



RESEARCH PROJECTS

1979

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN-18

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

RESEARCH PROJECTS FOR 1979

INTRODUCTION

The Research Projects of the Central Marine Fisheries Research Institute for 1979 have been formulated and reoriented to meet two major goals. Firstly, the projects would reflect the major thrusts that have been planned in marine fisheries research during the Sixth Five Year Plan and secondly, the year 1979 is a very significant one being the Golden Jubilee year of Indian Council of Agricultural Research. In a series of communications, the Director General, ICAR has clearly spelt out the guidelines of major areas of activity in the field of Agriculture, Animal Science and Fisheries in the country to be taken up during the Golden Jubilee Year as a part of the 'LAB-TO-LAND' programmes. This would entail in our case, considerable emphasis on the transfer of developed technology to the coastal rural population.

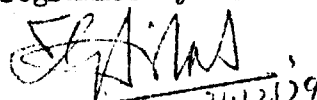
The Research Projects are basic, adaptive and applied in nature wherever necessary and lay stress on the proper exploration and monitoring of the fishery resources of our economic zone. The specific research needs and problems of maritime states, Union territories and fishing industries have also been given due consideration.

Mariculture investigations are to be intensified and based on the technologies already developed by the Institute, demonstration projects are to be taken up for fin fishes, shell fishes and seaweeds. Suitable training programmes have been introduced for imparting training at various levels on mariculture, underwater investigations and on fishery resources assessment. The Institute will also be taking up Inter-Institutional Projects and Sponsored Projects. Operational Research Projects form an integrated approach to blending sea farming with traditional small-scale capture fisheries for rural development and will be taken up at selected centres in some of the maritime states.

In the 'LAB-TO-LAND' programme, the Institute will be involved in the transfer of technology at selected centres covering about 250 fishermen families in prawn, fish, mussel, oyster and seaweed culture. It is proposed to commence the pre-project work on the UNDP Centre of Excellence in mariculture at the Institute during the year.

The projects on the status of the major fisheries will provide the balance sheet for both demersal and pelagic fisheries in understanding the assets and liabilities of the resources. The projects on the stock assessment of commercially important species are intended to evolve suitable marine resources management policies. With the recruitment of additional staff and five yearly assessment of scientific and technical personnel, re-deployment of personnel on priority projects will be made, if necessary during the course of the year. The designation of Scientific and Technical staff are indicated as on 1-1-1979.

These projects were discussed in depth taking into consideration the local needs of the various maritime States and also the problems confronting the country as a whole, and were finalised at the meetings of the Officers-in-charge, Project Leaders and Division heads held in October/November 1978 for implementation in 1979 in anticipation of the formal approval of the programmes by the Institute's Management Committee.


(E.G. SILAS) 24/2/79
DIRECTOR

ABBREVIATIONS USED

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

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN

RESEARCH PROJECTS FOR 1979

Code No.	Title of Project/Problem	Page No.
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FISHERIES RESOURCES ASSESSMENT DIVISION

Assessment of marine fisheries resources

FSS/FRA/1.1	1	Sample survey for estimating the marine fish production and the effort expended to get the production from mechanised and non-mechanised boats	1
FSS/FRA/1.2	2	Frame Survey	4
FSS/FRA/1.3	3	Stock assessment and estimation of potential yield of commercially important fishes	6
FSS/FRA/ST-1	4	Fishery Data Centre ...	8
FSS/FRA/1.4	5	Standardization of fishing effort	10
FSS/FRA/1.5	6	Survey of estuarine fisheries ...	12
FSS/FRA/1.6	7	Exploited marine fisheries resources of the maritime states ...	14
FSS/FRA/1.7	8	Socio-economic survey of small-scale fisheries at selected centres for an integrated development of the coastal rural sector	16
*FSS/FRA/1.8	9	Impact of purse seine operations on the socio-economic conditions of traditional fisherman at selected centres in Karnataka and Goa regions ...	18
*FSS/FRA/1.9	10	The impact of mechanised fishing on the socio economic conditions of fishermen living in Sakthikulangara-Neendakara area	20

* New project

Annexure	..	Annexure showing the list of technical staff at various fields	22
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FISHERY BIOLOGY DIVISION

A. Pelagic Fishery Resources

Investigations on clupeoid fishery resources

FB/PR/1.1	11	The fishery and resource characteristics of oil sardine	25
FB/PR/1.2	..	Unit stocks of oil sardine (merged with FB/PR/6.1)	
FB/PR/1.3	12	Evaluation of the resources of lesser sardines (Revised)	27
FB/PR/1.3.2	13	Evaluation of the resources of anchovies (Revised)	29
FB/PR/1.4	..	Oil sardine fishery atlas (Project completed in 1978).	
FB/PR/1.5	..	Present status of oil sardine fishery (Project completed in 1977)	
FB/PR/1.6	..	Present status of the fishery of anchovies (Project completed in 1978).	

Investigations on mackerel fishery resources

FB/PR/2.1	14	The fishery resource characteristics of mackerel	31
FB/PR/2.2	..	Unit stocks of mackerel (merged with FB/PR/6.1)	
FB/PR/2.3	..	Mackerel fishery Atlas (Project completed in 1978).	
FB/PR/2.4	..	The present status of mackerel fishery (Project completed in 1977).	

Investigations on the resources of tunas and related fishes

FB/PR/3.1	15	Resources of tunas and bill fishes	33
FB/PR/3.2	..	Status report on the fishery for tunas (Project completed in 1977).	
FB/PR/3.3	16	Resources of seer fishes	35
FB/PR/3.4	17	Culture of anchovies as live-bait for tunas	37

Investigations on Bombay duck resources

FB/PR/4.1	18	The fishery and resources characteristics of Bombay duck (revised)	39
FB/PR/4.2	..	Unit stocks of Bombay duck (merged with FB/PR/6.1)	

Investigations on other pelagic fish resources

FB/PR/5.1	19	Fishery and resource characteristics of Carangids (Revised)	41
FB/PR/5.2	20	The resource characteristics of ribbon fishes (Revised)	43
FB/PR/5.3	21	The fishery and resource characteristics of sharks (Revised)	45
FB/PR/5.4	22	Resource characteristics of pomfrets (Revised)	47

Investigation on the Unit stocks of Pelagic fish resources

FB/PR/6.1	23	Unit stocks of oil sardine, mackerel and Bombay duck (Revised)	49
-----------	----	--	----

Investigations on the spawning and nursery grounds of pelagic fish

*FB/PR/7.1	24	Evaluation of the distribution and abundance of spawners and young fish	51
------------	----	---	----

B. Demersal Fishery Resources

Investigations on major demersal fishery resources

FB/PR/1.1.1	25	The fishery and resource characteristics of catfishes (Revised).	53
FB/PR/1.1.2	26	Resource characteristics of perches (Revised)	55
FB/PR/1.1.3	27	Resource characteristics of threadfin breams (Revised)	57
FB/PR/1.2	28	The fishery and resource characteristics of sciaenids (Revised)	59
FB/PR/1.3	29	The fishery and resource characteristics of silver bellies (Revised)	61
FB/PR/1.4	30	Evaluation of the demersal resources of some selected centres	63
FB/PR/1.5	..	Resources of flat fishes and pomfrets (merged with FB/PR/5.4)	

FB/PR/1.6	31	Resource characteristics of rays and skates (Revised)	...	65
FB/PR/1.7	32	The fishery and resource characteristics of lizard fishes (Revised)	...	67

Investigations on other fishery resources

FB/OF/1.1	..	Resources of commercially important elasmobranchs (merged with FB/PR/5.3 and FB/PR/1.6)	...	
-----------	----	---	-----	--

Mariculture - Culture of finfishes

FB/CUL/1.1.1	33	Culture of marine fishes (Revised)		69
FB/CUL/1.1.2	34	Breeding, seed production and culture of milkfish and pearl spot (Revised)		71
*FB/CUL/1.1.3	35	Breeding, seed production and culture of grey mullets	...	73
FB/CUL/1.2	36	Aquaculture of eels	...	75

CRUSTACEAN FISHERIES DIVISION

Crustacean resources investigations

CF/RE/1.1.1	37	Assessment of Penaeid prawn resources		77
CF/RE/1.1.2	38	Assessment of Non-Penaeid prawn resources		80
CF/RE/1.1.3	39	Assessment of prawn resources in the nursery grounds		82
*CF/RE/1.1.4	40	Evaluation of penaeid prawn fishery with special reference to fisheries effort etc.	...	85
CF/RE/1.2	..	Estimation of population parameters of prawns off Cochin (merged with CF/RE/1.1)		
CF/RE/1.3	41	Assessment of lobster and crab resources	...	87
CF/RE/1.4	42	Prawn fishery atlas	...	89
CF/RE/1.6	43	Genetic resources of commercially important prawns	...	91
CF/RE/1.7	44	Assessment of Stomatopod resources		93
CF/RE/1.5	..	Status report on prawn fishery (Project completed)	...	

MARICULTURE_ CULTURE OF CRUSTACEANS

CF/CUL/1.1.1	45	Intensive culture of marine prawns	95
CF/CUL/1.1.2	46	Mass production of prawn seeds	97
CF/CUL/1.1.3	47	Culture of commercially important crabs	99
CF/CUL/1.2	..	Development of artificial feed for prawn larvae and juveniles (project terminated)	
CF/CUL/1.3	..	Investigations on salinity tolerance of penaeid prawns (project terminated)	
CF/CUL/1.4	..	Some aspects of endocrinology of prawns (modified as an IOP project)	
CF/CUL/1.5	48	Culture of spiny lobsters ...	101

MOLLUSCAN FISHERIES DIVISIONMolluscan fishery resources

MOL/RE/1.1	49	Resources survey of commercially important molluscs ...	103
MOL/RE/1.2	50	Survey of Cephalopod resources in the Economic Zone (Title revised) ...	105
MOL/RE/1.3	..	Investigations on the pearl oyster and chanks (Project completed in 1977)	
MOL/RE/1.4	..	Pearl oyster Atlas (Project completed in 1978)	
*MOL/RE/1.5	51	Genetic resources of commercially important molluscs ...	107

Mariculture - Culture of molluscs

MOL/CUL/1.1	52	Culture of edible oysters ...	109
MOL/CUL/1.2	53	Culture of mussels ...	111
MOL/CUL/1.3	54	Culture of clams and window pane oysters (project revised) ...	113
MOL/CUL/1.4	55	Pearl culture ...	115
MOL/CUL/1.5	56	Development of hatchery system for edible oyster seed production ...	117
MOL/CUL/1.6	57	Development of hatchery system for mussel seed production ...	119
MOL/CUL/1.7	58	Development of hatchery system for pearl oyster seed production ...	121

*MOL/CUL/1.8	59	Culture of Cephalopods	...	123
--------------	----	------------------------	-----	-----

FISHERY ENVIRONMENTAL DIVISION

Fishery Oceanography Investigations

MBO/ES/1.1	60	Physical and chemical aspects of shelf and adjacent waters	...	125
MBO/ES/3	61	Fishery Oceanographic atlas	...	127

Phytoplankton and Primary productivity

MBO/PP/1.1	62	Investigations on phytoplankton and primary productivity of the shelf and adjacent waters	...	129
MBO/PP/1.2	63	Productivity and nutrient cycles in the prawn fields around Cochin	...	131
*MBO/PP/1.3	64	Productivity of the aquatic plants in the coastal areas	...	133

Neustonological investigations

*MBO/NU/1	65	Evaluation of the role of neuston in the reproduction of marine organisms and biogenic transformation	...	135
-----------	----	---	-----	-----

Secondary production

MBO/PL/1.1	66	Investigations on secondary production of the shelf and adjacent waters	...	137
------------	----	---	-----	-----

Investigations on fish eggs and larvae

MBO/FEL/1.1	67	Investigations on the eggs and larvae of commercially important fishes from the shelf and adjacent waters	...	139
-------------	----	---	-----	-----

Economically important sea weed resources

MBO/SW/1.1	68	Seaweed resources investigations		141
MBO/SW/1.2	69	Culture of economically important seaweeds	...	143

Ecological energetics

MBO/EE/1.2	70	Ecological energetics of the fishing grounds off Cochin	...	145
------------	----	---	-----	-----

Mud Banks and their influence on fisheries

MBO/MB/1.1	71	Investigations on the mud banks of the Kerala coast and their influence on the fishery	...	147
------------	----	--	-----	-----

Benthos of the fishing grounds

MBO/BF/1.1	72	Effect of aquatic weed deposits on the fishing grounds off Cochin	...	149
------------	----	---	-----	-----

Mass culture of plankters

MBO/MCP/1	73	Mass culture of plankters	...	151
-----------	----	---------------------------	-----	-----

Marine pollution

MBO/MP/1.1	74	Marine pollution in relation to the protection of the living resources		153
------------	----	--	--	-----

Investigations on coral reef resources

MBO/CR/1.1	75	Ecology and resources of the fringing reefs and atolls	...	155
------------	----	--	-----	-----

Investigations on Mangrove swamps

MBO/MS/1.1	76	Ecology of the mangrove swamps	...	157
------------	----	--------------------------------	-----	-----

Investigations on sponges

MBO/SP/1.1	77	Investigations on useful and harmful sponges	...	159
------------	----	--	-----	-----

Investigations on marine reptiles and mammals

MBO/MM/1.1	78	Investigations on the distribution, biology, feeding habits, reproduction and behaviour of marine turtles, dolphins and porpoises	...	161
------------	----	---	-----	-----

INTER DIVISIONAL PROJECTS

Survey of fish seed resources

CMFRI/IDP/1	79	Survey of molluscs (bivalves), prawn and fish seed resources	...	163
-------------	----	--	-----	-----

Fish and shell fish disease

CMFRI/IDP/2	80	Investigations on fish and shellfish diseases	..	166
-------------	----	---	----	-----

National tagging programme

CMFRI/IDP/3	81	National programme of tagging oil sardine, mackerel and prawns	...	168
CMFRI/IDP/4	..	Tagging of cat fishes (merged with CMFRI/IDP/3)		

Fishery resources of the economic zone

CMFRI/IDP/5	82	Exploration of fishery resources of the continental shelf edge and oceanic waters of our economic zone ...	170
-------------	----	--	-----

Man-made changes on Environment

CMFRI/IDP/6	83	Artificial enrichment of lagoon waters in Minicoy ...	172
CMFRI/IDP/7	84	Impact of Thanneermukkom Bund on the fisheries of Vembanad Lake ...	174

Nutritional Physiology of Fish and Shellfish

CMFRI/IDP/8	85	Nutrition and ecological energetics in prawns ...	177
-------------	----	---	-----

Reproductive physiology of fishes and shell fishes

CMFRI/IDP/9	86	Endocrinology in prawns ...	179
CMFRI/IDP/10	..	Induced breeding of <u>Chanos chanos</u> and seed production (merged with FB/CUL/1.1.2)	
CMFRI/IDP/11	87	Studies on the ecology production and economics of crop, marine prawn/fish culture ...	181

INTER-INSTITUTIONAL PROJECTS

IIP/1	88	Fish/prawn feed development for intensive culture ...	184
IIP/2	89	Operation of Conventional and experimental 'Dol' nets from two centres viz., Bassein and Navabunder and study the catch composition ...	186
IIP/3	90	Product development and quality control of molluscan products ...	188
*IIP/4	91	Economics of marine fisheries in Calicut area ...	190

DEMONSTRATION PROJECTS IN MARICULTURE

CMFRI/DP/1	92	Demonstration project on pearl oyster culture and pearl production ...	192
------------	----	--	-----

CMFRI/DP/2	93	Demonstration project on edible oyster culture ...	191
CMFRI/DP/3	94	Demonstration project on mussel culture	196
CMFRI/DP/4	95	Demonstration project on seaweed culture	198

TRAINING PROGRAMMES IN MARINE FISHERIES
RESEARCH

CMFRI/TP/1	96	Training in marine prawn culture	200
CMFRI/TR/2	97	Training in pearl culture	202
CMFRI/TR/3	98	Training in edible oyster culture	204
CMFRI/TR/4	99	Training in under-water investigations by SCUBA diving ...	206
CMFRI/TR/5	100	Training in seaweed culture and utilization	208
CMFRI/TR/6	101	Training in fishery resources assessment including population dynamics ...	210
ICAR Golden Jubilæe- Lab to Land Programmes			213
Sponsored Projects and other Projects			214

RESEARCH PROJECT - 1979

 1. Institute Code No. FSS/FRA/1.1

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

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

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

Title of Problem: FSS/FRA/1.1 Sample Survey for estimating marine fish production and fishing effort expended to get the production from mechanised units and non-mechanised units.

 5. Name and designation of Principal Investigator: G.Venkataraman S-3

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

Associate Leader : T. Jacob, S-3

Part Time

<u>Establishments</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	K. Alagaraja, S-2	A.S. Kaikini - T6
	S.K. Dharmaraja, S-2	C.R. Shanmughavelu T6
	K.K.P. Panikkar, S-1	M.G. Dayanandan T6
	R. Satyadas, S-1	Syed Basheeruddin T6
	M. Srinath, S-1	S.S. Dan, T6
Cochin	K. Narayana Kurup, S-1	G. Balakrishnan T4
	K. Balan, S	Varghese Philipose, TII-3
	B.P. Kumari, S	U.K. Satyavan T II-3
	K. Vijayalekshmi, S	Varghese Jacob T II-3
		G. Krishnankutty Nair, TII-3
		P. Sivaraman, T II-3
		V. Rajendran, T II-3
		V.P. Annam, T II-3
		A. Kanakkan, T-2
		P.K. Mahadevan Pillai, TII-3
		S. Raja Najeemudeen, T2
		K. Santhakumari, T2
		P.L. Ammini, T2
		C.J. Prasad, T2
		T.A. Sankarankutty, T2

Technical Staff T1, T2 and TII-3 at 40 centres)

 7. Location of the Research Project: Cochin

8.(a) Objectives: Estimation of marine fish production and effort in terms of number of operations of unit gear of different types of (a) non-mechanised units and (b) mechanised units along with the detailed break-up of the yield according to variety, region and type of gear and variation in the price structure at the landing centres.

 (b) Practical Utility:

The data on catch and effort form the basic requirements for the assessment of exploited stocks. The estimates arrived at as well as the price statistics are made use of by the Governmental agencies and the fishing industry for the fishery developmental programmes in the country.

 9. Technical programme:

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

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

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

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

 10. Date of start: Continuing project

11. Likely date of completion: Continuing project

12. Estimated man months: 804 man months/year

 13. Facilities required:

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

14. If financed by an organisation other than the Institute

a) Name of the financing organisation --

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

15. Approximate cost: -----

16. Signatures of:

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

RESEARCH PROJECT - 1979

1. Institute Code No. FSS/FRA/1.2
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FSS/FRA/1 Assessment of marine fishery resources
- Title of Problem: FSS/FRA/1.2 Frame Survey.

5. Name and designation of Principal Investigator: S.K.Dharma Raja, S-2.
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Associate Leader: G. Venkataraman, S-3.
- Part time:

Establishments	Scientific Associates	Technical Associates
	T. Jacob, S-3	A.S. Kaikini, T6
	K. Alagaraja, S-2.	S. Basheeruddin, T6
	M. Srinath, S-1	C.R. Shanmugavelu, T6
	K.K.P. Panikkar, S-1	M.G. Dayanandan, T6
	R. Sathiadas, S-1	S.S. Dan, T6
	K. Narayanakutty, S-1	G. Balakrishnan, T4
	B. P. Kumari, S	Varughese Philipose, T II-3
Cochin	K. Vijayalakshmi, S	Varughese Jacob, TII-3
		P. Sivaraman, T-II-3.
		V. Rajendran TII-3
		K. Santhakumari, T2
		A. Kanakkan, T2
		P.L. Ammini, T2 & other technical field staff.

7. Location of the Research Project: Cochin
8. (a) Objectives:
- Village-wise data on fishermen population, fishing units of different types and information on fish landing centres will be collected under this project by this Institute. These will also bring out the nature of changing pattern of fishing industry and its consequent impact on fishermen.
- Practical Utility: ---
- (b) For estimating total marine fish production based on the sample survey and for studying the socio-economic conditions of the fishermen populations as well as the changing pattern of the fishing industry, the information collected on the village-wise data on fishermen population, fishing units and other information concerning the infrastructure is of vital importance.

 9. Technical Programme:

During 1979 a fresh frame survey will be taken up and village-wise data will be collected in all the 1900 villages scattered along the coast of India. More data such as the cost of fishing boat, and **gears** and the socio-economic conditions of fishermen will be collected.

 10. Date of start: 1979

 11. Likely date of completion: End of 1979

 12. Estimated man months: 279 man months/year

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

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

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

a. Name of the financing organisation --

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

 15. Approximate cost: ----

 16. Signatures of :

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

-
1. Institute Code No. FSS/FRA/1.3
-
2. I.C.A.R. Code No.
-
3. Name and address of Central Marine Fisheries
Research Institute/Centre: Research Institute, Cochin
-
4. Title of Project: FSS/FRA/1 Assessment of marine fishery
resources

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

-
5. Name and designation of
Principal Investigator: K. Alagaraja, S-2
-
6. Name(s) and designation of Associate(s) and Establishments
on which borne:
Part time:

Associate Leader: T. Jacob S-3.

