

**MANPOWER STUDY SERIES-66**



**GOVERNMENT OF KERALA**

**STUDY ON  
DEMAND  
AND  
SUPPLY OF  
TRAINED TECHNICAL AND SCIENTIFIC  
PERSONNEL FOR THE  
DEVELOPMENT OF  
INLAND  
FISHERY SECTOR**

**DEPARTMENT OF ECONOMICS & STATISTICS  
TRIVANDRUM**

**1989**



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STUDY ON DEMAND AND SUPPLY OF  
TRAINED TECHNICAL AND SCIENTIFIC PERSONNEL FOR  
THE DEVELOPMENT OF INLAND FISHERY SECTOR

MANPOWER DIVISION  
DEPARTMENT OF ECONOMICS & STATISTICS  
TRIVANDRUM  
MARCH, 1989.



## P R E F A C E

With the introduction of modern methodology in fishing and allied industries the fisheries sector has become a crucial area of economic development of Kerala. Inland fishing sector which consists of brackish water and fresh water fisheries is an area where fundamental and rapid changes are being taking place. Various development programmes have been chalked out in the field of fresh water fish culture for increasing production as well as employment opportunities. This study which has been formulated and prepared by Smt. L.R.Lilly Bai the Manpower Officer in the Department of Fisheries will help to throw some light in the latest technological improvements and employment potential in this field. It is also hoped that this report will be useful to those who are interested in formulating inland fishery programmes.

Trivandrum,  
28-2-1989.

DIRECTOR

MNR. 9/3.



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Study on Demand and Supply of Trained Technical and Scientific Personnel for the Development of Inland Fishery Sector.

Introduction

Fish and fisheries play an important role in the well being of the Kerala's Economy. The employment potential of the fishery and allied industries is very significant in the context of the grave situation of unemployment and under employment in the State. Though there was progress in the development of fishing industry during past plan periods vast potential for the development of inland fisheries remained untapped. Considering the fact that Kerala has abundant inland fishery resources several programmes for the development on inland sector have been included in the VII th plan.

The inland fisheries consists of brackish water fisheries and the fresh water fisheries. While the former occurs in the estuarine regions, the extensive back water areas running half way of the state from the south to north and the connected canals, the latter flourishes in the rivers, reserviors, ponds and fresh water lakes.

Kerala has extensive inland water resources comprising numerous estauries, brackish water lakes, rivers, reserviors tanks and ponds. There are fortyone (west flowing) rivers in Kerala with hundreds of revulets and canals. The most important of them are Baliapattom, Anjarakandy Chulliar, Bharathapuzha, Chalakudy, Periyar, Meenachil, Pamba, Manimala, Kallada and Neyyar. Further the State has number of irrigation reserviors, a large number of private and public tanks and hundreds of ponds both private and public, suitable for fish culture.

Fresh water fish culture programmes were introduced in Kerala with a view to increase the production of fish in the state and providing employment opportunities to the rural population. Now there is an awareness among the people even in remote villages, with regard to the benefits of fish farming.

A sizable portion of the brackish water areas and fresh waters are amenable to scientific pisciculture with potential yield many times higher than the present yield from capture fisheries. If properly organised, aquaculture could pave the way for the rapid development of the rural economy in many parts of the state. In fact the future development of Kerala fisheries largely depends on the extent to which the inland fisheries could be developed on scientific lines. The estimated extent of different type of inland waters in the state are as follows.

Table 1

Inland water resources of Kerala

<u>Type of inland water</u>	<u>Estimated area (Heactares)</u>
Rivers	85000
Tanks and ponds	3300
Reservoirs	27774
Brackish water, lakes, back waters and estanries	242600
Total	<u>358674</u> =====

(Source-Fisheries fact book and administration report for 1987-88)

2. Development of brackish water fishery sector

The immediate prospects in the inland fishery sector are to implement schemes for the development of brackish water areas which now contribute bulk of the inland catches. There are also prospects for mariculture subject to technological improvements and considerable changes in the attitudes and food habits of the local people. The practice of trapping and holding fish and prawn seeds is a traditional practice in the pokkali and kari paddy fields of Kerala mostly reclaimed from the back waters. After the monsoon period, the water in the back waters and paddy fields turn brackish and no more paddy cultivation is possible until rain starts again and the brackish water is flushed out. By providing sluice gates the flow of brackish water in the paddy field is

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restricted and the naturally stocked fish and prawn seeds in the fields during tides are allowed to grow for a period of two to three months. The harvesting of these fish and prawn is done by draining the water during low tides. With the boom in shrimp exporting trade, farmers started stocking young ones of fast growing shrimp in pokkali fields at increasing rate.

