical utility: The seaweed resources have a great role to play in the phycocolloid industry in the country. The survey of the shallow and deep water resources of seaweeds have been completed. Information is wanting with regard to seaweed resources of other regions of Indian coast. The present project will meet this requirement as also ways and means of augmenting production through outdoor and field culture technologies.

10. Technical programme: 1. To estimate the natural seaweed resources of Lakshadweep and Andaman-Nicobar Islands. 2. To suggest harvest and cropping pattern in selected islands. 3.To conduct outdoor cultivation of agar yielding seaweeds.under running seawater by different culture techniques at Mandapam. 5. To undertake studies on the seasonal variation in growth and carrageenan content in some red seaweeds of Mandapam coast. 6. To study the growth and biochemical constituents in some edible seaweeds of Mandapam area. 7. To collect data on the 4. To undertake spore culture of economically important seaweeds at Mandapam.

commercial seaweed exploitation from Tamil Nadu coast by enquiring from seaweed collection at Vedalai, Keelakarai, Periyapatnam etc. 8. To give training islanders in the Lakshadweep group of Islands in the techniques of seaweed culture in collaboration with KVK and TTC. 9. In addition to the taxonomy, ecology and biology of the seaweeds under Rhodophyceae (red), special attention may be made to culture different species of Gracilaria (other than G.edulis). 10. Since Hypnea musciformis and other species of Hypnea also yield agar. The taxonomy, ecology, biology and evaluation of the commercial potential of this red seaweed can be included in the project with special reference to suitable culture methods and potential yield.

Work done: The seaweed resources survey of shallow waters of Tamil Nadu, Kerala and Lakshadweep were completed. The deep water survey of seaweed resources from Dhanushkodi to Kanyakumari in Tamil Nadu coast was also completed. Field cultivation of Gracilaria edulis in Gulf of Mannar and Palk Bay was standardised. In Minicoy lagoon the seaweed production was found to be 7.1 fold in culture experiments. Outdoor culture of G.edulis was carried out successfully with gravitational flow of seawater at Mandapam and maximum yield of 4.8 fold was obtained after 70 days of culture period.

Work envisaged: As given in the Technical programme

11. Date of start : 1992 12. Likely date of completion: 1995

13. Estimated man months: 36 man months/year

14. Facilities required

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

15. If financed by an organisation other than the Institute: Nil
a) Name of the financing organisation
b) Title of project

16. Approximate cost

a) Salary of scientific staff	:	Rs 2.5 lakhs
b) Salary of technical staff	:	1.3 lakhs
c) Salary of supporting staff	:	--
d) Casual labourer cost, if any		--
e) Cost of equipment, facility etc.	:	0.5 "
f) Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.		0.5 "
		"
g) Total cost		Rs 5.0 "

17. Signature of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. FEM/RS/1.1 2. ICAR Code No.

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

4. Title of project : Remote Sensing and fisheries

5. Title of Sub-project: Application of remote sensing technology in marine fisheries

6. Name and designation of Project Leader : M.S. Rajagopalan, Principal Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Cochin	M.S. Rajagopalan	Pri. Sci.	25	1,2,3,5,6,7
Kakinada	G. Subbaraju	-do-	50	2,3,4
Cochin	K. Sathianathan	Scientist	25	1,4
	N.G.K. Pillai	Sr. Sci.	25	4
	Grace Mathew	Sci. SG	25	4,6
Calicut	V.N. Pillai	Pri. Sci.	25	3
Visakha-patnam	K. Vijayakumar	Scientist	50	6

Technical Assistance: V.K. Balachandran, Varghese Philipose, A Kanagam, A. Nandakumar, L.R. Khambadkar (Cochin)

8. Location of Research Project: Cochin, Calicut, Kakinada, Visakhapatnam

9. a) Objectives: To make increased use of remote sensing data for correlating the data on productivity, SST etc. with potential areas of fishing in the EEZ.

   b) Practical utility: Satellite imageries provide continuous data on parameters such as SST, Chlorophyll, sedimentation, coastal changes etc. on a large scale covering most of the EEZ. These data have several applications in marine living resources investigations including mapping of potential areas of fishing, fisheries forecast, etc.

10. Technical Programme

1. To analyse all available environmental data collected by different research centres and relate it to commercial fish catch in the region.

2. Processing analysis and verification of satellite data on fisheries potential obtained regularly from SAC & NRSA with fish catch data.
3. Collection/acquisition of sea truth data such as SST, Chlorophyll concentration etc. from different research centres and from the cruises of FORV Sagar Sampada.
4. To identify parameters other than SST & Chlorophyll which may be useful for remote sensing applications in fisheries.
5. Collection/acquisition of ground truth data on coastal zone ecological parameter for correlation with remote sensing data.
6. Selective dissemination of information/map on fishery potential areas to mechanised boat owners at single centre zones (Fisheries Harbour) and obtaining feed back information on weekly catch trends.
7. To build up a strong ocean information system based on remote sensing and undertake user promotion activities.