<u>Establi- shments</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	G. Venkataraman, S-3	C.R. Shanmughavelu, T6
	S.K. Dharmaraja, S-2	M.G. Dayanandan T-6
	K. Marayana Kurup, S-1	G. Balakrishnan, T-4
	M. Srinath, S-1	U.K. Satyavan, TII-3
	K. Balan, S	Varghese Phillipose TII-3
	B. Prasanna Kumari, S	
	K. Vijayalakshmi, S	

-
7. Location of the Research Project: Cochin
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8. (a) Objectives:

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

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

(b) Practical Utility:

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

 9. Technical programme: -----

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

 10. Date of start: Continuing -----

 11. Likely date of completion: Continuing -----

 12. Estimated man months: 26 man months -----

 13. Facilities required: -----

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

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

a) Name of the financing organisation: --

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

 15. Approximate cost: -----

 16. Signatures of: -----

Sd.
 Principal Investigator

Sd.
 Head of Division

Sd.
 Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. FSS/FRA/ST.1
2. I.C.A.R. Code No. -----
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin
4. Title of Project: Assessment of fishery Resources

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

5. Name and Designation of Principal Investigator: T. Jacob S-3
6. Name and Designation of Associates and Establishment on which borne:
- Associate Leader: K. Alagaraja, S-2.
- Part time:

<u>Establishments</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Cochin	G. Venkataraman, S-3	C.R. Shanmugha Velu, T-6
	S.K. Dharmaraja, S-2	M.G. Dayanandan, T6
	M. Srinath, S-1	G. Balakrishnan, T4
	K. Narayana Kurup, S-1.	U.K. Satyavan, TII-3
	K. Balan, S	Varghese Jacob, TII-3
	B. Prasanna Kumari, S	Varghese Philipose TII-3
	K. Vijayalekshmi, S	G. Krishnan Kutty Nair, TII-3
		P. Sivaraman, TII-3
		V. Rajendran, TII-3
		V.P. Annam, TII-3
		P.K. Mahadevan Pillai, TII-3
		A. Kanakkan, T-2
		S. Haja Najemuddin, T-2
		K. Santha Kumari, T-2
		C.J. Prasad, T-2
		T.A. Sankarankutty T-2
		P.L. Ammini, T-2

-
7. Location of the Research Project: Cochin
-

8. (a) Objectives:

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

 (b) Practical Utility:

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

9. Technical programme:

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

10. Date of start: Continuing -----

11. Likely date of completion: Continuing -----

12. Estimated man months: 62 man months/year -----

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost: -----

16. Signatures of:

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

RESEARCH PROJECT - 1979

-
1. Institute Code No. FSS/FRA/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: FSS/FRA/1 Assessment of Marine Fishery Resources.
- Title of Problem: FSS/FRA/1.4 Standardisation of fishing effort.
-
5. Name and designation of Principal Investigator S.K.Dharmaraja, S-2.
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time:
- | <u>Establishments</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|-----------------------|------------------------------|-----------------------------|
| | T. Jacob, S-3 | |
| | K. Alagaraja, S-2 | G. Balakrishnan, T-4. |
| Cochin | K. Narayana Kurup, S-1 | |
| | B. Prasanna Kumari, S | |
| | K. Balan, S | |
| | K. Vijayalekshmi, S | |
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
- At present fishing effort is evaluated in terms of man hours which may not have much significance in the fish population studies.
- In multispecies fishery exploited by multigears evaluation of fishing effort in terms of standard units is essential. This project is aimed at this.
-
- (b) Practical Utility:
- For stock assessment studies the standardisation of effort will help to study the stock abundance.
-
9. Technical programme:
- From the available analysed data standardisation of effort with reference to selected commercially important species the same using suitable statistical techniques.
-

-
10. Date of start: 1978
-
11. Likely date of completion: End of 1980
-
12. Estimated man months: 13 man months/year
-
13. Facilities required: Facilities available in
Project No.FSS/FRA/1.1
- i) land -- iv) foreign exchange: -
- ii) labour -- v) Estimated cost: -
- iii) Special equipment -- T.A.:
- Contingency: -
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation: -
- b) Title of the project(if the
project forms a part of a
larger project) ---
-
15. Approximate cost: ----
-
- 16 Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

-
1. Institute Code No. FSS/FRA/1.5
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Central Marine Fisheries
Institute/Centre: Research Institute, Cochin
-
4. Title of Project: FSS/FRA/1 Fishery Resources
Assessment
- Title of Problem: FSS/FRA/1.5 Survey of Esuarine
Fisheries
-
5. Name and designation of
Principal Investigator: K.Narayana Kurup, S
-
6. Name(s) and designation of Associate(s) and Establishments
on which borne:
Part time:
- | <u>Establishments</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|-----------------------|--|--|
| Cochin | G. Venkataraman, S-3
T. Jacob, S-3
K. Alagaraja, S-2
S.K. Dharmaraja, S-2 | G. Balakrishnan, T4
Varghese Philipose TII-3
and Field Staff to be
recruited. |
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
At present there is no comprehensive account of
fishery resources from Estuarine regions. The project
aims at evolving a suitable sampling design to esti-
mate the fishery resources from this region.
-
- (b) Practical Utility:
- Some important marine fishes and prawn spend part of
their life time in estuarine areas. For proper assess-
ment of seed resources required for mariculture and
assessment of stock recruited to the fishery, data
from estuaries are necessary.
-
9. Technical programme:
- Initially Pilot surveys would be taken up to study the
problem in detail in order to arrive at a suitable
sampling design for this purpose.
-

10. Date of start: 1978

11. Likely date of completion: Continuing Project

12. Estimated man months: 251 man months/year

13. Facilities required:

i) land: --

iv) foreign exchange

ii) labour --

v) Estimated cost:

iii) Special equipment -

T.A.:

Contingency: --

14. If financed by an organisation other than the Institute

a) Name of the financing organisation: ---

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

15. Approximate cost:

16. Signatures of:

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

RESEARCH PROJECT - 1979

1. Institute Code No.	FSS/FRA/1.6

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

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

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

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

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

6. Name(s) and designation of Associate(s) and Establishments on which borne:	
Associate Leader :	K. Narayana Kurup, S-1

<u>Establishments</u>	<u>Part time Scientific Associates</u>
	<u>Technical Associates</u>
	G. Venkataraman, S-3
	T. Jacob, S-3
	K. Alagaraja, S-2
Cochin	S.K.Dharma Raja, S-2
	B.Prasanna Kumari, S
	K.Vijayalakshmi, S
	G. Balakrishnan, T-4
	Varughese Jacob, T.II-3
	Varughese Philipose "
	G.Krishnan Kutty
	Nair, T.II-3
	P. Sivaraman, T.II-3
	V.P. Annam, T.II-3
	A. Kanakkan, T-2
	V. Rajendran, T.II-3
	S. Haja
	Najeemuddin, T-2
	C.J. Prasad, T-2
	T.A. Sankarankutty, T-2
	K. Santhakumary, T-2
	P.L. Ammini, T-2

7. Location of the Research Project:	Cochin

 8. (a) Objectives:

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

 (b) Practical Utility:

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

 9. Technical programme:

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

 10. Date of start: 1978

 11. Likely date of completion: End of 1980

 12. Estimated man months : 44 man months

 13. Facilities required:

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

 14. If financed by an organisation other than the Institute

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

 15. Approximate cost:

 16. Signatures of:

Sd.
 Principal Investigator

Sd.
 Head of Division

Sd.
 Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. FSS/FRA/1.7
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre. Central marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Assessment of marine fisheries resources.
- Title of Problem: FSS/FRA/1.7 Socio-economic surveys of small scale fisheries at selected centres for an integrated development of the coastal rural sector.
-
5. Name and designation of Principal Investigator: K.K.P. Panikkar, S-1
-
6. Name(s) and designation of Associate(s) and Establishment on which borne:
- a) Whole time Nil
- b) Part time Associate Leader : R.Sathia Das, S-1
- Technical staff to be recruited.
-
7. Location of the Research Project: Kovalam near Madras, Mandapam, Manakkudy, Vizhinjam, Calicut etc.
-
- 8.(a) Objectives:
- To carry out a comprehensive survey of the small scale fisheries of selected coastal fishing zones to understand the present status and impact of introduction of new technologies and practices such as sea farming for the socio-economic development of the sector.
-
- (b) Practical Utility:
- The small scale fisheries contribute to over 60% of the marine fish production of the country. Despite its importance no comprehensive socio-economic survey of the sector to understand the present status, to identify the difficulties, bottlenecks encountered has been made. In spite of various developmental efforts such as mechanisation of crafts, introduction of mechanised fishing vessels etc. fishermen live below the poverty line. One of the ways proposed for the development of the sector and to

improve the income of fishermen is to carry out the traditional fisheries along with culture of suitable organisms in the coastal zone there by bringing about a blend of capture and culture fisheries. The information gathered by this survey would help to identify the difficulties/bottlenecks encountered in the sector and to suggest the necessary remedial measures and to formulate further developmental programmes.

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: 1983

12. Estimated man months: 76 man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

-
1. Institute Code No. FSS/FRA/1.8
-
2. I.C.A.R. Code No.
-
3. Name & address of Research Institute/Centre: C.M.F.R.I., Cochin.
-
4. Title of Project: FSS/FRA/1. Assessment of Marine Fishery Resources
- Title of Problem: FSS/FRA/1.8 Impact of purse-seine operations on the socio-economic conditions of traditional fishermen at selected centres in Karnataka and Goa regions
-
5. Name & Designation of Principal Investigator: T. Jacob, S-3
-
6. Name(s) and Designation(s) of Associates and Establishments on which borne.
- Associate leaders: S.K. Dharmaraja, S-2; K.K.P. Panikkar, S-1
- Technical Associates: Technical staff to be recruited.
-
7. Location of the Research Project: Cochin
Field work at selected centres in Karnataka & Goa.
-
8. a) Objectives
- To carry out comprehensive study of the changes brought about by purse-seine operations in the fish landing pattern and in the socio-economic conditions of traditional fishermen with special reference to Rampani net operators.
-
- b) Practical utility:
- Large number of purse-seiners are operating in Karnataka and Goa coasts. In Karnataka alone their number is expected to go up to 180. This naturally will have a significant effect on the Rampani net operators and other traditional fishermen. Information collected on the socio-economic conditions of the fishermen will be extremely useful for suggesting remedial measures, if needed, and to formulate future developmental plans.
-

9. Technical programme:

- (i) To develop suitable methodology for the collection of data on price statistics, distribution system and other infra-structure in the related areas.
- (ii) To study the changes brought about in the socio-economic conditions of the fisherfolk due to the introduction of large number of purse-seiners.
- (iii) To attempt costing studies pertaining to purse-seiners and traditional units.

 10. Date of start: 1979

11. Likely date of completion: 1981

12. Estimated man months: 5 man months

13. Facilities required:

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

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

 15. Approximate cost:

16. Signatures of:

Sd.
 Principal Investigator

Sd. Sd.
 Head of Division Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. FSS/FRA/1.9
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FSS/FRA/1. Assessment of Marine Fishery Resources.
- Title of Problem: FSS/FRA/1.9 The impact of mechanised fishing on the socio-economic conditions of fishermen living in Sakthikulangara - Neendakara area.
-
5. Name and designation of Principal Investigator: G. Venkataraman, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne.
- Part time:
- Associate leader : R. Sathia Das, S-1
- Scientific Associates Technical Associates
- K. Alagaraja, S-2 Technical staff to be recruited.
- S.K. Dharma Raja, S-2
-
7. Location of the Research Project: Cochin.
-
8. (a) Objectives:
- To carry out a comprehensive study of the changes in the socio-economic conditions of the fishermen living in Sakthikulangara - Neendakara area caused by the operations of mechanised vessels based at Sakthikulangara - Neendakara.
- (b) Practical Utility:
- With the establishment of Indo-Norwegian Project (later known as IFP) at Neendakara and subsequent introduction of private mechanised vessels the traditional fishing has been greatly influenced by mechanised fishing. It is very necessary to know the changes brought about in the income levels, employment opportunities, prices of fish realised etc. in planning the development programmes for the fishermen of the area.
-

9. Technical programme:

- 1) To develop a suitable proforma for collection of data on the fish prices realised, marketing and distributing processes for both mechanised and indigenous Crafts and such other socio-economic information from the fishing villages in Sakthikulangara - Neendakara area.
 - 2) To study the changes brought about in the economics of the people other than those engaged in fishing, caused by the introduction of mechanised vessels.
 - 3) To assess the cost benefit factors of fishing operations by mechanised and non-mechanised boats.
-

10. Date of start: 1979

11. Likely date of completion: 1981

12. Estimated man months: 6 man month

13. Facilities required:

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

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

15. Approximate cost:

16. Signatures of:

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

Fishery Resources Assessment Division
List of Field Staff at various centres

<u>Name</u>	<u>Headquarters</u>
1. Sapan Kumar Ghosh	- Junput
2. K. Dhanaraju	- Gopalpur
3. K. Ramasomaya july	- Gopalpur
*4. K. Chittibabu	- Palasa
5. M. Chandrasekar	- Palasa
6. M. Radhakrishnan	- Srikakulam
7. V. Achutha Rao	- Waltair
8. S. Sathya Rao	- Waltair
9. P. Appalaraju	- Waltair
10. C. V. Seshagiri Rao	- Kakinada
11. K. V. S. Seshagiri Rao	- Narasapur
12. P. Ananda Rao	- Machilipatnam
13. N. Varatharajan	- Ongole
14. T. Chandrasekhara Rao	- Ongole
15. G. C. Lakshmiah	- Nellore
16. A. Hanumantha Rao	- Nellore
*17. M. Mohamed Sultan	- Madras
18. P. Karunakaran Nair	- Madras
19. H. Kather Batcha	- Madras
20. S. Subramani	- Madras
21. M. Bose	- Kovalam
22. S. Manivasagam	- Mahabalipuram
23. L. Chidambaram	- Pondicherry
24. L. Jayasankaran	- Cuddalore
25. A. Sreenivasan	- Cuddalore
26. K. Muniyandi	- Porto Novo
27. K. S. Krishnan	- Nagapattanam
28. V. Thanapathi	- Nagapattanam
29. A. Ganapathy	- Pattukottai
30. C. Kasinathan	- Mandapam Camp
31. S. Sankaralingam	- Mandapam Camp
32. P. Palani	- Mandapam Camp
33. K. Muthiah	- Mandapam Camp
*34. C. Balasundaram	- Mandapam Camp
35. R. Somu	- Mandapam Camp

<u>Name</u>		<u>Headquarters</u>
36. M.R.Arputharaj	-	Tuticorin
*37. R.Gurusamy	-	Tuticorin
38. S.R.C. Samuel	-	Cape Comorin
39. N.Rathnaswamy	-	Cape Comorin
40. W.P. Ebenezer	-	Cape Comorin
41. K.Ramakrishnan Nair	-	Cape Comorin
42. R.Bhaskaran Achari	-	Vizhinjam
43. T.G.Vijaya Warriar	-	Quilon
44. K.RamaChandran Nair	-	Quilon
45. S.B.Chandrangathan	-	Quilon
46. M. Babu Philip	-	Alleppey
47. K.C.Yohannan	-	Cochin
48. U.K.Sathyavan	-	Cochin
49. P.K.Mahadevan Pillai	-	Cochin
50. S.Siddalingaiah	-	Cochin
51. K.Thulasidas	-	Cochin
*52. Joseph Andrews	-	Cochin
53. C.K.Krishnan	-	Chavakkad
54. G.Surendranath	-	Chavakkad
55. A.A.Thankappan	-	Calicut
56. K.Soman	-	Calicut
57. T.Girijavallabhan	-	Cannanoore
58. O.M.M.Habeeb Mohamed	-	Mangalore
59. V.Sivaswamy	-	Mangalore
60. Jacob Jerold Joel	-	Mangalore
61. Padmasekara	-	Mangalore
62. Y.V.Venkatachalamoorthy-	-	Mangalore
63. B.Sreedhara	-	Mangalore
64. N.Chennappa Gowda	-	Bhatkal
65. T.Krishnankutty	-	Karwar
66. K.Chandran	-	Karwar
67. S.K.Balakumar	-	Karwar
*68. E.K.Raveendran	-	Karwar
*69. T.S.Balasubramanian	-	Karwar
70. A. Ahamed Kamal Basha	-	Goa
71. N.Narayana	-	Goa
72. Mascarenhas Robert	-	Goa
73. D.Soundararajan	-	Malvan
74. A.Prosper	-	Malvan
75. N.Paniswamy	-	Ratnagiri

<u>Name</u>		<u>Headquarters</u>
76. K. Ramadoss Gandhi	-	Ratnagiri
77. C.J. Josekutty	-	Janjira Murud
78. M. Shriram	-	Bombay
79. J.L. Oza	-	Bombay
80. S.B. Shitole	-	Bombay
81. D.G. Jadav	-	Bombay
82. R. Dias Johnny	-	Bombay
83. S.D. Dhuri	-	Bombay
84. P.M. Dalwadi	-	Bombay
85. S.S. Sugawekar	-	Bombay
86. Hameed Batcha	-	Dahanu
87. M. Chellappa	-	Dumas
88. T. Krishnababu	-	Dumas
89. T. Gangadharan	-	Veraval
90. Y.D. Savaria	-	Veraval
91. K.B. Waghmare	-	Jamnagar

* Now on study leave

1. Institute Code No. FB/PR/1.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: FB/PR/1 Investigations on clupeoid fishery resources.
Title of Problem. FB/PR/1.1 The fishery and resource characteristics of oil sardine.
5. Name and designation of Principal Investigator: V.Balan, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | | |
|-----------------------|------------------------------|-----------------------------|
| a) <u>Whole time:</u> | Nil | |
| b) <u>Part time:</u> | | |
| <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
| Cochin | P.Vijayaraghavan, S-1 | R.Reghu, T-II-3 |
| Calicut | .. | V.Janaki, T-1 |
| | | P.Swarnalatha, T-1 |
| Mangalore | M.H.Dhulkhed, S-2 | U.Umakumari, T-1 |
| Karwar | G.G.Annigeri, S-1 | K.Balachandran, T-1 |
| Goa | .. | P.M.Aboobaker, T-II-3 |
7. Location of the Research Project: Cochin, Calicut, Mangalore, Karwar and Goa.
8. a) Objectives:
1. To monitor the biological and fishery characteristics of the resource.
 2. To assess the size of the exploitable resource.
 3. To prepare the annual space/time fishery maps on the distribution pattern of the oil sardine.
 4. To develop a prediction system.

b) Practical Utility:

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

9. Technical programme:

1. A regular record of catch and effort data of different gears with special reference to purse seine will be maintained at the centres selected for biological sampling from which resource characteristics will be studied.
2. The relationship between the catch and the important environmental parameters will be examined based on which fishery forecast could be made.
3. The impact of purse seine fishing on the traditional fishery will be studied.
4. Systematic exploratory fishing surveys and serial surveys will be conducted to chart the pattern of distribution and abundance of the resource in space and time.

10. Date of start: 1976

11. Likely date of completion: continuing

12. Estimated man months: 40 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director.

-
1. Institute Code No. FB/PR/1.3.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FB/PR/1 Investigations on clupeoid fishery resources.
 Title of Problem: FB/PR/1.3.1 Evaluation of the resources of lesser sardines.
-
5. Name and designation of Principal Investigator: P.Sam Bennet, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|-----------------------------|
| Waltair | .. | P. Ramalingam, T-II-3 |
| Kakinada | (to be posted) | .. |
| Madras | J.C.Jnanamuthu, S-1 | .. |
| Mandapam Camp | R. Thiagarajan, S | .. |
| Vizhinjam | S. Lazarus, S-1 | .. |
| Cochin | .. | R. Reghu, T-II-3 |
| Karwar | G.G. Annigeri, S-1 | .. |
| Goa | .. | P.M.Aboobaker, T-II-3 |
-
7. Location of the Research Project: Waltair, Kakinada, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Cochin, Karwar and Goa.
-
8. a) Objectives:
1. To evaluate the species-wise abundance of lesser sardines.
 2. To elucidate the important biological and fishery features of the different species.
 3. To study the homogeneity of otherwise of the exploited stocks.
-
- b) Practical Utility:
- Lesser sardines account for about 10% of the total marine fish landings along both the coasts of India. Information on their distribution and abundance, together with other biological aspects is necessary for developing their fisheries into more productive ones.
-

9. Technical programme:

1. To study the species compositions and select the important species resources at the respective centres.
2. Collection of resources data relating to catch and effort.
3. Study of biological aspects such as age and size composition, sex ratio, maturity and spawning.
4. Analysis of the distribution pattern of the resources along both the coasts.
5. Examination of meristic and morphometric characters, and external and internal parasites to identify the stocks.
6. Systematic Exploratory fishing surveys and Aerial Surveys will be conducted to chart the pattern of distribution and abundance in space and time.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 30 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/1.3.2
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/PR/1 Investigations on clupeoid fishery resources.
- Title of Problem: FB/PR/1.3.2 Evaluation of the resources of anchovies.

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

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

- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	--	M.R.Soma Raju, T II-3
Kakinada	(to be posted)	..
Madras	J.C.Gnanamuthu, S-1	..
Mandapam Camp	P.Radhakrishnan Nair, S	..
Vizhinjam	..	A.K. Velayudhan, T-1
Cochin	K.V.Narayana Rao, S-2	M.N.Kesavan Elayathu, T-1
Mangalore	G. Syda Rao, S-1	..
Bombay	Vinay D. Deshmukh, S-1	..

7. Location of the Research Project: Waltair, Kakinada, Madras, Mandapam Camp, Vizhinjam, Cochin, Mangalore and Bombay.

8. a) Objectives:

1. To evaluate the species-wise abundance of anchovies.
2. To elucidate the important biological and fishery features of the commercially important species.
3. To study the homogeneity or otherwise of the exploited stocks.

b) Practical Utility:

Anchovies account for about 10% of the total marine fish landings along both the coasts of India. Information on their distribution and abundance, together with other biological aspects is necessary for developing their fisheries into more productive ones.

9. Technical programme:

1. Study of the species composition of the genera, Stolephorus, Thryssa, Coilia, Setipinna, and Thrissina and selection of the important species for detailed study at each centres.
2. Collection of resources data relating to catch and effort.
3. Study of biological aspects such as age and size composition, sex ratio, maturity and spawning.
4. Analysis of the distribution pattern of the resources along both the coasts.
5. Examination of meristic and morphometric characters, and external and internal parasites to identify the stocks.
6. Systematic exploratory fishing surveys will be conducted to chart the distribution and abundance of anchovies in space and time.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 40 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. FB/PR/2.1

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

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

4. Title of Project: FB/PR/2 Investigations on mackerel fishery resources.

Title of Problem: FB/PR/ 2.1 The fishery and resource characteristics of the mackerel.

5. Name and designation of Principal Investigator: A.Noble, S-2

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	..	M.V.Soma Raju, T-II-3
Madras	(to be posted)	..
Mandapam Camp	G.Mohanraj, S-1	..
Vizhinjam	..	K.Rajasekharan Nair, T II-3
Cochin	..	J.Narayana Swamy, T-1
Calicut	T.M.Yohannan, S	..
Mangalore	N.S.Radhakrishnan, S-1	..
Karwar	M.V.Pai, S-1	K.Ramachandra, T-2
Goa	..	P.M.Aboobaker, T-II-3

7. Location of the Research Project: Waltair, Madras, Mandapam Camp, Vizhinjam Cochin, Calicut, Mangalore, Karwar and Goa.

8. a) Objectives:

1. To study the relative abundance of the mackerel in space and time, both inshore indigenous and offshore mechanised fishing and to monitor the effect of purse seine fishery on indigenous fishery.
2. To analyse and maintain on continuing basis, data on resource characteristics such as distribution, size and age composition, rate of growth, sex and maturity, recruitment and mortality.
3. To assess the exploitable resource and to know the dynamics of the stock.

b) Practical Utility:

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

9. Technical programme:

1. Data on the catch and effort of both indigenous inshore and mechanised offshore fishing (purse-seines) at all centres to be collected, based on random sampling. The Karwar centre to make observations on purse seining for mackerel at Bhatkal and Goa also.
2. Relative abundance of mackerel to be correlated with environmental parameters so as to evolve short term as well as long term prediction system for the fishery.
3. Size, rate of growth, age composition, sex and maturity, recruitment and mortality to be studied by sampling the catch at centres of observation. Dynamics of the stock like rate of exploitation, maximum equilibrium yield and yield per recruit to be worked out as far as possible.
4. Migration of the mackerel to be studied and races to be spotted out.
5. Systematic exploratory fishing surveys and Aerial Surveys will be undertaken to chart the pattern of distribution and abundance of the resources in space and time.

10. Date of start: 1976

11. Likely date of completion: continuing

12. Estimated man months: 68 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/3.1

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

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

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

Title of Problem: FB/PR/3.1 Resources of tunas and bill fishes.

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

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Minicoy	P. Livingston, S	..
Tuticorin	Pon Siraimetan, S	..
Vizhinjam	M.D.K.Kuthalingam, S-2	S. Sadasiva Sarma, TII-3
Cochin	M.S.Rajagopalan, S-2	..
	P.Parameswaran Pillai, S-1	..
Calicut	V. Balan, S-1	..
Mangalore	C. Muthiah, S-1	..
Goa	..	P.M. Aboobaker, T-II-3

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

8. a) Objectives:

To estimate the resources of tunas and bill fishes and study the biological parameters; to investigate the bait fish resources in the Minicoy island.

b) Practical Utility:

Although tunas form less than 1% of the Annual marine fish catch of the country, the potential for the development of their fishery is great especially in view of the extended economic zone. The information on the biology and resource characteristics of tunas and bill fishes will be of great utility while expanding their fisheries.