### 3. Brackish water area

According to available estimates, the state possess a total brackish water area of about 2.43 lakh hectares. The extent of brackish water areas available and which could be reclaimed and used for brackish water prawn and fish culture is as follows.

Table 2

<u>Name of area</u>	<u>Area(in hectares)</u>
Kuttanad	49000
Shertallai	4900
Cochin-Kanayanoor	5700
Parur	10000
Trichur	10000
Vaikom	10000
North Kerala	32000
	<hr/>
	121600
	=====

There is only limited idea regarding the total brackish water area under private ownership. However it may not be wrong to assume that the areas under private ownership are mostly the areas suitable for prawn farming as is evidenced by the flourishing prawn filtration in the state. This being the fact, the state should perceive two district policy packages, one for the development of prawn farming in the private fields and other in the state owned brackish water areas.

A survey for identifying brackish water area suitable for prawn farming is now in progress. The staff created for the survey work during VIth plan period is still continuing and will continue till the survey work is over, Ernakulam District especially Kanayannoor taluk has extensive areas of paddy fields lying fallow. It is also known that through appropriate measures by the state, the effective area of filtration, and for that matter of scientific culture, around Ernakulam area can be increased considerably. Besides, there are other water areas unsuitable for paddy cultivation. By giving proper guidance and assistance these areas can be developed as ideal farms for intensive prawn culture which will generate considerable amount of income and employment, considering all these facts a new Brackish Water Farmers Development Agency was established with head quarters at Ernakulam. For the smooth functioning of the agency, the following categories of technical and professional posts are also sanctioned.

Table 3

<u>Category of technical post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Chief Executive Officer	1	Rs. 1600-2710
Extension Officer	1	Rs. 950-1640
Driver cum operator	1	Rs. 600-950

In addition to the above professional and technical category of posts, there is vast scope for part-time employment for large number of fishermen as well as coastal and rural population for seasonal work such as seed collection, fishing gear fabrication and manufacture of auxilliary equipments. In fact the functioning of this project will help not only to create employment opportunities but also to provide sustenance to many families. It is also estimated that during the 1st stage work of the Agency it can provide job opportunity to about 5000 persons. Out of the 121600 hectare of brackish water area, which could be reclaimed and used for brackish water fish and prawn culture, at present about 6070 hectare of low lying paddy fields adjoining the back waters of Alleppey and Ernakulam are utilised for paddy-cum-fish culture. There is another proposal for

promoting scientific practices of culture in these areas. The target fixed is for covering 30 hectare per annum.

Further, it is expected that 15000 hectare of brackish water area could be brought under prawn and fish culture during this plan period and by this way 9000 fishermen can also be employed for the watch and maintenance of these 15000 hectare of brackish waters.

#### 4. Reservoir fishermen

Out of the 27774 hectare of area under reservoirs in the state the area presently stocked with fish comes to about 8901 hectare and harvested area comes to 5264 hectare ie. 32% and 19% respectively of the total area. The productivity of the harvested area is not at all satisfactory due to the low stocking of the area and undercatching of the fish caused by natural hazards like submerged stumps of trees in reservoir beds, poaching etc. At the existing level of production, reservoir fisheries in Kerala is not remunerative. Improved stocking, better harvesting and more efficient management would help to raise the productivity. At present fish culture has been attended to in the following reservoirs in the state.

- |               |                  |
|---------------|------------------|
| 1. Vazhani    | 7. Chulliar      |
| 2. Peechi     | 8. Manpalam      |
| 3. Malampuzha | 9. Kanjiranpuzha |
| 4. Meenkara   | 10. Peppara      |
| 5. Walayar    | 11. Kallada      |
| 6. Pothundi   |                  |

The area wise details of these 11 reservoirs is given in Appendix I. The area given is water spread area at maximum flood level. The present production rate of reservoir fishermen is very low, the average yield in 1987-88 has 6.7 kg/ha./year (source- Administration Report of the Department of Fisheries for 1987-88).

