REPORT OF THE SEMINAR ON FISHERY AND AQUACULTURE INFORMATION SYSTEMS IN SOUTHEAST ASIA

BANGKOK, THAILAND, 7-10 FEBRUARY 1989

THE SECRETARIAT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
in cooperation with the
INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

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1. INTRODUCTION

The need to improve fisheries information management in the region was recognized as early as 1982 when SEAFDEC, in collaboration with IDRC, organized the Seminar on Fisheries Information Science in Southeast Asia. During the Seminar, existing fisheries information systems at the national, international, and regional levels were identified, and corresponding problems and constraints were discussed. The recommendation to strengthen the national information services and to promote regional cooperation/collaboration with a view to improving effective transfer of fishery information within and outside the region was considered.

As a sequel to the 1982 Seminar, the SEAFDEC Secretariat organized the SEAFIS Regional Seminar on Fishery and Aquaculture Information Systems in Southeast Asia, held in Bangkok, Thailand, from 7 to 10 February 1989. The list of participants and observers, and the Agenda appear as Annexes 1 and 2. The objectives of the Seminar were to review the current status of fishery and aquaculture information systems in the region, and to determine future activities in order to strengthen collaboration between various information sources in Southeast Asia. The Seminar also aimed to determine the appropriate training programs which could enhance development of fishery information systems in the region as well as improve information management.

2. CURRENT STATUS

Seventeen information systems were presented during the Seminar under national, regional, and international information programs. The Indonesian Fisheries Information System (INFIS), the Malaysian Fishery Information System (MALFIS), the proposed Philippine Aquatic Sciences and Fisheries Information System (PASFIS), and the Fishery Information System of Thailand (THAIFIS) were discussed as national programs.

Under the regional programs were the Agricultural Information Network for Southeast Asia (AGINFONET-SEA) which evolved from the restructured Agriculture Information Bank for Asia (AIBA), the information program of the Bay of Bengal Programme for Fisheries Development (BOBP), the Brackishwater Aquaculture Information System (BRAIS) of the SEAFDEC Aquaculture Department, the information services of the Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH), the information systems implemented by the Network of Aquaculture Centres in Asia (NACA) and the FAO Regional Office for Asia and the Pacific (FAO/RAPA), the information programs of the Southeast Asian Fisheries Development Center (SEAFDEC) and the Southeast Asian Fisheries Information System (SEAFIS) of the SEAFDEC Secretariat.

International programs included the Aquatic Sciences and Fisheries Information System (ASFIS) of the Food and Agriculture Organization of the United Nations (FAO) and the Selective Fisheries Information Service (SFIS) implemented by the International Center for Living Aquatic Resources Management (ICLARM).

In addition, other information programs implemented at a national level in the Philippines were discussed, such as the Fishery Information Program of the Philippine Bureau of Fisheries and Aquatic Resources (BFAR), the National Information Program of the Philippine Council for Aquatic and Marine Research and Development (PCAMRD), and the Aquaculture Technology Outreach Program (ATOP) implemented by the Aquaculture Department of SEAFDEC. The activities of the Marine Affairs and Aquatic Resources Information System (MAARIS) implemented by the National Aquatic Resources Agency (NARA) of Sri Lanka were also presented at the Seminar.

2.1 Indonesian Fisheries Information System (INFIS)

INFIS is a national information service integrating the efforts of various institutes in the field of fisheries information processing and dissemination. The main channel of information flow includes the libraries of the respective institutions, with the Library of the Directorate-General of Fisheries as coordinating library. Prior to the establishment of INFIS, the libraries worked independently from one another. To date, 18 libraries specializing on fisheries are linked to the INFIS network. The coordinating library has been made responsible for the collection of all printed materials produced by the input centers, which in turn have been made responsible for regularly transmitting through the libraries all relevant information to the coordinating library.

The main objective of INFIS is to respond effectively to the information requirements of fisheries workers. Emphasis has been placed on the repackaging of current literature in local languages and in a popularized format. INFIS has also envisaged translating relevant articles from foreign literatures into the Indonesian language.

One significant contribution of the INFIS network to the national fisheries development of Indonesia is increased technology transfer at the grass-root level. Training has always been an important component of INFIS because of the lack of skilled personnel to handle the networking activities.

INFIS intends to expand its national network, fully computerize its collection and services, improve infrastructure as well as the document delivery system, and develop linkages with national, regional, and international information systems for exchange of fisheries information.

2.2 Malaysian Fishery Information System (MALFIS)

MALFIS acts as the national network of agencies concerned with fisheries-related information, and coordinates with relevant agencies/departments on information services in Malaysia. MALFIS serves not only as a storage of documents and publications related to fisheries, but also provides fisheries information services at various levels in Malaysia as well as to SEAFIS. Prior to the establishment of MALFIS, fisheries data and information were sent directly to SEAFIS for processing and packaging. With MALFIS as focal point, collection, storage and processing can now be done at the national level.