9. Technical programme:

1. To collect species-wise data on catch, effort and biological characteristics of tunas and bill fishes.
 2. To keep a close watch on the purse seine and drift net landings of tunas at centres like Mangalore, Calicut & Kochin.
 3. Investigations on bait fish resources in the Lakshadweep.
 4. Investigations on environmental parameters related to tuna fisheries.
-

10. Date of start : 1976

11. Likely date of completion: continuing

12. Estimated man months: 40 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal InvestigatorSd/-
Head of DivisionSd/-
Director

1. Institute Code No. FB/PR/3.3
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/PR/3 Investigations on the resources of tunas and related fishes.
Title of Problem: FB/PR/3.3 Resources of seer fishes.
5. Name and designation of Principal Investigator: M.V.Pai, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	(to be posted)	..
Tuticorin	Gracy Mathew, S-1	G. Arumugham, T-1
Calicut	T.M.Yohannan, S	..
Mangalore	C. Muthiah, S-1	..
Karwar	..	K.Ramachandra, T-2

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

8. a) Objectives:

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

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start : 1976

11. Likely date of completion: 1980

12. Estimated man months: 24 man months/year

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signature of :

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/3.4

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

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

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

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

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

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Vizhinjam	G.Gopakumar, S-1 Madan Mohan, S-1	A.K.Velayudhan, T-1

7. Location of the Research Project: Vizhinjam

8. a) Objectives:

To investigate the possibility of maintaining a steady state of availability of live-bait for tuna fishing by utilizing the resources of Stolephorus.

b) Practical Utility:

In view of the scarcity of the commonly used live bait for tuna fishing in India, it is necessary to find out other suitable fish for live bait purpose. Fishes of the genus Stolephorus have been found to constitute a considerable portion of the fish biomass along the southwest coast of India. Some of these species are known to serve as good live-bait for tuna elsewhere. The tuna fishing industry in India could be further developed if these anchovies could be stocked alive in large quantities and be made readily available for live bait purpose throughout the fishing season.

9. Technical programme:

1. Anchovies collected from bag nets and purse seines will be transported and maintained alive in cages suspended from rafts in coastal waters.
2. Fish will be stocked in different densities to find out the optimum density levels without mortality.
3. Different compounded low cost feeds will be tried to provide suitable nutrition for the fish.
4. The 'condition factor' of fish in the cages will be compared with those available in the wild state.
5. Salinity, oxygen and temperature of the water in the cages as well as outside the cages will be monitored.
6. Laboratory studies on tolerance of anchovies to changes in salinity, oxygen and temperature will be carried out.
7. The hardiness and the chumming qualities of different species of anchovies will be investigated.

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months: 32 man months/year

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/4.1

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

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

4. Title of Project: FB/PR/4 Investigations on Bombay duck resources.

Title of Problem: FB/PR/4.1 The fishery and resource characteristics of Bombay duck.

5. Name and designation of Principal Investigator: S.V. Bapat, Joint Director

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Janput	(to be posted)	..
Kakinada	(to be posted)	..
Bombay	V.M. Deshmukh, S-2 (APL) Alexander Kurien, S-1	D.H. Karsanbhai, T-1
Veraval	M.Zaffar Khan, S	..

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

8. a) Objectives:

1. To assess the relative abundance of the Bombay duck in space and time.
2. To monitor the characteristics of the resources such as size and age composition, sex ratio, recruitment and mortality.
3. To study the effect of fishing on Bombay duck population with special reference to the changes in mean size and age.

b) Practical Utility:

Bombay duck forms an important fishery in India yielding a catch of 60,000-70000 tonnes per annum. As there are indications of the resources being subjected to heavy fishing pressure a careful watch of the catch trends and stock characteristics should be maintained. The study on the stock has to be intensified considerably, for the proper management of the fishery.

9. Technical programme:

1. Accurate resources data especially on catch and effort will be collected from landing centres and also by personal participation in the surveys conducted by the fishing vessels.
 2. Biological aspects such as age and growth, food and feeding habits, maturity, sex ratio, spawning and migration will be studied along with stock assessment.
 3. Exploratory fishing surveys and aerial surveys will be conducted to chart the distribution and abundance of the resource in space and time.
-

10. Date of start: 1976

11. Likely date of completion: continuing

12. Estimated man months: 28 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. FB/PR/5.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/PR/5 Investigations on other pelagic fish resources.
- Title of Problem: FB/PR/5.1 Fishery and resource characteristics of Carangids.

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Kakinada	V. Sreeramachandra Murty, S-1	..
Madras	(to be posted)	..
Vizhinjam	..	T. Prabhakaran Nair, T II-3
Mangalore	..	J.J. Joel, T-II-3
Bombay	Vinay D. Deshmukh, S-1	..

7. Location of the Research Project: Waltair, Kakinada, Madras, Vizhinjam, Mangalore and Bombay

8. a) Objectives:

1. To evaluate the relative abundance of the resources of the Carangids along the East and West coast of India.
2. To delimit new and/or under exploited fishing grounds.
3. To study the growth, feeding and reproductive biology of the Commercially important species.

8. b) Practical Utility:

The knowledge gained as detailed in (a) has immediate application in the exploitation of the resources in the areas concerned besides helping in the formulation of management policies for a ration exploitation. Since the resource mentioned is commercially important, a knowledge of its availability could help in increasing harvests of food from the seas.

9. Technical programme:

1. Observations on inshore and offshore catches.
 2. Collection of environmental data.
 3. Collection of representation of representative samples for examination at the laboratory.
 4. Collection of data on length, food and maturity.
 5. Application of growth models to understand the status of the fishery.
 6. Survey of the fishing grounds to locate areas of abundance with Research Vessel.
-

10. Date of start: 1976

11. Likely date of completion: Continuing

12. Estimated man months: 28 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. FB/PR/5.2
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/PR/5 Investigations on other pelagic fish resources.
- Title of Problem: FB/PR/ 5.2 The resource characteristics of ribbon fishes.

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

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

- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Kakinada	Y. Appanna sastry, S-1	..
Tuticorin (Idinthakara)	(to be posted)	..
Vizhinjam	S.Lazarus, S-1	..
Mangalore	..	J.J.Joel, T.II-3
Bombay	S.K. Chakraborty, S-1	..

7. Location of the Research Project: Kakinada, Madras, Tuticorin (Idinthakara), Vizhinjam, Mangalore and Bombay.

8. a) Objectives:

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

b) Practical Utility:

The ribbon fishes from important fisheries along both the coasts and the work proposed relates to monitoring of stocks at a few representative centres.

9. Technical programme:

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

10. Date of start: 1969

11. Likely date of completion: Continuing

12. Estimated man months: 24 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/5.3
2. I.C.A.R. Code No.
3. Name and address of Research Institute / Centre. Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/PR/5 Investigations on other pelagic fish resources.
- Title of Problem: FB/PR/5.3 The fishery and resource characteristics of sharks.

5. Name and designation of Principal Investigator: M.D.K. Kuthalingam, S-2

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	(To be posted)	..
Madras	..	S. Basheeruddin, T-6
Mandapam Camp	P.Natarajan, S	..
Tuticorin	M.E. Rajapandian, S	..
Vizhinjam	..	S.G. Vincent, T-II-3
Calicut	P.Devadoss, S-1	..
Bombay	K.S. Sundaram, S	..
Veraval	H. Mohamed Kasim, S-1	..

7. Location of the Research Project: Waltair, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Calicut, Bombay and Veraval.

8. a) Objectives:

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

b) Practical Utility:

The knowledge as gained in (a) has immediate application in the exploitation of the resource in the areas concerned. Since resource mentioned is commercially important, a knowledge on its availability could help in increasing harvest of the resource from the seas.

9. Technical programme:

1. Estimation of species-wise catch trends in respect of depths and fishing gear.
2. Determination of age and growth.
3. Observations on the food habits and spawning biology.
4. Investigations on fecundity, embryonic history.
5. Investigations on the nutritional aspect (Protein, carbohydrates, fat content, Urea content etc) of shark meat.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 32 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. FB/PR/5.4

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

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

4. Title of Project: FB/PR/5 Investigations on other pelagic fish resources

Title of Problem: FB/PR/5.4 Resource characteristics of pomfrets.

5. Name and designation of Principal Investigator: K.V.Narayana Rao, S-2

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

a) Whole time: Nil

b) Part time:

Establishment

Scientific Associates

Technical Associates

Puri	K.N. Rajan, S	..
Madras	(To be posted)	..
Mandapam Camp	G.Nandakumar, S	..
Vizhinjam		K.Rajasekharan Nair, T-II-3
Cochin	A.A. Jayaprakash, S	M.N. Kesavan Elayathu, T-1
Bombay	V.M. Deshmukh, S-2 (APL)	..
Veraval	..	J.P. Karbhari, T-6

7. Location of the Research Project: Puri, Madras, Mandapam Camp, Vizhinjam, Cochin, Bombay and Veraval.

8. a) Objectives:

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

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start: 1969

11. Likely date of completion. Continuing

12. Estimated man months: 32 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/6.1

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

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

4. Title of Project: FB/PR/6 Investigations on the Unit stocks of pelagic fish resources

Title of Problems: FB/PR/6.1 Unit stocks of oil sardine, mackerel and Bombay duck.

5. Name and designation of Principal Investigator: M.H.Dhulkhed, S-2

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

a) Whole time: M1

b) Part time:

Establishment

Scientific
Associates

Technical
Associates

Karwar

S. Muthuswamy, S-1

..

Bombay

M.K.George, S-1 (APL)
Alexander Kurien, S-1

..

7. Location of the Research Project: Mangalore, Karwar and Bombay.

8. a) Objectives:

To identify the natural units, in the population and their effect on the fishery.

b) Practical Utility:

Information on the unit stocks in a resource of a species is necessary to understand the population structure, which will help in the rational exploitation of the resource.

9. Technical programme:

Serological and Electrophoretic studies will be undertaken on the species mentioned.

10. Date of start: 1979

11. Likely date of completion: 1983

12. Estimated man months: 16 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. FB/PR/7.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin.
4. Title of project: FB/PR/7 Investigations on the spawning and nursery grounds of pelagic fish.
- Title of Problem: FB/PR/7.1 Evaluation of the distribution and abundance of spawners and young fish.

5. Name and designation of Principal Investigator: K.V.Narayana Rao, S-2
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	..	P.Ramalingam, T-II-3
Kakinada	(To be posted)	..
Madras	K.G.Girijavallabhan, S-1	..
Vizhinjam	G. Gopakumar, S-1 (APL)	..
Cochin	A. A. Jayaprakash, S	M.N. Kesavan Elayathu, T-1
Mangalore	K. Satyanarayana Rao, S-1	..

7. Location of the Research Project: Waltair, Kakinada, Madras, Vizhinjam, Cochin and Mangalore

8. a) Objectives:

1. To evaluate the breeding and nursery grounds of commercially important pelagic species.
2. To estimate the annual variation in the abundance of young fish of the concerned species to evaluate the recruitment pattern.

b) Practical Utility:

Very little information is available at present on the spawning grounds and the distribution and abundance of the young fish of the important pelagic fish resources. These investigations are necessary to understand the recruitment pattern and the fluctuations of the concerned fish species.

9. Technical programme:

1. Observations to be made on spawners of pelagic fish from the commercial catches to determine their relative abundance in space and time.
 2. Observations to be made on young fish from the catches of the suitable non-selective gear to assess the relative abundance of important species in space and time.
 3. Wherever possible experimental fishing surveys for spawners and young fish will be conducted.
 4. Catch and effort data on both spawners and young fish of important pelagic fish Resources to be collected.
-

10. Date of start: 1979

11. Likely date of completion: 1983

12. Estimated man months: 28 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. FB/DR/1.1.1
-
2. I.C.A.R.Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FB/DR/1 Investigations on major demersal fishery resources.
- Title of Problem: FB/DR/1.1.1 The fishery and resource characteristics of catfishes.
-

5. Name and designation of Principal Investigator: B.Krishnamoorthi, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	..	P.Mojumdar, T-6 S.S.Dan, T-6
Madras	E.Vivekanandan, S-1	..
Cochin	(To be posted)	
Calicut	N. Gopinatha Menon, S	..
Bombay	Vinay D.Deshmukh, S-1	.
Veraval	H. Mohamed Kasim, S-1	H.K. Dhokia, T-1 .

-
7. Location of the Research Project: Waltair, Madras, Cochin, Calicut, Bombay and Veraval.
-

8. a) Objectives:
1. To evaluate the relative abundance of the resources of the Catfishes along the East and West Coasts of India.
 2. To delimit new and/or under exploited fishing grounds.
 3. To study the growth, feeding and reproductive biology of the commercially important species.
-

b) Practical Utility:

The knowledge gained as detailed in (a) has immediate application in the exploitation of the Resources in the areas concerned besides helping in the formulation of management policies for a rational exploitation. Since, the resource mentioned is commercially important, a knowledge of its availability would help in increasing harvests of food from the seas.

9. Technical programme:

1. Observations on inshore and offshore catches.
 2. Collection of environmental data.
 3. Collection of representative samples of fish for examination at the laboratory.
 4. Collection of data on length, food and maturity.
 5. Application of growth models to understand the status of the fishery.
 6. Survey of the fishing grounds to locate areas of abundance with Research Vessel.
-

10. Date of start: 1976

11. Likely date of completion: Continuing

12. Estimated man months: 32 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/DR/1.1.2
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: FB/DR/1 Investigations on major demersal resources.

Title of Problem: FB/DR/1.1.2 Resource characteristics of perches.

5. Name and designation of Principal Investigator: Gracy Mathew, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Mandapam Camp	R. Thiagarajan, S	..
Tuticorin	P.Sam Bennet, S-1	..
Vizhinjam	Madan Mohan, S-1 P.A. Thomas, S-1	..
Bombay	K.S. Sundaram, S	..

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

8. a) Objectives:
1. To evaluate the relative abundance of resources of the perches.
 2. To delimit new and/or underexploited fishing grounds.
 3. To study the growth, food and feeding and reproductive biology of commercially important species of perches.

b) Practical Utility:

The knowledge gained in (a) has immediate application in the exploitation of the resources in areas mentioned besides helping in the formulation of management policies for a rational exploitation.

9. Technical programme:

1. Observations on the inshore and offshore catches.
 2. Collection of representative samples of fish for examination at the laboratory.
 3. Collection of data on length, food and maturity of the commercially important species.
 4. Application of growth models to understand the status of the fishery.
 5. Introduction of experimental fishing with perch traps at Tuticorin.
-

10. Date of start: 1976

11. Likely date of completion: Continuing

12. Estimated man months: 24 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

57

1. Institute Code No.	FB/DR/1.1.3	
2. I.C.A.K. Code No.		
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.	
4. Title of Project :	FB/DR/1	Investigations on major demersal fishery resources.
Title of Problem: FB/DR/1.1.3 Resource characteristics of threadfin breams.		
5. Name and designation of Principal Investigator:	V. S. Sriramachandra Murty, S-1	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) Whole time:	Nil	
b) Part time:		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	..	P. Ramalingam, T-II-3
Madras	D.B. James, S-1	..
Cochin	M.M. Meiyappan, S	..
Bombay	Vinay D. Deshmukh, S-1	..
7. Location of the Research Project:	Waltair, Kakinada, Madras, Cochin and Bombay.	
8. a) Objectives:		
1.	To evaluate the relative abundance of the resources of the threadfin breams (Nemipterids) along the east and west coast of India.	
2.	To delimit new and/or unexploited fishing grounds.	
3.	To study the growth, feeding and reproductive biology of the commercially important species.	

b) Practical Utility:

The knowledge gained as detailed in (a) has immediate application in the exploitation of the resources in the areas concerned, besides helping in the formulation of Management policies for a rational exploitation.

9. Technical programme:

1. Observations on the inshore and offshore catches.
2. Collection of environmental data.
3. Collection of representative samples of fish for examination at the laboratory.
4. Collection of data on length, food and maturity.
5. Application of growth models to understand the status of the fishery.
6. Survey of the fishing grounds to locate areas of abundance with Exploratory fishing Vessel.

10. Date of start: 1976

11. Likely date of completion: Continuing

12. Estimated man months: 20 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	FB/DR/1.2
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: FB/DR/1	Investigations on major demersal fishery resources.
Title of Problem: FB/DR/1.2	The fishery and resource characteristics of sciaenids.
5. Name and designation of Principal Investigator:	T. Tholasilingam, S-3
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
a) <u>Whole time</u> :	Nil
b) <u>Part time</u> :	

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	T. Appa Rao, S-1	..
Kakinada	V. Sriramachandra Murty, S-1	..
Madras	E. Vivekanandan, S-1	..
Tuticorin	(To be posted)	..
Calicut	K.V. Somasekharan Nair, S	..
Karwar	(To be posted)	..
Bombay	S.K. Chakraborty, S-1	..
Veraval (Porbounder)	..	J.P. Karbhari, T-6

7. Location of the Research Project:	Waltair, Kakinada, Madras, Tuticorin, Calicut, Karwar, Bombay and Veraval (Porbounder).
8. a) Objectives:	
1.	To study the fishery and biology of commercially important species of sciaenids.
2.	To evaluate the changes the stock characteristics.

b) Practical Utility:

The sciaenids form about 5.5% of the annual marine fish catch of the country. They form important component of the total catches. Our knowledge of the species composition and characteristics of important stocks of this group is still inadequate. The project will help to elucidate these aspects and indicate the possibilities of increasing the production. The effect of fishing on the stocks will be a subject of continuous study.

9. Technical programme:

1. Data on catch trends, relative abundance, biological parameters and the species composition of the resource to be collected.
 2. Exploratory fishing surveys to be conducted to chart the distribution and abundance of the resource in space and time.
 3. Food, spawning, recruitment, growth, age and mortality of the important species to be studied.
-

10. Date of start: 1969**11. Likely date of completion:** Continuing**12. Estimated man months:** 36 man months/year.**13. Facilities required:**

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:**16. Signatures of:**

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/DR/1.3

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

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

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

Title of Problem: FB/DR/1.3 The fishery and resource characteristics of silver bellies.

5. Name and designation of Principal Investigator: J.C. Gnanamuthu, S-1

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Kakinada	V. Sriramachandra Murty, S-1	..
Mandapam Camp	N. Gopalakrishna Pillai, S-1	M. Badruddeen, T II-3
Cochin	G.S. Daniel Selvaraj, S	..
Karwar	..	S.K. Dalakumar, T-2

7. Location of the Research Project: Kakinada, Madras, Mandapam Camp, Cochin and Karwar.

8. a) Objectives:

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

b) Practical Utility:

The introduction of trawl fishing has led to the development of a major fishery for silver bellies in the coastal waters of India. Recently a decline in the catch and catch-per-unit effort of this group have been noted in Mandapam Region. It is necessary to keep a close watch on the development of the fishery.

9. Technical programme:

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

10. Date of start: 1969

11. Likely date of completion : Continuing

12. Estimated man months: 24 man months/year.

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. FB/DR/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FB/DR/1 Investigations on major demersal fishery resources.
- Title of Problem: FB/DR/1.4 Evaluation of the demersal resources (of some selected Centres).
-
5. Name and designation of Principal Investigator: C.Mukundan, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|---|------------------------------------|
| Waltair | T. Appa Rao, S-1
S. Reuben, S-1 | P. Mojumdar, T-6
S. S. Dan, T-6 |
| Kakinada | V. S. R. Murty, S-1
Y. Appanna Sastry, S-1 | W. Venugopalam, T-II-3 |
| Madras | P. T. Meenakshisundaram, S-1
E. Vivekanandan, S-1
R. Sarvesan, S | .. |
| Mandapam Camp | K. M. S. Ameer Hamsa, S-1
N. Gopalakrishna Pillai, S-1
P. Radhakrishnan Nair, S | M. Badruddeen T-II.3 |
| Tuticorin | P. Sam Bennet, S-1 | .. |
| Cochin | M. M. Melyappan, S
A. A. Jaya Prakash, S | J. Narayana Swamy, T-1 |
| Bombay | V. M. Deshmukh, S-1
S. K. Chakraborty, S-1
M. K. George, S-1 | .. |
-
7. Location of the Research Project: Waltair, Kakinada, Madras, Mandapam Camp, Tuticorin, Cochin and Bombay.
-

8. a) Objectives:

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

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start: 1976

11. Likely date of completion : 1980

12. Estimated man months: 88 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	FB/DR/1.6	
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.	
4. Title of Project: FB/DR/1.6	Investigations on major demersal fishery resources.	
Title of Problem: FB/DR/1.6	Resource characteristics of rays and skates.	
5. Name and designation of Principal Investigator:	M.D.K.Kuthalingam, S-2	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time</u> :	Nil	
b) <u>Part time</u> :		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	(To be posted)	..
Madras	(To be posted)	..
Mandapam Camp	P.Natarajan, S	..
Tuticorin	M.E.Rajapandian, S	..
Vizhinjam	..	S.G. Vincent, T-II-3
Calicut	P. Devadoss, S-1	..
Bombay	(To be posted)	..
Veraval	(To be posted)	..
7. Location of the Research Project:	Waltair, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Calicut, Bombay and Veraval.	
8. a) Objectives:		
1. To find the regional and species-wise abundance of rays and skates and their seasonal fluctuations.		
2. To elucidate various biological aspects such as food and feeding habits, age and embryonic development of commercially important species of rays and skates.		

b) Practical Utility:

The knowledge as gained in (a) has immediate application in the exploitation of the resources in the areas concerned. Since the resources mentioned are commercially important, a knowledge of their availability could help in increasing harvests of the resource from the seas.

9. Technical programme:

1. Estimation of species-wise catch trends in respect of depths and fishing gear.
 2. Determination of age and growth.
 3. Observations on the food habits and spawning biology.
 4. Investigations on fecundity, and embryonic history.
-

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 36 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

67

1. Institute Code No.	FB/DR/1.7	

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

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

4. Title of Project: FB/DR/1	Investigations on major demersal fishery resources.	
Title of Problem: FB/DR/1.7 The fishery and resource characteristics of lizard fishes.		

5. Name and designation of Principal Investigator:	S.V.Bapat, Joint Director.	

6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time:</u> Nil		
b) <u>Part time:</u>		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	(To be posted)	..
Kakinada	..	W.Venugopalan, T-II-3
Madras	..	Syed Basheeruddin, T-6
Mandapam Camp	G.Nandakumar, S	..
Vizhinjam	P.A. Thomas, S-1	
Cochin	..	R.Reghu, T-II-3
Calicut	N.Gopinathamenon, S	..
Mangalore	(to be posted)	..
Bombay	(to be posted)	..

7. Location of the Research Project:	Waltair, Kakinada, Madras, Mandapam Camp, Vizhinjam, Cochin, Calicut, Mangalore and Bombay.	

8. a) Objectives:		
1. To assess the relative abundance of Lizard fish in space and time.		
2. To monitor the characteristics of the resources such as size and age composition, sex ratio, recruitment and mortality.		

b) Practical Utility:

The lizard fishes are the important constituents of the trawl catches especially in the region where the Bombay duck is scarce. Information on their biology and relative abundance would help in increasing the production.

9. Technical programme:

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

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

10. Date of start: 1976

11. Likely date of completion : Continuing

12. Estimated man months: 40 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator.

Sd/-
Head of Division.

Sd/-
Director.