11. Date of start : 1991 12. Likely date of completion: Continuing

13. Estimated man-months 20 man months/year

14. Facilities required

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

15. If financed by an organisation other than the Institute

a) Name of financing organisation : D.O.D.
b) Title of project :

16. Approximate cost

a) Salary of Scientific staff		: Rs 0.8 lakhs
b) Salary of Technical staff		: Rs 0.4 "
c) Salary of Supporting staff		:
d) Casual labourer cost, if any		: Rs 1.0 "
e) Cost of equipment, facility etc.		
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.		: Rs 0.2 "
	T.A.	: Rs 0.2 "
g) Total cost		: Rs 2.6 "

17. Signature of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. FORV/SS/1 2. I.C.A.R. Code No.

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

4. Title of project : Fishery oceanography of the offshore regions of the Indian EEZ

5. Title of Sub-project:

6. Name and Designation of Project Leader : G. Subbaraju, Principal Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin Kakinada	G. Subbaraju	Pri. Sci.	25	As per technical programme
Calicut	V.N. Pillai	Pri. Sci.	25	

Technical Assistance: P.M. Aboobaker, A. Nandakumar (Cochin)

8. Location of the Research Project: Cochin, Kakinada, Calicut

9. a) Objectives: To explain the variations observed in the fishery of offshore and deep sea regions of the Indian EEZ in relation to changes in the oceanographic conditions.

b) Practical utility:

Prediction of fishery for the benefit of vessel operators/ Administrators.

. Technical programme: Analysis and processing of relevant oceanographic data collected during the cruises of FORV Sagar Sampada and interpretation of the same in relation to fish catch data collected by the vessel.

1. Date of start: Jan. 1989 12. Likely date of completion: 1995

3. Estimated man-months : 18 man months/year

4. Facilities required

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

15. If financed by an organisation other than the Institute: Yes (partly)

a) Name of financing organisation: DOD will meet all expenses connected with data collection

b) Title of project: Survey of living resources of the Indian EEZ (DOD Scheme)

16. Approximate cost

a) Salary of scientists	: Rs	1.5 lakhs
b) Salary of technical staff	: Rs	0.3 "
c) Salary of supporting staff		--
d) Casual labourer cost, if any		--
e) Cost of equipment, facility etc.		--
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	: Rs	0.12 "
T.A.	:	0.2 "
g) Total cost	: Rs	2.12 lakhs

17. Signatures of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. FORV/SS/3 2. ICAR Code No.

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

4. Title of project : Results of the exploratory survey of the Indian EEZ by FORV Sagar Sampada

5. Title of Sub-project: Investigations on zooplankton and components of DSL of the EEZ of India

6. Name and Designation of Project Leader : K.J. Mathew Senior Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Cochin	K.J. Mathew	Sr. Sci.	60	1, 3a
	T.S. Naomi	Scientist	50	1, 3c
	N.Gopinatha Menon	Sr. Sci.	25	2, 3f
	K.Prabhakaran Nair	Sci. SG	50	3d
	M.P. Molly	Scientist	30	3d
Karwar	V.S. Kakati	Sr.Scientist	25	3c
Madras	M.M. Meiyappan	Sci. SG	50	3c
Mangalore	P.V. Rao	Pri. Sci.	50	3b

Technical Assistance: K.N. Gopalakrishnan, K. Solamon, K.Balachandran (Cochin), A. Mohan (Madras)

8. Location of the Research Project: Cochin, Karwar, Madras and Mangalore

9. a) Objectives: To study the biomass and various groups of zooplankton and the mesopelagic resources of the DSL in relation to environment and fishery resources of the EEZ..

b) Practical utility: A study of the total zooplankton biomass would help in understanding the productivity at the secondary level which could very well be correlated to the abundance and distribution of fish. (ii) Study of the components of DSL would reveal the magnitude of a hitherto unestimated and unexploited resource. A study of the total biomass of IKMT samples would indicate the richness of forage organisms available to primary and secondary carnivores.

10. Technical Programme

1. Estimation of total zooplankton biomass; study of zooplankton groups, zooplankton sorting, documentation of data, distribution of samples and data.
2. Estimation of biomass of IKMT collections, sorting of IKMT samples, documentation of data.
3. Studies on the distribution, abundance and related environmental parameters of selected groups ie. a) Euphasiae, b) decapod crustaceans (c) Cephalopods, (d) Copepods, e) Cladocera, (f) Gomostomatidae, Nomeidae & Bregmacerotidae.
4. Studies on the Deep scattering larger - detection, biomass, components etc.

11. Date of start: Jan. 1989 12. Likely date of completion: 1994

13. Estimated man months : 40 man months/year

14. Facilities required

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

15. If financed by an organisation other than the Institute:
a) Name of financing organisation: The DOD will meet all expenses connected with data collection.
b) Title of project:

16. Approximate cost

a) Salary of Scientific staff	: Rs 6,00,000	
b) Salary of Technical staff	: Rs 1,50,000	
c) Salary of supporting staff	: -	
d) Casual labourer cost, if any	: Rs 75,000	(For sorting zooplankton)
e) Cost of equipment, facility etc.	-	
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	: Rs 5,000	
g) Total cost	: Rs 8,30,000	

17. Signature of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. FEM/EE/1 2. ICAR Code No.

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

4. Title of Project : Conservation and management of coral reef ecosystem

5. Title of Sub-project: Investigations on coral reef ecosystem in Gulf of Mannar and Lakshadweep

6. Name and Designation of Project Leader : C.S. Gopinadha Pillai, Principal Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Cochin	C.S. Gopinadha Pillai	Pri. Sci.	75	1, 2, 3
	T.S. Velayudhan	Sci. SG	25	"

Technical Assistance: K.N. Pushkaran (Cochin), Identified technical staff at Minicoy, Tuticorin and Mandapam Camp.

