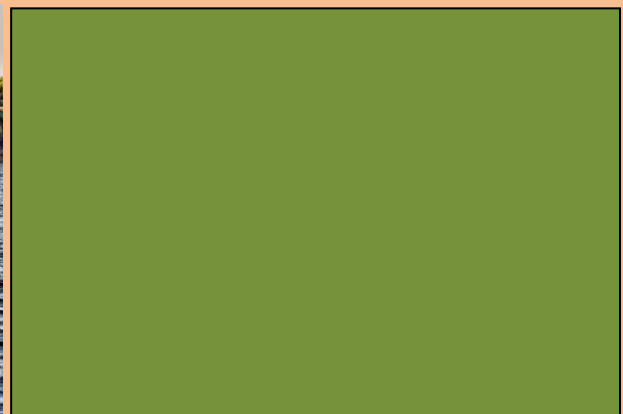


LMIS

Report on

Fisheries Sector

Agriculture Skill Council of India



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Introduction

The Indian fisher community, marine or inland could perhaps be the poorest of the poor and most disadvantaged amongst all rural communities in the country. As required by their profession, their habitations are close to water bodies like rivers, reservoirs, estuaries, backwaters, oceans and are mostly away from the normal bounds of civic amenities. Often cited as the 'last mile', many schemes/programmes of the Government either fail to reach these communities located in remote localities or their implementation remains as a symbolic gesture

Fishery is an essential sector in India. It provides employment to millions of people and contributes to food security of the country. With a coastline of over 8,000 km, an Exclusive Economic Zone (EEZ) of over 2 million sq km, and with extensive freshwater resources, fisheries play a vital role. India is the third largest producer of fish and the second largest producer of fresh water fish in the world (total production is 8.23 million tonnes and 3.25 million tonnes for marine and 4.98 million tonnes for inland fisheries in 2010-11). Currently, fisheries and aquaculture contribute 0.79 per cent to the national GDP and 4.39 per cent to agriculture and allied activities, while the average annual value of output during the 2010-2011 was 57,369 crores. Marine Fisheries contributes to food security and provides direct employment to over 1.5 million fisher people besides others indirectly dependent on the sector.

It is true that in wake of globalization, liberalization & privatization, flow of technologies has increased. Fisheries & allied sectors are also transforming into industry at a faster pace. Therefore, there is demand for knowledgeable and skilled human resource for the development of standard products & services in the sector. Presently skilled workforce to undertake these operations is developed on-the-job by the industries & farms involved in fisheries related enterprises. The skilled workforce/ human resource need to be prepared through Vocational Education & Training system. To sustain fisheries in the new millennium, the quality, technical skills and management of fisheries manpower in the country will have to improve in consonance with the rapidly changing needs of our society. Human resources development (HRD) for raising a cadre of experts at various levels to support research and vindicate a sustained development of the fishery sector is critically important.

According to the CMFRI Census 2010, there are 3,432 marine fishing villages and 1,537 marine fish landing centres in 9 maritime states and 2 union territories. The total marine fisher folk population was about 4 million comprising in 874749 families. Nearly 61% of the fishermen families were under BPL category. The average family size was 4.63 and the overall sex ratio was 928 females per 1000 males. About 38% marine fisher folk were engaged in active fishing with 85% of them having full time engagement. About 63.6% of the fisher folk were engaged in fishing and allied activities. Nearly 57% of the fisher folk engaged in fish seed collection were females and 43% were males.

On Going Scheme in Fishery:

- Development of Inland Fisheries and Aquaculture
- Development of Marine Fisheries, Infrastructure and Post Harvest Operations
- National Scheme of Welfare of Fishermen
- Strengthening of Database and Geographical Information System of the Fisheries Sector
- Assistance to Fisheries Institutes
- National Fisheries Development Board
- Issuance of Biometric Identity cards to Coastal Fishermen.