RESEARCH PROJECT - 1979

69

-
1. Institute Code No. FB/CUL/1.1.1
2. I.C.A.R. Code No. _____
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: FB/CUL/1. Mariculture - Culture of finfishes.
 Title of Problem: FB/CUL/1.1.1 Culture of marine fishes.
5. Name and designation of Principal Investigator: P.S.B.R. James, Joint Director.
-

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

a) Whole time: Nil

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	T.Appa Rao, S-1 (APL) S.Reuben, S-1	..
Mandapam Camp	D. Kandasamy, S-1 (APL) A.Raju, S-1 R. Soundararajan, S V.S.Rengaswamy, S	Joseph Rodrigues, T-II-3
Tuticorin	R. Marichamy, S-1 (APL) S.Sharmugham, S-1	..
Narakkal	L.Krishnan, S-1 (APL) A.R. Thirunavukkarasu, S-1	..
Calicut	R.S.Lal Mohan, S-1 (APL)	K.Nandakumaran, T II-3
Mangalore	M.H.Dhulkhed, S-2 (APL)	J.J.Joel, T-II-3

7. Location of the Research Project Waltair, Mandapam Camp, Tuticorin, Narakkal, Calicut and Mangalore.
-

8. a) Objectives:

- To investigate the possibility of culture of compatible brackishwater and inshore fishes like milkfish, mullets, sandwhitting, groupers, snappers, siganus and flat-fishes.
 - To assess the production potential of different groups of fishes and other marine animals in different culture systems on commercial scale.
-

b) Practical Utility:

There are vast stretches of low lying coastal areas which lie unproductive at present but could be converted into productive fish farms. Both in these areas and in the shallow coastal waters fast growing and highly productive brackishwater and inshore fishes can be grown in different culture systems. The project aims at developing suitable technologies for large scale culture of compatible species in order to increase the production from such waters.

9. Technical programme:

1. To develop suitable culture systems for the utilization of the seasonal inundated coastal areas, derelict/and inshore areas /waters for fish culture.
2. Collection of fish seed from the brackish and inshore waters for stocking and culture.
3. To formulate and compound suitable artificial feeds for feeding culture species.
4. To evolve suitable techniques for the mono-and poly-culture of compatible species on commercial scale in different culture systems. viz. farms, pens, cages and polythene lined ponds.
5. To study the production rates of various species under different culture systems, and to work out the economics of production.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 64 man months/year.

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/CUL/1.1.2
2. I.C.A.R Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project:FB/CUL/1. Title of Problem:FB/CUL/1.1.2 Mariculture - Culture of marine fishes. Breeding, seed production and culture of milkfish and pearl spot.
5. Name and designation of Principal Investigator: E.G. Silas, Director
6. Name (s) and designation of Associate(s) and Establishment on which borne:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------------|-----------------------------|
| Mandapam Camp | G. Mohanraj, S-1
V. Gandhi, S-1 | .. |
| Narakkal | A.R.Thirunavakkarasu, S-1 | .. |
7. Location of the Research Project: Mandapam Camp and Narakkal
8. a) Objectives:
1. To maintain stocks of spawning population for large scale seed production of Milk fish (Chanos chanos) and pearl spot (Etroplus suratensis).

b) Practical Utility:

Culture of pearl spot is extensively practised along with other fish and shell fish. The production of pearl spot fry on a large scale will meet the requirement of fish culturists for the intensive culture operations. The milk fish Chanos chanos do not breed in captivity, the culture at present depends on the fry collected from the brackish water pools and creeks along the coast. However, the occurrence is limited based on the spawning season of this fish. By induced breeding it should be possible to obtain large numbers of milk fish fry which will go long way to meet the demands of the fish culturists.

9. Technical programme:

1. Collection, transport and conditioning of mature milk fish and pearl spot.
2. To develop techniques for induced breeding, using pituitary extracts and hormone Corionic gonadotrophine.
3. To develop suitable hatchery techniques for large scale seed production including suitable feed for different larval stages, fry and fingerlings.

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months: 24 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. FB/CUL/1.1.3
-
2. I.C.A.R. Code No. -----
-
3. Name and address of Research Institut/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of the Project:FB/CUL/1 Mariculture - Culture of fin fishes.
Title of Problem:FB/CUL/1.1.3 Breeding, seed production and culture of grey mullets.
-
5. Name and designation of Principal Investigator: P.S.B.R. James, Joint Director
-
6. Name (s) and designation of Associate(s) and Establishment on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Mandapam Camp	G. Mohanraj, S-1 A. Raju, S-1 V.S. Rengaswamy, S	..
Narakkal	L. Krishnan, S-1 (APL)	..

-
7. Location of the Research project: Mandapam Camp and Narakkal
-

8. a) Objectives:

- (i) To breed the important species of grey mullets by hypophysation for the production of seed of the desired species.
- (ii) To collect the seed of grey mullets from nature and culture them in sea water ponds, lagoons and other suitable environments.

b) Practical Utility:

By hypophysation, the commercially important species of grey mullets may be bred, leading to the production of seed of the desired species, for large scale farming in ponds and lagoons. In addition, the naturally occurring seed of grey mullets can be collected and utilised for farming and production of fish.

9. Technical Programme:

1. Weekly/fortnightly samples of grey mullets will be collected from commercial catches at important fish landing centres and analysed for data on maturation and spawning.
2. Brood fish would be collected whenever available and maintained in plastic pools for hypophysation.
3. Collection and storage of pituitary glands from mullets and other suitable fishes.
4. Conducting of experiments on hypophysation of the most common species, including stripping.
5. To develop suitable hatchery techniques for large scale seed production and artificial feeds for larvae, fry and fingerlings.
6. Rearing and culturing of grey mullets in ponds, lagoons and other suitable environments utilizing the artificially produced and naturally occurring seed (by periodic collections at fortnightly intervals).
7. Conduct trials on mixed farming of grey mullets with other suitable fishes.

10. Date of start: 1979

11. Likely date of completion: 1983

12. Estimated man months: 20 man months/Year

13. Facilities required:

- | | |
|--------------------------|-----------------------|
| i) land | iv) Foreign exchange: |
| ii) labour | v) Estimated cost: |
| iii) Special requirement | |

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

a) Name of the financing organisation:

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director.

1. Institute Code No.	FB/CUL/1.2		
2. I.C.A.R. Code No.			
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.		
4. Title of Project: FB/CUL/1	Aquaculture of fin fishes		
Title of Problem: FB/CUL/1.2	Culture of eels.		
5. Name and designation of Principal Investigator:	R. Soundararajan, S.		
6. Name(s) and designation of Associate(s) and Establishment on which borne:			
a) <u>Whole time</u> :	Nil		
b) <u>Part time</u> :			
	<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	Mandapam Camp	D. Kandasami, S-1	..
7. Location of the Research Project:	Mandapam Camp		
8. a) Objectives:			
	i) To culture eels in running water. ii) To compound suitable feed for the fishes. iii) To estimate the growth rate and production potential of the fish under different conditions. iv) To survey the elver resources of the east and west coasts of India.		
b) Practical Utility:			
	Elvers command a good market in Japan. Similarly in foreign countries the freshwater eels is a favoured item among food fishes. The elver resources of the country are practically unutilised at present. The present project is expected to result in exploitation of the elver resources and the development of the eel culture technology suitable to this country.		

9. Technical Programme:

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

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 12 man months/Year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

- a) Name of the Project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

77

- | | |
|---|--|
| 1. Institute Code No. | : CF/RE/1.1.1 |
| 2. I.C.A.R. Code No. | : |
| 3. Name and address of Research Institute/Centre | Central Marine Fisheries
: Research Institute, Cochin |
| 4. Title of project:CF/RE/1 | Crustacean Resources |
| Title of problem:CF/RE/1.1.1 | Investigations
Assessment of Penaeid prawn resources |
| 5. Name and designation of Principal Investigator | M.J. George,
: Scientist S-2 |
| 6. Name(s) and designation of Associate(s) and Establishments on which borne: | |

a) Whole time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Tuticorin	Mary K. Manissery, S-1	..
Cochin	V. Thangaraj Subramanian, S-1	..

b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Janput	..	*
Puri	K.N. Rajan, S	P.V.K. Rao, T-1
Waltair	P.E. Sampson Manickam, S	M.V. Somaraju, T.II-3
Kakinada	S. Lalitha Devi, S-1	W. Venugopalam, T.II-3
Madras	D.B. James, S-1	A.C. Sekhar, T.II-3
Mandapam Camp	G. Nandakumar, S	..
Neendakara	..	*
Cochin	M.M. Thomas, S-1 N.S. Kurup, S-1	C. Nalini, T-2 K. Chellappan, T-1 J.D. Eapen, T-1
Calicut	M.M. Kunju, S-2	..
Mangalore	K.K. Sukumaran, S	..
Karwar	K.Y. Telang, S-1	..
Bombay	S. Ramamurthy, S-3	..
Veraval	M. Aravindakshan, S	..
Jamnagar	G.Sudhakara Rao, S-1	..
	..	*

* Staff not in position

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

8. a) Objectives:

- 1) To assess the magnitude of the exploited resources of the various species of penaeid prawns and to study their relative abundance in space and time along the Indian coast.
- 2) To monitor the population characteristics of all the important species at different places.
- 3) To study the biological characteristics of the commercial species and to maintain the relevant data on a continuing basis.
- 4) To undertake spawning surveys of important species in the inshore and offshore waters.
- 5) To evaluate the resource potential of the under exploited areas and to find out new resources beyond the conventional fishing grounds.

b) Practical Utility:

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

9. Technical programme:

- 1) Data on catch and effort for the penaeid prawns fished from the sea will be collected at the centres mentioned above based on random sampling.
- 2) Species composition and their seasonal abundance in the catch, size and sex composition, maturity, food and other biological aspects of the individual species will be recorded.
- 3) Detailed studies on the population characteristics will be undertaken.
- 4) At centres where research vessel facilities are available spawning and resource survey will be carried out.

10. Date of start : 1969

11. Likely date of completion: Continuing

12. Estimated man months : 105 man months/year

13. Facilities required :

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No : CF/RE/1.1.2.
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin
-
4. Title of project: CF/RE/1 : Crustacean Resources Investigations
Title of problem: CF/RE/1.1.2 Assessment of Nonpenaeid prawn Resources
-
5. Name and designation of Principal Investigator Dr. S. Ramamurthy, : Scientist S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|-----------------------------|
| Bombay | V.D. Deshmukh, S-1 | .. |
- b) Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|-----------------------------|
| Janput | .. | * |
| Kakinada | S. Lalitha Devi, S-1 | W. Venugopalan, T.II-3 |
| Cochin | V.S. Kakati, S-1 | S. Lakshmi, T.II-3 |
| Veraval | G. Sudhakara Rao, S-1 | .. |
| Jamnagar | .. | * |
-
7. Location of the Research Project: Janput*, Kakinada, Cochin, Bombay, Veraval and Jamnagar*
-
8. a) Objectives:
- 1) To assess the magnitude of the exploited resources of the various species of non-penaeid prawns and to study their relative abundance in space and time along the Indian coasts
 - 2) To monitor the population characteristics of the commercial species and to maintain the relevant data on a continuing basis.
 - 3) To study the biological and population aspects of the constituent species
 - 4) To evaluate the resource potential beyond the presently exploited fishing zone.
-
- * Staff not in position

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start : 1969

11. Likely date of completion: Continuing

12. Estimated man months : 36 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. : CF/RE/1.1.3
-
2. I.C.A.R. Code No. :
-
3. Name and address of Central Marine Fisheries
Research Institute/Centre : Research Institute, Cochin
-
4. Title of project: CF/RE/1 Crustacean Resources Investigations
Title of problem: CF/RE/1.1.3 Assessment of prawn resources in the
nursery grounds
-
5. Name and designation of C. Suseelan,
Principal Investigator : Scientist S-1
-
6. Name(s) and designation of Associate(s) and Establishments
on which borne:
- a) Whole time: Nil
- b) Part time :
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|---|
| Puri | K.N. Rajan, S | P.V.K. Rao, T-1 |
| Waltair | P.E. Sampson
Manickam, S | M.V. Somaraju, T.II-3 |
| Kakinada | S. Lalitha Devi, S-1 | W. Venugopalam, T.II-3 |
| Madras | K. Devarajan, S | A.C. Sekhar, T.II-3 |
| Cochin | V.S. Kakati, S-1 | K.N. Gopalakrishnan,
T.II-3
S. Lakshmi, T.II-3
K. Chellappan, T-1
J.D. Eapen, T-1 |
| Calicut | .. | K. Koumudi Menon,
T.II-3 |
| Mangalore | K.K. Sukumaran | .. |
| Karwar | K.Y. Telang | .. |
-
7. Location of the Puri, Waltair, Kakinada, Madras, Cochin,
Research Project: Calicut, Mangalore, and Karwar.
-

8. a) Objectives:

- 1) To study the rate of recruitment of post-larval and juvenile penaeid prawns into the nursery areas and to use their abundance as an index for forecasting the magnitude of the marine fishery of the succeeding period.
- 2) To study the distribution, growth rates, migration, food and feeding habits, mortality etc. of the various species in the same as well as widely separated estuarine ecosystems.
- 3) To assess the magnitude and exploitation of the juvenile prawn resources from the nursery grounds and to study their impact on the marine fishery of the neighbouring areas.
- 4) To collect and maintain systematic data on the sizes of the prawns Vs the mesh sizes of the gears employed.

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start : 1978

11. Likely date of completion: Continuing

12. Estimated man months : 55 man months

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. : CF/RE/1.1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin
-
4. Title of project: CF/RE/1 Crustacean Resources Investigations
 Title of problem: CF/RE/1.1.4 Evaluation of penaeid prawn fishery with special reference to fishing effort, size distribution and dynamics of the resources at selected centres.
-
5. Name and designation of Principal Investigator : M.J. George, Scientist S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time :
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|--------------------------------------|-----------------------------|
| Cochin | M.M. Thomas, S-1
C. Suseelan, S-1 | C. Nalini, T-2 |
-
7. Location of the Research Project: Cochin
-
8. a) Objectives:
- To evaluate the present level of exploitation of the prawn fisheries at those centres where over exploitation is apprehended.
-
- b) Practical Utility:
- In recent years there has been considerable increase in fishing effort for exploitation of penaeid prawn resources from the inshore waters. Monitoring studies conducted by the Institute have indicated that the fishery at certain centres is reaching the optimum level of exploitation due to the large concentration of mechanised vessels in such areas. A critical evaluation of the present level of the fishery vis-a-vis fishing effort, size distribution and other parameters of the population would help to suggest measures for the rational exploitation and conservation of this valuable resource.
-

9. Technical programme:

- 1) Data collected earlier at different centres will be analysed for fishing effort, size and other biological parameters of the individual species and the pattern of fishing effort and size distribution at those centres will be studied in space and time.
- 2) The data will be statistically treated to examine the cause of fluctuations due to fishery independent factors or otherwise.
- 3) Optimum fishing effort required for rational exploitation of the resources will be determined.

10. Date of start : January 1979

11. Likely date of completion: December 1979

12. Estimated man months : 8 man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT -1979

87

-
1. Institute Code No. : CF/RE/1.3
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Central Marine Fisheries
Institute/Centre Research Institute, Cochin
-
4. Title of Project:CF/RE/1 Crustacean resources Investigations
Title of problem:CF/RE/1.3 Assessment of lobster and crab
resources
-
5. Name and designation of Mrs. P.V. Kagwade,
Principal Investigator :Scientist S-2
-

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

a) Whole time: Nil

b) Part time :

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Kakinada	S. Lalitha Devi, S-1	W. Venugopalam, T.II-3
Madras	E.V. Radhakrishnan, S-1	..
Mandapam Camp	K.M.S. Ameer Hamsa, S-1	..
Tuticorin	..	M.Manickaraja, T-2
Cochin	M. Kathirvel, S-1	..
Calicut	..	K.K. Balasubramanian T.II-3
Mangalore	*	..
Veraval	G. Sudhakara Rao, S-1	..

-
7. Location of the Research Kakinada, Madras, Mandapam Camp,
Project: Tuticorin, Cochin, Calicut,
Mangalore*, Bombay, and Veraval
-

8. a) Objectives:

- 1) To collect resources data on shallow water lobsters,
deep-water lobsters and commercially important crabs.
- 2) To elucidate the various biological aspects such as age
and growth, food and feeding habits, maturation, spawning,
migration and behaviour of commercially important species
of lobsters and crabs.

* Staff not in position

b) Practical Utility:

Lobsters and crabs form about 10-15% of the total Crustacean landings in India and there is an expert market for lobster tails and crab meat. The characteristics of these natural resources have to be fully determined and the rate of their exploitation closely watched to avoid overfishing.

9. Technical programme:

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

10. Date of start : 1976

11. Likely date of completion : Continuing

12. Estimated man months : 28 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT -1979

-
1. Institute Code No. : CF/RE/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Central Marine Fisheries
Institute/Centre Research Institute, Cochin
-
4. Title of project:CF/RE/1 Crustacean Resources Investigations
Title of problem:CF/RE/1.4 Prawn Fishery Atlas
-
5. Name and designation of E. G. Silas,
Principal Investigator Director
-
6. Name(s) and designation of Associate(s) and Establishments
on which borne:

a) Whole time : Nil

b) Part time :

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Cochin	S.K. Dharmaraja, S-2	..
	K. Rengarajan, S-1	..
	I. David Raj, S	..

-
7. Location of the
Research Project : Cochin
-

8. a) Objectives:

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

b) Practical Utility:

The fishery atlas will be of great use to the industry and
the Government of the maritime states in planning future
developments. It will also highlight the gaps in our know-
ledge regarding the prawn resources of the country which
need further investigation.

9. Technical programme:

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

10. Date of start : 1976

11. Likely date of completion : 1979

12. Estimated man months : 20 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

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

9. Technical programme:

- 1) Initially the study would be confined to Penaeus indicus and Metapenaeus dobsoni.
 - 2) Statistically adequate samples of these species will be collected from different centres of the west and east coasts for detailed morphometric studies.
 - 3) The genetic map of the species will be studied through cytological, and other procedures.
 - 4) Electrophoretic studies of the above species will ^{be} undertaken to identify the unit stocks.
-

10. Date of start : 1978

11. Likely date of completion : 1982

12. Estimated man months : 12 man months/year

13. Facilities required:

- i) land
 - ii) labour
 - iii) special equipment (Electrophoretic apparatus with all accessories)
 - iv) foreign exchange
 - v) Estimated cost:
-

14. If financed by an organisation other than the Institute

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

15. Approximate cost :

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT -1979

93

1. Institute Code No.	: CF/RE/1.7	

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

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

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

5. Name and designation of Principal Investigator	M.M. Kunju, Scientist S-2	

6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time</u> : Nil		
b) <u>Part time</u> :		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	..	A.C. Sekhar, T.II-3
Cochin	..	M. Ayyappan Pillai, T.II-3
Calicut	..	K. Koumudi Menon, T.II-3
Mangalore	K.K. Sukumaran, S	O. Thippeswamy, T-1
Karwar	K.Y. Telang, S-1	..

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

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

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

9. Technical programme:

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

10. Date of start : 1978

11. Likely date of completion : Continuing

12. Estimated man months : 20 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Principal Investigator

Head of Division

Director

1. Institute Code No. : CF/CUL/1.1.1
2. I.C.A.R. Code No. :
3. Name and address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin
4. Title of project: CF/CUL/1 Culture of crustaceans
Title of problem: CF/CUL/1.1.1 Intensive culture of marine prawns

5. Name and designation of Principal Investigator : P. Vedavyasa Rao, Scientist S-3

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

a) Whole time: Nil

b) Part time :

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Kakinada	K.A. Narasimham, S-1 V. Sriramachandra Murthy, S-1 S. Lalitha Devi, S-1	..
Mandapam Camp	G. Nandakumar, S	..
Tuticorin	S. Shanmugam, S	..
Cochin	C.P. Ramamirtham, S-2 M. Kathirvel, S-1	M. Ayyappan Pillai, T.II-3 C. Thankappan Pillai, T.II-3
Narakkal	Syed Ahmed Ali, S-1	..
Calicut	M.M. Kunju, S-2	K.K. Balasubramanian, T.II-3
Mangalore	K.K. Sukumaran, S	O. Thippeswamy, T-1

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

8. a) Objectives:

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

8. b) Practical Utility:

It is estimated that about 2.6 million ha of brackish water areas suitable for prawn culture are available in the country besides the coastal lagoons and bays. The establishment of intensive prawn culture in these regions could help to augment prawn production, better utilisation and conservation of vast areas of derelict water source, to provide employment to large number of rural population and to improve their economy.

9. Technical Programme:

- 1) Survey of different ecosystems in the coastal zone to obtain information on the suitability of the area for marine prawn culture will be undertaken.
- 2) Carry out field experiments by selective stocking of fast growing and larger species of marine prawns and evaluate the techniques of intensive culture under different conditions and systems.
- 3) The total nutritional requirements of prawns will be studied and suitable artificial feeds will be developed. These feeds will be tested in the laboratory as well as in the field to determine the most suitable feed for accelerated growth.
- 4) Reliable data on various aspects of intensive culture through (i) seeds produced from hatcheries and (ii) seeds obtained from natural source will be gathered to study the economic feasibility of large scale intensive culture.
- 5) Participate in the pilot/operational research to test and demonstrate the economic viability of intensive prawn culture.
- 6) To provide consultancy service to entrepreneurs for setting up of intensive prawn culture.

10. Date of start : 1977

11. Likely date of completion : Continuing

12. Estimated man months : 36 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No : CF/CUL/1.1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre : Central Marine Fisheries Research Institute, Cochin
-
4. Title of project: CF/CUL/1 Culture of crustaceans
Title of problem: CF/CUL/1.1.2 Mass production of prawn seeds
-
5. Name and designation of Principal Investigator : M.S. Muthu, Scientist S-2
-
6. Name(s) and designation of Associat(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time :

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K. Devarajan, S	V. Selvaraj, T.II-3
Cochin	N. Neelakanta Pillai, S-1 C.P. Gopinathan, S-1	..
Narakkal	S.K. Pandian, S-1 M. Rajamani, S-1 A. Lakshminarayana, S-1 C. Merylal James, S	K.K. Surendran, T-1 C.S. Sasidharan, T-1

-
7. Location of the Research Project : Madras, Cochin and Narakkal
-

8. a) Objectives:

- 1) To develop and perfect hatchery techniques for large scale production of the seed of culturable species of penaeid prawns.
 - 2) To develop methods for maintaining a captive stock of breeder prawns in the laboratory or in suitable enclosures in the natural environment so that hatchery operations could proceed without interruption throughout the year.
 - 3) To train personnel at various levels in hatchery methods for large scale production of prawn seed.
-

9. Technical programme:

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

10. Date of start : 1978

11. Likely date of completion : Continuing

12. Estimated man months : 32 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost :

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CF/CUL/1.1.3.

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

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

4. Title of project: CF/CUL/1 Culture of crustaceans
Title of problem: CF/CUL/1.1.3 Culture of commercially important crabs

5. Name and designation of Principal Investigator R. Marichamy
Scientist S-1

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

a) Whole time: Nil

b) Part time :

Establishment

Scientific Associates

Technical Associates

Tuticorin

..

A. Manickaraja, T-2
S. Rajapackiam, T-1

Narakkal

N.Noelakanta Pillai,
S-1
M. Kathirvel, S-1

..

