

## SURVEY OF AQUATIC AND FISHERIES INFORMATION SYSTEM CAPACITY IN THE REGION OF COCHIN, KERALA

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Fisheries sector plays an important role in the Indian economy. It provides nutritional security, employment and income to the population and foreign exchange to the nation through seafood export. The fisheries production has registered an excellent growth during the past half century in India. Information is a very important constituent for the development of the sector, especially education, extension, research and development.

The present study evaluates the information capacity of the aquatic and fisheries institutions in the region of Cochin, Kerala. Cochin is in an advantageous position for the development of the sector. Institutions, small and large numbering 29 within the geographical proximity of 6 km radius in Cochin is an added factor for information resource sharing and cooperative information services and ventures for the benefit of stakeholders in India and Cochin region in particular. The present study gives an overview of the institutions in the region regarding their activities, information resources, services, infrastructure and dissemination mechanisms.

Characterization of these institutions has been tried by considering the presence or absence of parameters of information system viz Information Resources, Information Services, Information Dissemination, Information Infrastructure and Information Domains together which it is termed "Information Capacity" in this study. As the result of the study, the top ranking institution that can play the central role in the regional information network activities in the field of aquatic and fisheries sector has been identified.

**KEYWORDS/DESCRIPTORS:** Aquatic and fisheries information capacity; Aquatic and fisheries information system; Aquatic and fisheries institutes

### 1 INTRODUCTION

The fisheries sector, in India, contributes significantly towards strengthening household food and nutritional security, generation of gainful employment and income and manifold increment in fish export. These facts establish that fisheries sector is an important enterprise of Indian economy in general and agriculture sector in particular. Research and development activities have transformed this traditional sector of post-independence days to a developing multi-crore industry now. India ranks second in culture and third in capture fisheries production, and is one of the leading nations in marine products export [1].

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Fishery Science is a multi-disciplinary, multi-faceted and applied branch of knowledge. The aquatic and fishery information is an important asset if research and academic activities are to support sustainable development in the sector. Facilitating access to fisheries information from national and international sources, mechanisms for speedy and effective exchange of information at regional level, and ensuring the dissemination of fisheries information generated locally, as well as its preservation for future generations are very important for development of the sector.

Several functionaries at various levels of the government and other organizations are involved in decision-making, planning and development of fisheries sector in India [2]. Timely availability of quality data/information is *sine qua non* for sound and effective decision-making, policy formulation, research and development in this vital economic and food sector.

## **2 INFORMATION AND THE FISHERIES**

The development of a good management of fishery resources is generally the result of the quality of research conducted and information available *vis-à-vis* information services develop in response to scientific needs. Lack of access to information has been identified as an important barrier in this field. The situation provides an ample scope for an Aquatic and Fisheries Information System to mitigate information vacuum with a futuristic view.

Importance of the issue had been recognized but things remain without much change in the field. Raman Nair opined that the sector needs a strong and efficient Fisheries Information System (FIS) that provides for collection, organisation and accessing fisheries research information to harness information resources generated in fisheries, to guide fisheries research and development, to frame holistic approach for fishery planning and development and to assess production potential of prospective technologies for different fishery waters [3]. The need for a national fisheries information system has been stated by Sujatha, HR et al in their study [4]. Inadequate documentation of fishery information is coupled with the highly scattered nature of fisheries management options relevant to each ecosystem and is a major handicap for the fisheries sector development.

## **3 SCOPE OF THE STUDY**

Kerala occupied the pride place in fish production in India for long periods in the past. It accounts for a quarter of the country's marine production and fishermen population and one fifth of its fishing fleet. Fishery is of vital importance to the State's economy in terms of its contribution to employment, income, foreign exchange earnings and protein intake of its people.

Cochin region abound with ideal ecosystem for fisheries is rich with aquatic biodiversity and the range of ecosystems such as ocean, coastal and island systems, backwaters, rivers, streams, mangrove sanctuaries; infrastructure like sea port, air port; and the geographical advantage that makes it a landing point in the western coast of international optical fiber network. The Cochin fishery harbour is one of the major fish landing centres of South India, where approximately 2500 fishing vessels which includes trawlers, motorboats and conventional crafts operate. An estimated 150 fish and shellfish processing and exporting houses are located in and around Cochin.

The geographical proximity within which a number of expert institutes in Aquatic and Fisheries sector located in Cochin region merits the region for a detailed study of the information capacity of these institutions and aspects of integrating them into an information system of the region through an appropriate operational capacity building.

#### **4 INFORMATION SYSTEM FOR AQUATIC AND FISHERIES SECTOR IN THE REGION OF COCHIN**

Availability of timely and adequate information on the critical inputs is the pre-requisite for sustainable high productivity and food security in the country that fairly depends on the judicious use of natural resources [5]. The purpose of generation of a technical report or paper does not end with the use of the information contained in it by the scientific community. It should ultimately be carried forward to the people for the benefit of the country as a whole. That is the essence of an Information System.