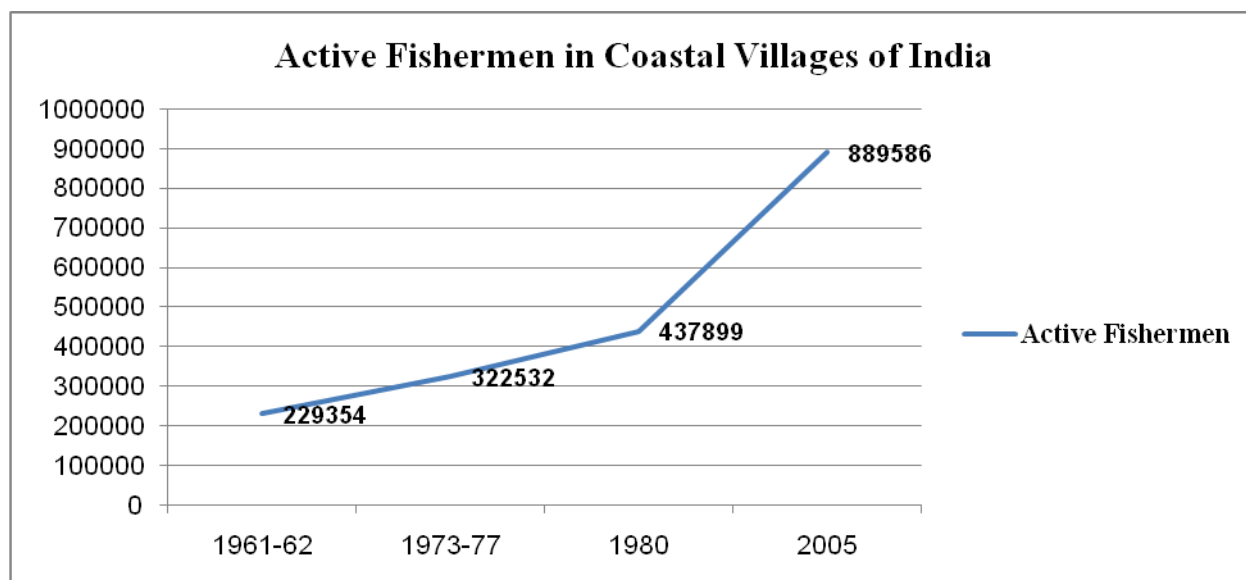
State and activity wise marine fisher population in India:

Active fishers increased more than proportionate to the growth in population in the states of West Bengal, Orissa, Karnataka, and Gujarat. Conversely, there was lesser growth rate of active fishers compared to population growth in Andhra Pradesh and UT of Daman and Diu.

STATE/UT	Active Fisherman	Fishing Allied	Non-fishing workers	Total
West Bengal	70 750	57 741	141 074	269 565
Odisha	121 282	152 534	176 575	450 391
Andhra Pradesh	138 614	152 892	218 485	509 991
Tamil Nadu	206 908	104 509	478 991	790 408
Puducherry	10 341	10 095	22 592	43 028
Kerala	140 222	71 074	390 938	602 234
Karnataka	37 632	45 699	87 583	170 914
Goa	2 515	3 382	4 771	10 668
Maharashtra	72 074	81 780	165 543	319 397
Gujurat	83 322	75 082	164 811	323 215
Daman & Diu	5 868	1 603	21 834	29 305
A & N Islands	4 247	6 580	4 439	15 266
Lakshadweep	8 040	3 561	28 721	40 322
India	901 815	766 532	1 906 357	3 574 704

Source: Planning Commission

Marine fisheries is recognized as a sunrise sector and the prospects of foreign exchange earnings and employability is attracting more and more people into active fishing and allied sectors. The marine fisheries census of CMFRI has estimated coastal population and manpower employed in active fishing and related sectors from time to time. The active fishers in coastal villages in marine fisheries have been increasing over the years at a compound growth rate of 3.13% almost in consonance with population growth of 3%.



Source: *The marine fisheries census of CMFRI*

Growth of active fishermen in coastal fishing villages over years (1961-62 to 2005)

Human resource utilization in marine fisheries covers not only the coastal fisher folk but also the adjacent and sometimes distant residents also. On an average, 5 kg of marine fish produced gives employment to one in harvesting and 1.2 persons in post harvest sector. (Source: CMFRI).

