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Part Three

FEBRUARY 1991



NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP

16-18 September 1987

Papers Presented
Sessions V, VI & VII

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
P. B. No. 2704, E. R. G. Road, Cochin-682 031, India

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MANPOWER DEVELOPMENT FOR MARINE FISHERIES

Paper - 65

MAN-POWER NEEDS FOR MARINE FISHERIES

BY 2000 AD

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ABSTRACT

Formal training of operatives for marine fishing industry started in late forties when the erstwhile Deep Sea Fishing Station commenced training activities. However, organised training for fisheries personnel commenced with the establishment of CIFNET (erstwhile CIFO) and CIFE in the early sixties. The former catered to the manpower needs for operating the fishing vessels while the latter produced the managerial/administrative personnel for shore support. Today a number of fishery colleges and Agricultural colleges supplement the training activities of these two training establishments in fisheries-related disciplines.

Accent on innovations of harvest and post harvest technologies of marine capture fisheries has necessitated upgradation and modernisation of training processes of CIFNET. This has been done following a series of studies and evaluations commensurate with the type and kind of technologies, breed and nature of craft and gear introduced etc. In addition to meeting the domestic needs, the trained manpower is the national wealth which is spared for development of industry in friendly developing countries to our advantage due to the inflow of foreign exchange. Reckoning the present pace of growth of our marine fishing industry a projection of the manpower needs for 2000 AD is attempted in the present paper. The nature and specialities of the human resources that would be needed that time have been attempted to be identified and the innovation to be made in the production process are outlined.

MAN-POWER PLANNING

Man-power planning is the scheduling of programmes to develop human resources in line with national goals of economic development, in a dynamic situation, imbalances of the manpower demand and supply relationship are to be accepted. However, the need is to create conditions which will reduce likelihood of severe ensuring imbalances. While formulating new educational system to achieve goals of manpower planning, the system has to face the challenge.

1. To re-arrange educational priorities to meet requirements of the occupational structure.
2. To modernise the courses and skilled forms

in tune with the shift in the nature of skills needed.

New technology not only generates new challenging occupations in new and old industries on the technical content to some of the existing occupations but tend to undergo qualitative change.

NEED FOR MAN-POWER DEVELOPMENT FOR MARINE FISHERIES

The Govt. of India has been committed to development of fisheries, both marine and inland sectors. The objectives of fisheries development are:

- 1) To increase production of protein-rich foods

- 2) To exploit valuable natural resources available in the seas around the country
- 3) To increase foreign exchange earning
- 4) To generate new employment potential
- 5) To help the social and economic advancement of the fishing communities.

Increased production in the marine fisheries sector is now possible only by extending area of exploitation into the offshore and deep sea regions. For achieving this there is need for the use of advanced technology. Such technological developments, particularly in the exploitation of deep sea resources, called for a suitable trained man-power with fairly good knowledge of complex technologies, varieties of skills and familiarity of instruments.

TRENDS IN MAN-POWER DEVELOPMENT

Fisheries training leading to certification is a relatively new concept and has its origin in the need to reduce the high extent and mortality rates of fishing boat cruise, improve their economic efficiency and improved working conditions of the individual fishermen.

Fisheries training has by tradition been the 'father to son' activity or atleast through participation in local operations where informations of skill have been imparted through participation in the activities, when trips were short and fishing subsistence oriented technology was the main focus. In the temperate regions (Developed countries) boat building techniques have lead to the marine fleets being comprised of larger among vessels and the fishing fleets have tended to follow these trends, although there has been other constraints of development. Nevertheless increase in the size of fishing crafts lead to the expansion of trips in both distance and time which in turn created certain needs for trained personnel in the use of sail, navigation, fishing and fish preservation. Increased demand for fish from industrial areas coupled with identification of new and extensive offshore region/new methodology knowledge, how to make the use of ice for fish preservation, sail and steam followed by mechanical propulsion and ever-increased markets results in larger wide ranging and more sophisticated fishing fleets. Eventually, fishing cruises were a global nature and long operation required the wide variety of skills and expertise.