The study has taken up combination of aquatic science and fisheries. Integration of these two fields is assuming importance due to the challenges posed by WTO Regime that must be addressed to render fisheries and aquaculture competitive, sustainable, viable and equitable. The aquatic and fisheries field is also compounded with the problems of pollution, depleting resources, population pressures etc. It is essential to harness aquatic and fisheries information resources in the region for the development of the fisheries sector.

#### **5 COVERAGE AND RELEVANCE OF THE STUDY**

Wide coverage of the subject was aimed at arriving generalization of the problems prevailing in the field. Considering the flux in technology for information storage, retrieval and dissemination and also information system statistics from time to time, it was felt that specific conclusions might not be in order. Specific recommendations shall be suitable only for time bound and phased action plan after detailed study in the field.

#### **6 DEFINITION OF TERMS**

A fishery may be defined in a broad sense as a system composed of interacting components such as the aquatic biota, the aquatic habitat, and the human users of these renewable natural resources. Each component of a fishery influences how that fishery performs, and understanding the entire system and all its parts are essential to the successful management of a fishery [6]. Fishery science has two different meanings. First, it is a body of scientific knowledge pertaining to the fisheries and their environment. It is also called fisheries science or just fisheries. Second, it is a profession that expands and uses the body of scientific fishery knowledge to obtain optimum benefits for society from the living resources of the waters [7]. In this sense, it includes research of many kinds and application to problems of the fisheries and aquatic environments.

Aquatic science covers a wide range of topics, including marine organisms and ecosystem dynamics; ocean currents, waves, and geographical fluid dynamics; plate tectonics and the geology of the sea floor; and fluxes of various chemical substances and physical properties within

the ocean and across its boundaries which is also relevant to fisheries [8]. The word 'information' is used to refer to a number of different phenomena. These phenomena have been classified into three groupings: (1) Anything perceived as potentially signifying something (e.g. printed books); (2) The process of informing; and (3) That which is learned from some evidence or communication [9]. All three are valid uses of the term 'information'. No. 1 may be the most comfortable in the context and then No. 2.

'Information system' is concerned with the unit of knowledge from the point of origin, leading to its dissemination to users after passing through a chain of processes that transform it into a usable form [10]. Web definition of 'Information system' denotes as a combination of hardware, software, infrastructure and trained personnel organised to facilitate planning, control, coordination and decision-making in an organization [11]. The process includes computer technology, communication technology and programming necessary for the system to operate. In this study, the term "Information System" comprises of computerized and non-computerized systems for collecting, compiling, organizing and managing databases containing information relating to aquatic science and fisheries. The term 'capacity' denotes meaning with regard to the ability or power to contain, absorb or hold the maximum volume or amount [12].

## **7 MODE OF STUDY**

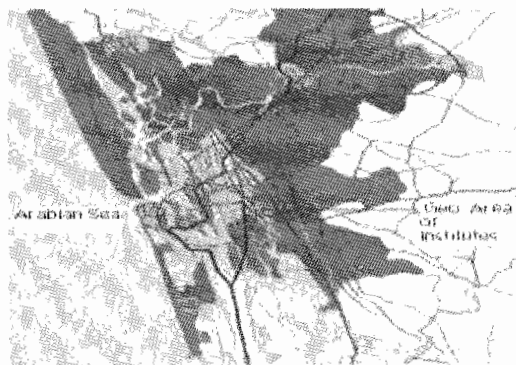
The essentials of an information systems such as (1) information resources, (2) information dissemination, (3) information services, (4) information infrastructure, and (5) information domains the institutes have information base were taken as the parameters for characterisation in this study. Field visits have been carried out in the region and surveys were conducted to assess information base of the institutes. Questionnaire, Interview and Observation were the survey methods used for data collection. Characterisation arrived at the final phase of the study is given in Appendix 2.

## **8 REGION OF COCHIN**

Cochin or Kochi is a vibrant natural port city situated on the southwest coast of the Indian peninsula in the state of Kerala. Cochin was a major centre for Indian spice trade that attracted spice merchants from Britain, Portugal, Holland and Arabic countries as far back in the early 16th century. It is one of the finest natural harbors in the world and one of the nation's busiest ports. Its strategic importance over the centuries is underlined by the sobriquet "Queen of the Arabian Sea". Informally, Cochin is also referred to as the Gateway to Kerala.

Cochin has outgrown its original bounds, and is now the general name given to much of the region adjoining the original town, which now includes Cochin, Fort Cochin, Mattancherry, Ernakulam and many other nearby towns and villages situated in the main land and in the clusters of islands on Vembanad lake. The expanding Cochin region called Greater Cochin consists squarely of 632 sq km area [13]. The region is having well-developed transport and communication network. It forms a vital traffic point in Kerala as well as South India.

General information of the region is given in Table 1. The Map of Cochin region is shown in Fig 1.