The improvement in traditional gear incorporating new concepts and materials coupled with introduction of modern technique would augment the yield from fresh water impoundments considerably. The reservoirs are not fully exploited due to inaccessibility of the traditional gear to certain areas. Introduction of low power boats with shallow draught was necessary for fishing as well as quick transportation of fishes in extensive reservoirs. The problems in reservoir fisheries development are,

1. lack of back ground information
2. lack of control on the part of the department of fisheries over most of the reservoirs owned by different departments
3. Shortage of quality fish seed and
4. Absence of inter agencies co-ordination

One of the basic pre-requisites for reservoir development is an assured and constant supply of quality fish seed. It is expected that by the end of this plan period about 50% of the total reservoir area could be stocked adequately with fish and production rate of 6.7 kg./ha/year could be enhanced to 10 kg./ha/yr and thus the total inland fish production would be increased to 150 tonnes during 1990.

#### 5. Pisciculture in ponds and tanks

##### Fish farmers development agencies

Although state has about 3300 ha. of ponds and tanks, and small water bodies suitable for fish culture, the area brought under pisciculture constitute hardly about 50% of the total area. The programme of the Fish Farmers Development agency in Quilon, Trichur and Palghat and before that the composite fish culture, have been under implementation over the last few years with a view to motivating the farmers to utilise their water bodies for fish culture. The Fish Farmers Development Agencies aimed at popularising fresh water fish culture among the farmers. Fresh water fish culture in ponds and tanks have been extended through these Fish Farmers Development Agencies by providing their incentives by way of subsidy in kind, training, bank finance, extension support etc. The major activities of the Fish Farmers Development Agencies have been, survey and identification of suitable water areas for fish culture, supply of quality fish seeds popularisation of technology and technical know how among fish culturists and training of fish farmers in the modern scientific techniques of fish culture. During the seventh plan period Govt. of India have accorded permission for extending the area of operation of the existing three Fish Farmers Development Agencies to the neighbouring districts also. Consequently the area of operation of the F.F.D. Agencies, Quilon has been extended to Trivandrum and Pathanamthitta districts. F.F.D.A. Trichur to Ernakulam District and

and F.F.D.A Palghat to Malappuram District bringing more and more area under fresh water fish culture. With a view to cover the water areas in other districts, proposal for establishing three more new Fish Farmers Development Agencies have been sent to Government of India. However sanction has been accorded to start only one FFDA in Cannanore District for the functioning of the new Fish Farmers Development Agency the following posts are essential and sanction is awaited for the creation of the following new additional technical posts.

Table IV

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Chief Executive Officer	1	Rs. 1600-2750
Extension Officer	2	Rs. 1050-2000
Driver	1	Rs. 600-950
Fishermen-cum-watchman	2	Rs. 575-900

As the area of operation of the agency has been extended to near by district, the existing agencies are also in need of additional staff in order to carry out the promotional activities in the extended area. Moreover it is a fact that the staff pattern sanctioned to the agency in Kerala is not equivalent to that of the agencies functioning elsewhere in the country. In the circumstances it has been requested to Government to sanction the following category of posts also.

Table V

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Extension Officer	4	Rs.850-1600
Fishermen cum watchman	4	Rs.575-900
Driver	1	Rs.600-950

Further sanction has now come for starting a new agency at Alleppey creation of the following post has become necessary during the plan period.

Table VI

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Chief Executive Officer	1	Rs. 1600-2750
Extension Officer	2	Rs. 1050-2000
Driver	1	Rs. 600-950
Fishermen -cum-watchmen	2	Rs. 575-900

During the VIth plan period about 2500 fish farmers were registered in the existing three agencies and training on fish culture was imparted to about 10000 persons under this scheme and it is expected that many of these might be engaged in fish culture. Besides, a few persons might have been indirectly engaged in harvesting, processing of fish ect. About 1700 hectare of water area was brought to fish culture by these three agencies till July 1987 since their inception. In the light of the above facts it is expected that about 3000 hectare of ponds and tanks may be brought under fish culture by the end of the VIIth plan period and at least 5000 persons can directly be engaged in fish culture under this scheme during the plan period. It is also assumed that the present rate of production of 472 kg./ha/year could be increased to 1000 kg./ha/yr and thus the total production may reach 3000 tonnes by the end of the plan period. The inland fish production in Kerala for the last 5 years is given below.

