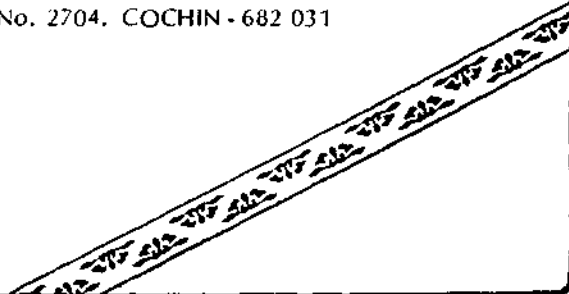




HAND BOOK OF TRAINING PROGRAMMES



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
P. B. No. 2704, COCHIN - 682 031



HANDBOOK OF TRAINING PROGRAMMES

Compiled by

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(LIMITED DISTRIBUTION)

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PREFACE

The Central Marine Fisheries Research Institute (CMFRI) has developed expertise in various aspects of marine fisheries research and development during the past several years. Based on the expertise thus developed, the Institute has been offering training courses periodically to officials from State Governments, Universities, ICAR Institutes, Krishi Vigyan Kendras (KVK), Industry, prospective and practicing farmers, etc. in various specialised subjects like hatchery production of marine prawn seed, prawn farming, pearl oyster culture, edible oyster culture and hatchery technology, seaweed culture and utilisation, SCUBA diving, methods of estimation of marine fish production, stock assessment, etc.

A Trainers' Training Centre (TTC) has been sanctioned to the CMFRI in 1983 by the Indian Council of Agricultural Research. The Centre is located at Narakkal, Vypeen Island near Cochin, where a Krishi Vigyan Kendra established in 1976 has also been functioning. The two Centres have been jointly organising training programmes at Trainers' level by TTC and at the farmers' level by KVK.

In view of the increasing demand for training in various specialised technologies which have been developed by the Institute under the Mariculture programmes, the scientific methods for estimation of marine fish catches, fish stock assessment and underwater surveys, a need arose to consolidate all informations on the training programmes of the Institute and make the information available to the user agencies in a compact form for reference. The present Handbook contains details of the various training courses offered by the TTC at different research centres of the Institute where the necessary infrastructural facilities and expertise are available. It is hoped that this Handbook will be useful to all organisations, institutions, universities, industry and the farmers who desire to avail and depute their employees for training at the Institute.

Cochin - 682 031,
11-9-1986.

P. S. B. R. James
Director,
C. M. F. R. Institute

INTRODUCTION

The Central Marine Fisheries Research Institute, a National Institute for marine fisheries research with National Marine Living Resources Data Centre has been engaged in the marine fishery resources assessment, during the early years, to ensure the rational exploitation of the available resources and to discover new fishing grounds and new resources along the continental shelf and shelf edge waters. These studies have shown that in some areas the exploitation has reached a stabilisation level while in others the stocks have been heavily exploited. This has led to the diversification and intensification of the research activities in Mariculture to augment the marine fish production. Thus, during the last decade, the major thrust has been given for development of culture of fishes, prawns, mussels, edible oysters, pearl oysters, pearl production, seaweed culture, etc. The technological feasibilities of some of these cultures have already been demonstrated for the benefit of the interested farmers and other entrepreneurs, and some of them have taken this on a regular and commercial basis.

In order to transfer these technologies to the entrepreneurs and interested parties/Government Agencies, training programmes are organised by the CMFRI at various levels and at different centres. Besides, training has been given to scientific and technical personnel from various government and autonomous agencies in the resources assessment of marine fisheries and resources surveys of the sea bottom by SCUBA diving. This Publication now provides briefly, the informations on the scope of these trainings, the expertise available in the Institute, course contents, venues, durations, accommodation, etc. for the information of those interested in these training programmes.

1. PRAWN FARMING

The traditional culture of prawns and fishes, already in vogue in the pokkali fields of Kerala and 'bheries' of West Bengal, has certain disadvantages. In this practice, selection of species and maintenance of optimum levels of stocking are not possible. Moreover, the undesirable species and the predators which enter the fields reduce the number and growth of the desirable species, adversely affecting the production. To overcome these difficulties, the Institute has developed scientific farming methods to improve the traditional system. This technology has been popularised among the small and marginal farmers and fish culturists by demonstrations organised by the Institute, at various places and through the Lab-to-Land Programme in the fields of adopted families. Therefore, there is great demand for trained field and extension personnel in the maritime States in the country. To meet this demand, the Institute has been training the officials of the government and autonomous agencies.