**Fig. 1: Map of Cochin (Courtesy: <http://www.gcdaonline.com/>)  
[Concentration of aquatic and fisheries institutes is encircled]**

**Table 1: General Information of Cochin region**

Area	632 Sq Km
Location	9 ° 57"N, 76 ° 15"E

## **9 AQUATIC AND FISHERIES INSTITUTES IN THE COCHIN REGION**

List of aquatic and fisheries institutions in Cochin region is given at Appendix 1. An overview of the objectives and functions of the institutions, information resources and services in the respective libraries are discussed in the following sections.

### **9.1 Central Institute of Fisheries Nautical and Engineering Training (CIFNET)**

CIFNET is for generation of technical personnel statutorily required for manning medium and large fishing vessels and functionally required for shore establishments. The four-year Bachelor degree course in Fisheries Science (Nautical Science) and Vessel Navigator Course and Marine Fitter Course each of 24 months duration are the main training courses offered by CIFNET. The institute also offers statutory courses namely Elementary Fishing Technology Course and Advanced Fishing Technology Course [14]. Mechanisms for information dissemination of the institute are the Bulletins, Annual Reports, Training programmes etc. Information resources and services at CIFNET are conventional and limited in nature. Information resources are mainly on Gear Technology and Fishery Biology. Rare collections include Tide Tables, Fishery Survey Reports etc. Website at [www.cifnet.nic.in](http://www.cifnet.nic.in) provides an overview of the institute's activities and achievements.

### **9.2 Fishery Survey of India (FSI) Zonal Base, Cochin**

FSI, Cochin (formerly Offshore Fishing Station, Cochin) is one of the operational bases of FSI, Mumbai. FSI conducts exploratory resource surveys especially on pelagic resources and

imparts onboard training to the fishing-hands, institutional in-vessel training to the students sponsored by the CIFNET, Kochi. FSI, Cochin comprise of three survey vessels.

The objectives of the organization are to carry out exploratory survey of the deep resources in relation to location of grounds, species composition and suitability of fishing vessels and gears; to train personnel for manning deep-sea vessels; and to disseminate information and data regarding the commercial possibility of deep-sea fishing on the basis of its experience [15]. The marine fisheries resources data collected by the 13 large Ocean going vessels forms the main information database of the Institute and published as Expedition Reports of FSI. Results of the surveys and assessment of fish stocks, and charting of fishing ground in the Indian Exclusive Economic Zone (EEZ), monitoring of fishery resources are brought out by FSI Mumbai through a series of publications such as Bulletins, Charts, Atlas, Occasional Papers, Special Publications, Workshops, Resources Information Series and quarterly newsletter namely Meena News.

The major components of the marine data of FSI, Cochin is on Pelagic fisheries resources. Its library has limited resources of books and journals. Services are conventional. The web site of FSI <http://www.fsi.gov.in> provides information on activities and achievements, mandate, and abstracts of FSI publications since its inception. Department of Ocean Development designated Fishery Survey of India as National Marine Data Centres (NMDC) for Offshore Fisheries related data under the programme of National Ocean Information System (NOIS) [16].

### **9.3 National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT)**

Formerly Integrated Fisheries Project (IFP), and renamed as NIFPHATT, is the continuation of the expertise and equipments of the Indo-Norwegian Project of 1953. The institute has Processing and Marketing Division; Refrigeration Section, Training Section and Civil Engineering Section. NIFPHATT provides an ideal post-harvest technology up-gradation and dissemination facility that shall benefit the fish processing industry. Large-scale production and marketing of various value-added products from all varieties of captured and cultured fishes are the services disseminated by the institute [17]. Institute also conducts regular, short term, long term and need based training in post harvest technology, refrigeration technology, canning of sea foods, product development from fresh water fish, fish filleting and freezing, HACCP (Hazard Analysis Critical Control Point) concepts to trainees, students and Self Help Groups from fishermen community.

The institute disseminates the successful works to the fishing industry by way of workshops, publication of booklets, training, consultancy services etc. Newsletter is the main dissemination mechanism. The library provides minimum services with its resources. Library professional is not deployed in the institute. Survey Reports on fishery resources of early period stored in the library need conservation/digitisation considering its archival value. The website at <http://ifpkochi.nic.in> provides information about NIFPHATT activities.

#### **9.4 Marine Products Export Development Authority (MPEDA)**

MPEDA, an agency of Ministry of Commerce, set up in 1972, is responsible to develop and regulate marine products industry with special reference to export promotion. With its headquarters at Cochin, the authority has six regional centres in Cochin, Chennai, Kolkata, Visakhapatnam, Veraval and Mumbai. Sub Regional Offices and Regional Centres for aquaculture are functioning at different parts of the country in close association with the Departments of Fisheries of the respective State Governments, the seafood industry and other organizations involved in the export trade. It also has two Trade Promotion overseas offices in Tokyo and New York [18]. MPEDA is the specialized organization on commercial and economic aspects of seafood. It acts as the resources base for government, managers, exporters, importers, researchers and students in the field.