Table VIInland fish production in Kerala for the last 5 years

	(Qty. in tonnes)				
	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>	<u>1985-86</u>	<u>1986-87</u>
Fish catch from open water	26249	27096	27466	28223	27499
Capture cum-culture fishermen reservoirs	35	35	23	42	43
Fish culture in tanks and ponds	101	123	128	304	652
<b>Total</b>	<b>26385</b>	<b>27254</b>	<b>27617</b>	<b>28569</b>	<b>28194</b>



## 6. Prawn hatcheries

Setting up of adequate number of prawn hatcheries is a pre-requisite for promoting large scale aquaculture in the brackish water area. The climatic, hydrographic and productivity conditions of the water bodies in the state are good for large scale fish and prawn culture. Owing to various reasons such as lack of proper technical know how, inadequacy of seed, financial problems etc., scientific prawn farming did not make any headway in the state so far. The major constraint is the limitation of quality seed. Realising the scope of prawn farming, financial institutions are now coming forward for financing fishery projects. The fish farmers are also aware of the fact that prawn farming is profitable. In prawn filtering areas, the farming is done by allowing nature entry of prawn juveniles from the adjacent brackish waters. The main draw book of such practice is that the juveniles of prawns thus entrapped normally consist of a mixture of slow growing species. As now the main hurdle for the large scale development of culture fisheries is scarcity of good quality of fish and prawn seeds, it is proposed to establish prawn hatcheries at suitable centres along the war. The most suitable site selected for setting up a shrimp hatchery at the northern region is Mopla bay in Cannanore District which is one of the important prawn landing centres in Kerala. Now the construction of one hatchery is in progress at Mopla bay. Hatchery operation needs continuous attention during day and night irrespective of Sunday and holidays. The essential technical staff required for the smooth functioning of the hatchery are the following.

Table VII

<u>Category</u>	<u>Number of post</u>	<u>Scale of pay</u>
Superintendent	1	Rs. 1250-2500
Research Officer	1	Rs. 1050-2000
Research Assistant	2	Rs. 950-1640
Driver	1	Rs. 600-950
Fishermen	1	Rs. 550-800

It is expected to complete the project during 1988 itself and hence these posts may also be created during the year. Preliminary steps for establishing more hatcheries are in progress.

#### 7. Fish seed farms

With a view to meet the seed requirements of fish water varieties two chinese model hatcheries have been constructed at Polachira and Malampuzha. These farms are expected to start functioning shortly. With the commissioning of these natural seed farms there will be a substantial increase in the production of fish seed. If sufficient quantities and quality seeds are available for supply to private fish farmers, a lot of fish farmers can be attracted to the field of fish culture in private ponds and tanks and by this way employment generation will be increased many fold. Again for the smooth functioning of the new seed farmers the following technical categories of posts are essential.

Table VIII

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Hatchery Manager	2	Rs.1600-2710
Hatchery Engineer	2	Rs.1050-2000
Field Supervisor	2	Rs.850-1600
Technical/Salesman	6	Rs. 850-1600
Fishermen cum watchman	4	Rs. 550-800
Driver	4	Rs. 600-950

#### 8. Integrated Fisheries project for fishermen development (NCDC aided scheme).

A pilot project for the integrated development of fishermen village has been under implementation by "Malsyafed" in 15 selected villages in Trivandrum, Ernakulam and Cannanore districts with financial assistance from the National Co-operative Development Corporation. The first phase of the project has been under implementation. Supply of fishery implements at subsidised rates to the fishermen, provision of infrastructural facilities like auction hall, cold storage, saltery tank drying platform sanitation etc. in the fishermen villages, setting up of consumer

outlets, distribution of kerosene at fair price, organisation of fish marketing establishment of out board motor repair centres, are the main components approved for implementation in pilot project. The success of the implementation of the 1st phase paved the way for the second phase of the project from the beginning of 1987-88. It is estimated that the project will provide direct benefits to 4617 active fishermen and 330 small scale fish distributors. Altogether 26800 fishermen population in 32 fishermen villages are to be covered by the project. Besides the project is expected to provide indirect employment to many more in the handling, processing and distribution of fish.

#### 9. Strengthening of technical cell for survey and investigation of brackish water.

The responsibility to identify and survey suitable areas is now vested with the department of fisheries. Since major developments are visualised in brackish water sector in the coming years a brackish water farmer's development agency has been sanctioned as a pilot programme. Government of India have also communicated administrative approval for creating a technical cell for survey and identification of suitable area for future development. The object of the project is to provide necessary technical support for developing large scale prawn culture through systematic survey and identification of identified areas and preparation of projects and implementation of specific projects. The programme will be implemented in phases. In the first phase an extensive preliminary survey will be carried out covering the entire brackish water areas by physical verification and short listing of the areas available prima facie for development on the basis of the revenue records. The preliminary investigation can be carried out by the Assistant Director of Fisheries (Survey) who will be the implementing Officer. For assisting the implementing Officer the following supporting technical staff will be created.