7. Location of the Research Project : Tuticorin and Narakkal

8. a) Objectives:

To develop suitable technique for the culture of commercially important portunid crabs and to study the feasibility of crab culture on large scale

b) Practical Utility:

The commercially important crabs occurring in our waters are suitable for culture in the coastal waters. The results of this research programme would enable to develop and establish crab culture practice and to augment crab production

9. Technical programme:

- 1) Berried crabs of economic importance will be collected from the nature and kept in captivity to study the hatching of eggs and development of larvae.
- 2) The crab seeds thus obtained and those collected from the wild source will be reared in the farm to stocking size and suitable techniques of culture will be evolved.
- 3) Feasibility of large scale culture of crabs will be studied.
- 4) Studies on the food and feeding requirements at different stages will be carried out to find the suitable food for culture.
- 5) Maturation of crabs through eye-stalk ablation will be studied.

10. Date of start : 1978

11. Likely date of completion : 1982

12. Estimated man months : 12 man months

13. Facilities required:

- i) land Planned to convert the mangrove swamp
 area into culture ponds
- ii) labour
- iii) special equipment ..
- iv) foreign exchange ..
- v) Estimated cost ..

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost :

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	: CF/CUL/1.5	

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

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

4. Title of project:CF/CUL/1	Culture of crustaceans	
Title of problem:CF/CUL/1.5	Culture of spiny lobster (<u>Panulirus</u> sp)	

5. Name and designation of Principal Investigator	T. Tholasilingam : Scientist S-3	

6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time</u> :	Nil	
b) <u>Part time</u> :		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K. Rengarajan, S-2 E.V. Radhakrishnan, S-1	V. Selvaraj, T.II-3 Shahul Hameed, T-1

7. Location of the Research Project	: Madras	

8. a) Objectives:		
To develop suitable indigenous techniques for the culture of commercially important spiny lobsters leading to the establishment of viable lobster culture fisheries.		

b) Practical Utility:		
Mass production of lobster seeds and large scale culture of lobsters to augment production and export of lobster tails.		

9. Technical programme:		
1) Berried spiny lobster will be collected from the sea and hatchery experiments will be carried out under controlled conditions.		
2) Induced maturation of gonad will be studied through hormonal control.		
3) The food requirements of larval and post-larval stages will be worked out and techniques of rearing their stages to stocking size will be developed.		
4) Pueruli will be collected from natural source by working different type of collectors and culture experiments will be undertaken with a view to raise them upto marketable size.		
5) Field experiments with different stocking densities will be undertaken to study the techno-economic feasibility of lobster culture.		

-
10. Date of start : 1978
-
11. Likely date of completion : 1982
-
12. Estimated man months : 20 man months/year
-
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) estimated cost
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

sd/-
Director

RESEARCH PROJECT 1979

103

1. Institute Code No.		MOL/RE/1.1
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre:		Central Marine Fisheries Research Institute, Cochin.
4. Title of Project		: MOL/RE/1 Molluscan Fishery Resources
Title of Problem		: MOL/RE/1.1 Resources Survey of commercially important molluscs
5. Name and designation of Principal Investigator.		K. Nagappan Nayar, S-3
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
<u>Whole time</u> : Nil		
<u>Part time:</u>		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Waltair	T. Appa Rao, S-1	B. Narayana Rao, T-2
Kakinada	K. A. Narasimham, S-1 Y. Appannasastri, S	W. Venugopalam, T. II. 3
Madras	R. Sarvesan, S	..
Mandapam Camp	D. Sivalingam, S P. Natarajan, S	..
Tuticorin	S. Mahadevan, S-2 K. Ramadoss, S	C. T. Rajan, T. I. 3 N. Sundaram, T-2
Vizhinjam	K. K. Appukuttan, S-1	T. Prabhakaran Nair, T. II-3 Mathew Joseph, T-1 K. T. Thomas, T-1
Cochin	M. M. Meiyappan, S A. A. Jayaprakash, S	..
Kozhikode	P. S. Kuriakose, S	V. G. Sundranathan, T-1 M. P. Sivadasan, T-1
Mangalore	K. Satyanarayana Rao, S-1 Syda Rao, S-1	..
Bombay	K. S. Sundaram, S	
7. Location of the Research Project:		Waltair, Kakinada, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Cochin, Kozhikode, Mangalore, Bombay.

8. a) Objectives: The inshore area and the estuaries, backwaters and tidal creeks along the coasts have good molluscan resources such as oysters, clams, mussels, pearl oysters and windowpane oysters. So far only a few of these areas have been surveyed. Systematic surveys of the resources will enable preparation of atlases of our molluscan fishery resources and estimation of total production. Statewise availability of molluscan resources will be assessed and reports brought out periodically for the benefit of those interested in the shellfish exploitation and fishery management.
- b) Practical Utility: At present a correct evaluation of the exploited molluscan resources in the marine fish landings of our country is not available. The survey will provide the estimates and make an assessment of the potential resources. The survey will be of great help in identifying specific areas where culture operations could be undertaken.
9. Technical programme:
- a) Survey of molluscan resources of the inshore area, estuaries, backwaters and tidal creeks.
- b) Environmental parameters in these areas to determine their influence on the fisheries.
- c) Assessment of the magnitude of sustenance molluscan fisheries and study of the socio-economic conditions of selected areas.
10. Date of start: 1976
11. Likely date of completion : 1980
12. Estimated man months : 60 man months/year
13. Facilities required:
- i) land iv) foreign exchange
- ii) labour v) Estimated cost:
- iii) Special equipment
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)
15. Approximate cost
16. Signature of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

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

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

9. Technical programme:

1. to study the fishery and biology of species of cephalopods (cuttlefish, squids and octopus).
2. Collection of pelagic and oceanic squids in exploratory surveys for studying the extent of resources, spatial and vertical distribution, life history studies and abundance of larval cephalopods in relation to hydrographic factors.
3. to suggest exploitation of suitable species of cuttlefishes and squids on a large commercial scale for the purpose of exporting to foreign markets.
4. conducting experimental fishing in selected centres.

10. Date of start : 1976

11. Likely date of completion : 1980

12. Estimated man months : 50 manmonths/year

13. Facilities required :

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of :

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. MOL/RE/1.5
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: MOL/RE/1 Molluscan Fishery Resources
- Title of Problem: MOL/RE/1.5 Genetic resources of commercially important molluscs.

5. Name and designation of Principal Investigator: K. Alagaraswami, S-3

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

Whole time: Nil

Part time:

Establishment

Scientific
Associates

Technical
Associates

Cochin P.V. Srinivasan, S-1 (to be posted)

7. Location of the Research Project: Cochin

8. a) Objectives:

1. Identification and cataloguing of the genetic resources of commercially important species of molluscs.
2. Selection of genotypes for culture/breeding based on desirable genetic characteristics.

- b) Practical Utility:

The prospects for large scale culture of molluscan shellfishes are already known. At present the selection of organisms for culture is based on the ready availability of the material. However, it would be necessary to have a full knowledge of the genetic qualities of the stocks to be introduced in culture to be able to select the desirable genetic material. The project would collect the necessary data for this.

9. Technical programme:

1. Collection of principal genetic material of the commercially important species of molluscs, to begin with pearl oysters and clams.
 2. Assessment of salient genetic qualities, preservation and cataloguing of genotypes.
-

10. Date of start: 1979

11. Likely date of completion: 1984

12. Estimated man months: 4 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. MOL/CUL/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project : MOL/CUL/1 Mariculture - culture of molluscs.
Title of Problem : MOL/CUL/1.1 Culture of edible oysters.
-
5. Name and designation of Principal Investigator. K. Nagappan Nayar, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time: Nil
- Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|---|--|
| Tuticorin | S. Mahadevan, S-2
K. Ramadoss, S
M. E. Rajapandian, S | N. Sundaram, T-2
C. T. Rajan, T-I-3 |
-
7. Location of the Research Project: Tuticorin
-
8. a) Objectives:
1. To evolve suitable farming techniques for growing edible oyster and for collection of seed.
 2. To study the growth of oysters from natural beds and the farm.
 3. To study the meat-shell relationship and flesh values of different size groups in different seasons.
 4. To investigate the basic aspects of biology and physiology of the oyster and the physico-chemical and biological factors that influence the growth and survival of the oyster population.
 5. To study the lines of improvement in spat collection methods, greater yield of meat and control of pests.
-

b) Practical utility:

Creeks, bays and lagoons could be selected and utilized for large-scale oyster farming thus ensuring steady and sufficient supply of healthy oysters for consumption by the public. By-product industry such as shell grit for poultry can be started on profitable lines.

9. Technical programme:

1. Selection of suitable farm sites in tidal creeks
2. Designing suitable farm materials and methods for farming oyster.
3. Stocking, growing and harvesting the oysters grown.
4. Biological, Ecological and hydrological studies.
5. Investigation on the fouling communities and developing techniques to minimise their settlement.
6. Determination of the optimum size at harvesting.
7. Development of suitable methods for fattening and purification of farm oysters.
8. Investigation on the oyster diseases and pests.

10. Date of start : 1976

11. Likely date of completion: 1982

12. Estimated man months: 10 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

-
1. Institute Code No. MOL/CUL/1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project : MOL/CUL/1. Mariculture - culture of molluscs
 Title of Problem : MOL/CUL/1.2 Culture of mussels
-
5. Name and designation of Principal Investigator. S.Mahadevan, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time : Nil
- Part time :
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|--|
| Waltair | S.Reuben, S-1 | S.S. Dan, T-6 |
| Madras | S. Sampson Marikam, S. | D.Poovannan, T-1 |
| | K.Rangarajan, S-2 | Srinivasagam, T-1 |
| | N.Ramachandran, S-1 | |
| Vizhinjam | K.K.Appukuttan, S-1 | T. Prabhakaran Nair, T-2 ^{II.3} |
| | | P.Radhakrishnan, T-2 |
| | | Mathew Joseph, T-1 |
| | | K.T.Thomas, T-1 |
| Calicut | P.S.Kuriakose, S | V.G.Surendranathan, T-1 |
| | | M.P.Sivadasan, T-1 |
-
7. Location of the Research Project: Waltair, Madras, Vizhinjam and Calicut
-
8. a) Objectives:
1. To evolve suitable farming techniques for mussel culture at different centres.
 2. To study spat fall in natural beds and farm and to develop efficient methods of spat collection and transportation.
 3. To investigate percentage edibility and nutritional value of mussels at different sizes to fix harvestable size.
 4. To study the ecological factors influencing spat fall, movement of spat, attachment and growth.
 5. To obtain data on the biology of brown and green mussels in the natural grounds and farm areas.
-

b) Practical utility:

At present mussels form a sustenance fishery at some places. However, the demand for mussels both in the internal and export market is bound to increase necessitating development of proper large scale culture technique. The results obtained will enable us to take up farming operations on a large scale in the open sea.

9. Technical programme:

1. Simultaneous data collection on the biology of the green and brown mussels from the natural beds and the farms.
2. Suitable farming techniques depending on the localities are to be developed for farming mussels.
3. Standardisation of the techniques of spat collection by conducting experiments using different types of spat collectors; also development of methods for transportation of spat.
4. Study of environmental parameters which have an influence over spawning and spat settlement.

10. Date of start : 1976

11. Likely date of completion : 1980

12. Estimated man months: 42 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. MOL/CUL/1.3

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

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

4. Title of Project: MOL/CUL/1 Mariculture - Culture of molluscs
 Title of Problem: MOL/CUL/1.3 Culture of clams and windowpane oyster.

5. Name and designation of Principal Investigator: K.A.Narasimham, S-1

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

Establishment	Scientific Associates	Technical Associates
Waltair	S.Reuben, S-1 T.Appa Rao, S-1 P.S.Sampson Manickam, S	..
Kakinada		K.Narayana Rao, T-1
Cochin	P.V. Srinivasan, S-1 G.Radhakrishnan, S	..
Mangalore	K.Satyanarayana Rao, S-1 G.Syda Rao, S-1	D.Nagaraja, T-1

7. Location of the Research Project: Waltair, Kakinada, Cochin and Mangalore

8. a) Objectives:

1. to evolve suitable farming methods for clams and windowpane oyster.
2. to study the effectiveness of clam farming and also to compare and study the rate of growth, size at sexual maturity, index of condition etc. of natural bed forms with that of the cultured forms.
3. to transplant seed clams from thickly populated and dense beds to suitable places and create new beds.
4. to investigate the advantages of clam farming along with fish farming in ponds.

b) Practical Utility:

Being a very important source of sustenance fishery along the Indian coast, clam farming needs a major thrust. The results obtained will enable us to take up large scale farming at selected centres along the coast and thereby increase the production of this low-cost protein food.

9. Technical programme:

1. To evolve simple culture techniques for clam farming at different centres.
2. To study the soil and water conditions of the clambeds.
3. To obtain biological data on selected species.
4. Polyculture and mixed culture of clams with fish/prawns.
5. Development of culture techniques for windowpane oyster (at Kakinada).

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 24 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No, MOL/CUL/1.4
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: MOL/CUL/1. Mariculture - Culture of Molluscs
- Title of Problem: MOL/CUL/1.4 Pearl culture

5. Name and designation of Principal Investigator: K. Alagaraswami, S-3
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Tuticorin	* A. Chellam, S-1 A.C.C. Victor, S S. Dharmaraj, S T.S. Velayudhan, S	J. Antony Pitchai, T-2 A. Dasman Fernando, T-2 Soosai V. Rayen, T-2
Vizhinjam	K.K. Appukuttan, S-1	T. Prabhakaran Nair, T-II-3 Mathew Joseph, T-1 K.T. Thomas, T-1

7. Location of the Research Project: Tuticorin, Vizhinjam

8. a) objectives:

1. To achieve further refinements in the technology of cultured pearl production.
2. To work for obtaining higher production rates and increase in the ratio of quality pearls.
3. To improve techniques of pearl oyster farming.
4. To monitor spat fall in the natural beds and farms.
5. To investigate the differences between the pearl oyster populations off Tuticorin and in Vizhinjam.

* Associate Project Leader at Tuticorin

b) Practical Utility:

The development of pearl culture technology at the Institute has created an active interest for establishing pearl culture industry in India. A pilot project for commercial production has been taken up by the Kerala State and the Government of Tamil Nadu is considering a project at Tuticorin. The technical know-how is being supplied by the Institute to the States. The Institute itself is having a Demonstration Project. Being a new venture, constant R and D improvements would become necessary and the present project would meet the needs. The project also forms the base for the Training Programmes in Pearl Culture.

9. Technical programme:

1. Strengthening pearl oyster farms at project centres.
 2. Investigations on the use of synthetic materials for rafts.
 3. Continuing oyster and spat collection programmes to monitor spatfall and growth of oysters.
 4. Control of boring and fouling organisms affecting the farm.
 5. Biological studies on growth, feeding and reproduction of oysters.
 6. Improvements in surgical and pre-and post-operative procedures for achieving higher gross yield and higher ratio of top class pearls.
 7. Experiments on tank culture of oysters.
 8. Evaluation of the usefulness of the components of mixed species of pearl oysters in pearl production.
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 40 man months/year.

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	MOL/CUL/1.5		
2. I.C.A.R. Code No.			
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.		
4. Title of Project: MOL/CUL/1	Mariculture - culture of molluscs		
Title of Problem: MOL/CUL/1.5	Development of hatchery system for edible oyster seed production.		
5. Name and designation of Principal Investigator	K.Nagappan Nayar, S-3		
6. Name(s) and designation of Associate(s) and Establishments on which borne:			
a) <u>Whole time:</u>	Nil		
b) <u>Part time:</u>			
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>	
Tuticorin	D.C.V.Easterson, S-1 K.Ramadoss, S M.E.Rajapandian, S.	..	
7. Location of the Research project:	Tuticorin		
8. a) Objectives:			
To develop suitable hatchery technique for the seed production of edible oysters so as to get a constant supply of healthy seeds throughout the year without having to depend only on nature for seed requirements.			
b) Practical Utility:			
As availability of natural seeds cannot be relied upon, suitable hatchery methods evolved, will be of immense help in providing an uninterrupted supply of healthy seeds to culturists.			

9. Technical programme:

1. to establish a full-fledged laboratory with temperature controlled rooms to spawn and grow the oyster larvae to settling stage.
2. to try different methods of conditioning the adults and inducing them to spawn by suitable physical or chemical treatment.
3. Mass culture of algae and flagellat^{es} to be used as food for the larvae and spat.
4. suitable techniques to be evolved for the collection of spat at the settling time of the larvae in the tank.
5. to develop a proper nursery system.
6. to evolve suitable methods for the transport of seeds from the hatchery to the farm sites.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 16 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1.	Institute Code No.	MOL/CUL/1.6	
2.	I.C.A.R. Code No.		
3.	Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin	
4.	Title of Project: MOL/CUL/1	Mariculture - Culture of Molluscs	
	Title of Problem: MOL/CUL/1.6	Development of hatchery system for mussel seed production.	
5.	Name and designation of principal Investigator:	K. Fangarajan, S-2	
6.	Names and designation of Associates and Establishments on which borne:		
	Whole time:	Nil	
	Part time:		
	<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	Madras	N. Ramachandran, S-1	P. Poovanan, T-1 Sreenivasagam, T-1
	Vizhinjam	K.K. Appukuttan, S-1	T. Prabhakaran Nair, TII3 Mathew Joseph, T-2 K.T. Thomas, T-1
7.	Location of the Research Project.	Madras, Vizhinjam	
8.	a) Objectives:	To develop suitable hatchery technique for the seed production of mussels so as to get a constant supply of healthy seeds throughout the year without having to depend only on nature for seed requirements.	
	b) Practical Utility:	As availability of natural seeds cannot be relied upon, suitable hatchery methods evolved, will be of immense help in providing an uninterrupted supply of healthy seeds to culturists.	

9. Technical programme:

1. To establish a full-fledged laboratory with temperature control rooms to spawn and grow the mussel larvae to settling stage.
2. to try different methods of conditioning the adults and inducing them to spawn by suitable physical or chemical treatment.
3. Mass culture of algae and flagellates to be used as food for the larvae and spat.
4. suitable techniques to be evolved for the collection of spat at the settling time of the larvae in the tank
5. to develop a proper nursery system
6. to evolve suitable methods for the transport of seed from the hatchery to the farming area.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 32 man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Signatures of:

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

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

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 20 man months/year

13. Facilities required:

- i) land
- ii) labour
- iii) special equipment

- iv) foreign exchange
- v) Estimated cost.

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost

16. Signatures of:

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

1.	Institute Code No.	MOL/CUL/1.8	
2.	I.C.A.R. Code No.		
3.	Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin	
4.	Title of Project:	MOL/CUL/1 Mariculture - Culture of molluscs	
	Title of Problem:	MOL/CUL/1.8 Culture of cephalopods	
5.	Name and designation of Principal Investigator:	D. Sivalingam, S	
6.	Name(s) and designation of Associate(s) and Establishments on which borne:		
	a) <u>Whole time</u> :	Nil	
	b) <u>Part time</u> :		
	<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	Mandapam Camp	S. Krishna Pillai, S	..
7.	Location of the Research Project:	Mandapam Camp.	
8.	a) Objectives:	To explore the possibilities and to develop techniques for culturing suitable species of cuttlefish, squids and octopus.	
	b) Practical Utility:	Culture techniques for rearing cephalopods, if successful, have good scope for adoption on commercial lines for enhancing production. The products have a high demand in the export market.	
9.	Technical programme:		
	1. Collection of egg clusters from the spawning grounds and hatching them in the laboratory.		
	2. Rearing the young ones to commercial size and working out water space and food requirements at different stages of growth.		

- 124
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10. Date of start: 1979
-
11. Likely date of completion: 1984
-
12. Estimated man months: 6 man months/year
-
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) Estimated cost:
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/ES/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Fishery Oceanography Investigations
- Title of Problem: MBO/ES/1.1 Physical and Chemical aspects of the shelf and adjacent waters.
-
5. Name and designation of Principal Investigator: A.V.S. Murty, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne: Part time
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|--|------------------------------------|
| Waltair | P.Mojunder, S-2 | K.P.Viswanathan, T2. |
| Madras | K.G.Girijavallabhan, S-1 | T.Dandapani, T1. |
| Mandapam Camp | S.Krishna Pillai, S | M.Selvaraj, T2
M.Najimuddin, T2 |
| Tuticorin | R.Marichamy, S
Pon Siraimetan, S | S.Rajapackiam, T1 |
| Vizhinjam | .. | R.Vasanthakumar T.I.3 |
| Cochin | C.P.Ramamirtham, S-2
D.S.Rao, S-2 | .. |
| Calicut | .. | M.P.Kunhikrishnan, T-2 |
| Mangalore | R.Padmini, S-1 | C.M.Allikunju, T-2 |
| Karwar | G.G.Annigeri, S-2
S.Muthuswamy, S-1 | K. Balachandran T2
Dinesh, T1 |
| Bombay | .. | G.S.Bhat, T2. |
-
7. Location of the Research Project: Waltair, *Kakinada, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Cochin, Calicut, Mangalore, Karwar, *Goa, Bombay, *Veraval, *Minicoy.
-
8. (a) Objectives:
To determine the sea water characteristics of the shelf and adjacent waters and their influence on biological productivity and fisheries
-
- *Staff not in position

(b) Practical Utility:

A continuous monitoring programme of the sea water characteristics is of great value in assessing the fertility, biological productivity and fisheries of the economic zone

9. Technical programme:

1. Hydrographical and meteorological data to be collected, processed and analysed for physical and chemical parameters.
 2. Nutrient contents of the sea water to be analysed and processed for the seasonal variations in relation to the rate of primary organic production.
 3. To identify the environmental factors which influence the fisheries
-

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 96 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/ES/3.1
-
2. I.C.A.R.Code No.
-
3. Name and address of Research Central Marine Fisheries Research
Institute/Centre: Institute, Cochin
-
4. Title of Project: Fishery Oceanographic Atlas
- Title of Problem:MBO/ES/3 Preparation of Atlas of inshore
hydrographic conditions and areas
of upwelling in relation to
fisheries
-
5. Name and designation of Principal Investigator: G.Subbaraju, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on
which borne:
- Part time
- Staff to be posted
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
- Preparation of fishery oceanographic atlases to show the
influence of the environmental factors on fisheries.
-
- (b) Practical Utility:
- The atlas when published will be useful for indicating the
hydrological conditions and potential grounds and serve as a
guide for commercial fisheries
-
9. Technical Programme:
1. Consolidation of the available information on inshore
hydrography, upwelling and fisheries along the Indian
coasts.
 2. Mapping of the inshore hydrographic conditions and the
areas of upwelling in time and space.
 3. Pictorial representation of areas of upwelling and
productivity together with fishery data.
-

10. Date of start: 1978

11. Likely date of completion 1980

12. Estimated man months 32 man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

129

1. Institute Code No. MBO/PP/1.1

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

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

4. Title of Project: Phytoplankton and primary productivity

Title of Problem: MBO/PP/1.1 Phytoplankton and primary productivity of the shelf and adjacent waters.

5. Name and designation of Principal Investigator P.V.Ramachandran Nair, S-3

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

Part time:

Establishment

Scientific Associates

Technical Associates

Waltair

..

K.P.Viswanathan T2.

Madras

K.G.Girijavallabhan, S-1

..

Mandapam Camp

..

J.X.Rodrigo, T2

Cochin

C.P.Gopinathan, S-1

V.K.Balachandran, TII-3

Calicut

P.Karuppaswamy, S
C.V.Mathew, S

..