8. Location of the Research Project: Cochin

9. a) Objectives: To study and understand the specific ecological stresses on terrestrial and marine environment necessary for implementation of conservation measures and eco-development programmes, in some of the islands.

b) Practical utility:
The information gathered will help in identifying problems related to reef conservation and island development.

10. Technical programme:

1. To undertake short term surveys of identified islands in Gulf of Mannar and Lakshadweep for assessing environmental impact/stresses in the island ecosystems.

2. To conduct experimental work on transplantation and rejuvenation of corals and
3. to suggest suitable remedial measures and ecodevelopment programmes for the conservation of these ecosystem.
4. The above items of work will be undertaken by participation of scientists and technical staff drawn from different disciplines and different Research Centres as per requirement.

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11. Date of start: 1989 12. Likely date of completion: 1995

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13. Estimated man-months : 12 man months

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14. Facilities required

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

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15. If financed by an organisation other than the Institute

a) Name of financing organisation
b) Title of project

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16. Approximate cost

a) Salary of scientific staff	:	Rs 80,000
b) Salary of technical staff	:	Rs 12,000
c) Salary of supporting staff		
d) Casual labourer cost, if any		
e) Cost of equipment, facility etc.		
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	Rs 12,000
T.A.	:	Rs 10,000
g) Total cost	:	Rs 1.14 lakhs

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17. Signatures of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1993-94

1. Institute Code No. FEM/CUL/2 2. ICAR Code No.

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

4. Title of project : Breeding seed production and sea ranching of sea cucumber Holothurialscabra

5. Title of Sub-project:

6. Name and designation of Project Leader : D.B. James, Senior Scientist

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

Centre	Name	Designation	Time to be spent(%)	Work to be done
Tuticorin	D.B. James	Sr. Sci.	50	1-3

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

8. Location of the Research Project : Tuticorin

9. a) Objectives:
Breeding seed production and sea ranching of sea cucumber Holothuria scabra

b) Practical utility: At present India is exporting Beche-de-mer worth of nearly one crore of rupees. There is very great demand for beche-de-mer in Singapore and Hong Kong markets. The natural populations of H.scabra in the Gulf of Mannar and Palk Bay are fast dwindling due to overfishing. The natural populations can be revived by sea ranching programme.

10. Technical programme
1. To standardise the techniques for induced spawning
2. To develop suitable rearing techniques for various stages of larvae.
3. To sea ranch the juveniles produced in the hatchery in suitable places to augment coastal production.

Work done: For the first time Holothuria scabra was induced to **spawn in the laboratory.** The various stages of larvae were successfully reared to juvenile stage. Breeding and rearing experiments were continued.

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11. Date of start : 1987 12. Likely date of completion: 1995

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13. Estimated man months : 12 man months/year

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14. Facilities required

i.	Land : Nil	v. Fish ponds	: Nil
ii.	Labour: 4 persons	vi. Foreign exchange	: Nil
iii.	Special equipment : Nil	vii. Other items	: Nil
iv.	Hatchery-cum-shed : Present	viii. Total estimated cost	

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

a) Name of the financing organisation : MPEDA

b) Title of the Project

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16. Approximate cost

a) Salary of scientific staff	: Rs 0.70 lakhs
b) Salary of technical staff	: Rs 0.60 lakhs
c) Salary of Supporting staff	
d) Casual labourer cost, if any	: Rs 0.14 lakhs
e) Cost of equipment, facility etc.	: Rs 1.00 lakhs
f) Contingencies, such as chemicals fertilizers, seed, animals, feeds, sprayers etc.	: Rs 0.20 lakhs
g) Total cost	: Rs 2.64 lakhs

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17. Signatures of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1993-94

1. **Institute Code No.** FEM/AR/1 2. ICAR Code No.

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

4. Title of the Project : Studies on exploitation of auxiliary marine living resources

5. Title of Sub-project:

6. Name and designation of Project Leader : P.A. Thomas, Senior Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Vizhinjam	P.A. Thomas	Sr. Sci.	50	1-5
	S. Jasmin	Scientist	50	"

Technical Assistance

8. Location of the Research Project: Vizhinjam

9. a) Objectives

1. To monitor the exploitation of non-conventional ancillary marine resources which are being exported to various countries for extraction of rare chemicals and 'wonder' drugs from the point of view of conservation of these resources.
2. To render expertise in identifying these plants and ~~xxxxx~~ animals which are collected by various agencies and to prevent wasteful and indiscriminate collection of these material.
3. To suggest measures for the optimum use of these resources and their conservation.

b) Practical utility : The data and information collected on resources yielding wonder drugs will help in conserving these resources and also help in evaluating the drug potential, their export and related information needed for scientific studies.

10. Technical programme

1. Collection of data and information on the exploitation of non conventional marine plants and animals from which rare chemical and wonder drugs are being extracted by foreign.
2. Evaluate the export trend of these ancillary resources. This will be made at primary (collection site) as well as through export data.
3. Evaluation of their drug potential from published data.
4. Help the various Institutions in India to identify the source material.
5. Pass on any new data collected on source material from data on export trend to competent Institutions in India for follow up action.