As the national focal point of the information system in Malaysia, MALFIS has proposed closer coordination between MALFIS and MalayBRAIS for better administration and management. At present, MALFIS is enhancing its hardware and software facilities, and hopes for continued assistance from other organizations including SEAFDEC.

2.3 Fishery Information Program of the Philippine Bureau of Fisheries and Aquatic Resources (BFAR)

As regards its information program, BFAR has several projects geared towards facilitating the flow of fisheries information and the preparation of technology packages for dissemination to end-users. Studies on fisheries technology relating to aquaculture, fishing, post-harvest, and marine resources are conducted. Technologies that need verification are field-tested in different fisheries facilities. Research papers are packaged and reproduced in a local language that is understood by field technicians and the clientele. The clientele are fish farmers, fishermen, fish processors, vendors and also consumers.

In addition to the printed materials/publications, audio-visual facilities are used to disseminate fisheries information. These include slides, filmstrips, and video tapes used during training courses, and the mass media is utilized to inform the public on matters that need immediate dissemination.

Information dissemination is constrained by the high cost of printing and of time slots for television and radio broadcasts, as well as poor linkage between research institutions and technology transfer agencies; some research outputs are not responsive to the needs of the industry, while publications in English cannot always be effectively used by target users; the clientele may be situated in remote areas difficult to reach, and in fishing communities transportation and communication are relatively poor.

2.4 The Philippine Council for Aquatic and Marine Research and Development (PCAMRD) and its National Information Program

PCAMRD established the Aquatic Resources Management Information Unit (ARMIU) in July 1988. Activities of ARMIU include processing and packaging of technologies translated into laymen's language, literature search on fisheries and aquatic

resources, processing and compiling of approved, completed and on-going researches, and compilation of a directory of available manpower in the National Aquatic Resources R and D System (NARRDS). Publications addressed to the needs of the industry are produced.

PCAMRD's future plans are to strengthen its information processing unit to undertake computerized bibliographic searches, foster cooperation and linkages with national and international agencies, provide training of information personnel, provide referral services to identify experts and agencies for specific information needs, and establish a document delivery service.

2.5 Philippine Aquatic Sciences and Fisheries Information System (PASFIS)

The proposal on the formal establishment of PASFIS was discussed. PASFIS aims to develop an aquatic sciences and fisheries information system for the Philippines. PASFIS intends to extend its services to the private sector, print regular information publications, coordinate with existing national/ regional and international information systems, and train information personnel in the various aspects of fisheries information management.

The operation of PASFIS will be performed by a network of coordinating and cooperating institutions headed by a lead center. This is being based at the University of the Philippines in the Visayas. Twelve sub-centers will be based in the geographic regional sites in the Philippines.

Even prior to the formal establishment of PASFIS, some activities have been carried out, such as bibliography production and indexing using hardware and software provided by SEAFIS. Through PASFIS, bibliographies and the Index to Philippine Periodicals have been produced.

2.6 Marine Affairs and Aquatic Resources Information System (MAARIS)

MAARIS was established as a system designed for the development of aquatic resources and marine affairs in Sri Lanka. Its activities are intended to cover national, regional, and international levels with the following progressive steps: 1) the establishment of an automated national registry and research library on marine affairs; 2) creation of a computerized database on national marine and aquatic resources literature; 3) establishment on a documentation unit responsible for the processing and packaging of information; and 4) provision of current awareness and outreach services.

Highlighted in this system are computerized literature search and a document procurement service. The system makes available retrospective searches from the ASFA database from the Rome on-line. MAARIS hopes to participate in regional information activities via the Indian Ocean Marine Affairs Cooperation (IOMAC) activities now being conducted by its Secretariat in Colombo. At present, it services the documentation and printing requirements, as well as continuing to be the repackaging unit of the IOMAC Secretariat. It will, when fully operational, be able to act as a switchboard service for information exchange.

2.7 Fishery Information System of Thailand (THAIFIS)

THAIFIS, which was established with support and assistance from SEAFIS, coordinates with the SEAFDEC Secretariat in the compilation and exchange of fishery information both within and outside the region, including information available at the Department of Fisheries of Thailand.

THAIFIS has collected and compiled a list of existing literature, both published and unpublished, on aquatic resources and fisheries in Thailand. The SEAFDEC Secretariat has assisted in the initial operations of THAIFIS in terms of personnel assignment, supplies, and equipment.

The first bibliography produced by THAIFIS is the Thai Fisheries Bibliography 1981-1985 containing materials on aquatic resources and fisheries issued during the period. The THAIFIS Acquisition List is issued every two months.