Before International boards were active, perhaps the most embarrassing legislation was the

British Merchant Shipping Act of 1893 and subsequent up- dating amendments. Operating throughout colonial emperor the legislation became the state in Indian in 1931. The state laid down conditions for obtaining certificates of competency of sea-going vessels and also for fishing vessels operating in certain waters. Thus the certificate of competency while ensuring that the help was well and truly trained to handle his vessel did not provide for any test or technological capability of skills were expected to be acquired in the course of the 2,3 or 4 year period prior to being examined.

EVOLUTION OF MAN-POWER DEVELOPMENT IN INDIA

The first step of technological advancement in the field of marine fisheries attempted in India was the mechanisation of suitable indigenous crafts and introduction of newly designed mechanised boats deploying the existing fishing methods of set and drift gill nets more efficiently and undertaking the new industrial fishing methods of 'Bottom trawling' using gears made of synthetic fibre in the West Indian coast. It was the introduction of a new fishing technology and fishing gear technology in the field of artisanal fisheries. Success of such a programme dependent on availability of trained man-power. With FAO Assistance the Govt. of India established a chain of fishermen training centres all over India in the 1950s. These training centres have the limited objective of training the artisanal fishermen in the operation of small mechanised fishing boats and their maintenance. There are at present 31 such fishemen training centres in the country with total intake capacity of around 900 candidates. About 800 candidates have so far trained in these sectors. The minimum entry requirement of these centres is the basic education upto 5th standard with atleast 5 years fishing experience.

MANNING OF OCEAN-GOING FISHING VESSELS

The statutory requirements for manning ocean going fishing crafts and the higher levels of engineering knowledge demanded by the complexity of engines and mechanisms made the creation of technical man-power an essential pre-requisites for further development of Marine fisheries as an Industry. The introduction of

ocean going fishing vessels attracted the provisions of the Indian Merchant Shipping Act 1958 (Merchant Shipping Act was revised to meet the demands of the technical man-power after independence for purposes of manning and safety at sea). The rules under Merchant Shipping Act 1958 require that all fishing vessels of 15 tons net and above have to be registered with the Mercantile Marine Department of Directorate General of Shipping, Ministry of Transport.

The Skippers and Engineers of deep sea fishing vessels and highly trained qualified personnel requires several years of training and experience before they could qualify themselves for the respective certificates of competency. Facilities of training of the above personnel did not exist in the country till 1948. Personnel had to be sent to UK to receive training considering the importance and specialised nature of training Govt. of India initiated an adhoc training programme in 1948 under the then Deep Sea Fishing Organisation, Bombay. But the training programme consisted of a broad practical training on board the vessels of the deep sea fishing organisation. No theoretical knowledge was imparted. To overcome these deficiencies, a Committee of Fisheries and Education was constituted by the Govt. of India in 1959 under the

Chairmanship of Dr. N.K. Panikkar then the Fisheries Development Adviser to Govt. of India. On the recommendations of the Committee the Central Institute of Fisheries Nautical & Engineering Training (erstwhile Central Institute of Fisheries Operatives) was established in Cochin in 1963. The objectives of CIFNET are:

- Create technical manpower for the operation of deep sea fishing vessels.
- Create technical manpower to run the shore establishments that support the operation of deep-sea fishing vessels.
- Create teachers for fishermen training centres run by the maritime states and union territories.
- Conduct various refresher training programmes for the vessel operatives and shore technicians/managers.
- Provide technical consultancy service in all matters concerned with marine fishing with special reference to technical manpower requirements.
- Help developing nations in the South-east Asian, Gulf and African regions to create technical manpower for the operation of their fishing fleets and running of their supporting shore establishments. The details of the 7 regular courses undertaken by CIFNET are given below:

Name of the Course	Duration (months)	Capacity			Total
		Cochin	Madras	Visakhapatnam	
Fishing Secondhands Course	15	40	40	20	100
Engine Drivers Course	15	40	40	20	100
Boat Building Foremen Course	15	20	Nil	Nil	20
Shore Mechanics Course	12	20	20	Nil	40
Advanced Diploma in Fishing Gear Technology	12	10	-	-	10
Radio Telephone Operators Course	9	15	15	Nil	30
Teachers Training Course	6	10	Nil	Nil	10