Library housekeeping operations are automated. News oriented alerting through e-mail is the unique service provided by the library to the scientists, groups of exporters and importers with news items scanned from the international and national magazines and news papers. The institute is well knit with LAN and computers, provided with broadband Internet connection, and also hooked to the national network of NIC (NICNET).

Institute has a publications division. It publishes bulletin named PRIME, the Price Indicator of Marine Products Export on weekly basis and MPEDA newsletter on monthly basis. Other publications include directories, statistics, handbooks, catalogues, guides etc both in print and CD format. The institute has resources to function as the resource base on all aspects of the WTO regime and multilateral trade regimes on specific fish items and products. Publications in print are the main dissemination medium aimed for the fisheries sector. The web page of MPEDA at [www.mpeda.com](http://www.mpeda.com) functions as an information source on the subject.

#### **9.5 Centre for Marine Living Resources and Ecology (CMLRE)**

CMLRE is an attached office of the Department of Ocean Development at Kochi under the Ministry of Earth Science and is entrusted with the mandate of coordinating and implementing the Marine Living Resources (MLR) Programme of the Department. CMLRE was established at Cochin in 1998 by upgrading the erstwhile Sagar Sampada Cell with exclusive facilities for implementing MLR Programme. The MLR Programme envisages survey, assessment and exploitation of the MLR and studies on the response of MLR to changes in the physical environment with the objective of developing an ecosystem model for the management of the living resources in the Indian EEZ [19]. The Fishery Oceanographic Research Vessel (FORV) Sagar Sampada is utilized for the studies. Survey and resultant information focus on deep-sea fishery, tuna resources, harmful algal blooms, bioluminescent planktons, marine mammals, environment and the productivity patterns.

The Centre has a small library with very limited resources and runs without professional hands. Data holdings of the centre constitute the ocean resource survey of Sagar Sampada. CMLRE web page at <http://cmlre.gov.in> gives information about the centre and its activities.

## **9.6 Central Inland Capture Fisheries Research Institute (CIFRI) Cochin Unit**

CIFRI is headquartered at Barrackpore. One Research Unit is functioning in the campus of CMFRI, Cochin. The unit conducts research on fisheries and environment of inland open waters of the region. CIFRI acts as a national data centre on inland fisheries. The regional centre does not have an information centre of its own. The Unit uses the resources of CMFRI library and information centre.

## **9.7 Central Institute of Fisheries Technology (CIFT)**

The institute was started functioning at Cochin in 1957. Research centres function at Veraval, Visakhapatnam, Kurla, Mumbai, Calicut and Hoshangabad. Research works are carried out in seven research divisions at CIFT. The institute is basically working in technology aspects of production, processing and distribution of fisheries, and encompasses requisite supply and processing sub-systems [20]. The investigations conducted at the Institute include the development of standard designs of small mechanized boats, quality specifications and designs of different types of gears, suitable trawl winches, machine for removing weeds from inland waters, cost saving fish packing containers, standardization of freezing conditions of fish, designing of artificial tunnel drier, ready-to-serve fish curry, collagen-chitosan membrane for plastic surgery and dentistry, and other fish products [21]. In order to disseminate the technological developments, it is involved in training programmes, publication of Information Services, News Letter, Technology Advisory Services, and other priced and non-priced publications.

Library has a firm footing on the stock of information resources. It has automated the housekeeping operations and provides information services. Library subscribes to 88 journals for the use at headquarters and about 50 journals for Regional stations on a CAP basis. 20 of the journals subscribed are of Online. Research papers of the scientists of the institute have been archived digitally by the library. Library is the input centre for ASFA database and also the nodal centre of CeRA (Consortium for e-resources in Agriculture) of ICAR. CIFT's web site at <http://www.cift.res.in> also provides information dissemination services. Links such as Knowledge Base, Ask an Expert, FAQ, Statistics, Research Papers etc shows signs of integration of data for use by the stakeholders.

## **9.8 Central Marine Fisheries Research Institute (CMFRI)**

CMFRI has three Regional Centres, eight Research Centres, and fifteen Field Centres all along the Indian coast, coordinated by headquarters at Cochin dedicated towards R&D on capture fisheries and sea farming technologies, fisheries education, and transfer of technology and consultancy services.

The major objectives of the institute are to provide research support, both on short-term and long term basis, for rational exploitation, conservation and management of the marine and brackish water fishery resources [22]. Further, the development support for growth with stability of the industrial artisan, and culture fisheries through transfer of technology, dissemination of information and education, training and extension are also contemplated. In order to meet these



objectives, the institute is involved in many multidisciplinary research projects relating to marine fisheries. The main data holdings of CMFRI comprise of the following:-

1. Catch and effort data on marine fish landings in the country from inshore waters of the EEZ, giving species-wise, gear-wise, state-wise and zone-wise particulars on an annual periodicity;
2. Biological data such as length, weight, sex, maturity stages of selected species; and
3. Data on fishery related environmental parameters.