Table IX

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Extension Officer(Zoology)	2	Rs. 1050-2000
Assistant Extension Officer (Chemistry)	2	Rs. 950-1640
Field man/Field Assistant	1	Rs. 600-950
Driver	2	Rs. 600-950
Fisherman cum watchman	1	Rs. 575-900

Besides the above regular staff, the services of casual labourers for limited periods subject to requirement will be engaged for collection of Statistical details from different districts.

In the 2nd phase of the survey the programme will be carried out by two Biology units and two Engineering units. All the units will function under the administrative control of an Officer in the rank of Deputy Director of fisheries who will co-ordinate the various activities connected with the survey analysis and Engineering investigation besides formulating viable projects. The following technical posts are likely to be created for the successful implementation of the 2nd phase of the project.

Table X

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Deputy Director	1	Rs. 1600-2750
Assistant Executive Engineer	1	Rs. 1250-2750
Assistant Engineer	2	Rs. 1050-2000
Surveyer	2	Rs. 700-1140
Draftsman	2	Rs. 700-1140
Driver	1	Rs. 600-950

#### 10. Fishermen Welfare Fund Board

Following an enactment by the state legislature, during 1986 a Fisheries Welfare Fund and Fisheries Welfare Board to operate were set up in the state. The Board started functioning from the beginning of 1987. For the smooth functioning of the Board three regional offices were also started. The posts newly created in order to facilitate the smooth functioning of the Welfare fund board are the following.

Table XI

<u>Name of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Fishermen Welfare Commissioner	1	Consolidated pay Rs. 3500/--
Joint Commissioner	1	Rs. 1950-2950
Secretary	1	Rs. 1600-2750
Finance Officer	1	Rs. 1500-2685
Junior Executive	1	Rs. 1050-2000
Office Manager	1	Rs. 950-1640
Regional Executive	3	Rs. 1250-2500
Junior Executive	6	Rs. 1050-2000
Driver	4	Rs. 600-950

The purpose of this Board is to organise welfare programmes for the benefit of fishermen members of the welfare societies. The programmes launched include group insurance and relief against accidental death or found missing while fishing at sea, pension, hut and craft insurance etc. About 18000 active fishermen could enjoy the benefits of this welfare fund since the organisation of the board.

#### 11. Summary and conclusion

Development of fresh and brackish water fish culture will greatly help to solve the acute unemployment problems faced by the state. It is estimated that the implementation of the schemes provided in this plan will provide job opportunities to technical managerial and skilled personal in addition to the 19 technical and professional posts newly created so far during the plan period. In addition to the full time employment opportunities mentioned above there is vast scope for part time employment for large number of fishermen as well as coastal rural population for seasonal work such as seed collection fishing, gear fabrication and manufacture of ancillary equipments. It is assumed that these ancillary items of work will provide job opportunities to a substantial number by the end of this plan period. This will enhance individual income and in turn improve the socio economic condition of the fishermen families.

APPENDIX-IArea of reservoirs

<u>Name of reservoir</u>	<u>Area in hactare</u>
Vazhai	255
Peechi	1263
Malampuzha	2313
Meenkara	259
Walayar	259
Pothundi	363
Mangalam	393
Chulliar	159
Kanjirapuzha	465
Peppara	582
Kallada	2590
Total	8901

APPENDIX IIDetails of new technical & professional posts created during VIIth plan period.

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Fishermen Welfare Commissioner	1	Rs. 3500/-
Joint Commissioner	1	Rs. 1950-2950
Secretary	1	Rs. 1600-2750
Finance Officer	1	Rs. 1500-2685
Junior Executive	1	Rs. 1050-2000
Office Manager	1	Rs. 950-1640
Regional Executive	3	Rs. 1250-2500
Junior Executive	6	Rs. 1050-2000
Driver	4	Rs. 600-950
Total	19	

APPENDIX III

Details of Employment potential during VIIth Plan period

<u>Category of post</u>	<u>Number of post</u>	<u>Scale of pay</u>
Chief Executive/Deputy Director Secretary	6	Rs. 1600-2750
Extension Officer/Research Officer Hatchery Engineer	11	Rs. 1050-2000
Assistant Executive Engineer/ Superintendent	2	Rs. 1250-2500
Research Assistant/Assistant Extension Officer	5	Rs. 950-1640
Field Supervisor/Fish cultural Officer/Technical Salesman	12	Rs. 850-1600
Surveyor-cum-Draftsman	4	Rs. 700-1140
Driver cum operator/Fieldman	13	Rs. 600-950
Fisherman cum watchmen	14	Rs. 550-800

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