Karwar

..

G.M.Kulkarni, T.2.3

7. Location of the Research Project: Waltair, Madras, Mandapam Camp, Tuticorin, Vizhinjam, Cochin, Calicut, Mangalore, and Karwar.

8. (a) Objectives:

1. Assess the potential productivity of the economic zone.
2. Determine the spatial variability of organic production and factors governing it.
3. Estimate the standing crop of phytoplankton organisms and to determine the relationship between phytoplankton with other parameters.
4. Examine the influence of isolated environmental factors on algal growth

(b) Practical utility:

Continuous study of the phytoplankton productivity of inshore waters is very essential as the major fisheries of the country are confined to coastal waters. This will enable an assessment of fluctuations in potential yield of demersal and pelagic fish stocks. Measurements of primary production is also essential in marine food chain studies.

9. Technical Programme:

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

10. Date of start: 1976

11. Likely date of completion 1980

12. Estimated man months: 23 man months/year

13. Facilities required:

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

14. If financed by organisation other than the Institute

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

15. Approximate cost: Inst. Project

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

131

1. Institute Code No.	MBO/PP/1.2

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

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

4. Title of Project:	Phytoplankton and primary productivity
Title of Problem:MBO/PP/1.2	Productivity and nutrient cycle in the prawn fields around Cochin

5. Name and designation of Principal Investigator	C.P.Gopinathan, Scientist S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:	
Part time:	
<u>Establishment</u>	<u>Scientific Associates</u> <u>Technical Associates</u>
Cochin	P.V.Ramachandran Nair, S-3 V.K.Balachandran, T II-3 P.Parameswaran Pillai, S-1 K.K.Valsala, T-1 V.Kunjukrishna Pillai, S-1

7. Location of the Research Project:	Cochin

8. (a) Objectives:	
To estimate the productivity and nutrient regeneration cycle, in the prawn fields in the Cochin backwater and adjoining areas	

(b) Practical Utility:	
The relative yields of prawn field vary considerably. The stocking capacity in the perennial fields will be dependent on the amount of natural food available. This information will provide a clue on the stocking capacity in the perennial fields. In the seasonal fields, it will be possible to obtain information on the rate of growth based on the productivity and regeneration of nutrients.	

9. Technical Programme:

1. Measurement of basic productivity using oxygen and C^{14} techniques and determination of the standing crop of phytoplankton in terms of chlorophyll and by total cell counts.
 2. Study of the energy-flow in the prawn culture field. Analysis of the detritus and feeding experiment in the laboratory to study the conversion efficiency.
 3. Determination of the hydrographic parameters including nutrients.
 4. Determination of the rate of regeneration and consumption of the essential nutrients in the medium.
 5. Estimation of the benthic fauna.
-

10. Date of start: January 1978

11. Likely date of completion: December 1979 (First phase completed in August 1978)

12. Estimated man months: 10

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT - 1979

133

1. Institute Code No.	MBO/PP/1.3		
2. I.C.A.R. Code No.			
3. Name and address of Research Institute:	Central Marine Fisheries Research Institute, Cochin		
4. Title of Project:	Investigations on Primary production.		
Title of Problem: MBO/PP/1.3	Productivity of the aquatic mycrophytes in the coastal areas.		
5. Name and designation of Principal Investigator:	P.V. Ramachandran Nair, Scientist S-3		
6. Name(s) and designation of Associate(s) and Establishments on which borne			
Part time:			
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>	
Cochin	C.P. Gopinathan, S-1 (Research Scholars to be recruited)	--	
7. Location of the Research Project:	COCHIN		
8. a) <u>Objectives:</u>	Aquatic macrophytic communities range from littoral and intertidal algae comprising the classes, Chlorophyceae, Phaeophyceae and Rhodophyceae; pteridophytes such as <u>Salvinia</u>, <u>Azolla</u>, <u>Trichomanes</u> etc. and angiosperms such as <u>Eichornia</u>, <u>Pistia</u>, <u>Lemna</u> and <u>sea-grasses</u>. Investigations on the productivity of these aquatic plants along the coasts of India as well as their physiology efficiency contribute to the understanding of the overall productivity of the coastal and adjacent areas. Though considerable data have been collected on the productivity of the microscopie algae of the euphotic zone of the near and offshore waters of the Indian Seas, practically very little information is available on the productivity of the macrophytes. The present project is aimed at understanding the role of macrophytes in the productivity of the different aquatic ecosystems.		

b) Practical Utility:

The Institute has already conducted extensive studies on the productivity of planktonic algae present in the euphotic zone of the inshore and off shore areas of the seas around India using light and dark bottle and radio-isotope of carbon (^{14}C) techniques. The data obtained so far have contributed to the estimation of production at primary level which is utilized by herbivores and carnivores and ultimately harvested by man as living resources. However, very little information is available on the resources and production of macrophytes, which provide vital information on their contribution to the ecosystem. The present project envisages detailed research on the production, availability, physiological efficiency and bio-ecology of the macrophytes of the Indian coastal waters.

9. Technical Programme:

1. Selection of suitable sites along the west and east coasts of India for the collection of macrophytes and other ecological parameters.
 2. Sampling from rectangular quadrates in contiguous communities collection of samples by random numbers on rectangular co-ordinates.
 3. Treatment of samples including cleaning, estimation of biomass (wt.weight, dry weight etc.) sorting and identification.
 4. Qualitative and quantitative analyses including trace metals; estimation of production, and physiological efficiency of macrophytes.
 5. Correlation of the data with the ecological parameters.
 6. Processing of the data and reporting on the findings.
-

10. Date of start: 1979

11. Likely date of completion: 1981

12. Estimated man months: 150

13. Facilities required:

- | | |
|-----------------------------|--------------------------------|
| i) land: - | iii) special Labtest ICAP unit |
| ii) labour: 4 drivers | equipment: |
| | iv) foreign exchange: - |
| v) estimated cost: 2 lakhs. | |
-

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

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

15. Approximate cost: 2.80 lakhs

16. Signatures of:

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

1. Institute Code No. MBO/NU/1.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: Neustonological Investigations
 Title of Problem: MBO/NU/1.1 Evaluation of the role of neuston in the reproduction of marine organisms and biogenic transformation
5. Name and designation of principal investigator: P.Parameswaran Pillai, Scientist S-1
6. Names and designations of Associates:
 Whole time : Nil Part time:

Establishment	Scientific Associates	Technical Associates
Cochin	P.V.Ramachandran Nair, S-3 C.P. Gopinathan, S-1	M.Ayyappan Pillai, T II 3 K.K. Valsala, T-1

7. Location of research project: Cochin

8 (a) Objectives:

- i) Qualitative and quantitative assessment of the composition and density of neuston and estimation of biological productivity in the coastal and adjacent waters at fixed stations.
- ii) To investigate the relation between the neuston and the embryonic and post-embryonic development of commercially important fishes and crustaceans.
- iii) Estimation of the role of neuston in the transformation of matter in nature; collection of neustonological data for a critical evaluation of the biological effects of biogenic and other contaminants at the sea surface.

8 (b) Practical utility:

The neuston occurring in the sea surface (0-5 cm depth) play a major role in the reproduction of marine organisms, development of ecological processes and biogenic transformation of matter in nature. The neustonic biotope with characteristic cosmic (solar radiation), trophic and other biotic factors provide an ecological phase for most of the benthic, nektonic and planktonic organisms. Further, larvae and adults of nektonic and planktonic organisms consume large quantities of neuston and hence they are significant in the production biology. Data on neuston are also necessary for a critical evaluation of the biological effects of contaminants of the sea surface and for improving protection of fisheries. Marine farming, aimed at devising methods of breeding fishes and crustaceans in artificial conditions require an adequate knowledge of the neustonic mode of life of these organisms.

9. Technical Programme:

- i) Devising suitable gear to collect neuston from the upper 5 cm of water column.
- ii) Collection of data on the thermo-saline conditions of the surface biotope.
- iii) Estimation of the biogenic and non-biogenic components and density of neuston in the samples; assessment of the

biological productivity at the neustonic biotope.

- iv) Census of fish eggs and larvae and larvae of invertebrates in the neuston for fishery purpose; analysis of the role of neuston in the reproduction of invertebrates and fishes and in the biogenic transformation.
- v) Investigations on the biological effects of contaminants of sea surface for improving protection of marine fisheries and mariculture operations.

10. Date of start:	1979

11. Likely date of completion:	Continuing

12. Estimated man-months:	30/year

13 Facilities required:	
i) Land:	-
ii) Labour:	-
iii) Special equipment:	Neuston net, modified and fabricated locally.
iv) Foreign exchange:	-
v) Estimated cost:	Institute's project

14. If financed by an organisation other than the Institute:	
a) Name of the financing organisation:	nil
b) Title of the project (if the project forms a part of the larger project)	--

15. Approximate cost:	Institute's project

16. Signatures of:	

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

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/PL/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of project: MBO/PL/1 Secondary production
- Title of problem: MBO/PL/1.1 Secondary production of the shelf and adjacent waters.
-

5. Name and designation of principal investigator: K.J.Mathew, S-1
-

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

Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K.G.Girijavallabhan, S-1	..
Mandapam Camp	S.Krishna.Pillai, S-1	J.X.Rodrigo, T2
Tuticorin	R.Marichamy, S Pon Siraimetan, S	..
Cochin	K.Rengarajan, S-1	..
Calicut	C.V.Mathew, S	..
Mangalore	..	C.M.Allikunju, T-II
Karwar	T.S.Naomi, S	..

-
7. Location of the research project: *Waltair, Madras, Mandapam Camp, Tuticorin, Cochin, Calicut, Mangalore, Karwar, *Bombay and *Minicoy
-

8. (a) Objectives:

This project is to assess the role of zooplankton in the complete marine food chain and elucidate ecological aspects such as secondary production in relation to fisheries.

- (b) Practical Utility:

In any fishery oriented investigation, the proper understanding of the relationship between the fishes that constitute the fishery and zooplankton which constitute their food is an essential pre-requisite. The most important factor that influence the fishery of a region is the plankton production.

*Staff not in position

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

9. Technical Programme:

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

10. Date of start 1976

11. Likely date of completion 1980

12. Estimated man months: 47 man months/year

13. Facilities required:

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

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

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

15. Approximate cost: Institute project

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

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

(b) Practical Utility:

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

9. Technical Programme:

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

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months:

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

1. Institute Code No. MBO/SW/1.1

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

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

4. Title of Project: MBO/SW/1 Survey of Economically important
seaweed resources.

Title of Problem: MBO/SW/1.1 Seaweed Resources Investigations

5. Name and designation of Principal Investigator V.S.K.Chennubhotla, S-2

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

Part time:

Establishment

Scientific Associates

Technical Associates

Mandapam Camp

..

S.Kalimuthu, T.II.3
M.Selvaraj, T2
M.Najamuddin, T2
J.R.Ramalingam, T2.

7. Location of the research project: Mandapam Camp and Vizhinjam

8. (a) Objectives

To study the seaweed resources of the Kerala Coast for estimating the standing crop and for mapping productive areas in order to provide basic information to seaweed processing industries.

(b) Practical Utility:

Seaweeds yield agar agar, algin, and other chemicals. Recently industries have been started in Tamil Nadu and other states and the demand for seaweeds for industry is increasing.

9. Technical Programme:

1. Survey of Seaweed resources to be undertaken along the remaining part of Tamil Nadu coast and in Kerala.
2. Seaweed sample to be collected along the transects from different stations.
3. Statistical analysis of the raw data.

10. Date of start: 1978

11. Likely date of completion: 1979

12. Estimated man months:

13. Facilities required:

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

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

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

15. Approximate cost: Institute Project

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/SW/1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: MBO/SW/1 Seaweed Resources investigations
- Title of Problem: MBO/SW/1.2 Culture of economically important seaweeds
-
5. Name and designation of Principal Investigator: V.S.K.Chennubhotla, S-2
-
6. Name(s) and designations of Associate(s) and Establishments on which borne:
- Part time:
- | <u>Establishments</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|-----------------------|------------------------------|---|
| Mandapam Camp | .. | S.Kalimuthu, T-II-3
J.R.Ramalingam, T2
M.Najimuddin, T2
M.Selvaraj, T2 |
-
7. Location of the research project: Mandapam Camp and Tuticorin
-
8. (a) Objectives:
- To carry out culture experiments on commercially important seaweeds to investigate the life history and to develop suitable techniques for seaweed farming
-
- (b) Practical utility:
- This will provide additional raw materials in off seasons and also production could be increased according to the demand.
-
9. Technical Programme:
1. Laboratory culture of seaweeds to be maintained for studying the life history and physiological factors.
 2. Farming and culturing of economically important seaweeds by means of spores and vegetative propagation.
-

10. Date of start: 1976
11. Likely date of completion: 1980
12. Estimated man months: 28 man months/year
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) Estimated cost:
14. If financed by an organisation other than the Institute:
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
15. Approximate cost: Institute Project
16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

145

1. Institute Code No. MBO/EE/1.2

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

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

4. Title of Project: MBO/EE/1 Ecological Energetics

Title of Problem: MBO/EE/1.2 Ecological energetics in the fishing grounds off Cochin.

5. Name and designation of Principal Investigator: C.P.Ramamirtham, S-2

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

Part time:

Establishments

Scientific Associates

Technical Associates

Cochin

V. Josanto, S-1
A.G.Ponnaiah, S-1
P.Parameswaran Pillai, S-1
I.David Raj, S

V.K.Balachandran, T.II.3

7. Location of the Research Project: Cochin

8. (a) Objectives:

To calculate the ratio of yield to production in a typical inshore fishing ground for making accurate assessment of potential yield.

(b) Practical Utility:

Studies on the production and conversion of energy at different trophic levels form a basic pre-requisite for assessment of the potential catch available from the productive inshore waters of the upwelling area of the west coast of India.

-
9. Technical programme:
1. Study the rate of production at different trophic levels
 2. Estimate the conversion efficiency from primary to tertiary levels
 3. Entegrated investigation on the food chain and utilisation of energy in a fishing ground from primary to tertiary level including the hydrographic parameters.
-
10. Date of start: 1975
-
11. Likely date of completion: Continuing
-
12. Estimated man months: 40 man months/year
-
13. Facilities required:
- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) estimated cost |
| iii) special equipment | |
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

1. Institute Code No. MBO/MB/1.1

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

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

4. Title of Project: MBO/MB/1.1 Mud banks and their influence on fisheries

Title of Problem: Investigations on the mud banks of the Kerala coast and their influence on fisheries.

5. Name and designation of Principal Investigator D.S. Rao, S-2

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

Part time:

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Cochin	K.J.Mathew, S-1 A.Regunathan, S	V.K.Balachandran, T.II.3 C.Thankappan Pillai, T-2

7. Location of the Research Project: Cochin

8. (a) Objectives:

Investigations, on the mud banks for understanding their origin, formation, dissipation and influence on fisheries

(b) Practical utility:

Mud banks are special phenomenon occurring along the Kerala and Karnataka Coasts during Monsoon months. Their occurrence is also said to coincide with good fishing. In view of the importance of mud banks to fisheries, the Institute is expanding its programme of work to other areas.

9. Technical Programme:

1. To extend the present investigations on the various mud bank regions of the south west coast upto Mangalore.
2. Seasonal echo-survey of the mud banks.
3. Assessing the fishery operations inside and outside the mud banks during different seasons.
4. Seasonal observations on currents and hydrographic parameters.

5. Geological studies of the mud of the mud banks.
(sediments in suspension and at the bottom)

6) Pre and post mud bank period data to be included.

10 Date of start: 1976

11. Likely date of completion 1981

12. Estimated man months: 10 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost: 3.21 lakhs

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

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

9. Technical Programme:

1. Determine the extent of weed deposits (especially Salvinia) in the fishing grounds off Cochin.
2. To estimate the benthic productivity.
3. Investigate the break-down processes, recycling etc. of the weed by bacteriological analysis.
4. Study the vertical stratification of the bottom layers by core sampling

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

15

- 1. Institute Code No. MBO/MCP/1

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

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

4. Title of Project: MBO/MCP/1 Mass culturing of plankters

Title of Problem:

- 5. Name and designation of Principal Investigator: P.V.Ramachandran Nair, S-3

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

Part time

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	Geeta Bharathan, S-1	..
Tuticorin	D.C.V.Easterson, S-1	..
Cochin	C.P.Gopinathan, S-1 C.M.James, S P.Parameswaran Pillai, S-1	V.K.Balachandran, T-II.3 M.Ayyappan Pillai, T-II-3. R.Palanichamy, T-2

- 7. Location of the research project. Madras, Tuticorin and Cochin.

8. (a) Objectives:

To develop mass culture of various organisms for feeding hatchery produced larvae.

(b) Practical utility:

Culture of phytoplankton organisms for use as feed for rearing of some important species of fishes and prawns has already been attempted in the laboratory. There is need for developing techniques for experimental investigations on the uptake of toxic substance at different trophic levels in the marine food chain. Large scale culturing of plankters is a new line of development which is now being attempted in other countries also with similar objectives in view. The techniques evolved for successful culturing organisms will have wide applications.

9. Technical Programme:

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

10. Date of start: 1974

11. Likely date of completion : Continuing

12. Estimated man months: 26 man months/year

13. Facilities required:

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

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

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

15. Approximate cost: Institute Project

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

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1. Institute Code No. MBO/MP/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Marine Pollution
- Title of Problem: MBO/MP/1.1 Marine pollution in relation to protection of living resources
-

5. Name and designation of Principal Investigator: P.V.Ramachandran Nair, S-3
-

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

Part time:

<u>Establishments</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K.G.Girijavallabhan, S-1	..
Tuticorin	R.Marichamy, S	..
Cochin	M.S.Rajagopalan, S-2 C.P.Gopinathan, S-1 V.Kunjukrishna Pillai, S-1 V.Chandrika, S	D.Vincent, T-2
Calicut	P.Karuppaswamy, S	
Karwar	G.G.Annigery, S-2 S.Muthuswamy, S-1 M.V. Pai, S-1	G.M.Kulkarni, T2 K. Balachandran T2 Dinesh, T1

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

8. (a) Objectives:

To identify sources of marine pollution, assess their effect on living organisms, and to suggest preventive and remedial measures for protecting the living resources of the seas especially fisheries

(b) Practical utility:

In recent years there has been a world-wide awareness of the problems of marine pollution because of the immense growth of human population and industries, large scale application of pesticides and several other forms of human interference with the natural environments. Apart from these, certain biological phenomena like phytoplankton blooms created conditions which lead to pollution and ultimately deoxygenation of water and mortality

of fish and other marine life. Hence studies on marine environmental damage by different sources become an obvious necessity.

9. Technical Programme:

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

10. Date of start: 1971

11. Likely date of completion: Continuing

12. Estimated man months: 58 man months/year

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

-
1. Institute Code No, MBO/CR/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MBO/CR/1 Investigations on the coral reef resources
- Title of Problem: MBO/CR/1.1 Ecology and resources of the fringing reefs and atolls.
-
5. Name and designation of Principal Investigator: C.S.Gopinatha Pillai, S-1
-
6. Name(s) and designations of associate(s) and Establishments on which borne:

7. Location of the research project: Cochin

8. (a) Objectives:

A Study of the zonation, and ecology of the reefs and their major associated marine animals of the southeastern coast of India and the atoll reefs of Lakshadweep will be carried out. The environmental damage to reef ecosystem due to quarrying of corals for industrial purpose will be assessed with special reference to the reefs of Gulf of Mannar and Palk Bay.

(b) Practical utility

Information gained on the occurrence and abundance of economically important reef associated animals will be importance to their rational exploitation. Ecological data will be of practical utility in considering coral reefs as potential grounds for mariculture. The environmental effect of coral quarrying will help us to formulate measures of conservation.

9. Technical Programme:

1. The accessible reefs will be qualitatively and quantitatively surveyed by unit sampling and traverse survey.
 2. Comparative studies on the undisturbed and quarried reefs sites will be carried out to assess the ecological changes and environmental damages.
-

156

10. Date of start: 1975

11. Likely date of completion: Continuing

12. Estimated man months: 10 man months/year

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/MS/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Ecological studies of mangrove swamps
- Title of Problem: MBO/MS/1.1 Ecology of the mangrove swamps and their associated fauna and flora
-
5. Name and designation of Principal Investigator: M.S. Rajagopalan, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time:
- | <u>Establishments</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|-----------------------|---|-----------------------------|
| Tuticorin | .. | A. Bastin Fernando, T-II.3 |
| Cochin | C.S. Gopinadha Pillai, S-1
G.S. Daniel Selvaraj, S-1 | A. Kanagam, T2. |
-
7. Location of the Research Project: *Kakinada, *Portonovo, Tuticorin, and Cochin
-
8. (a) Objectives:
1. To elucidate the various ecological aspects connected with mangrove swamps
 2. To investigate the formation and zonation of mangroves vegetation
 3. To determine qualitatively and quantitatively the mangrove associated fauna, their interrelationship and influence on local fisheries
-
- (b) Practical utility:
- Mangrove swamps have characteristic flora and fauna. The ecological conditions make the mangrove areas highly productive. Further mangrove areas serve as nursery grounds for many species of fishes and prawns
-

*Staff not in position

9. Technical programme:

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

10. Date of start: 1976

11. Likely date of completion: 1979

12. Estimated man months: 24 man months/year

13. Facilities required:

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

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

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

159

1. Institute Code No. MBO/SP/1.1

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

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

4. Title of Project: MBO/SP/1.1 Investigations on Sponges

Title of Problem: Useful and Harmful Sponges

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

6. Name(s) and designations of Associate(s) and Establishment(s)
on which borne:

Part time:

Establishments

Scientific Associates

Technical Associates

Tuticorin

K. Ramadoss, S

r.

Vizhinjam

7. Location of the Research Project: Tuticorin and Vizhinjam

8. (a) Objectives:

The study of sponges is receiving considerable attention now since specific and often peculiar chemical compounds are known to occur in this group of animals. Of late, certain species belonging to the class Demospongiae from the Indian Ocean have attracted attention of both biologist and chemists from this point of view. A survey of this group from the Indian Ocean is proposed to be undertaken in this project.

Boring sponges are considered to be a menace to the molluscan fishery in several parts of the world. Some species of boring sponges which are rather passive in natural beds may turn out to be very active in artificial beds or on culture rafts. For outlining any remedy for this predicament, an assessment of the activity of these organisms in both natural and artificial environments is highly essential. Such a study will help in a better management of our molluscan culture farms.