Library is a true modern one. All the housekeeping operations are automated. OPAC is interfaced with the Web. E-mail Alert Service, and Content Page Service are provided regularly. Technical Bulletins published till date are digitized and are available online at [eprints.cmfri.org.in](http://eprints.cmfri.org.in). Besides, the institute brings out Bulletins, Special publications, Quarterly newsletter and the Marine Fisheries Information Service and publishes the Indian Journal of Fisheries. CMFRI website, [www.cmfri.org.in](http://www.cmfri.org.in) provides links to Library intranet and services. CMFRI is the designated centre of the NMDC on Coastal Marine Living Resources under the NOIS programme of the Department of Ocean Development. CMFRI launched a portal based information dissemination system named 'Fish Watch' signifying 50 years of time-series data on marine fish landings and effort for the benefit of the fisheries sector [23].

#### **9.9 National Bureau of Fish Genetic Resources (NBFG) Cochin Unit**

NBFG is headquartered at Lucknow. Cochin Research Unit of the Bureau is functioning in the campus of CMFRI, Cochin. This unit is carrying out research activities pertaining to genetic characterization, conservation and cataloguing of the vast fish genetic resources of marine and brackish water ecosystems of the country as well as of endemic freshwater fish species from the Western Ghats. The Library and Documentation unit of HQs NBFG, Lucknow acts as a repository of literature and information and provides latest information in the field of fish diversity, genetics, fisheries conservation and related aspects [24]. The regional centre does not have an information centre of its own. It rely on the resources of CMFRI library.

#### **9.10 National Institute of Oceanography (NIO) Regional Centre, Cochin**

The major objective of the NIO is to provide research and development support for utilizing the ocean resources and to develop technologies necessary for exploiting the ocean resources. Fishery resources and their exploitation is one of the eight major research areas of the institute [25]. The regional centre conduct researches on different aspects of coastal and open ocean environment. The centre is also part of National Ocean Information System (NOIS) as Regional Centre NIO Bombay is the National Marine Data Centre on Marine Pollution. Information transfer and sharing among the labs are made through CSIR Intranet Portal. The NIO library has been recognized as the National Information Centre for Marine Sciences (NICMAS) since mid 90s. NICMAS cater to the needs of the users from within the institute and the marine information seekers at [www.nio.org/nicmas/](http://www.nio.org/nicmas/). The regional Library is linked to NICMAS portal. Library is a conventional one and resources are maintained for reference purpose only. The rare collections of

library include old Indian Daily Weather Reports, Indian Ocean Expedition Data and the special collection of Dr SZ Qasim.

### **9.11 Department of Fisheries (DOF), Government of Kerala**

The Department of Fisheries is an important productive sector under the Govt. of Kerala. This department implements all the development and management programmes envisaged by the government in the fisheries sector. The department also carries out a number of programmes and projects for the welfare of the fisher folk [26]. Governance of the fisheries sector is vested with the Minister for Fisheries. The chief executive responsible for fisheries in the Government is the Secretary to the Government (Fisheries). The Department of Fisheries headed by the Director of Fisheries, is structurally stratified and organized under State, zonal, district and panchayat levels.

Offices of the Joint Director (Central) of Fisheries and the Deputy Director (Ernakulam Dist) of Fisheries are located ad jointly. A training institute named National Institute of Fisheries Administration and Management (NIFAM) is located at the outskirts of the Cochin region. A number of agencies for implementation of government programmes formed under the aegis of the DOF such as Fisheries Resource Management Society, Kerala (FIRMA), branch offices of Agency for Development of Aquaculture, Kerala (ADAK); Fresh water Fisher Farmer's Development Agency (FFDA), and Society for Assistance to Fisher Women (SAF) are also located in the Cochin region and work in association with the Department.

These offices do not have an information desk or centre or library for dissemination of information to the needy such as students, researchers, government officials, fisher folk etc. DOF publishes statistical data books on fisheries sector decennially. Government reports, Commission reports etc on aquatic and fisheries sector are not maintained, conserved and made available in these offices. Basic data on socio-cultural information of fisher-folk are not available in published format. Base registers, files, clerks and officers are the information sources in these departments.

### **9.12 Matsyafed**

Matsyafed, the Kerala State Co-operative Federation for Fisheries Development Ltd, Trivandrum is the Apex Federation of 653 Primary Fisherman Development Co-Operative Societies spread over 9 maritime districts and one inland district of Kottayam, 334 in marine sector, 186 in the inland sector and 133 women co-operatives [27]. The Federation has a District Office in each of the maritime districts and one in the inland district, aiming activities such as Development, Welfare, Extension, Commercial, Aquaculture etc. The office of the District Manager, Ernakulam Dist is located in Cochin region.

Matsyafed publishes quarterly newsletter in local language and disseminates customized information to the primary societies from the head office. The District Office at Cochin does not hold information sources and provide information services relating to fisheries. Base records and files are the only sources of information at district level. Matsyafed provides information about their activities at <http://matsyafed.org>.