11. Date of start: 1992-93 12. Likely date of completion: 1994-95

13. Estimated man-months : 4.5 months/year

14. Facilities required

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

15. If financed by an organisation other than the Institute:
   a) Name of the financing organisation
   b) Title of the project

16. Approximate cost

a) Salary of scientific staff	:	Rs 33,600
b) Salary of technical staff	:	-
c) Salary of supporting staff		-
d) Casual labourer cost, if any	:	1,000
e) Cost of equipment, facility etc.	:	2,000
f) Contingencies, such as chemicals, fertilisers, seed, animals, feed, sprayers etc.	:	1,500
T.A.	:	8,000
Library Books/Photography/ Xeroxing	:	Rs 3,000
g) Total cost	:	Rs 49,100

17. Signatures of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993 - 94

1. Institute code No: FE & E/24.1 2. I.C.A.R.Code No:

3. Name and address of Research Institute: C.M.F.R.Institute, Cochin-31.

4. Title of project: Studies on production cost, profitability and optimum resource allocation in marine fishery sector.

5. Title of sub-project: Study on economic performance of trawlers

6. Name and designation of Project Leader : D.B.S.Sehara, Scientist (SG)

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	D.B.S.Sehara	Scientist (SG)	75	As per the technical programme.
	K.K.P.Panikkar	-do-	25	
Technical Assistance:				
	S.S.Dan	T-7		
	K.P.Salini	T-1		

8. Location of the Research Project: Cochin

9. (a) Objectives: To evaluate the economic efficiency of different sizes of trawlers. To analyse the cost structure and factor productivity in trawl operation.

(b) Practical utility: The study will generate information on input demand function of trawl units. It will provide vital information on returns to capital, labour and management for trawl units which would help the industry in making suitable entrepreneurial decisions and credit agencies in formulating lending policies.

10. Technical Programme: Sample units from different sizes of trawlers operating at selected centres along Kerala, Karnataka, Orissa and West Bengal coast will be drawn. Data regarding the details of catch, price, cost and employment will be collected on systematically selected random observation days. Data will be analysed by adopting suitable econometric methods and report will be prepared.

Work done: The economic data collection from sample trawl units have been initiated from Digha, Paradeep, Balaramgudi and Sakthikulangara centres. No centre could be taken in Karnataka due to shortage of T.A.funds.

Work envisaged: The data collection will continue at the 4 centres upto October '93. The data collected for one full year will be analysed to study the economic performance of trawlers.

11.Date of start: April '92 12.Likely date of completion: April '94.

13.Estimated man-months/year: : 25 man months

14.Facilities required:

i) Land	)	v) Fish ponds	)
ii) Labour	) Nil	vi) Foreign exchange	)
iii) Special requirements	)	vii) Other items	) Nil
iv) Animal sheds	)	viii) Total estimated cost	)

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

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16.Approximate cost:

a) Salary of scientific staff	: Rs.	1,10,000
b) Salary of Technical staff	:	25,000
c) Salary of supporting staff	:	Nil
d) Casual labourer cost, if any	:	Nil
e) Cost of equipment, facility etc. (T.A.)		20,000
f) Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	20,000 (For rendering help in data collection)
g) Total cost	: Rs.	1,75,000

17.Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director.

RESEARCH PROJECT 1993-94

1. Institute code No: FE & E/26.1 2. I.C.A.R.Code No:

3. Name and address of Research Institute : C.M.F.R.Institute, Cochin-31.

4. Title of project: Investigations on the effectiveness of Extension methods in transfer of technology in marine fisheries.

5. Title of sub-project: Studies on the efficacy of village adoption in transfer of technologies (TOT) in marine fisheries.

6. Name and designation of Project Leader : A.Regunathan, Scientist (SG)

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

Centre	Name & Designation	Time to be spent (%)	Work to be done
Cochin	A.Regunathan, Scientist (SG)	70	As per the technical programme
	M.M.Thomas, Principal Scientist	30	

Technical Assistance:

A.N.Mohanan, T-5
A.Kanakkan, T.II-3

8. Location of the research project: Cochin

9. (a) Objectives:

i) To study the effectiveness of transfer of scientific fish/prawn culture technologies through village adoption.

ii) To study the potentials of integration of fish/prawn culture technologies with other systems of production in an adopted village (Narakkal).

iii) To study the resource characteristics of target population.

iv) To delineate the constraints in the adoption of scientifi fish/prawn culture and their integration with other systems of production in an adopted village.

v) To bring a favourable change in the characteristics of the village in general and the target population in particular.

(b) Practical utility:

In transfer of technology, one could think of either motivating the potential farmers to come forward on their own and adopt a technology or undertake an aggressive programme to deliver the technology in a manner they understand and act. Since extension is the weakest link in marine fisheries development, it is fair and more expedient to adopt a coastal village and be responsible for the development of the people and the village through an aggressive technology transfer programme of the Institute and integrate fisheries with other allied systems of agricultural production, so that, the impact of the programme in the village in general and the target group in particular would radiate into the adjoining areas at a faster rate and promote adoption of technologies based on demonstrated utility.

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10. Technical programme

a) Identification of project area
b) Development of instruments
c) Organisation of Bench-mark survey
d) Identification of beneficiaries
e) Organisation of demonstrations
f) Organisation of interest groups
g) Development of programme objectives and implementation with special reference to fish/prawn culture and their integration with other systems of agricultural production.
h) Farm development, stocking with HYV finfish/shellfish seeds, monitoring, harvesting and marketing.
i) Data collection on resource characteristics of farmers
j) Organisation of training programmes
k) Development of facilities and practice of other systems of production
l) Organisation of seminars, film/video shows, campaigns and other mass contact programmes.