- i. Course content :
- a. Site selection and construction of prawn farms.
 - b. Eradication of predators, fertilisation and preparation of ponds.
 - c. Collection, sorting, identification and transportation of prawn seed from the wild.
 - d. Stocking of ponds, and monitoring and management of stock.
 - e. Monitoring of environmental parameters which affect prawn production.
 - f. Prawn diseases and treatment.
 - g. Harvesting, post-harvest handling and marketing.

- ii. Eligibility : a. Extension officers of the State Fisheries Department, Officials not below Research Assistant engaged in extension work, staff of KVKs and extension personnel of Agricultural Universities.
- iii. Course strength : 10 (Ten)
- iv. Duration : 10 days
- v. Course dates : October, December and February.
- vi. Venue : 1. Krishi Vigyan Kendra/Trainers' Training Centre, CMFRI, Narakkal.
2. Marine Prawn Hatchery Laboratory CMFRI, Narakkal.
- vii. Co-ordinating officer : Chief Training Organiser, Trainers' Training Centre, CMFRI, Narakkal - 682 505.

2. HATCHERY PRODUCTION OF MARINE PRAWN SEED

The Institute has developed suitable technologies for the production of marine prawn seed in the Marine Prawn Hatchery Laboratory of CMFRI at Narakkal to ensure a steady supply of seed of quality prawns to meet the ever increasing demand from the small and large prawn farmers. Techniques of mass culture of live feed for the prawn larvae also have been developed. There is urgent need for the establishment of more hatcheries at various other centres, under the government and other agencies, to meet the demand for seed. Therefore, the Institute has been organising training courses for the officials from the Fisheries Departments of maritime States and other interested agencies in establishing hatcheries.

- i. Course content :
 - a. Techniques of induced maturation in the laboratory through eyestalk ablation.
 - b. Methods of spawning and rearing of larvae to stocking size in hatchery on a large scale.
 - c. Development and maintenance of algal culture for feeding prawn larvae.
 - d. Use of compounded feeds in larval rearing.
 - e. Monitoring of water quality in the maturation facility and hatchery tank.
- ii. Eligibility : Officials sponsored by the State and Central Government Departments, ICAR Institutes, Krishi Vigyan Kendras, Agricultural and other Universities.
- iii. Course strength : 10 (Ten)

- iv. Duration : 15 days
- v. Course dates : January to March
- vi. Venue : Marine Prawn Hatchery Laboratory,
CMFRI, Narakkal - 682 505, Kerala.
- vii. Co-ordinating
officer : Officer-in-Charge,
Marine Prawn Hatchery Laboratory,
CMFRI, Narakkal - 682 505.

3. SEAWEED CULTURE

Seaweeds are used as raw material for the manufacture of agar-agar and algin. The Institute has developed simple technology for the culture of commercially important seaweeds. In order to transfer this low cost technology to those who are interested to take up this enterprise, the Institute has been conducting training courses at Mandapam Camp.

- i. Course content :
 - a. Identification of cultivable seaweeds.
 - b. Selection of culture sites.
 - c. Preparation of coir nets for culturing seaweeds.
 - d. Seeding the coir nets.
 - e. Monitoring growth of seaweeds and harvesting.
 - f. Extraction of agar and algin from seaweeds.
- ii. Eligibility : Persons interested to start seaweeds culture and who can understand Tamil/English.
- iii. Course strength : 10 (Ten)
- iv. Duration : 10 days
- v. Course dates : September and February
- vi. Venue : Regional Centre of CMFRI,
Marine Fisheries P. O.,
Mandapam Camp, Tamil Nadu.
- vii. Co-ordinating officer : Officer-in-Charge,
Regional Centre of CMFRI,
Marine Fisheries P. O.,
Mandapam Camp, Tamil Nadu.

4. FARMING OF EDIBLE OYSTERS

The Institute has developed the technical know-how for the successful farming of edible oysters in the creeks and backwaters. To ensure quick dissemination of this new technology, the Institute has been engaged in giving training to prospective culturists.

- i. Course content :
 - a. Identification of edible oysters.
 - b. Preparation of racks, cages and trays for growing oysters in the farm.
 - c. Preparation of spat collectors.
 - d. Monitoring of oyster growth and environmental conditions of the farm.
 - e. Harvesting, purification and shucking of oysters.
- ii. Eligibility : Persons interested in oyster farming and who can understand Tamil/English and Extension officials of government and autonomous agencies.
- iii. Course strength : 10 (Ten)
- iv. Duration : 10 days
- v. Course dates : March
- vi. Venue : Karapad Field Laboratory,
Tuticorin Research Centre of CMFRI,
Tuticorin, Tamil Nadu.
- vii. Co-ordinating officer : Officer-in-Charge,
Tuticorin Research Centre of CMFRI,
Tuticorin, Tamil Nadu.