### **9.13 Faculty of Marine Science, Cochin University of Science and Technology (CUSAT)**

The faculty consists of (a) School of Ocean Science and Technology (formerly School of Marine Science) and (b) School of Industrial Fisheries. School of Industrial Fisheries impart education, training and research facilities in the areas of fisheries biology, aquaculture, fishing craft and gear technology, fish processing technology, fisheries economics and fisheries management. The School of Ocean Science and Technology is the biggest of its kind among the countries in South East Asia where interdisciplinary courses and research are offered in all branches of marine sciences [28]. The School has Departments on Chemical Oceanography; Physical Oceanography; Marine Biology, Microbiology and Biochemistry; Marine Geology; and Atmospheric Sciences. The faculty also consists of the (a) Centre for Integrated Management of Coastal Zones (b) Centre for Mangrove Studies (c) National Centre for Aquatic Animal Health and (d) Centre for Monsoon Studies. The faculty publishes Journal of Marine and Atmospheric Research and News Bulletin named "OSTC News Bulletin"..

The library and information centre at Lake View Campus of the University cater to the needs of the faculty of Marine Science. Besides books, journals, theses, library holds rare and valuable Expedition Reports and Discovery Reports of yester years. The campus is provided with Internet facilities, CD-ROM search, online services such as e-journals, e-gateway etc offered by the CUSAT web page [www.cusat.ac.in](http://www.cusat.ac.in) CUSAT is well knit under intranet. Central Library offers web based information services. OPAC of Central library and links to E-gateway, E-journals, JCCC-UGC INFONET consortia, INDEST-AICTE consortia, SciFinder, e-gateway to the Indian universities and colleges are provided in the web page and intranet of library at <http://library.cusat.ac.in>.

### **9.14 Kerala University of Fisheries and Ocean Studies, Kochi (KUFOS)**

The College of Fisheries has been started in the year 1979 as the constituent college of the Kerala Agricultural University with the main objective of creating fisheries graduates with a view to provide professionals in fisheries sector. The demand for qualified professionals is on increase with the increasing activity in different segments of the industry. Considering the yeomen services put in by the college for the last 25 years, the Government of Kerala has elevated the college to the status of the university, one of its first in India [29]. Currently, the university offers bachelor, master and doctoral programmes in fisheries and related subjects. The college had 15 institutional publications and one patent in its credit. The college had been the recognised centre for Ph D studies under Mahatma Gandhi University, (MG University) Kerala.

The library has good collection of books, journals, FAO publications, theses, technical bulletins, reports, and CDROM databases. House keeping operations are automated. OPAC service is provided to the users. Web page at [www.cofpanangad.org](http://www.cofpanangad.org) provides information about the university and its activities.

Fisheries Station, Puthuvypu on Cochin sea shore, now affiliated to KUFOS carry out research on various species of fishes, conservation of mangroves, fish brood stock culture for

supply to the farmers etc. The station on 50 acres of land is proposed to be the hub for Schools on Ocean studies under the new university.

#### **9.15 St Albert's College, Ernakulam (Mahatma Gandhi University, Kerala)**

The college started in 1946 is an accredited first grade Arts, Science and Commerce college affiliated to Mahatma Gandhi University, Kerala. The college, under the Department of Aquaculture, Fisheries and Biochemistry offers 3 years B Sc in Aquaculture, B Sc in Industrial Fish and Fisheries and 2 years M Sc in Applied Fisheries and Aquaculture to provide students with opportunities to develop a career in academia and research [30].

The college is a recognised study centre of Indira Gandhi National Open University (IGNOU) and Off-Campus academic centre of the School of Distance Education, MG University. College library offers modern library services, internet services including UGC-INFONET connectivity. Housekeeping operations are automated. Information resources in Zoology and departmental collections on fisheries are rich to cater to the needs of the students.

#### **9.16 Sacred Heart College, Thevara (Mahatma Gandhi University, Kerala)**

Established in 1944, affiliated to MG University, accredited with A+ grade, the college offers 11 undergraduate courses, 10 postgraduate programmes and have 6 research centers. The college is a recognised study centre of IGNOU, Bharathiyar University, Coimbatore and an Off-Campus academic centre of the School of Distance Education, MG University for various courses [31]. The Centre for Aquaculture Studies of the college offers 2 year M Sc Aquaculture and Fish Processing as self financing vocational course so as to meet the increasing demand for well qualified and trained technical managers required by various branches of aquaculture industry in Cochin. Main library offers modern information services such as OPAC, Internet, UGC-INFONET Connectivity, reference services. The library has good collection of books and journals. Besides, Department of Zoology has a rich information resource including fisheries.