Work done

The feasibility of transfer of technology of scientific fish/prawn culture in the watering canals of coconut groves has already been demonstrated as a profitable enterprise. Fish seeds have been distributed to the identified farmers and the stock is monitored.

Work envisaged

Fish and prawn culture technology will be transferred to a selected coastal village and innovations pertaining to other systems of agriculture suitable to the selected area will be integrated to have a round the year activity and full scale involvement of the people in order to motivate the people towards adoption of scientific innovations and to demonstrate their utility to increase their agricultural production and improve their living conditions.

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11. Date of start: April 1992. 12. Likely date of completion: March 1994

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

14. Facilities required:

i) Land	Nil	v) Fish ponds:	
ii) Labour		vi) Foreign exchange	Nil
iii) Special requirement		vii) Other items	
iv) Animal shed		viii) Total estimated cost	

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

a) Name of the financing organisation:
b) Title of the project:

16. Approximate cost:

a) Salary of scientific staff	: Rs.	82,000/-
b) Salary of technical staff	:	42,500/-
c) Salary of supporting staff	:	5,000/-
d) T.A.	:	5,000/-
e) Casual labourer cost, if any	:	1,000/-
f) Cost of equipment, facility etc.	:	5,000/-
g) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	85,750/-
h) Total cost		2,26,250/-

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

RESEARCH PROJECT 1993-94

1. Institute code No: FE & E/26.2 2. I.C.A.R. Code No:

3. Name and address of Research Institute : C.M.F.R.Institute, Cochin-31

4. Title of project: Investigations on the effectiveness of Extension methods in transfer of technology in marine fisheries.

5. Title of sub-project: Empowering rural women through extension education - An action research in a fishing village.

6. Name and designation of Project Leader :Krishna Srinath, Scientist (SG)

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

Centre	Name & Designation	Time to be spent (%)	Work to be done
Cochin	Krishna Srinath, Scientist (SG)	90	As per technical programme
	Manpal Sanhotra, Scientist	40	

Technical Assistance:

A.M.Mohanan, Tech.Officer
K.P.Salini, Field Asstt.

8. Location of the research project: Cochin

9. (a) Objectives:

i) To develop qualities of empowernment among fisher-women.

ii) To develop skills on income generating enterprises

iii) To improve the standard of living of rural women at selected centres through adoption of innovations

(b) Practical utility:

The study will help in equipping women for better utilization of their own resources and opportunity and also will help in understanding the constraints faced by women in fishing villages in participation in the development programmes.

10. Technical programme:

i) Collection of gender-related socio-economic information from fishing villages.
ii) Organisation of demonstration of prawn culture involving the feed developed by the Institute.
iii) Organisation of demonstration of prawn feed production at household level
iv) Organisation of demonstration of integrated farming and related technologies
v) Organisation of training in enterpreneurship development and group approach in technology adoption.
vi) Development and use of traditional methods and audio-visual aids in the propagation of technology.
vii) Organising group discussions, seminars and exhibitions
viii) Development of linkage with government and voluntary agencies engaged in fisheries and rural development.
ix Evaluation of the effectiveness of the activities on the level of empowernment of selected women.

Work done:

a) Time series gender - related socio-economic information was collected from 2 centres namely south Chellanam and Fort Cochin from 50 and 25 households respectively. Case studies on role of women in prawn/fish culture were initiated.

b) The following extension education programme were carried out involving participating approach through Matsya-Mahilavedi, the fisherwomen's society adopted under the study.

i. Demonstration of prawn culture technology including the feed developed and standardised at the Institute in 10 cents canal owned by the society member.

ii. Group discussion on the constraints in prawn culture technology involving 25 prawn farmers.

iii. Integrated programmes including poultry, nutrition and population education, and participation in exhibitions and meetings, linking government and voluntary agencies.

Work envisaged:

As per technical programme 1993 - 94

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11. Date of start: April 1992 12. Likely date of completion: March 1994.

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

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14. Facilities required:

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

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

a) Name of the financing organisation:
b) Title of the project:

16. Approximate cost:

a) Salary of scientific staff:	Rs.	1,30,000/-
b) Salary of technical staff:		36,600/-
c) Salary of supporting staff:		
d) Casual labourer cost, if any:		
e) Cost of equipment, facility, etc:		
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds:		35,000/-
g) T.A.		5,000/-
h) Total cost		2,06,600/-

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director.

RESEARCH PROJECT 1993-94

1. Institute code No: FE & E/27 2. I.C.A.R.Code No:

3. Name and address of Research Institute : C.M.F.R.Institute, Cochin-31.

4. Title of project: Studies in socio-psychological dimensions in capture and culture fisheries.

5. Title of sub-project: Investigations on the entrepreneurial behaviour of fishermen in capture and culture fisheries and variables contributing to it.

6. Name and designation of project leader : Jancy Gupta, Scientist

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	Jancy Gupta	Scientist	75	As per col. No.10.

Technical Assistance:

A.Kanakkan	T-II.3
K.P.Salini	T-1

8. Location of the research project: Cochin

9. (a) Objectives: To study the various dimensions of the entrepreneurial behaviour of marine fishermen and prawn farmers.