5. HATCHERY PRODUCTION OF EDIBLE OYSTER SEED

The technology of production of edible oyster seed under controlled conditions in the laboratory has been developed by the Institute at Tuticorin. As part of the transfer of technology programme training courses have been conducted on this topic for the benefit of the interested parties. This proven technology helps to produce sufficient quantities of spat of edible oysters even at places where they are not readily available for farming.

- i. Course content :
 - a. Techniques for the production of oyster seed through hatchery system.
 - b. Induced maturation and techniques involved in artificial spawning of edible oysters.
 - c. Methods of culture of oyster larvae under controlled conditions.
 - d. Techniques adopted for settling of oyster spat and maintenance of spat under the laboratory and field conditions.
 - e. Culture of algal food for rearing oyster larvae.
 - f. Management of oyster hatchery.
- ii. Eligibility : Officials of the State Fisheries Departments, KVKs and Agricultural Universities.
- iii. Course strength : 10 (Ten)
- iv. Duration : 10 days
- v. Course dates : February
- vi. Venue : Karapad Field Laboratory, Tuticorin Research Centre of CMFRI, Tuticorin, Tamil Nadu.
- vii. Co-ordinating officer : Officer-in-Charge, Tuticorin Research Centre of CMFRI, Tuticorin, Tamil Nadu.

6. PEARL CULTURE

The Institute has developed indigenous technology for the production of cultured pearls by culturing the pearl oysters and artificially inducing the production of pearls, using indigenously made nuclei. Considering the great scope of this technology for reducing the import of pearls from foreign countries for internal market, a number of training programmes have been arranged at Tuticorin for the benefit of the extension personnel of the Fisheries Department of the States and other institutions and entrepreneurs.

- i. Course content :
 - a. Background information on pearl culture.
 - b. Biology of pearl oyster.
 - c. Culture of mother pearl oysters.
 - d. Surgery of pearl oyster for implantation of nucleus.
 - e. Collection of the pearls from the oysters.
 - f. Management of pearl oyster farm.
- ii. Eligibility : Extension staff of Fisheries Departments and prospective pearl culturists.
- iii. Course strength : 10 (Ten)
- iv. Duration : 4 weeks
- v. Course dates : September and October.
- vi. Venue : Karapad Field Laboratory,
Tuticorin Research Centre of CMFRI,
Tuticorin, Tamil Nadu.
- vii. Co-ordinating officer : Officer-in-Charge,
Tuticorin Research Centre of CMFRI,
Tuticorin, Tamil Nadu.

7. SCUBA DIVING

SCUBA (Self Contained Underwater Breathing Apparatus) diving is an authentic method of assessing the marine resources at the bottom of the sea which is quite essential for the judicious exploitation of these resources by the various agencies concerned. Scientists of the CMFRI have been engaged in carrying out underwater studies using aqualung ever since 1960, Tuticorin as the Project Centre. The Institute has thus a team of scientists well experienced in this area of underwater diving and exploratory work trained and with well organised infrastructural facilities for imparting training to aspiring candidates. Training courses have been conducted from time to time under this programme to scientists, technical personnel and other individuals in this special skill. It has been proposed to organise this training programme regularly.

- i. Course content :
 - a. Basic rules and pre-requisites of skin diving.
 - b. Selection of diving equipments and their operations.
 - c. Use of aqualungs, and its hazards and safety measures to be followed.
 - d. Precautions to be taken in deep diving and safety regulations.
 - e. Underwater surveying of marine fishes, collection techniques at sea bottom and underwater photography.
 - f. Underwater vehicles and other recent advances in sea bottom studies by direct observations.
- ii. Eligibility : Preferably science graduates. Relaxable in case of experienced technical personnel.

- iii. Course strength : 6 (Six)
- iv. Duration : 8 weeks
- v. Course dates : February and March
- vi. Venue : Tuticorin Research Centre of CMFRI,
90 North Beach Road, Tuticorin-628 001.
- vii. Co-ordinating officer : Officer-in-Charge,
Tuticorin Research Centre of CMFRI,
Tuticorin, Tamil Nadu.