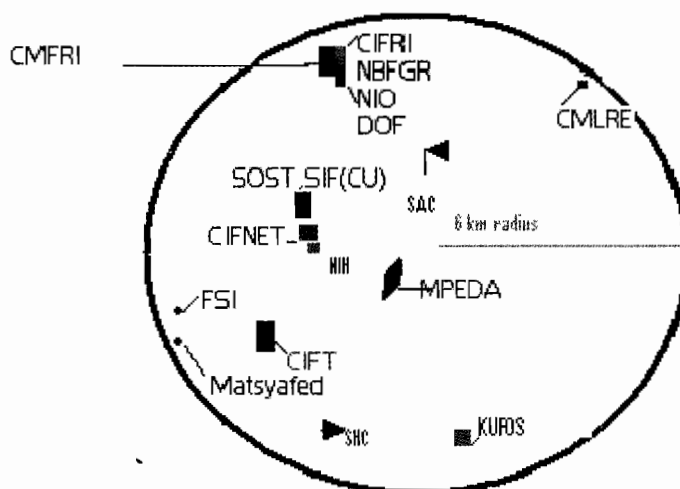
### **10 FINDINGS OF THE STUDY**

#### **10.1 Information Capacity of the region**

There are 29 institutions, small and large, devoted to aquatic and fisheries science in the Cochin region. Out of these, Library and Information System of CMFRI ranks top in terms of information resources, services, dissemination, infrastructure and information domains in the field of fisheries, particularly marine fisheries. On this basis, CMFRI Library and Information System can function as the apex centre of the regional Aquatic and Fisheries Information System (AFIS) network in Cochin on its formation. Total 04 institutions in the region are considered prestigious in this sector in terms of their information capacity, infrastructure and services. (Refer Appendix 2 for list of institutions scoring more than 10 points) These institutes have evolved as resourceful information systems in the region by sheer strength of the knowledge resources they hold. However, an institutional network, based on cooperative agreements is absent among these institutions and in the region as a whole.

## 10.2 Geographic Proximity

The factor of geographical proximity is found very favorable for establishing an Aquatic and Fisheries Information System for Cochin region. The location of suitable partners is an important factor in resource sharing, for, until all resources are not converted into digital form, it is necessary that the documents, other than those that could be faxed are physically available within a reasonable distance. Proximity of the closely linked centers in the subject field is an added advantage for the region. Fig 4.5 shows the proximity of aquatic and fisheries institutes in 6 km radius in Cochin region.



Geographical Proximity of aquatic and fisheries institutes in Cochin Region  
Diagrammatic Representation (not to the scale)

**Note:** Legend : NIF= NIFPHATT; CU=CUSAT; SAC= St Albert's College; SHC=Sacred Heart College

**Fig. 4.5: Proximity of Aquatic and Fisheries Institutions in Cochin Region**

## 10.3 Characterization of Fisheries Institutions Relating to Information Capacity

Characterization of the aquatic and fisheries institutions in the region of Cochin formulated after the study is given as Appendix 2. Characterization carried out in the study has not been based on quantification but on the fact of presence or the absence of the system components and criteria considered for evaluation.

## 11 CONCLUSION

Institutional capacity of aquatic and fisheries information is commendable in overall terms and in special with Central Research Institutions under Indian Council of Agricultural Research (ICAR). The status acquired by these institutes over the years with their experience and contribution in the field is enormous. These institutions hold a good collection of print, non-print

and electronic information sources acquired according to the mandate and research activities of the institutes. They also generate a good amount of valuable information. However, a large chunk of information still remains in paper form. Efficient campus wide information networks in these institutions, interlinking of these networks in the region, joining relevant consortia efforts by these networks and a joint venture to convert back files into digital form can help to conserve, manage and disseminate the knowledge resource of the aquatic and fisheries sector so that productivity and sustainability can be improved for the benefit of the society.

Concerted efforts at the organization level and financial support from the Government are required to overcome lacuna in dissemination of information as development of the society depend on information.

The study found that the central institutions in the region are capable of supporting local and national fisheries management/planning with their information capacity in the domains of (a) Fishery and Operations, (b) Biology and Environment, (c) Economic and Financial, and (d) Socio-cultural areas.

The Central institutions in the region are members of different networks/information systems at national level such as ICAR, CSIR, NICNET and international systems such as Aquatic Sciences and Fisheries Information System (ASFIS) for the purpose of information dissemination and sharing. However, these neighboring institutions are not linked to any resource sharing programmes among themselves. If the regional network is formed and the fisheries related institutions are linked to the network, it shall be mutually beneficial for the partners.

The study on the aquatic and fisheries information system is a timely exercise. It is observed that no integrated information system is in operation in the region. The institutional capacities available can be integrated into an Aquatic and Fisheries Information System (AFIS) with due care on aspects of networking, resource sharing, consortium approach, standardization, and common formats so as to bring further laurels in the field. Such integration can boost research and development in the sector contributing to unprecedented changes in capabilities.