2) To study the relationship between selected independent variables and entrepreneurial behaviour.

(b) Practical utility: Studies in the past have indicated the association between adoption of innovations and entrepreneurial behaviour. The outcome of the present project will provide valuable information on the entrepreneurial behaviour of fishermen and factors related to it, which can be used by planners and policy makers in fisheries development.

10. Technical programme: 1) Review of literature 2) Development of suitable instruments for the study and measurement of the independent and dependent variables. 3) Selection of sample and collection of data using the instruments developed, from marine fishermen and prawn farmers. 4) Tabulation, analysis and interpretation of data

Work done:

Work envisaged: As per technical programme

11. Date of start: April 1992. 12. Likely date of completion: March '94

13. Estimated man-months: 12 man months

14. Facilities required:

i) Land ii) Labour iii) Equipment iv) Animal shed	Nil	v) Fish ponds vi) Foreign exchange vii) Other items viii) Total estimated cost	Nil

16. Approximate cost:

a) Salary of scientific staff	: Rs.	25,000-00
b) Salary of technical staff	:	9,000-00
c) Salary of supporting staff	:	
d) Casual labourer cost, if any	:	Nil
e) Cost of equipment, facility etc.	:	Nil
f) Contingencies (for data collection)	:	2,000-00
g) Total cost		36,000-00

17. Signature of:

Sd/- Project Leader	Sd/- Head of Division	Sd/- Director.

RESEARCH PROJECT 1993-94

1. Institute code No: FE & E/28 2. I.C.A.R.Code No:

3. Name and address of Research Institute: C.M.F.R.Institute, Cochin-31.

4. Title of project: Marine fish marketing system and prices structure.

5. Title of sub-project: A study on marine fish marketing in Tamil Nadu

6. Name and designation of project leader : R.Sathiadhas, Scientist (SG)

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	R.Sathiadhas,	Scientist (SG)	40	As per col. No.10.

Technical Assistance:

A.Bastian Fernando (Tuticorin)
A.Kanakkan (Cochin)

8. Location of research project: Cochin

9. (A) i. To analyse the fish marketing structure and role of intermediaries in the distribution channel.
ii. To estimate the employment generated in the fishery sector by the postharvest operations of marine fish.
iii. To assess the marketing margins and fishermens' share in consumers rupee for all commercially important varieties of fish and to suggest policy measures to improve marketing efficiency.

(b) Practical utility: The study will be useful for the formulation of appropriate marketing management policies pertaining to marine fisheries.

10. Technical programme: The data on prices of all commercially important varieties of fish at selected primary (Producers market), wholesale and retail markets in Tamil Nadu will be collected for a period of one year covering all seasons. The information on marketing costs and profit margins at different stages of transactions along the marketing channel will also be collected from the selected centres.

1. Date of start: 1st April 1993 12. Likely date of completion : 31st March'95.

3. Estimated man-months: 15 man-months/year

4. Facilities required:

i) Land	Nil	v) Fish ponds	Nil
ii) Labour		vi) Foreign exchange	
iii) Equipment		vii) Other items	
iv) Animal shed		viii) Total estimated cost	

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

a) Name of financing organization:
b) Title of project:

6. Approximate cost:

a) Salary of scientific staff:	Rs. 40,000/-
b) Salary of technical staff :	40,000/-
c) Salary of supporting staff:	Nil
d) Casual labourer cost, if any:	Nil
e) Cost of equipment, facility, etc. (T.A.) (T.A.)	5,000/-
f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers, etc. :	63,000/- (for enumerators rendering help in data collection)
g) Total cost :	1,48,000/-

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director.

RESEARCH PROJECT 1993-94

1. Institute Code No. CMFRI/IDP/1 2. I.C.A.R. Code No.

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

4. Title of Project : Forecasting the abundance of Pelagic Fisheries resources of India

5. Title of Sub-Project : Forecasting of fishery of the Oil sardine, mackerel and Bombay duck in the fishing grounds

6. Name and Designation of Project Leader : G. Luther, Principal Scientist

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

Centre	Name & Designation		Division	Time to be spent (%)	Work to be done
Visakhapatnam	G. Luther	PS(PL)	(PFD)	25	3,6,7,8
Bombay	Alexander Kurian	Sr.S	(PFD)	30	3, 6, 8
Cochin	M.S. Rajagopalan	PS	(FEMD)	25	1, 6, 8
	K. Alagaraja	PS	(FRAD)	25	2, 3 to 6 & 8
	P.N.R. Nair	Sr.S	(PFD)	30	3, 6, 8
	T.V. Satyanandan	S	(FRAD)	25	3 to 6 & 8
	S. Muthuswami	S-2	(FEMD)	25	9

Technical Assistance: M.S. Sumithrudu (Visakhapatnam), A. Nandakumar, Joseph Andrews, M. Abdul Nizar (Cochin), J.D. Sarang (Bombay)

8. Location of the Research Project : Visakhapatnam, Bombay & Cochin

9. a) Objectives: To understand the relationship between variations in the environmental characteristics and the abundance of major pelagic fish resources, and to develop a prediction system.

b) Practical Utility: Wide fluctuations in the annual yields of the important pelagic fishes are very well known. And there is evidence to show that changes in environmental characteristics also influence the abundance of these fishes. The project therefore attempts to understand the relationship between environmental factors and availability of the resources to the fishery.