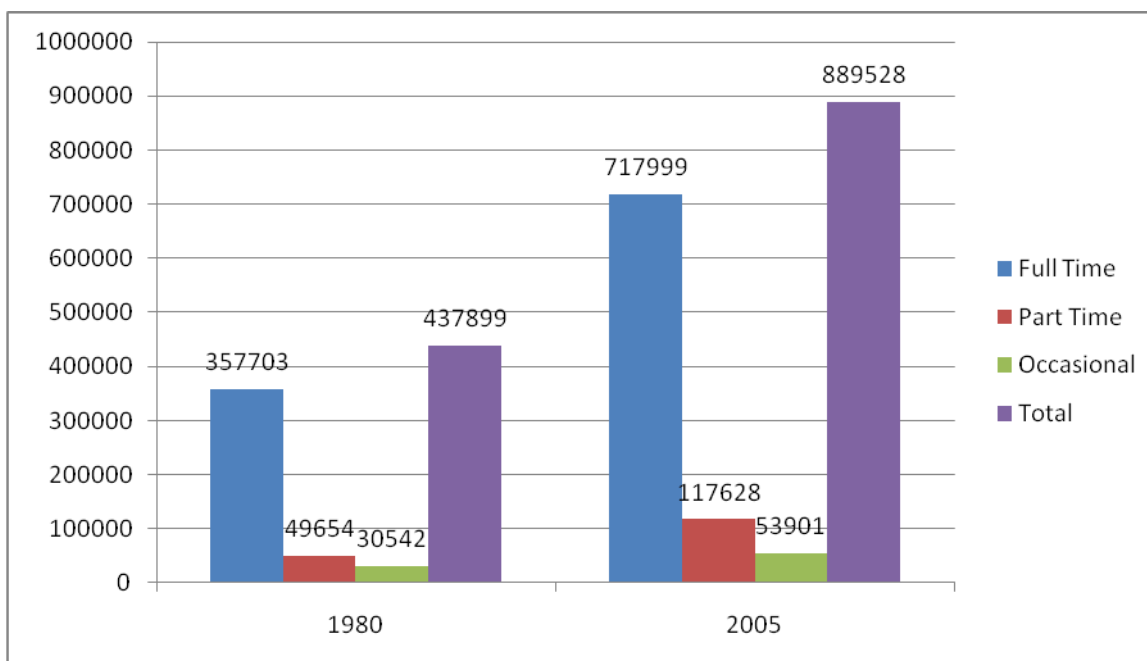
The sectoral distribution of employment pattern of active fishers over the years is presented in below table. There is a clear shift of employment pattern towards mechanized and motorized sectors.

Active fisher in	1980-81	1997-98	2003-04	2004-05
Mechanised sector	114000	200000	412596	430931
Motorised Sector	-	170000	442581	401577
Non-Mechanised sector	348000	650000	365360	415312
Total	462000	1020000	1220577	1247820

Source: *Various Marine Fisheries Census of CMFRI*

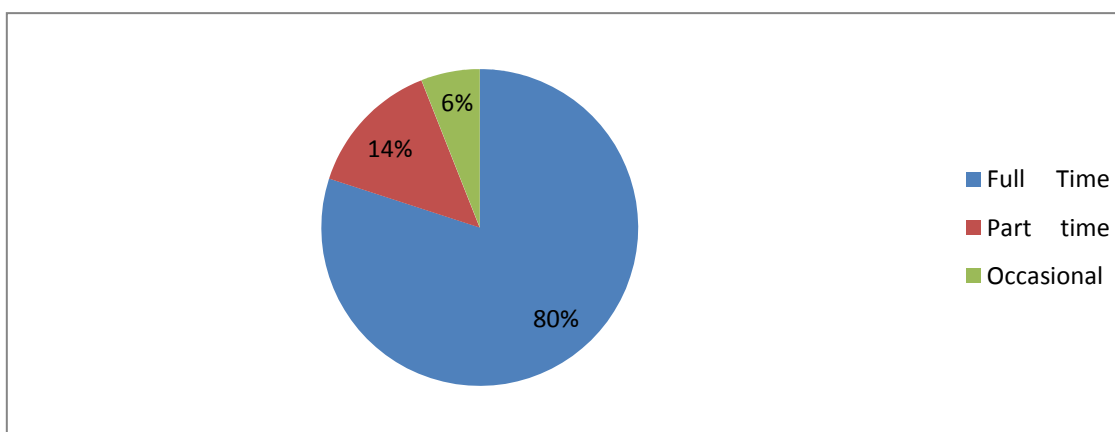
Sectoral distribution and growth of active fishermen in India