(b) Practical utility:

1. The data on the availability of various species of sponges would be of great value in extracting Drugs and Chemicals from marine sponges.
 2. Knowledge regarding the activity of boring sponges is essential for effective management of molluscan culture farms.
-

9. Technical Programme:

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

10. Date of start: 1977

11. Likely date of completion: Continuing

12. Estimated man months: Nine months/year

13. Facilities required:

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

14. If financed by organisation other than the Institute:

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT 1979

-
1. Institute Code No. MBO/MM/1.1
-
2. I.C.A.R.Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of project: MBO/MM/1 Investigations on marine mammals and turtles
- Title of Problem: MBO/MM/1.1 Investigations on the distribution biology, feeding habits reproductions and behaviour of marine turtles dolphins and porpoises
-
5. Name and designation of Principal Investigator E.G.Silas, Director
-
6. Name(s) and designations of Associate(s) and establishments on which borne:
- Part time:
- | <u>Establishments</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|-----------------------|------------------------------|-----------------------------|
| Madras | M.Rajagopal, S | .. |
| Mandapam Camp | .. | A.A.P.Mudaliar, T.II.3 |
| Tuticorin | .. | A.Bastian Fernando, T.II.3 |
| Calicut | R.S.Lal Mohan, S-1 | .. |
-
7. Location of the research project: Madras, Mandapam, Tuticorin, Cochin and Calicut
-
8. (a) Objectives:
1. To study the biology and resources of marine turtles
 2. Processing of data available on lesser cetaceans (dolphins, porpoises and smaller whales) of the Indian Seas and to study the distribution, biology and feeding habits of some species, To examine whether conservation measures are necessary for the protection of lesser cetaceans.
-
- (b) Practical Utility:
- There is hardly any information available on dolphins, porpoises and smaller whales except for records of strandings. Dolphins constitute an important link in the trophic cycle in our shelf waters. No estimates are available about the populations of different species of dolphins in our coastal waters nor their
-

role as predators of fishes such as mackerels and sardines. Often damage to fishing gear is also caused by dolphins. A proper study of these animals and the species occurring in our waters, their biology and abundance will help considerably in evolving suitable management measures for proper conservation and utilisation of this resource.

Information on the marine turtle fishery along the southeast coast, revenue obtained, nesting grounds etc. will be helpful in the rational exploitation of the resource.

9. Technical Programme: (for marine mammals)

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

Technical Programme: (for Marine Turtles)

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

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 25 man months/year

13. Facilities required:

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

1. Institute Code No.	CMFRI/IDP/1
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre	Central Marine Fisheries Research Institute, Cochin
4. Title of Project:	Survey of molluscs (bivalves), prawn and fish seed resources.
5. Name and designation of the Principal Investigator	E.G. Silas, Director.
6. Names and designations of Associates and Establishments on which borne:	
a) <u>Whole time:</u>	Nil
b) <u>Part time:</u>	

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K. Rangarajan, S2 M. Rajagopal, S	Dhandapani, T
Tuticorin	S. Sanmugam, S	Bastian Fernando T II 3
Mandapam Camp	K.M. Ameer Hamsa, S1 R. Thiagarajan, S G. Nandakumar, S	---
Vizhinjam	S. Lazarus, S1 K. Prabhakaran Nair S	-
Cochin	K.J. Mathew, S1 G.S.D. Selvaraj, S1 K. Rengarajan, S1	K.N. Gopalakrishnan T II 3
Calicut	R.S. Lal Mohan, S1 K.V. Somasekharan Nair S N. Gopinatha Menon, S	K. Nandakumaran, T II 3 P. Ramadoss, T

7. Location of the research project: Madras, Tuticorin, Mandapam Camp, Vizhinjam, Cochin, Calicut.

8. (a) Objectives:

1. To locate areas of abundance of seeds of cultivable species of prawns, fishes and bivalve molluscs in the lakes, estuaries and other brakish water areas of Kerala and Tamil Nadu.
 2. To estimate the species-wise, season-wise and region-wise abundance of prawn fish and molluscan (bivalves) seeds.
 3. To identify areas suitable for brakish water farming.
 4. To understand the effect of various lunar phases on seed abundance.
 5. To carry out experiments on methods of seed collection and transportation.
-

8. (b) Practical Utility:

The interest of the industry in culturing on commercial scale marine prawns, fishes and bivalves is increasing. An essential pre-requisite is information on the region-wise and season-wise abundance of seeds of various species. The surveys are expected to meet these requirements.

9. Technical programme:

1. Bimonthly surveys will be undertaken to locate areas of abundance of seeds (post larvae and juveniles) of prawns, fishes and bivalves.
 2. The quantitative estimation of the seeds in various regions and seasons will be done by operating special gears meant for the purpose.
 3. Suitable locations for taking up coastal aquaculture will be charted and their ecology studied.
 4. Quarterly observations on seed availability will be carried out during a full moon phase, new moon phase and a mid-lunar phase at selected centres.
 5. Occurrence of ancillary resources such as seaweed in the area surveyed will be indicated.
-

10. Date of start: 1976

11. Likely date of completion 5 years

12. Estimated man months

13. Facilities required:

- | | |
|-------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) estimated cost; |
| iii) special equipments | Institute's project. |
-

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

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

15. Approximate cost: Institute project

16. Signatures of:

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

RESEARCH PROJECT - 1979

1. Institute Code No.	CMFRI/IDP/2	
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre	Central Marine Fisheries Research Institute, Cochin	
4. Title of Project:	Fish and shell fish diseases.	
Title of Problem:	Investigations on fish & shell fish diseases.	
5. Name and designation of Principal Investigator	S. Mahadevan, S2	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time:</u>	Nil	
b) <u>Part time:</u>		
Establishment	<u>Scientific Associates</u>	<u>Technical Associates</u>
Madras	K. Rangarajan, S2	--
Tuticorin	D.C.V. Easterson, S1	--
Mandapam Camp	K. Dorairaj, S1	--
Vizhinjam	S. Lazarus, S	--
Cochin	C. Thangappan Pillai	--
7. Location of the Research Project:	Madras, Tuticorin, Mandapam Camp, Vizhinjam, Cochin	
8. a) Objectives.	Marine fish and shell fish diseases constitute one of the important factors in regulating the populations in natural environment and in aquaculture. In India very little consideration and attention have been shown in this aspect. To fill up this gap in the knowledge and to take adequate steps it is necessary to undertake the studies. The studies constitute one of the essential steps in farm management.	

b) Practical Utility

The need for research on fish and shell fish as possible vectors of infectious diseases is of vital importance because of the increasing use of fish and shell fish as human food, the aquatic environment and the high rate of pollution of the aquatic environment. The studies will fulfill the need to ensure bacterially free food from the farms and also enable to keep down the cases of mortality of farmed animals on account of bacterial infections.

9. Technical programme:

1. Collection of diseased specimens and parasites from the different environment including cultured ponds.
2. Classification of diseases and determining the causative etiological factors and probable effects on population.
3. Development of preventive measures in the control of the documented diseases.
4. Specific cases of large-scale mortality, when reported to be investigated thoroughly.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 18 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No.	CMFRI/IDP/3

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

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

4. Title of Project:	National Programme of Tagging oilsardine, mackerel, prawns & catfishes.

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

6. Name(s) and designation of Associate(s) and Establishments on which borne:	
a) <u>Whole time:</u> Nil	
b) <u>Part time:</u>	
<u>Establishment</u>	<u>Scientific Associates</u> <u>Technical Associates</u>
Waltair	--- P. Mojumdar, T-6 S.S. Dan, T-6 and others.
Cochin	A. Noble, S-2 M.M. Thomas, S-1 and others. ---
Calicut	N.Gopinatha Menon, S-1 and others ---
Mangalore	N.S.Radhakrishnan, S-1 and others ---

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

8. a) <u>Objectives:</u>	
1. To study the migration patterns of oilsardine, mackerel, prawns and catfishes in space and time along the coasts of India where the species are of great economic importance.	
2. To study directly the rate of growth, rate of fishing of the stocks and shoaling behaviour of these species.	

3. The results obtained would form the basis of extending the project to cover other centres and other species such as tunas, Bombay duck, ribbon fishes etc.

b) Practical Utility:

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

9. Technical programme: To tag
1. At least 25,000 oilsardines, 25,000 mackerel and 50,000 prawns at Cochin,
 2. at least 25,000 oilsardines, 5000 mackerel and 5000 prawns at Calicut,
 3. at least 25,000 mackerel, 5000 oilsardine and 5000 prawns at Mangalore and
 4. at least 5000 catfishes at Waltair.

10. Date of start: January 1976.

11. Likely date of completion: 1980

12. Estimated man months: 100

13. Facilities required:

- i) land -
- ii) labour -
- iii) Special equipment: -

iv) foreign exchange: -

v) Estimated cost:

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

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

15. Approximate cost: 357,460

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

-
1. Institute Code No. CMFRI/IDP/5.
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Fishery Resources of the economic zone
- Title of Problem: CMFRI/IDP/5 Exploration of the fishery resources of the outer continental shelf and oceanic waters of Indian economic zone.
-
5. Name and designation of Principal Investigator: S.V. Bapat
Joint Director
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time: Nil
- Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|------------------------------|-----------------------------|
| Waltair | B. Krishnamoorthi, S-3 | -- |
| Cochin | C. Mukundan, S-1 | -- |
| Calicut | R.S. Lal Mohan, S-1 | -- |
| Karwar | M.V. Pai, S-1 | -- |
-
7. Location of the Research Project: Waltair, Cochin, Calicut, Karwar and Bombay.
-
8. a) Objectives:
- To carry out exploratory surveys on the fishery resources of the continental shelf edge and oceanic waters of our economic zone to understand the potential and exploitable resources available for commercial purpose.
-
- b) Practical Utility:
- India declared an Exclusive Economic Zone of 200 miles to explore, exploit, manage and conserve the living and non-living resources of her seas. This declaration has provided great opportunity and challenge for the development and exploitation of fishery resources available in the outer half of the continental shelf, shelf edge and oceanic waters within the economic zone. While the information on the fishery resources in the

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

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: continuing

12. Estimated man months: 24

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

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

RESEARCH PROJECT - 1979

-
1. Institute Code No. CMFRI/IDP/7
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Man-made changes on environment.

Title of Problem: CMFRI/IDP/7. Impact of Thanneermukkom Bund on the fisheries of the Vembanad Lake

-
5. Name & designation of Principal Investigator: K. Alagarswami, Scientist S-3
-

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

a) Whole time: Nil

b) Part time:

Establishment

Scientific Associates

Technical Associates

Cochin

S.K. Dharma Raja, S-2 M. Ayyappan
 C. Suseelan, S-1 Pillai, T.II-3
 V.Kunjukrishna Pillai S-1
 K.J. Mathew, S-1
 Daniel Selvaraj, S-1
 K.K.P. Panikkar, S-1
 V. Josanto, S-1
 G. Radhakrishnan, S-1

-
7. Location of the Research Project: Cochin
-

8. a) Objectives:

To make an assessment of the changes in the faunal, floral, ecological and biological characteristics as well as fisheries of the Vembanad Lake consequent on the construction of the Thanneermukkom Bund with a view to suggest the conservational measures of the natural living resources of the lake.

b) Practical Utility:

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

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months: 20 man months

13. Facilities required:

i) land:	-	iv) Foreign exchange:	-
ii) labour:	-	v) Estimated cost:	-
iii) Special Equipment:	-		

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

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

15. Approximate cost:

16. Signatures of:

Sd.

Sd.

Sd.

Principal Investigator

Head of Division

Director

1. Institute Code No.	CMFRI/IDP/8		
2. I.C.A.R. Code No.			
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin		
4. Title of Project:	Nutritional Physiology of fish and shell fish		
Title of Problem: CMFRI/IDP/8	Nutrition and ecological energetics in prawns.		
5. Name and designation of Principal Investigator	P.V. Ramachandran Nair, S3		
6. Name(s) and designation of Associate(s) and Establishments on which borne:			
a) <u>Whole time</u>	Nil		
b) <u>Part time</u>			
	<u>Establishments</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
	Madras	M. Vijayakumaran, S1	
	Tuticorin	D.C.V. Easterson, S1	
	Cochin/Narakkal	M.S. Muthu (APL) S2	--
		M. Rajamani, S1	
		A.G. Ponnaiah, S1	
	Calicut	C.V. Mathew, S	
7. Location of the Research Project:	Madras, Tuticorin, Cochin, Narakkal, Calicut.		
8. a) Objectives:			
	1. To investigate and evaluate the nutrition requirements of cultivable marine prawns.		
	2. To study the food conversion efficiency of the prawns under field conditions using natural/artificial diets with a view to evolve low cost and efficient prawn feed and to evaluate the optimum ration and cropping time.		
	3. To study the energy transfer at different trophic levels as present in culture ponds and in near shore regions.		
	4. To study the seasonal variation in chemical composition of major zooplankters; and assessment of their utility as feed in rearing of cultivable organisms.		

b) Practical Utility:

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

9. Technical programme:

Studies will be carried out in the following lines

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

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 48 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost: Institute Project

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/IDP/9
2. I.C.A.R. Code No. -----
3. Name and Address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin-18.
4. Title of Project: Reproductive physiology of fishes and shell fishes.
Title of Problem: CMFRI/IDP/9 Endocrinology in prawns.
5. Name & designation of principal Investigator: P.Vijayaraghavan, S-I
6. Name(s) and designation of Associate(s) and Establishments on which borne:
Full time: Nil
Part time:

Establishment	Scientific Associates	Technical Associates
Cochin	P.Vedavyasa Rao, S-3 N.S.Kurup, S-I	- - - -
7. Location of the Research Project: Cochin
8. a) Objectives:
- i) To investigate the topography and morphology of the endocrine complex.
 - ii) Preliminary studies on endocrine hormones and on the hormonal control on spawning, moulting and growth.
- b) Practical Utility:
- A detailed study of the neurosecretory cells of the brain and endocrine complex in the eye-stalk, which produce the reproductive and other hormones will help in perfecting techniques on artificial ripening of gonads and inducing growth in prawns to facilitate large scale culture.
9. Technical programme:
1. Collection of experimental animals and growing them in aquaria
 2. Study of topography and morphology of endocrine organs taking serial sections of the concerned tissues using microtechniques.
 3. Study of histology and histochemistry of the endocrine organs by using different histological techniques.
 4. Preliminary studies on the endocrine hormones based on the histology and histochemistry of the endocrine complex.

- b. Conducting experiments on hormonal control of spawning
moulting and growth.

10. Date of start: 1976

11. Likely date of completion: 1979

12. Estimated man months: 12 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of

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

RESEARCH PROJECT - 1979

181

1. Institute Code No.	CMFRI/DIP/11

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

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

4. Title of Project:	Investigations on culture ecosystems of marine fishes and shell fishes.

Title of Problem:CMFRI/IDP/11	Studies on the ecology, production and economics of crop-marine prawn/fish culture in different ecosystems.

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

6. Name(s) and designation of Associate(s) and Establishments on which borne:	
a) Whole time: Nil	
b) Part time:	
<u>Establishment</u>	<u>Scientific Associates</u> <u>Technical Associates</u>
Cochin	P.V.Ramachandran Nair S-3, (Associate Project leader) P.V. Rao, S-3 C.P. Ramamirtham, S-2 N.Neelakanta Pillai, S-1 V.Kunjukrishna Pillai, S-1 C.P. Gopinathan, S-1 P.Parameswaran Pillai, S-1 M. Kathirvel, S-1 K. Narayana Kurup, S-1 S.K. Pandian, S-1 A. Laxminarayanan, S-1 M. Rajamani, S-1 Syed Ahmed Ali, S-1 C.M. James, S-1
	T. Thankappan Pillai, T-2 T. Palanichamy, T-2

7. Location of the Research Project:	Cochin (Vypeen Island)

8. a) Objectives:

To obtain synoptic data on the ecology and dynamics of environment of the different ecosystems such as seasonal and perennial fields and shallow canals in the coastal region and to study the production and economics of crop-prawn/fish culture and the factors influencing them.

b) Practical Utility:

Comprehensive data and synoptic picture of the ecological, environmental and biological factors prevailing in the different ecosystems that are at present utilised for crop-prawn/fish culture in the coastal region are lacking. Information on these aspects is essential for effective management and improvement of integrated culture operations involving crop - livestock - fish.

9. Technical programme:

1. Topographical and physical features of the selected sites will be collected.
2. Daily observations on the nature of the day, climatic conditions including rainfall will be made.
3. Weekly observations on hydrology, productivity, fauna and flora of the selected study area will be carried out.
4. Monthly observations on benthic productivity, nitrogen phosphate, potash, zinc, organic carbon, bacterial production and water circulation pattern in the study area will be made.
5. The above data will be collected on statistically designed sampling procedure and will be maintained in the prescribed proformae.
6. Different phase of paddy cultivation namely preparatory phase involving the preparation of the field, seeding phase, growth phase, and harvesting phase will be closely studied by collecting relevant data.
7. Similarly, data on preparatory phase, stocking phase, culturing phase and harvest involved in prawn/fish cultivation will be collected and maintained.

8. The data collected above will be analysed to construct modely of culture systems and operations for effective evaluation, management and improvement.

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months: 40 man months

13. Facilities required:

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

14. If financed by an organisation other than the Institute

a) Name of the financing Organisation: C.M.F.R.I.

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

15. Approximate cost:

16. Signatures of:

Sd.

Sd.

Sd.

Principal Investigator Head of Division Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. IIP/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Central Marine Fisheries
Institute/Centre: Research Institute, Cochin
-
4. Title of Project: Inter-Institutional Project
Title of Problem: IIP/1. Fish/Prawn feed development
for intensive culture.
-
5. Name and designation of Principal Investigator Syed Ahammad Ali, S-1 (CMFRI)
(to be nominated) (CIFT)
-
6. Name(s) and designation of Associate(s) and Establishment
on which borne:
- a) Whole time: Nil
- b) Part time:

EstablishmentsScientific
AssociatesTechnical
Associates

Kovalam
Cochin

From CMFRI

M. Vijayakumaran, S-1
M. Kathirvel, S-1
From CIFT

(to be nominated)

-
7. Location of the Research Project: Kovalam, & Cochin
-

8. Objectives

Formulation and capsulation of suitable feed with cheap and readily available raw materials to feed the fishes and prawns at various stages in large scale culture practices; development of feed dispensing devices.

b) Practical Utility

Feeding of larval and juvenile stages of cultivable fishes and Prawns is one of the major problems encountered in aquaculture practices. Artificial feeds compounded with cheap and readily available raw materials are being used as supplementary feed for raising of fishes and Prawns to marketable size. Development of suitable feed, with Capsulation Process and dispensing devices would greatly help in the successful and profitable culture of these organisms.

 9. Technical Programme:

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

 10. Date of start: 1978

 11. Likely date of completion: 1980

 12. Estimated man months:

 13. Facilities required:

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

 14. If financed by an organisation other than the Institute

a. Name of the financing organisation

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

 15. Approximate cost:

 16. Signatures of

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

RESEARCH PROJECT - 1979

-
1. Institute Code No. IIP/2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin & Central Institute of Fisheries Technology, Cochin.
-
4. Title of Project: Operation of conventional and experimental 'Dol' nets from two centres viz. Bassein & Navabander to study the catch composition and survival rates of Bombay duck.
- Title of Problem: IIP/2
-
5. Name and designation of Principal Investigator: S.V. Bapat, Scientist S-3 Joint Director
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | <u>Part time:</u>
<u>Establishment</u> | <u>Scientific</u>
<u>Associates</u> | <u>Technical</u>
<u>Associates</u> |
|---|--|---------------------------------------|
| Bombay | Alexander Kurien, S-1 | D.L.Chindarkar, T-1 |
| Veraval | M.Z. Khan, S
Bhupendranath, S-1
(CIET)
Kuttappan, S-1
(CIET) | --
--
-- |
-
7. Location of the Research Project: Bombay and Veraval
-
8. a) Objectives.

To devise a suitable 'Dol' net which would provide escape opportunity for juveniles Bombay duck upto 100mm. in length.

b) Practical Utility:

Bombay duck forms an important fishery in India yielding a catch of 60-70 thousand tonnes per annum. As there are indications of the resource, being subjected to heavy fishing pressure, a careful watch on the catch trends and stock characteristics should be maintained.

Observations over the last few years have indicated that there is a gradual decrease in the average size of the fish in the commercial catch in Maharashtra and Gujarat. This has affected the fishery considerably resulting in reduced catches.

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: 3 years

12. Estimated man months:

13. Facilities required:

- i) land: -
- ii) labour: Net to be operated at Bassein and Navabander through local fishermen. The cost of operation will be compensated.
- iii) special equipment: --
- iv) foreign exchange: --
- v) Estimated cost: --
- vi) T.A. : Rs.2,900/2
- vii) Contingencies: Rs.28,500/2

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

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

15. Approximate cost:

16. Signatures of:

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

1. Institute Code No. IIP/3
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin and Central Institute of Fisheries Technology, Cochin
4. Title of Project: IIP/3. Product development and quality control of molluscan products.

Title of Problem:

5. Name and designation of Project Leader: Associate Project Leader
Principal Investigator: K. Alagarwami, S-3 P.V. Prabhu, S-2
CMFRI CIFT

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

- a) Whole time: Nil
b) Part time:

CIFT

CMFRI

<u>Establishment</u>	<u>Scientific Associates</u>	<u>Establishment</u>	<u>Scientific Associates</u>
Cochin	K.K. Balachandran, S-2	Kakinada	K.A. Narasimham, S-1
		Madras	R. Sarvesan, S-1
Calicut	Unnikrishnan Nair, S-1	Tuticorin	A. Chellam, S-1 P. Mathiah, S-1
		Cochin	P.V. Srinivasan, S-1
		Calicut	P.S. Kuriakose, S
		Mangalore	K. Satyanarayana Rao, S-1

7. Location of the Research Project: Kakinada, Madras, Tuticorin, Cochin, Calicut, and Mangalore.

8. a) Objectives:

Oysters, mussels, clams and cephalopods are a good source of protein, but at present they are consumed only by a small section of the coastal population and are discriminated by the people at large. This situation could possibly be overcome by developing products acceptable to a wider section of the community and at cheap cost. The products will be popularised by suitable extension programmes. The project aims at development of products and by-products resulting from culture of molluscs. Quality control studies will form a natural corollary to product development.

b) Practical Utility:

Development of acceptable low cost products rich in protein value would lead to better and greater utilisation of this source of food. Formulation of safe limits for consumption against pathogenic organisms and pollutants would ensure avoidance of health hazards. Development of by-products would result in higher yield of useful products. Squids and cuttlefishes already have a good export market and for other items there is a good potential for export.

9. Technical programme:

C.M.F.R.I.

1. Development of purification techniques.
2. Studies on the bacterial load at different stages of culture.
3. Estimation of biochemical composition of meat.
4. Investigations on the intake of toxic substances, if any.
5. Survey of market potential and steps for enhancing it.
6. Supply of material to the CIFT for processing work.

C.I.F.T.

1. Development of techniques for the transportation of molluscs to processing centres.
2. Processing of meat of oysters, mussels, clams and cephalopods at different stages of their biological condition; would include curing pickling, soup powder, protein concentrates, canning and freezing.
3. Evaluation of proximate composition and nutritional value of products.
4. Working out economics of processing.
5. Development of by-products; would include analysis of composition of pearl oyster shells with the specific object of evaluating their pharmaceutical uses; poultry feed from shells; uses of cephalopod shells.
6. Supply of data on the above aspects to C.M.F.R.I. with samples of processed products and by-products.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required:

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

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

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

15. Approximate cost

16. Signature of

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

INTER-INSTITUTIONAL RESEARCH PROJECT - 1979

-
1. Institute Code No. IIP/4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institutes/Centre. Central Marine Fisheries Research Institute, Cochin and Indian Agricultural Statistics Research Institute, New Delhi.
-
4. Title of Project:
- Title of Problem: IIP/4 Economics of marine fisheries in the Calicut area.
-
5. Name and designation of Principal Investigators. from:
- C.M.F.R.I. I.A.S.R.I.
K. ALAGARAJA, S-2 R.K. PANDEY, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne.
- C.M.F.R.I. I.A.S.R.I.
K.K.P. Panikkar, S-1 H.B. Choudhary, S-1
and Field staff to be recruited.
-
7. Location of the Research Project : Cochin.
-
8. a) Objectives:
- To study the impact of introduction of small mechanised fishing vessels on the socio-economic conditions of rural population in the coastal area near Calicut.
-
- b) Practical Utility:
- This study would suggest ways and means to improve the socio-economic conditions of coastal rural fisherfolk and other communities.
-
9. Technical Programme:
- On the basis of preliminary enquiries already made from the landing centres at Puthiappa and Elathur, schedules have been prepared for collection of data on different aspects of marine fisheries related to socio-economic conditions of the coastal rural folk of Calicut area. The sampling design would be decided on the basis of preliminary enquiries already made and after completing the frame survey of the area as per the Schedule I.