EDUCATION AND TRAINING FOR DEVELOPING MANAGERIAL AND ADMINISTRATIVE PERSONNEL

A demand for managerial and administrative personnel are meant for the Graduate and post-graduate level education recently introduced by some Indian Universities besides the two-year post-graduate diploma course, D.F.Sc. at the Central Institute of Fisheries Education, Bom-

bay under ICAR. The Central Institute of Fisheries Education (CIFE) Bombay was established in 1961 in pursuance of the recommendations of the Committee under Dr. N.K.Panikkar. CIFE was assigned responsibility of providing post-graduate level education in fisheries to create administrative and managerial personnel to plan and execute development programme. The 4 year graduate course in Fisheries, B.F.Sc. and 2 year post graduate level course in Fisheries

Science, M.F.Sc. conducted by the College of Fisheries in Mangalore, under the University of Agricultural Sciences, Bangalore produces Graduates and post graduates required for the above purpose. Similar courses leading to B.F.Sc. and M.F.Sc. are conducted by the Kerala Agricultural University in Cochin, Tuticorin Fisheries College under the Tamil Nadu Agricultural University, Maharashtra Vidyapeet etc.

EDUCATION AND TRAINING FOR SCIENTISTS AND TECHNOLOGISTS

Fishery/Marine Biology is the special subject for Post-graduate level is offered by Universities of Kerala, Cochin, Madras, Karnataka, Annamalai, Madurai and many other Universities. Facilities are also available for carrying out research on fish and fisheries leading to doctoral and post-doctoral degrees in Central Marine Fisheries Research Institute, Central Institute of Fisheries Technology, Central Institute of Fisheries Education, besides the Universities mentioned above.

PRESENT STATUS

Education and training in Fisheries in our country has now evolved into four tier pattern. These are:

1. Personnel for the introduction and implementation of new technologies in the field of artisanal fisheries (base level).
2. Statutorily required personnel for manning ocean going fishing vessels and technical personnel handling, processing, marketing, maintenance of vessels and machinery and fabrication of fishing gears (under Graduate and Graduate level).
3. Managerial and administrative personnel to plan and execute Fisheries Development programmes (Graduate and Post-graduate level).
4. Scientific and technical personnel for exploration of the resources and Scientific and Technological advancement in Fisheries (Post graduate level).

About 10,000 candidates has so far been trained in the fishermen training centres, besides exposing the artisanal fishermen to the various development in fishing technology. This has helped in the increase of the mechanised fleet

of about 25,000 during last 3 decades. The candidates who had undergone training in CIFNET is given in Table 1.

It can be seen that 2760 candidates have undergone training in the various courses conducted by CIFNET. The trained man-power has helped the commercial fishing fleet of our country consisting of about 100 vessels to operate efficiently besides about 60 to 70 Skippers and Engineers are working in the Overseas countries like Nigeria, Gulf countries etc.

MANPOWER NEEDS BY 2000 AD

As far as responsibility of CIFNET goes, it has to create the required manpower for manning ocean going fishing vessels that would be flying the Indian flag by 2000 AD. The projection has been worked out on the basis of available information gathered from the Ministry of Agriculture, from the trend of the construction of new fishing vessels within the country and outside the country etc. There are many unknown factors which worked as a constraint in making realistic projection. The unknown factor being the availability of funds for huge capital investment in the form of fishing vessels, development of necessary engines and external markets for the new species of fish to be caught, the correctness of the resources position and the policies of Govt. of India. A very reasonable projection of the increase in the Indian fishing fleet of vessels of more than 25 GRT showed the picture of 800 vessels by the year 2000 AD. The details of the accommodation of the projection has given in Annexure-I. Annexure-II gives a projection of the flow of certified hands to man the fishing vessels during the period 1987 - 2000 AD. It is found that the supply of the certified hands would be adequate to meet the demand by 2000 AD. However, it would be necessary to take an indepth review of the supply position of the trained manpower periodically in order to ensure that there is always inadequate supply to meet the demand. The fact that the creation of manpower is long drawn process and advanced planning is very essential. Annexure-III gives a picture of flow sheet showing the demand and supply of certified officers year by year from 1987 to 1990 and then for every 5 years.