While there is considerable sectoral shift by active fishers in marine fisheries, the extent of their dependence on fishing activities remain almost stable with increase in population. The total active fishers in marine fisheries and full time fishers doubled during the past 15 years. From the below graph it can be stated that The increase in part time fishers were more than other categories with 13 percent of the total active fishers engaged in part time fishing compared to the earlier 11 percent (Source: *Asian Fisheries Science* 22 (2009). 713-727)



Source: *Asian Fisheries Science* 22 (2009): 713-727

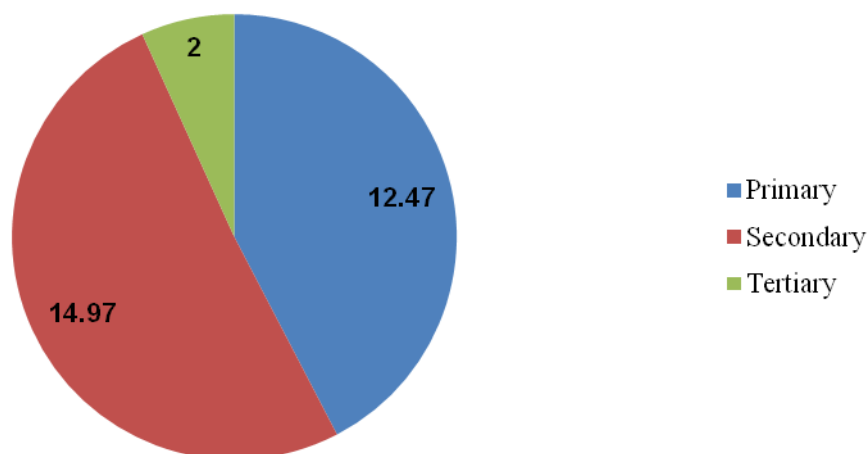
Change in involvement in active fishing over the years



Source: *National Marine Fisheries Census, 2005*

In India, marine fisheries sector employs around two million people of which 12.47 lakh people are in active fishing, 14.97 lakh in secondary sector avocations and two lakhs in tertiary sector. (Source: *Asian Fisheries Science* 22 (2009): 713-727). The export orientation of marine fisheries sector has led to mushrooming of seafood export units doing varied activities like peeling, curing, pre-processing, processing and packing. These units have high employment potential and employ women in large numbers. The tertiary sector undertakes fishery allied activities in which non-fishermen dominate. Fisheries sector has been faring high in terms of its foreign exchange earning potential and employability of vast majority of coastal community in the primary, secondary, and tertiary sectors associated with fishing.

Total number of people employed in lakhs



Source: Asian Fisheries Science 22 (2009): 713-727

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Engagement pattern of active marine fishers in India (2005)

Cost of Establishing Units:

The non-migratory units had average investment in fishing units ranging from Rs. 4000 for non-mechanised to Rs. 13.5 lakh for mechanised units. (Source: 723Asian Fisheries Science22 (2009): 713-727) Technological advancement has facilitated fish finding devices like eco-sounder and GPS and communication technologies to facilitate market intelligence. The capital investment in migratory units has increased considerably due to increase in size of vessel with storage capacity and use of electronic gadgets and telecommunication devices. For the migratory units (Multi-day mechanised fishing units), average investment varies from Rs. 15 lakh to Rs. 30 lakh (Source: 723Asian Fisheries Science22 (2009): 713-727).

Existing Infrastructure at Major Ports

Marine Fisheries Resources

PORT	No. of Deep sea Vessels	No. of Mechanised Fishing Vessels
Visakhapatnam	90	300
Chennai	50	500
Cochin	57	450
Kolkata	15	
Paradip	50	500
Mumbai		700

STATE/Union Territories	Major fishing Harbours Completed	Minor Fishing Harbours		Fishing Land Centres	
		Completed	Under Construction	Completed	Under Construction
Andhra Pradesh	1	4		17	4
Goa				4	1
Gujurat		5	2	21	
Karnataka		8	4	13	
Kerala	1	7	9	25	2
Maharastra	1	2	3	35	1
Odisha	1	4	1	25	3
Tamil Nadu	1	8	3	20	1
West Bengal	2	5		13	
A & N Islands		1		1	4
Daman & Diu				2	
Lakshyadeep				3	
Puducherry		1	3	1	
TOTAL	7	45	25	180	16