8. SAMPLING TECHNIQUES FOR ASSESSMENT OF EXPLOITED MARINE FISHERIES RESOURCES

The proper designing of sampling programmes in fishery resources assessment is as important as the implementation of the correct methodology, to ensure reliable information on the resources and the optimum exploitation of the stock. Therefore, it is essential that those engaged in the collection of resources assessment data and their analysis should have a thorough knowledge of the basic principles and the practical experience in the collection of the data in the field. The Institute has developed a stratified multistage random sampling design which is used widely for the collection of marine fishery resources data. It is necessary that the field staff of the Fisheries Departments of maritime States also should follow the same method in their own programme of collection of data to facilitate easy comparison. To ensure this, the Institute has been giving training in sampling methodology of CMFRI for the State fisheries officials.

- i. Course content :
 - a. Basic sampling techniques leading to stratified multistage random sampling design and their application.
 - b. Identification of species, gears and crafts.
 - c. Selection of units for observations, collections of specieswise, gear-wise catch and effort data, processing and analysis of data.
- ii. Eligibility : Graduate with experience in organising and collecting fisheries data. Candidates sponsored by Fisheries Departments of State and Central Governments, Statistics Department, ICAR Institutes, Agricultural and other Universities and fishing industry.

- iii. Course strength : 20 (Twenty)
- iv. Duration : 2 weeks
- v. Course date : November
- vi. Venue : Central Marine Fisheries Research
Institute, E.R.G. Road,
Cochin - 682 031.
- vii. Co-ordinating officer : Shri K. Narayana Kurup,
Scientist S 2,
Fishery Resources Assessment
Division, C.M.F.R.I., P.B. No. 2704,
Shanmugam Road P. O.,
E.R.G. Road, Cochin - 682 031.

9. FISHERY RESOURCES ASSESSMENT

Application of quantitative methods in fishery research has gained great importance as it is realised that a sound information base is essential for arriving at policy decisions for the judicious exploitation of the marine resources. The Institute with its long experience has developed expertise in the application of scientific methods in the collection, compilation and analysis of fishery data and in the handling of various models associated with fish stock assessment. To make these methods available to research, technical and administrative personnel working in the fishery sector at middle and higher levels, the Institute conducts a 6 weeks' training course in statistical methods and population dynamics.

- i. Course content : a. Elements of mathematics.
b. Summarisation of data.
c. Concept of probability.
d. Theoretical distributions.
e. Correlation and Regression.
f. Tests of significance.
g. Sampling technique.
h. Estimation of vital statistics.
i. Stock assessment.
j. Evaluation of production.
- ii. Eligibility : Graduates with aptitude and experience in fishery research and development sponsored by State and Central Government Fisheries Departments, Statistics Departments, ICAR Institutes, Agricultural and other Universities and fishing industry.
- iii. Course strength : 20 (Twenty)
- iv. Duration : 6 weeks
- v. Course date : January and February

- vi. Venue : Central Marine Fisheries Research
Institute, E.R.G. Road, Ernakulam,
Cochin-682 031
- vii. Co-ordinating officer : Shri K. Narayana Kurup,
Scientist S 2,
Fishery Resources Assessment
Division., C.M.F.R.I., P.B. No. 2704,
Shanmugam Road-P. O.,
E.R.G. Road, Cochin - 682 031.

10. POST-HARVEST TECHNOLOGY IN FISHERIES

The fishery products require quick and efficient post-harvest handling and processing due to their highly perishable nature. This also ensures the freshness and nutritive value of the products. Considerable research has been done in the field of scientific handling and processing of fish and shellfish by the Central Institute of Fisheries Technology, Cochin and efficient and less expensive methods of curing and processing have been developed. Training courses in Post-harvest technology in fisheries are conducted by the Trainers' Training Centre of CMFRI at Narakkal for the benefit of the inservice personnel from the various departments and universities.

- i. Course content :
 - a. Biochemical composition of fish and shellfish meat, their nutritive values and importance in the diet of man.
 - b. Post-harvest handling of fish.
 - c. Quality control in fish/shellfish processing.
 - d. General principles of preservation by freezing, canning and curing.
 - e. Scientific methods of preparation of dried fish.
 - f. Preparation of fish/prawn pickles.
 - g. Preparation of fish soup powder and fish wafers.
 - h. Preparation of shark fin rays.
- ii. Eligibility : Officials sponsored by the State and Central Government Departments, ICAR Institutes, Krishi Vigyan Kendras, Agricultural and other Universities.