In addition to the above certified personnel it is anticipated that about 3000 vessels of less than 25 GRT also will be added to the small scale fisheries sector. These vessels will have the

Table 1 Number of Candidates trained by CIFNET in different Courses

Name of the Course	Duration (months)	Cochin	Capacity Madras	Visakha patnam	Total	Total No. of candidates trained
Fishing Secondhands Course/ Mate Fishing Vessels Course	15) 18)	40	40	20	100	1028
Engine Drivers Course/Engine Driver Fishing Vessel Course	15) 18)	40	40	20	100	1008
Boat Building Foremen Course	15	20	-	-	20	98
Shore Mechanics Course	12	-	20	-	20	170
Gear Technicians Course/ Advanced Diploma in Fishing Gear Technology	12	10	-	-	10	133
Teachers Training Course	6	10	-	-	10	32
Engineer (FV) Course for DME's	12	-	-	10	10	18
Special In-service training Programmes to National/Departmental candidates						205
		Based on Specific requirements				
Special Training programmes to Overseas candidates sponsored by FAO/Commonwealth Secretariat/Foreign Govts/GOI			-do-			68
Total						2760

PROJECTED FISHING FLEET STRENGTH BY 2000 AD
(Vessels above 25 GRT)

Category of vessels	Target						Achievement / Expected Achievement					
	1987	1988	1989	1990	1995	Total in 2000	1987	1988	1989	1990	1995	Total in 2000
Imported	100	130	160	160	200	230	100	130	160	160	200	230
Indigenous	35+15	60+15*	80+15*	90+15*	140+15*	180+15*	15+25*	25+40*	30+50*	35+65*	55+105*	75+145*
Chartered	120	180	180	180	200	215	120	180	180	180	200	215
Obligatory Purchase against Charter	20	40	60	70	110	140	15	40	50	60	100	140
TOTAL	290	425	495	515	665	780	275	415	470	500	660	805

* vessels owned and operated by certified personal.

FLOW CHART OF CERTIFIED HANDS FOR FISHING VESSELS DURING 1987 - 2000 AD

Category	1987	Availability of Certified personal in					Demand	Total Supply
		1988	1989	1990	1995	2000		
Skippers	323	50	50	50	250	250	1000	973
Mates / Fishing Secondhands	426	50	50	50	250	250	1100	1076
Engineer(FV)	158	35	35	35	200	200	800	663
Engine Driver(FV)	395	50	50	50	250	250	1100	1045

FLOW SHEET SHOWING DEMAND AND SUPPLY OF CERTIFIED OFFICERS

Certified hands	1987			1988			1989			1990			1995			2000		
	Demand	Supply	Excess/ Less	Demand	Supply	Excess/ Less	Demand	Supply	Excess/ Less	Demand	Supply	Excess/ Less	Demand	Supply	Excess/ Less	Demand	Supply	Excess/ Less
Skipper	275@	323	Adequate-	415	373	Less	480	423	Less	490	473	Less	690	723	Adequate	890	973	Adequate
Mates/ Secondhand Fishing	275	426*	-do-	415	476	Adequate	480	526	Adequate	490	576	Adequate	690	826	-do-	890	1076	-do-
Engineer (FV)	275	158	Less	415	193	Less	480	228	Less	490	263	Less	690	463	Less	890	663	Less
Engine Driver (FV)	275	395	Adequate	415	445	Adequate	480	495	Adequate	490	545	Adequate	690	795	Adequate	890	1045	Adequate

@ Second Hand Fishing Vessels Certificate holders only are posted in chartered vessels.

* About 80 are in foreign countries.

necessary endurance and capability of imparting training, further the responsibility of manning these fishing vessels will be with the State Govts.

STRATEGIES OF MEETING NEEDS

The strategies already chalked out by CIFNET to meet the qualitative and quantitative needs of trained man-power for the marine fishing industry by 2000 AD is discussed below:

In 1977, the conference convened by the Inter Governmental Maritime Organisation (IMO) at Torremolinos (Spain) on the convention of safety of fishing vessels, 1977 was adopted. Govt. of India was one of the members of the Conference.