STATE/Union Territories	No. of Landing Centres
Andhra Pradesh	353
Goa	33
Gujurat	121
Karnataka	96
Kerala	187
Maharastra	152
Odisha	73
Tamil Nadu	407
West Bengal	59
A & N Islands	16
Daman & Diu	5
Lakshyadeep	10
Puducherry	25
TOTAL	1537

Source: Marine Fisheries census 2010

Inland Fisheries Resources

Rivers & Canals (Kms)	Reservoirs (Lakh Ha)	Tanks & Ponds (Lakh Ha)	Flood plain Lakes & derelict water (Lakh Ha)	Brackish water (Lakh Ha)	Total Water bodies (Lakh Ha)
195210	29.07	24.14	7.98	12.40	73.59

Source: State Govt & UTs (2010)

Status of Human Resource at Present

Total no of Fishing farmer Development Agencies	Total water area covered in Hectare	Total no. of fish farmer trained	Total no of beneficiaries
429	804754	959343	1386218

Source: State govt and UTs. (2010)

Total no of Sate Federation	total no of Central Societies	Total no of Primary Societies	Total no of membership
21	113	14620	2159228

Source: FISHCOPFED 2010-11

Demand Estimation of Human Resource in Fishery Sector

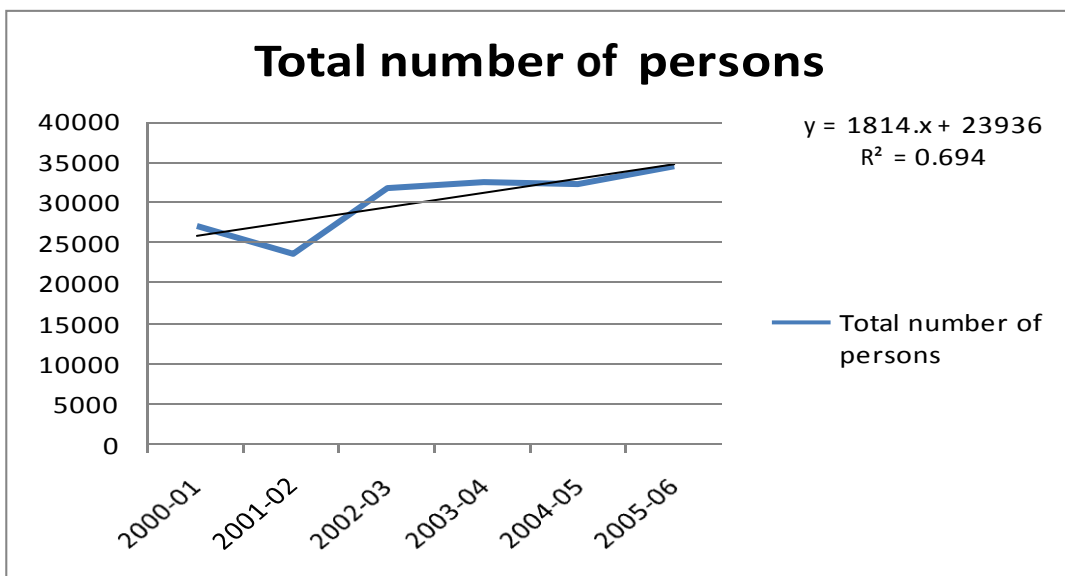
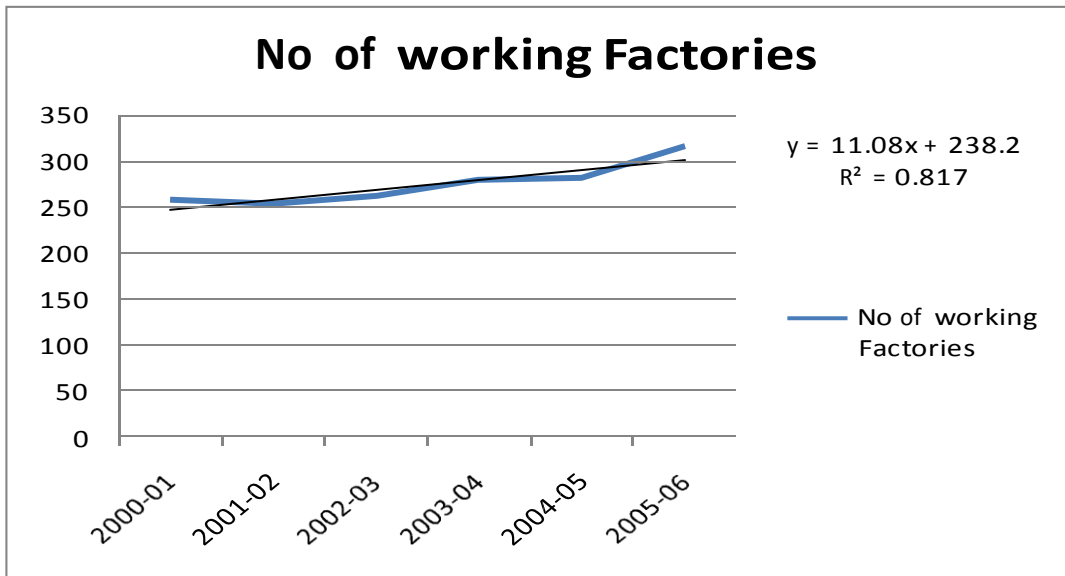
Demand estimation has been done separately for various sub-sectors of the fisheries sector. The subsectors are:

1. Fish Processing
2. Fish Seed hatcheries
3. Fish Feed Industry
4. Aquaculture
5. Deep Sea Fishing
6. Development & Extension
7. Research & Academic
8. Financial Institutions
9. Others (Civil services, fishing equipment Industry, Self employment, Global demand etc.)

Fish Processing:

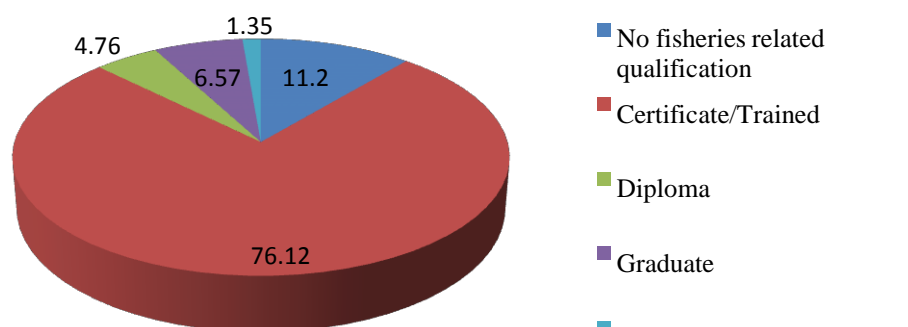
Year	No of working Factories	Total number of persons	Average no of persons per unit
2000-01	260	27065	104
2001-02	256	23649	92
2002-03	264	31844	121
2003-04	281	32426	115
2004-05	283	32240	114
2005-06	318	34496	108
Projections			
2014-15	404	51154	126
2019-20	460	60227	131

This projection has been considered in the context of data Processing industry units as available from Annual surveys of industries (CSO). The no. of factories and no. of persons engaged are projected using linear regression.



Results of establishment survey conducted by IAMR provide the distribution of employment of fish processing units by level of fishery related education. The norms developed by CIFE indicate that each processing plant of 10 tonnes of fish per day require about 70 semi-skilled workers, 10 skilled workers and 5 technicians. Using above to set of information, the distribution of employment in fish processing industry by level of education is given below.

Percent of persons with qualification



Fish Seed Hatcheries

According to CIFE norms a hatchery with 2-5 million fry per year capacity would require 6 technicians and 4 skilled fish farmers while a hatchery of 10-50 million fry per year would require 10 skilled fish farmers and 16 technicians. It is assumed that the number of hatcheries of these two types would also grow at 5% annually. Considering these assumption and information a projection of employment qualification wise is given below.