10. Technical Programme: 1. To collect selected available past data (1971-'91) on weather conditions, oceanographic features and primary and secondary production of the fishing grounds (by the associates from the FEMD). 2. To collect all available past data (1971-'91) on production statistics of oil sardine, mackerel and Bombay duck (by the associates from FRAD). 3. To collect biological data (1971-'91) pertaining to recruitment aspects (Associates from PFD & FRAD). 4. To computerise the data collected at TP 1, 2 & 3 alone (by the associates from FRAD). 5. To develop a suitable computer programme for the analysis of the data (by the associates from FRAD). 6. To analyse and interpret the possible correlations among biological and environmental features, and fish production data (associates from PFD, FEMD & FRAD). 7. Coordination of the various aspects of IDP (Project Leader). 8. Preparation of the Project report (jointly by all the associates). 9. Estimation of lipids.

11. Date of start: April '92 12. Likely date of completion: March '94

13. Estimated man-months : 23 man-months

14. Facilities required:

i) Land	:	v) Fish ponds	:
ii) Labour	:	vi) Foreign exchange	:
iii) Special requirement	:	vii) Other items	:
iv) Animal shed	:	viii) Total estimated cost	:

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

a) Name of financing organisation:

b) Title of Project :

16. Approximate cost:

a) Salary of scientific staff	:	Rs. 137,520
b) Salary of technical staff	:	" 82,000
c) Salary of supporting staff	:	
d) Casual labourer cost, if any	:	
e) Cost of equipment, facility etc.	:	
f) Contingencies, such as chemicals, fertilisers, seed, animals, feeds, sprayers etc.	:	" 25,200
g) TA/DA	:	" 20,000
h) Total cost	:	" 264,720

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute Code No. CMFRI/IDP/2 2. I.C.A.R. Code No.

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

4. Title of Project : Composite Sea Farming

5. Title of Sub-Project : Sea Farming of molluscs, sea cucumber, seaweeds, Seabass Groupers and Prawns.

6. Name and Designation of Project Leader : R. Marichamy Principal Scientist

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

Centre	Name & Designation	Division	Time to be spent (%)	Work to be done
Tuticorin	R. Marichamy, PS	DFD	25	Seabass & Grouper culture
	A.C.C. Victor, S (SG)	MFD	25	
	A.C.C. Victor, Sr.Sci.	MFD	25	Pearl culture
	M.E. Rajapandian, S(SG)	"	25	Edible oyster culture
	D.B. James Sr.Sci.	FEMD	25	Sea cucumber culture
	S. Rengaswami "	DFD	25	Seabass & Grouper Seed collection
Mandapam	P. Nammalwar "	DFD	25	Seabass & Groupers culture
	N. Kaliaperumal, "	FEMD	25	Seaweed culture
	E.V.Radhakrishnan, "	CFD	25	Prawn culture
	A.P. Lipton, "	MFD	25	Clam and mussel culture

Technical Assistance: N. Jesuraj, P. Muthukrishnan, D.Sundararajan, A.D. Gandhi, S. Rajapackiam (Tuticorin), N.R.Arputharaj, S. Kalimuthu (Mandapam).

8. Location of the Research Project : Valinokkam

9. a) Objectives: 1. To test the suitability of Valinokkam Bay for farming the 8 candidate species; 2. To involve fishermen in the farming activities so as to create awareness among them about the benefits leading to income generation and gainful employment opportunities; 3. To get feed back for upgrading the technologies; 4. To pave the way for setting up large scale sea farming projects.

b) Practical Utility: As fishermen will be involved in sea farming activities they get the requisite training in farming so that they will be equipped to take up sea farming on their own. As these are production oriented programmes, they generate income and employment in the rural area.

10. Technical Programme: (1) Establishment of culture system with the assistance of fishermen; (2) Stocking the farm with seed collected from natural grounds/hatchery; (3) Farm management involving the fishermen; (4) Evaluation of the results.

Work done: The Institute has developed technologies for farming pearl oyster , edible oyster , sea cucumber, clam, seaweed and prawn at different places. Last year these technologies were tested at Valinokkam.

Work envisaged: The above technologies will be tested in the Valinokkam Bay to assess their suitability.

11. Date of start : 1992-93 12. Likely date of completion : 1994-95

13. Estimated man-months : 27

14. Facilities required: Port Trust provides water base and other facilities

i)	Land :	v)	Fish ponds :
ii)	Labour :	vi)	Foreign exchange:
iii)	Special requirement :	vii)	Other items :
iv)	Animal shed :	viii)	Total estimated cost :

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

a) Name of the financing organisation :

b) Title of the Project :

16. Approximate cost :

a)	Salary of Scientific Staff	Rs.	1,60,000
b)	Salary of Technical Staff	:	70,000
c)	Salary of Supporting Staff	:	12,500
d)	Casual labourer cost, if any	:	30,000
e)	Cost of equipment, facility etc.	:	1,60,000
f)	Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.	:	12,000
g)	TA/DA	:	19,000
h)	Total cost	:	4,63,500

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT 1993-94

1. Institute code No. IDP/3. 2. I.C.A.R.Code No.

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

4. Title of Project: Investigations on the impact of motorisation of country craft on marine fishery along Kerala coast.

5. Title of sub-project:

6. Name and Designation of Project Leader: K.K.P.Panikkar, Scientist (SG)

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

Centre	Name & Designation	Division	Time to be spent (%)	Work to be done
Cochin	K.K.P.Panikkar Scientist (SG)	S.E.E.T.T.D	50	As per the technical programme.
	D.B.S.Sehara Scientist (SG)	S.E.E.T.T.D	25	
	K.S.Scariah Scientist (SG)	F.R.A.D.	25	