Convention applies to every new fishing vessels of 24 m. in length and over which are used commercially for catching fish, whales and other living resources of the sea. The resolution No.8 of the Conference requested Inter Governmental Maritime Organisation (IMO) to consider the problems of training and certification of crew of fishing vessels in co-operation of the International Labour Organisation and Food and Agricultural Organisation of the UN. On the basis of these recommendations the Director General of Shipping has already framed rules to 3 grades of certificates by substantially upgrading the syllabus. The new certificates proposed to come into force are:

- 1) Mate Fishing Vessels
- 2) Skippers of fishing vessels Gr.II
- 3) Skippers of fishing vessels Gr.I

The candidates will have to undergo the following compulsory courses before they qualify for any certificate of competency.

- 1) Mate of fishing vessel
 - i. First Aid
 - ii. Radar Observation
 - iii. Life boat course
 - iv. Elementary fishing technology
- 2) Skipper Gr.II
 - i. Fire fighting
 - ii. Radio telephony
 - iii. Advanced fishing technology
- 3) Skipper Gr.I
 - i. Radar simulator

The second major highlight is that, fishing technology which had not been accepted as a subject hitherto for the existing competency certificate examinations has given its due importance. Any one who has to pass a competency certificate examination for the deck side of fishing

vessels will have to pass the appropriate examination in fishing technology - either elementary or advanced fishing technology.

The new syllabus, compared to the old one, has been substantially enhanced in its contents and enrichment. In order to help officers who have not been groomed in the new subject-matter CIFNET would conduct refresher course for the benefit of the existing officers so that they can be brought upto the level required by the new examination rules.

In line with the proposed rules the batches of Fishing Second Hands Course from 1983 have been taught the new updated syllabus of the Mate Fishing Vessel Competency certificate examination by CIFNET.

SHORT TERM CERTIFICATE COURSES

Arrangements are being made by CIFNET to conduct the following short term courses in order to complete the transition from the existing certificate courses to the new certificate courses envisaged.

- 1) Elementary and advanced fishing technology certificate course granted under Rule 7.
- 2) Approved Radar observers Certificate course.
- 3) Approved life boatman certificate course.
- 4) Approved rader simulator course.

ENHANCEMENT OF SYLLABUS FOR ENGINEERING CERTIFICATE

The Consultative Committee of CIFNET constituted a sub committee to study the problems and formulate the revised syllabus and system of certification. The committee had prepared the enhanced syllabus and the same was forwarded to the Director General of Shipping, Bombay for necessary action. The expanded syllabus in refrigeration and hydraulics have been introduced from the Batch 1986.

NEW TRAINING COURSES

With the advancement of technology in fishing vessels, fishing gears, fish handling and navigational equipments, highly skilled technical manpower will be required to command the new vessels in the coming years. The following courses are proposed to meet the demand of highly skilled manpower.

- i. Two Diploma level courses of 3 years duration, one for Fisheries Nautical Science and the second in Fishing Engg. by CIFNET.
- ii. Advanced Diploma Course in Fishing Gear Technology of 12 months duration has been already started. It is meant for the technical officers working in the fisheries organisations both inside and outside the country.
- iii. Advanced Diploma Course in Fleet Management for officers in-charge of operation of fishing vessels both inside and outside the country.

SHORT TERM PROGRAMMES FOR INSERVICE PERSONNEL

It is necessary that inservice personnel should be exposed to short term training programme to make them keep abreast of the advancement of technology and to improve their knowledge and to acquire higher qualifications. It is proposed to have inservice programme to proper activities for Engineer fishing vessel cer-

tificate examination, skipper fishing vessel certificate examination, mate fishing vessel, second hand fishing vessel/engine driver fishing vessel certificate examination. Some of the courses mentioned above have been already started.

CONCLUSION

From the discussion of the information about the demand of trained manpower by 2000 AD and the position of the supply, it is clear that the National Institutes will be able to raise to the occasion to produce the required technical manpower in terms of quantity and quality. However, it is very essential that additional facilities of training aids, space, etc. will have to be considerably improved in order to make the standard of training to compare with the international Institutes. Training aids such as simulators for training in the use of electronic equipments for fish finding and navigation, class room facilities, residential facilities etc. will have to be improved adequately.