Year	Informally Trained	Diploma	Under Graduate	Post Graduate
2009-10	23380	3278	1107	221
2010-11	24570	3444	11657	233
2011-12	25776	3614	1220	244
2012-13	27090	3797	1287	257
2013-14	28425	3985	1347	269
2014-15	29844	4184	1413	283
2019-2020	38102	5341	1807	361

Fish Feed Industry

According to CIFE norms major industrial units require 5 fishery professionals and a medium unit require 4 fishery professionals. There are about 40 feed industrial units which have 150000 MT capacities. As per current feed industry requirement 180 professional is required but in 2020 the requirement will reach 500 which needs an annual addition of 25 professional per year.

Aquaculture

According to Coastal aquaculture Authority of India (CAA) there are 18630 aquaculture units till March 2010. Taking CIFE norms and CAA information into consideration the average stock demand for 2020 is 4130 which would increase from 2090 in 2009-10.

Deep Sea Fishing

As per department of Animal Husbandry, Dairying and Fisheries about 90 resource specific deep sea vessels were licensed to operate by 2009 but according to MPEDA there are only 60 vessels available presently and it is assumed to increase to 200 by year 2020. No of Fishery science professionals are required by year 2020 is 600 increasing from 200 presently. According to CIFE each deep sea vessels require 15 fishermen apart from professional and technicians. On this basis requirement for fishermen in this sub-sector presently is 900 which expected to grow to 3000 by year 2020.

Considering above major subsectors into account there is a rough estimate of projection of human resource demand at year 2020 subsector wise given below.

Sub-sector	Total number of persons will be Engaged in 2020
Fish Processing	60227
Fish Seed Hatcheries	93686
Fish Feed Industry	500
Aquaculture	339390
Deep Sea Fishing	6800

Areas of Employment:

- Fish Breeder
- Hatchery manager
- Fisheries technician
- Chemist
- Aquaculture engineer
- Instrument technician
- Engine/Motor/Electrical technician
- Hatchery technician
- Farm technician
- Feed Technician
- Water system technician
- Gear/Harvesting Technician
- Skilled farmers

Sectors of Employment:

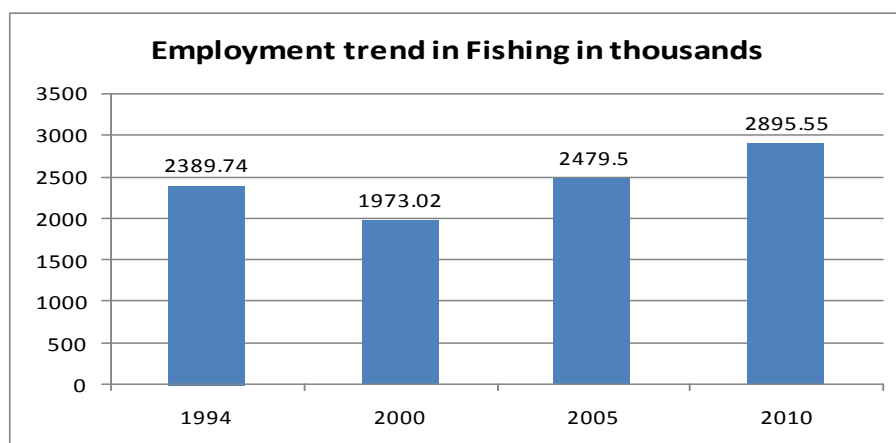
- **Government:** National Fisheries development Board, Marine Product Export Development Authority (MPEDA), Fisheries survey of India (FSI), Fish Farmers Development Agencies(FFDA), Coastal Aquaculture Authority(CAA), CIFNET, Department of Animal Husbandry, Dairying, and Fisheries(DAHDF) etc.

- **Private Sector**
- **Academics**
- **Entrepreneurship:** Ornamental fish culture, aquaculture, hatchery and seed production, commercial pearl production, Fish disease diagnostic center, consultancy services, and establishment of Agri-clinics etc.
- **Ancillary Sectors:** Net mending, Boat building, Manufacturing of fishing accessories, aqua feed preparation, fish oil antibiotic and aqua drug supply, Fishing by trawlers in high seas, preservation and marketing of sea products

Conclusion:

The fisheries sector has been recognised as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food, at the same time it is an instrument of livelihood for a large section of economically backward population of the country.

Below is the employment trend in fishery sector.



Source: ILO