Technical Assistance: A.Kanakkan, T-II-3
Joseph Andrews, T-II-3

8. Location of the research project: Cochin

9. a) Objectives: 1) To assess the socio-economic implications of the motorisation of traditional fishing crafts (2) To examine the impact of motorisation on marine fishery resources (3) To identify constraints and bottlenecks confronted by motorised sector.

   b) Practical utility: The study will help to find out to what extent motorisation has helped the fishermen to improve their socio-economic condition. It will provide basic information to public agencies to formulate developmental programmes and credit policies

10. Technical programme: 1. Ten centres will be selected giving representation for all regions of Kerala coast and all types of craft-gear combination of both motorised and non-motorised units (SEETTD & FRAD)

2. Data on economics of operation and other economic aspects will be collected for all these units (SEETTD)
3. Details of catch effort and species composition will be collected (FRAD)
4. Biological characteristics of the dominant groups in the catch composition of different craft-gear combinations. (Heads of PFD, DFD, CFD and MFD may provide the required information at the time of finalising the report).
5. Comprehensive analysis of data collected for preparing reports/scientific papers and for other purposes.

Work done:

Work envisaged: As per the technical programme given

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11. Date of start: April 1992 12. Likely date of completion: March 1994.

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13. Estimated man-months : 30 months

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14. Facilities required:

i) land	v) Fish ponds		
ii) Labour	vi) Foreign exchange		
iii) Special requirement	Nil	vii) Other items	Nil
iv) Animal shed		viii) Total estimated cost	

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15. If financed by an organisation other than the Institute: N.A.
a) Name of the financing organisation:
b) Title of the project:

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16. Approximate cost:

a) Salary of scientific staff	: Rs.	1,00,000/-
b) Salary of Technical staff:		15,000/-
c) Salary of Supporting staff:	Nil	
d) Casual labourer cost, if any:		50,000/-
e) Cost of equipment, facility etc:		Nil
f) Contingencies such as chemicals, fertilizers, seed, animals, feeds, surveys etc.	:	Nil
g) TA/DA	:	15,000
h) Total cost	:	1,80,000/-

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17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director.

RESEARCH PROJECT 1993-'94

1. Institute Code No. CMFRI/IDP/4 2. ICAR Code No.

3. Name and Address of Research Institute/Centre. : Central Marine Fisheries Research Institute, Cochin.31.

4. Title of Project : Assessment of exploited marine fishery resources.

5. Title of Sub-project : Impact of ring seine operations on the fishery of Kerala and Karnataka coast.

6. Name and Designation of Project Leader. : K.Balan, Scientist SG

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

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.Balan,	Scientist SG, FRAD	25	As per technical programme
	R.Sathyadas.	Scientist SG, FEED	50	

Technical Assistance: Joseph Andrews, M.Ramachandran.

8. Location of the Research Project : Cochin

9. (a) Objectives: 1) To study the effect of introduction of ring seines on the landings of the / . 2) To study the problems connected with the introduction of ring seine on the artisanal sector in particular. / region.

(b) Practical Utility: The information gathered by the study would help (1) to assess the changes in the landing patterns of traditional fishery especially the pelagic resources. (2) to suggest ways and means to conserve the fishery resources. (3) to study the advantages and disadvantages of the ring seine operation.

10. Technical Programme: (1) Collection and analysis of data on catch effort and Economics of operation of ring seine units from the centres selected. (2) Analysis of catch and effort data on ring seine units during the last 7 years.

3) Information on biological characteristics of the target groups will be furnished by the concerned associates dealing with the target groups at Cochin, Calicut and Mangalore from the PFD, DFD, and CFD and also associate themselves with the preparation of the final reports/Scientific papers.

Work done: (1) Prepared and tested various schedules for collection of economics of ring seine units operation. 2) Centres identified and units selected for data collection. 3) Collection of data on catch, effort and species composition of the resources exploited by ring seines completed. 4) Collection and analysis of data on economics of ring seine operations from sampled units started.

Work envisaged: As per technical programme

11.	Date of start	: 1-4-'92
12.	Lekely date of completion	: 31-3-'94
13.	Estimated man-months	: 7 man months
14.	Facilities required	:
	i. Land	v. Fish ponds
	ii. Labour	vi. Foreign exchange
	iii. Special requirement	vii. Other items
	iv. Animal shed	viii. Total estimated cost
15.	If financed by an organisation other than the Institute	: Nil
	(a) Name of the financing organisation.	
	(b) Title of the project.	
16.	Approximate cost:	
	(a) Salary of Scientific staff	: Rs. 55,800/-
	(b) Salary of Technical staff	: Rs. 28,000/-
	(c) Salary of supporting staff	:
	(d) Casual labour cost, if any	: Rs. 42,000/-
	(e) Cost of equipment, facility etc.	:
	(f) Contingencies, such as chemicals, fertilisers, seeds, animals, feeds, sprayers etc.	:
	Maintanence of the computer system	:
	(g) TA	: Rs. 16,000/-
	Total cost	: Rs.1,41,800/-

17. Signature of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director