- iii. Course strength : 10 (Ten)
- iv. Duration : 10 days
- v. Course dates : April, May, October, December, January and February.
- vi. Venue : Trainers' Training Centre of CMFRI, Narakkal - 682 505, Kerala.
- vii. Co-ordinating officer : Chief Training Organiser, Trainers' Training Centre, Narakkal - 682 505.

GENERAL INFORMATION

The nominations of the officers and applications from others along with their Bio-data in the prescribed proforma (Appendix I) should reach the Director, Central Marine Fisheries Research Institute, Post Box No. 2704, Shanmugham Road P. O., Ernakulam, Cochin - 682 031 atleast two weeks prior to the date of commencement of each training course.

The travelling and other allowances of the officers deputed will have to be borne by the respective departments. There is no hostel facility at headquarters and outstations. Therefore, the candidates will have to make their own arrangements for their stay during the training period. However, Co-ordinating officer will help them to reserve suitable accommodation on their behalf, if information is received sufficiently in advance. Trainers have to meet all expenses towards their travel, stay, etc. themselves. The training will be free.

The candidates are expected to reach the venue of training one day in advance.

The training courses on mariculture are conducted under the training programme of the Trainers' Training Centre of CMFRI, Narakkal. The others are conducted by the respective Divisions of the Institute, at a suitable place and time.

APPENDIX I

**BIO-DATA FOR OFFICER DEPUTED FOR TRAINING
(To be sent in duplicate along with department's nomination)**

1. Title of the Training Course :
2. Name in full (Block letters) :
3. Date of birth :
4. Educational qualifications :
5. Professional qualifications :
6. Post held at present :
7. Past experience in the
subject concerned in brief :
8. Postal address for corres-
pondence (Also telegraphic
address, if any) :

Signature of officer deputed

APPENDIX II

**DETAILS OF TRAINING COURSES GIVEN UNDER
THE KRISHI VIGYAN KENDRA, CMFRI, NARAKKAL
AS ON 1ST JUNE 1986**

Name of the Course	Number of persons trained			
	Men	Women	SC/ST	Total
I. FISHERIES				
a. Prawn Culture	1459	1382	1207	2841
b. Prawn/Fish Farm management	21	—	11	21
c. Eradication of predators from the Prawn/Fish Culture field	39	—	18	39
d. Finance and Financing Agencies in Prawn/Fish Culture	61	—	34	61
e. Bund making and sluice gate fixing	30	—	11	30
f. Seed collection	—	57	28	57
g. Prawn cum Paddy Culture	—	22	7	22
h. Harvesting, handling and marketing of cultured prawn/fish	32	—	19	32
i. Post-harvest Technology	—	79	35	79
	1642	1540	1370	3182

Name of the Course	Number of persons trained			
	Men	Women	SC/ST	Total
II. AGRICULTURE				
a. Vegetable Cultivation	—	231	115	231
b. Coconut Cultivation	14	—	11	14
	14	231	126	245
III. ANIMAL HUSBANDRY				
a. Poultry Farming	113	159	140	272
b. Duck Farming	—	35	16	35
c. Livestock development	59	35	49	94
	172	229	205	401
IV. HOME SCIENCE				
a. Nutrition	—	23	13	23
b. Health & Child Care	—	58	22	58
c. Food preservation	—	173	104	173
	—	254	139	254
V. FINANCING AGENCIES FOR GENERAL PURPOSES				
(IRDP SCHEME)	43	—	22	43
VI. SOCIAL FORESTRY				
	49	132	96	181
GRAND TOTAL	1920	2386	1958	4306

APPENDIX III

DETAILS OF TRAINING COURSES CONDUCTED UNDER TRAINERS' TRAINING CENTRE, CMFRI, NARAKKAL AS ON 1ST JUNE, 1986

Name of the Course	Number of persons trained
1. Prawn farming ...	12
2. Hatchery production of marine prawn seed	21
3. Seaweed Culture ...	7
4. Edible oyster Culture ...	13
5. Hatchery production of edible oyster seed	11
TOTAL	64

APPENDIX IV

DETAILS OF TRAINING COURSES CONDUCTED BY CMFRI ON OTHER SPECIAL SUBJECTS AS ON 1ST JUNE, 1986

Name of the Course	Number of persons trained
1. SCUBA Diving ...	5
2. Pearl Culture ...	28
3. Refresher Course on Pearl Culture	1
4. Sampling methodology of CMFRI in marine fisheries resources assessment	35
5. Fishery resources assessment	32
TOTAL	101