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## **APPENDIX 1**

### **AQUATIC AND FISHERIES INSTITUTES LOCATED IN COCHIN REGION**

#### **A. Government of India**

##### **(a) Ministry of Agriculture, Dept. of Animal Husbandry, Dairying & Fisheries**

1. Central Institute of Fisheries Nautical & Engineering Training (CIFNET) Fine Arts Avenue, Cochin-682016
2. Fisheries Survey of India (FSI) (Cochin Zonal Base) PB No. 853, Kochangady, Cochin-682051
3. National Institute of Fisheries Post Harvest Technology & Training, Fine Arts Avenue, Cochin-682016

##### **(b) Ministry of Commerce & Industry**

1. The Marine Products Export Development Authority (MPEDA), Panampally Avenue, MPEDA House, Cochin -682036
2. MPEDA Regional Centre (Aquaculture), Vallarpadam-PO, Cochin - 682504

##### **(c) Ministry of Earth Sciences**

1. Centre for Marine Living Resources & Ecology (CMLRE) Block C, 6th Floor, Kendriya Bhavan, Kakkanad, CSEZ -PO, Cochin 682037

##### **(d) Indian Council of Agricultural Research (ICAR)**

1. Central Inland Fisheries Research Institute (CIFRI), Cochin Unit CMFRI Campus, Cochin 682018
2. Central Institute of Fisheries Technology (CIFT), Willingdon Island, Matsyapuri-PO, Cochin- 682029
3. Central Marine Fisheries Research Institute (CMFRI), Ernakulam North -PO, Cochin 682018
4. National Bureau of Fish Genetic Resources (NBFGR), Cochin Unit, CMFRI Campus, Kochi - 682018

##### **(e) Council of Scientific and Industrial Research (CSIR)**

1. National Institute of Oceanography (NIO) Regional Centre, Ernakulam North -PO, Cochin

#### **B. Government of Kerala**

##### **(a) Dept of Fisheries**

1. Office of the Joint Director of Fisheries (Central Zone)
2. Dr. Salim Ali Road, Tatapuram PO, Cochin
3. Office of the Deputy Director of Fisheries (Ernakulam Dist)
4. Dr. Salim Ali Road, Tatapuram PO, Cochin
5. Matsyafed District Office, Thoppumpady, Kochi - 682005
6. NIFAM, O/o DD Fisheries, Salim Ali Raod, Tatapuram-PO, Cochin
7. FIRMA, Kadungalloor, Aluva, Ernakulam Dist
8. ADAK Regional Office, Vennala-PO, Cochin -28
9. FFDA Branch Office, Salim Ali Raod, Tatapuram-PO, Cochin
10. SAF, Kadungalloor, Aluva, Ernakulam Dist

#### **C. Universities**

##### **(a) Cochin University of Science & Technology**

1. School of Ocean Science & Technology, Fine Arts Avenue, Cochin-16
2. School of Industrial Fisheries, Fine Arts Avenue, Cochin-16
3. Centre for Integrated Management of Coastal Zones, School of Ocean Science & Technology, Fine Arts Avenue, Cochin-16
4. Centre for Mangrove Studies, School of Ocean Science & Technology, Fine Arts Avenue, Cochin-16



5. National Centre for Aquatic Animal Health, School of Ocean Science & Technology, Fine Arts Avenue, Cochin-16

6. Centre for Monsoon Studies, School of Ocean Science & Technology, Fine Arts Avenue, Cochin-16

**(b) Kerala University of Fisheries and Ocean Studies**

1. HQs, Panangad-PO, Cochin

2. KUFOS Fisheries Station, Puthuvypu, Vypeen, Ernakulam Dist

**(c) Affiliated colleges of Mahatma Gandhi University, Kottayam, Kerala**

1. St. Albert's College, Banerjee Road, Ernakulam, Cochin-682018

2. Sacred Heart College, Thevara, Cochin -682013

**APPENDIX 2**

**CHARACTERISATION OF INFORMATION SYSTEM CAPACITY OF THE INSTITUTIONS IN THE REGION OF COCHIN**

Info System Name	Info Resource				Info Dissemination				Info Serv		Info Infra			Info Domain				Total Points	
	Pr	Dig	NPr	OL	Pr	NPr	Web	Trg	Extn	C/Hy	RS	Inet	Intra	LAN	ID1	ID2	ID3		ID4
CIFNET	x				x		x	x		x		x		x	x				8
FSI	x				x		x	x						x	x				6
NIFPHATT	x				x		x	x		x		x		x	x				8
MPEDA	x	x		x	x		x	x	x	x		x	x	x			x		12
CMLRE	x				x		x					x							4
CIFRI					x		x					x							3
CIFT	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x			15
CMFRI	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	17
NBFGR							x					x							2
NIO	x	x			x		x			x		x		x	x				8
DOF							x		x										2
Matsyafed					x		x												2
CUSAT	x	x	x	x	x		x	x		x		x	x	x		x	x		13
KUFOS	x	x					x	x		x		x		x	x	x			9
MGU	x	x					x	x		x		x							6
Total	11	7	3	4	11	2	15	9	4	9	0	12	4	9	7	4	3	1	115

Info=Information

Pr=Print

Dig=Digital

NPr=Non-print

OL=Online

Trg=Training

Extn=Extension

Serv=Services

RS=Resource Sharing

ID=Information Domain

1=Fishery&Operations

2=Biology&Environment

3=Economic&Financial

4=Socio-cultural