Collection of data and supervision of field work would be done by C.M.F.R.I., data processing by I.A.S.R.I. analysis and interpretation of data by both C.M.F.R.I. and I.A.S.R.I. Being of importance to Fisheries sector the results will be published as a Bulletin of the C.M.F.R.I. as a collective effort of the two Institutes.

10. Date of start: 1978

11. Likely date of completion: 1979

12. Estimated man months: 3 man months

13. Facilities required:

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

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

a) Name of the financing organisation: -

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

15. Approximate cost:

16. Signatures of:

Sd.	Sd.	Sd.
Principal Investigator	Head of	Director
from C.M.F.R.I., Cochin.	Division	

-
1. Institute Code No, CMFRI/DP/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Demonstration Projects in mariculture
- Title of Problem: CMFRI/DP/1 Demonstration Project in pearl culture
-

5. Name and designation of principal Investigator: K. Alagarswami, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:

Whole time: Nil

Part time:

Establishment

Scientific Associates

Technical Associates

Tuticorin

*A. Chellam, S1
A.C.C. Victor, S
S. Dharmaraj, S
T.S. Velayudhan, S

J. Antony Pitchai, T2
Dasman Fernando, T2
Soosai V. Rayen T2

7. Location of the Research Project: Tuticorin
-

8. a) Objectives:

The technical know-how for production of cultured pearls has been fully developed at the Institute. There is an increasing demand for pearls in India, which is entirely met by import of pearls worth over Rs.8 million every year. India has great potential for pearl culture industry. The prospective entrepreneurs would expect to know the economics of pearl culture. The present project aims at collection of economic data on pearl culture and conducting demonstrations.

- b) Practical Utility:

The project will demonstrate the economic viability of pearl culture for the first time in the country. Further development of the industry would depend on the results obtained in the project.

* Associate Project Leader

 9. Technical programme:

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

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 40 man months/year

 13. Facilities required:

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

 14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

 15. Approximate cost:

 16. Signatures of:

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

-
1. Institute Code No. CMFRI/DP/2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Demonstration Projects in mariculture
 Title of Problem: CMFRI/DP/2 Demonstration Project on edible oyster culture
-
5. Name and designation of Principal Investigator: P. Muthiah, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time: Nil
- Part time:
- | Establishment | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|---------------|------------------------------|--|
| Tuticorin | Nil | R. Thangavel, T-2
N. Vaithinathan, T-1
M. Manivasagam, T-1
G. Srinivasan, T-1 |
-
7. Location of the Research Project: Tutioorin
-
8. a) Objectives:
1. Large scale seed procurement for the oyster farm and rearing them through rack method of culture along the creeks, bays and lagoons.
 2. Explore new demands and markets for the oysters in the hinterland of coastal areas and also in the cities.
 3. Methods of purification of oysters will be investigated for ensuring a bacterial free supply of the oysters.
 4. Investigations on utilisation of oyster shells.
-

b) Practical Utility:

The economic feasibility for the production of edible oysters through culture methods already developed by this institute will be demonstrated to the entrepreneurs.

9. Technical programme:

1. Various methods of seed procurement will be demonstrated.
 2. Based on the techniques perfected by the Institute, a model farm of oysters will be set up.
 3. The details of exact period of rearing the seeds to marketable size, purification aspects before marketing and better utilization of oyster shells will be highlighted.
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 60 man months/year

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Signatures of:

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

RESEARCH PROJECT - 1979

1. Institute Code No.	CMFRI/DP/3	
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin	
4. Title of Project:	Demonstration projects in mariculture	
Title of Problem: CMFRI/DP/3	Demonstration Project on Mussel Culture.	
5. Name and designation of Principal Investigator:	P.S. Kuriakose, S	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
Whole time:	Nil	
Part time:		
<u>Establishment</u>	<u>Scientific Associates</u>	<u>Technical Associates</u>
Calicut	Nil	V.G. Surendranathan, T-1 M.P. Sivadassan, T-1
7. Location of the Research Project:	Calicut	
8. a) Objectives:		
1. To determine the technical feasibility of mussel culture in coastal waters on a large scale.		
2. To enlighten the prospective entrepreneurs about the commercial viability of the process of mussel culture.		
3. To offer consultancy service to entrepreneurs on the technology of mussel culture.		
b) Practical Utility:		
It is expected that an industry on mussel culture by private agencies would be possible in the near future by adopting the fairly simple process of culture.		

 9. Technical programme:

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

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 20 man months/year

 13. Facilities required:

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

 14. If financed by an organisation other than the Institute

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

 15. Approximate cost:

 16. Signatures of

Sd/-
 Principal Investigator

Sd/-
 Head of Division

Sd/-
 Director

-
1. Institute Code No. CMFRI/DP/4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute. Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Demonstration projects in mariculture
 Title of problem: CMFRI/DP/4 Demonstration project in seaweed culture
-
5. Name and designation of Principal investigator: V.S.K. Chennubhotla, S-2
-
6. Name(s) designation of Associates:
- | | <u>Whole time:</u> | <u>Part time</u> |
|---------------|-----------------------|----------------------|
| Establishment | Scientific associates | Technical associates |
| Mandapam Camp | - | - |
-
7. Location of the Research Project: Mandapam Camp
-
8. (a) Objectives:
 To carry out large scale cultivation of Gracilaria edulis, to extract agar-agar and to demonstrate the possibilities of marketing the product.
-
- b) Practical Utility:
 This will serve to demonstrate to the interested parties, the utility of seaweed farming and the extraction techniques of agar-agar. This will generate additional employment for the fisherfolk especially during lean periods when the fishing activities are poor. This project can form an important contribution in the integrated rural development programmes of coastal villages.
-
9. Technical programme:
1. Large scale cultivation of Gracilaria edulis by long-line rope method and other methods.
 2. Harvesting of the crop after 80 days.
 3. Sun drying the seaweed
 4. Pulverising and leaching
 5. Extraction of agar-agar.
 6. Marketing the products.
-

-
10. Date of start: 1978
-
11. Likely date of completion: 1979
-
12. Estimated man months: 80 man months
-
13. Facilities required:
- i) land - iv) foreign exchange. -
- ii) labour - v) Estimated cost: -
- iii) Special equipment: -
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
- b) Title of the project(if the project forms a part of a larger project)
-
15. Signatures of:

 Sd. Sd. Sd.

Principal Investigator Head of Division Director

RESEARCH PROJECT - 1979

1. Institute Code No.	CMFRI/TR/1																																										

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

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

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

Title of Problem:CMFRI/TR/1	Training in marine prawn culture.																																										

5. Name and designation of Principal Investigator:	P. Vedavyasa Rao, S-3																																										

6. Name(s) and designation of Associate(s) and Establishments on which borne:																																											
a) <u>Whole time:</u> Nil																																											
b) <u>Part time:</u>																																											
<u>Establishment</u>	<table border="0"> <tr> <td><u>Scientific Associates</u></td> <td><u>Technical Associates</u></td> </tr> <tr> <td>M.J. George, S-2</td> <td>S. Lakshmi, T.II-3</td> </tr> <tr> <td>P.V.R. Nair, S-3</td> <td></td> </tr> <tr> <td>K. Alagaraja, S-2</td> <td>C. Nalini, T-2</td> </tr> <tr> <td>M.S. Muthu, S-2</td> <td></td> </tr> <tr> <td>M.M. Thomas, S-1</td> <td></td> </tr> <tr> <td>N.S. Kurup, S-1</td> <td>K. Chellappan, T-1</td> </tr> <tr> <td>N.N. Pillai, S-1</td> <td></td> </tr> <tr> <td>C. Suseelan, S-1</td> <td></td> </tr> <tr> <td>C.P.Gopinathan, S-1</td> <td>Jacob D. Eapen, T-1</td> </tr> <tr> <td>M. Kathirvel, S-1</td> <td></td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>S.K. Pandian, S-1</td> <td></td> </tr> <tr> <td>M. Rajamani, S-1</td> <td>----</td> </tr> <tr> <td>A.Laxminarayanan, S-1</td> <td></td> </tr> <tr> <td>Syed Ahmed Ali, S-1</td> <td></td> </tr> <tr> <td>C.M. James, S-1</td> <td></td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>M.M. Kunju, S-2</td> <td>----</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>S. Ramamurthy, S-2</td> <td>----</td> </tr> </table>	<u>Scientific Associates</u>	<u>Technical Associates</u>	M.J. George, S-2	S. Lakshmi, T.II-3	P.V.R. Nair, S-3		K. Alagaraja, S-2	C. Nalini, T-2	M.S. Muthu, S-2		M.M. Thomas, S-1		N.S. Kurup, S-1	K. Chellappan, T-1	N.N. Pillai, S-1		C. Suseelan, S-1		C.P.Gopinathan, S-1	Jacob D. Eapen, T-1	M. Kathirvel, S-1				S.K. Pandian, S-1		M. Rajamani, S-1	----	A.Laxminarayanan, S-1		Syed Ahmed Ali, S-1		C.M. James, S-1				M.M. Kunju, S-2	----			S. Ramamurthy, S-2	----
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S. Ramamurthy, S-2	----																																										

7. Location of the Research Project:	Cochin/Narakkal																																										

8. (a) Objectives:

To train technical/research personnel in intensive prawn culture techniques so as to meet the man power requirements for developing large scale marine prawn culture in the country.

b) Practical Utility:

One of the major constraints in the developments of intensive prawn culture on modern and scientific lines is the lack of trained research/managerial, technical and extension personnels. The Institute has developed indigenous techniques for controlled spawning and rearing of larvae and for culture of marine prawns on commercial line. The training courses envisaged in this project would enable to provide specialised training for the research/technical manpower required for the current immediate developmental programmes and also to create a reserve of qualified and trained research/technical personnel.

9. Technical programme:

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

10. Date of start: 1978

11. Likely date of completion: Continuing

12. Estimated man months: 7 man months

13. Facilities required:

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

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

a) Name of the financing Organisation:

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

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. CMFRI/TR/2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Training programmes in marine fisheries research
- Title of Problem: CMFRI/TR/2 Training in pearl culture
-
5. Name and designation of Principal Investigator: K. Alagaraswami, S3
-
6. Whole time: Nil
- Part time:

EstablishmentScientific AssociatesTechnical Associates

Tuticorin

* A. Chellam, S-1
A.C.C. Victor, S
S. Dharmaraj, S
T.S. Velayudhan, S

J. Antony Pitchai, T2
Dasman Fernando, T2
Soosai V. Rayen T2

and other staff at Tuticorin Research Centre.

-
7. Location of the Research Project: Tuticorin
-

8. a) Objectives:

The Institute has the technical know-how on pearl culture and many maritime States, /private firms have shown keen interest in acquiring the know-how. The Institute has conducted organised training courses - a long-term trainers' training course and a short term technician's training course for the benefit of the fisheries departments of the States and agricultural universities. The present project is aimed at continuing the Training Programme. There is demand for vocational training from the universities and this need will also be met.

* Associate Project Officer

b) Practical Utility:

The transfer of technology to the end-users through this project would help the States/Research organisations/private enterprises to take up pearl culture in their areas either on commercial lines or for development purposes. This is the only centre which offers such organised training in pearl culture in India.

9. Technical programme:

The curriculum of the different types of training courses namely long term, short term and vocational courses differ in content to meet the expected levels of attainments of managerial and technical personnel. Training is imparted on the development of pearl oyster resource, farm maintenance, pearl production through surgery and post-operative culture, harvesting techniques and management. The courses will be organised based on specific requirements of states etc., and on their sponsoring the candidates.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required:

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

14. If financed by an organisation other than the Institute

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. CMFRI/TR/3
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Training programmes in marine fisheries research
- Title of Problem: CMFRI/TR/3 Training in edible oyster culture.
-
5. Name and designation of Principal Investigator: K. Nagappan Nayar, S-3
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time: Nil
- Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|--|---------------------------------------|
| Tuticorin | S. Mahadevan, S-2
K. Ramadoss, S
M.E. Rajapandian, S | N. Sundaram, T-2
C.T. Rajan, T I 3 |
- and other staff at Tuticorin Research Centre.
-
7. Location of the Research Project: Tuticorin
-
8. a) Objectives:
- The process of edible oyster culture has been developed at the Institute. It is proposed to organise short term training courses in edible oyster culture to demonstrate and give practical training to the interested culturists.
-
- b) Practical Utility:
- The technical know-how of oyster culture will be transferred to the end users through the Training Programme. Based on the training, farmers will be able to take up oyster culture on commercial scale.
-

9. Technical programme:

To impart training in edible oyster culture the following technical aspects to be taught.

1. Selection of farm site.
2. Various methods of farming.
3. Construction of racks for culture purpose.
4. Collection methods of oysters and oyster spat.
5. Growing oyster spat.
6. Farm management.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required

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

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/TR/4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Training programmes in marine fisheries research.
 Title of Problem: CMFRI/TR/4 Training in underwater investigations by SCUBA Diving.
-
5. Name and designation of Principal Investigator: S. Mahadevan, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Whole time: Nil
- Part time:
- | <u>Establishment</u> | <u>Scientific Associates</u> | <u>Technical Associates</u> |
|----------------------|---|-----------------------------|
| Tuticorin | Trained staff at Tuticorin Research Centre. | |
-
7. Location of the Research Project: Tuticorin
-
8. a) Objectives:
- Training in SCUBA diving will be imparted to scientific and technical personnel who desire to carry out underwater scientific investigations.
-
- b) Practical Utility:
- Diving with SCUBA enables the scientists and technicians to get direct scientific information and data from sea-bed.
-
9. Technical programme:
1. Suitable scientific and technical persons from various research centres selected or sponsored will be given training in SCUBA diving.
 2. Candidates for short term sessions will be trained for a period of 8 weeks. Two or three such sessions will be held between November and April each year,
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required:

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

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

15. Approximate cost

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

1. Institute Code No. CMFRI/TR/5
2. I.C.A.R Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute Cochin-18.
4. Title of Project: Training programmes in marine fisheries research.
Title of Problem: CMFRI/TR/5 Training in sea-weed culture and utilization.

5. Name and designation of Principal Investigator: V.S.K.Chennubhotla, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:

EstablishmentScientific AssociatesTechnical Associates

7. Location of the Research Project: Mandanam Camp

8. a) Objectives:

To train technical/research personnel and interested individuals in the methods of sea-weed resources survey, culture and utilisation.

b) Practical Utility:

The Institute has already worked out the techno-economic feasibility of sea weed culture and utilization. There are frequent enquiries from interested individuals organisations regarding the seaweed resources methods of culture and utilization- The proposed training courses will meet this demand.

 9. Technical programme: -----

To impart training on the following aspects.

1. Identification of various species of economically important seaweeds.
2. Methods of resources survey.
3. Methods of sea weed culture.
4. Methods of sea weed utilization.

 10. Date of start: 1978 -----

 11. Likely date of completion: 1980 -----

 12. Estimated man months: -----

 13. Facilities required: -----

i) land -

iv) foreign exchange

ii) labour -

v) Estimated cost:

iii) special equipment

 14. If financed by an organisation other than the Institute

a) Name of the financing organisation

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

 15. Approximate cost: -----

 16. Signatures of: -----

Sd/.
 Principal Investigator

Sd.
 Head of Division

Sd.
 Director

RESEARCH PROJECT - 1979

1. Institute Code No. CMFRI/TR/6
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: Training programmes in marine fisheries research

Title of Problem: CMFRI/TR/6

Training in fishery resources assessment including population dynamics.

5. Name and designation of Principal Investigator:

K. Alagaraja, S-2

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

Associate leader: T. Jacob, S-3

- a) Whole time

Nil

- b) Part time

Scientific Associates

G. Venkataraman, S-3
 S.K. Dharmaraja, S-2
 K. Narayana Kurup, S-1
 M. Srinath, S-1
 A.K.P. Panikkar, S-1
 R. Sathia Das, S-1
 K. Balan, S
 B. Prasanna Kumari, S
 K. Vijayalakshmi, S

Technical Associates

C.R. Shanmugavelu, T-6
 M.G. Dayanandan, T-6
 G. Balakrishnan, T-4
 Varghese Philipose, T.II-3
 G. Krishnankutty Nair, T.II-3
 Varughese Jacob, T.II-3
 P. Sivaraman, T.II-3
 V. Rajendran, T.II-3
 V.P. Annam, T.II-3
 A. Kanakkan, T-2
 S. Haja Najeemuddin, T-2
 C.J. Prasad, T-2
 T.A. Sankarankutty, T-2
 K. Santhakumari, T-2
 P.L. Ammini, T-2

7. Location of the Research Project:

Cochin

8. a) Objectives:

This project aims at giving regular training on the aspect of resources assessment and population dynamics in fishery research to research, technical and field staff of various Fishery Research Institutes, Departments of Fisheries of State Governments, State Fisheries Corporations, Universities, Fishing Industry and other interested organisations.

b) Practical utility:

This project envisages two types of training, one for research/technical staff and the other for Field staff. As there is no regular training programme on these aspects this programme will enable (1) research/technical staff to plan their experiments/ research programmes well in advance so as to obtain data which would be amenable for quantitative analysis and to arrive at estimates of required parameters. (2) Field staff to collect data on fish landings and other related aspects more efficiently which would improve the quality of data and reduce non sampling errors to the minimum.

9. Technical programme:

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

Training for research/field staff will have theory and practicals in (i) basic statistics including probability, distributions and inference; (ii) univariate, bivariate and multivariate analysis; (iii) growth curves (iv) population models and (v) sample survey designs for arriving at estimates of marine fish landings etc.

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

10. Date of start: 1978
11. Likely date of completion: continuing
12. Estimated man months: 55 man months/year
13. Facilities required:
- | | | | |
|------------------------|---|-----------------------|---|
| i) land | - | iv) foreign exchange: | - |
| ii) labour | - | v) estimated cost: | - |
| iii) special equipment | - | | |
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project) -
15. Approximate cost:
16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

I.C.A.R. GOLDEN JUBILEE
LAB to LAND PROGRAMMES

Overall Co-ordination and Direction:

Dr.E.G.SILAS, DIRECTOR,
CMFRI

Inter-disciplinary team for Co-ordination

K.Alagarswami, S-3 (Leader)
P.V.R.Nair, S-3
P.V.Rao, S-3
K.V.N.Rao, S-2
K.Alagaraja-S-2

<u>Programme</u>	<u>Centre</u>	<u>Working group</u>
1. Prawn culture & Polyculture (Fish and prawn) for Ernakulam Dt.	Cochin	P.V.Rao, S-3 (Group Leader) V.Balakrishnan, S-1 M.Kathirvel, S-1 P.Karunakaran Nair, T-6 and other staff.
2. Prawn culture for Quilon Dt	Cochin-	P.V.R. Nair, S-3 (Group Leader) K.J.Mathew-S-1 P.Parameswaran Pillai, S-1 K.Rengorajan, S-1 and other staff
3. Mussel Culture at Karikadukuppam	Madras-	T.Tholasilingam, S-3 (Group Leader) K.Rangarajan, S-2 K.G.Girijavallabhan, S-1 A.C.Sekar, T II 3 and other staff
4. Mussel culture at Elathur	Calicut-	M.M. Kunju, S-2, (Group leader) P.S.Kuriakose, S C.V. Mathew, S and other staff
5. Oyster culture	Tuticorin	K.Nagappan Nayar, S-3 (Group Leader) P.Muthiah, S-1 M.E.Rajapandian, S and other staff
6. Seaweed Culture	Mandapam Camp	P.S.B.R. James, Joint Director, (Group Leader) W.S.K. Chennubhotla, S-2 S. Kalimuthu, T II 3

SPONSORED PROJECTS AND OTHER PROJECTS

1. Title: Centre of Excellence for Advanced studies in Mariculture

- Objectives : To promote and develop mariculture including coastal aquaculture in India, through a Centre of Excellence for research, managerial, technological and extension training, and as a base of advanced knowledge, research and intelligence on the culture of marine living organisms.

Sponsoring agencies: FAO/UNDP and the CMFRI(ICAR)

Duration: Seven years

Personnel: Director, CMFRI and Scientists of different divisions.

2. Title Co-operative Intensive Prawn farming Project.

- Objective: 1. To demonstrate the economic viability of systematic prawn farming in brackish water areas with a view to convince the financing Institutions and entrepreneurs;
2. to extend systematic prawn farming methods to vast stretches of unutilised swampy areas of the coastal region of the country;
3. to train local operatives in systematic prawn farming techniques.

Sponsoring agencies: 1. Department of Fisheries, Govt of Kerala
2. The Marine Products Export Development Authority, Cochin.
3. CMFRI

Duration: 2 years

Personnel: K.V.George, Scientists and Technical personnel of the prawn culture team of CMFRI, Cochin.

3. Title: Assessment of Fry Resource of Cultivable penaeid prawns at selected centres in Kerala and Karnataka.

Objectives: To obtain accurate data on the availability and abundance of Penaeid prawn by resource, particularly as those of Penaeus indicus and P.monodon and to make an estimation of these resources available for stocking.

Sponsoring agencies: Financed by: THE MPEDA
Implemented by: CMFRI

Duration: 15 months

Personnel: Director,
P.V.Rao, K. Alagaraja, K.J.Mathew
and Research Scholars.

Title: Elver Resources Survey and Eel culture

Objectives:

1. To undertake a survey of the major river systems in the east coast for elver resources
2. to culture elvers to marketable size under controlled conditions.
3. to export live elvers and cultured eels
4. to study techno-economic feasibility of elver collections, eel culture and marketing on commercial scales.

Sponsoring agencies:

Financed by: THE MPEDA

Implemented by: CMFRI

Duration: 5 years

Personnel: K. Dorairaj, S. Kandasami, Varatharajan,
A. D. Gandhi, Arputharaj, Hameed Batcha.

Operational Research Project

Title: An Integrated approach to blend sea farming with traditional capture fisheries
At Kovalam, near Madras

Objectives: The project will train fishermen in methods of mariculture of fishes prawns and molluscs so that these could be undertaken along with traditional capture fisheries. This would create a sense of involvement and participation in the sea-farming techniques evolved by the CMFRI and demonstrate the scope for overall improvement of socio-economic conditions of the area. The integrated approach to blending culture fisheries with capture fisheries for rural development is a new concept in marine fisheries sector in the country.

Sponsoring agencies: ICAR

Personnel: S.J. Rajan, and Technical Associates.

Krishi Vigyan Kendra and Trainers Training Centre, Narakal.

Objectives: The KVK is based on three fundamental principles- production, work-experience (learning by doing) and uplift of weaker population. It is designed to impart need-based vocational training to fish farmers who could go for self employment.

The trainers' Training Centre is intended to impart training managerial personnel who would educate trainers engaged in imparting training to fish farmers

Personnel: V. Balakrishnan, P. Karunakaran Nair,
K.V. George, P.K. Martin Thomson and others.

Sponsored by: ICAR

Implemented by: CMFRI