With continued support from SEAFDEC and from the Government of Thailand, THAIFIS intends to compile a directory of fisheries trade in Thailand, establish a database on fisheries information resources in Thailand, and a database on specialized subjects related to the fisheries of Thailand.

2.8 Fisheries Information Services of the FAO Regional Office for Asia and the Pacific (RAPA)

One of the functions of RAPA is to monitor and report major development trends in food and agriculture, including fisheries in the region. RAPA collects, processes, and disseminates information to different countries through its Fisheries Seotion and the RAPA Library.

The Fisheries Section of RAPA, which is also the seat of the Indo-Pacific Fishery Commission (IPFC) Secretariat, maintains a mailing list of about 700 addresses, mainly of institutions, for distribution of IPFC and RAPA materials related to fisheries. About 500 requests for information/publications are received annually by the IPFC Secretariat and the Fisheries Section.

The RAPA Library contains over 16,000 titles of various forms of information materials, of which about 1,500 are directly related to fisheries. FAO reports and other materials from United Nations agencies and international research institutions are also available at the RAPA Library.

2.9 INFOFISH Information System

The Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH) aims to promote trade in fish and fishery products from and within the region. Collaborating closely within the network of FAO-established services such as INFOPESCA (Latin America), INFOPECHE (Africa), and INFOSAMAK (Arab World), INFOFISH has direct access to GLOBEFISH, the computerized system on fish marketing information maintained by FAO in Rome.

INFOFISH provides the following services and products:

1) a trade promotion service which issues current price and market trends through the fortnightly publication called INFOFISH Trade News;

2) a technical advisory service which is dedicated to promoting international cooperation among fish inspection services and providing general information through the quarterly publication The Fish Inspector; and

3) a marketing information service which produces regular information on world and regional fish markets through the bi-monthly INFOFISH International.

INFOFISH also conducts special studies on products and markets, and compiles registers and lists which include the Fish Exporters and Importers Directory.

As its source of data, INFOFISH monitors various types of print and non-print media including correspondents, and analyses and disseminates information through these media. INFOFISH offers two other automated systems, namely, GLOBEFISH and FISHLINE, for which proposals are presently made on the restructuring of the management for efficiency of cost and operation of these services.

2.10 AGINFONET-SEA: A Resource for Fisheries Literature

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) implemented the Agricultural Information Bank of Asia (AIBA). In 1984, AIBA was restructured and membership of AIBA was limited to five countries, namely: Malaysia, Thailand, Singapore, Indonesia, and the Philippines. This was done for better manageability owing to the limited financial resources. At that time IDRC's funding support to AIBA had ceased. A network evolved from the restructured AIBA, i.e., the Agricultural Information Network for Southeast Asia (AGINFONET-SEA), with AIBA as a member.

AIBA and AGINFONET-SEA collaborate in the following areas: 1) literature searching and document delivery, 2) microfiche service, and 3) training. AGINFONET-SEA includes fisheries literature as part of its coverage of the broad field of agriculture. Fisheries information in the countries of Southeast Asia can reach the AGRIASIA and CARIS-SEA database through the national focal points at the Kasetsart University Library in Bangkok, Thailand; the National Library for Agricultural Sciences in Bogor, Indonesia; the National University of Singapore Library for Singapore; Universiti Pertanian Malaysia and the Malaysian Agricultural Research and Development Institute both in Serdang, Malaysia; and the University of the Philippines at Los Banos, and the Philippine Council for Agriculture, Natural Resources Research and Development (PCARRD) both in Los Banos, Laguna, for the Philippines.

2.11 Information Activities of the Bay of Bengal Programme (BOBP)

BOBP is a regional programme of FAO with Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, and Thailand as member countries. A well-equipped library helps to meet the information needs of BOBP by establishing an information base on small-scale fisheries and fisherfolk of member countries. Socio-economics with special emphasis on women, extension techniques, fishing technology, aquaculture, fishery resources, and post-harvest technology are the main subject area. The library comprises 6,000 publications and more than 1,000 FAO reports and documents as well as documents of government agencies and reports on small-scale fisheries and fishing communities.

The information output of BOBP includes a quarterly newsletter Bay of Bengal News, technical reports, audio-visuals, video programs, and photo exhibits.

A major problem faced by BOBP is that information is either not available or difficult to access. Although BOBP has exchange arrangements with most fishery institutions in the region, publications from these institutions are not received regularly. Another problem is the difficulty in getting copies of journal articles from other institutions.

2.12 Information Program of the Network of Aquaculture Centres in Asia (NACA)

NACA operates under the principle of in-country collaboration, which means the sharing of responsibilities based on the distinctive competence of each participating institution or center in the network.

The information program of NACA consists of the computerized information system (revitalized AQUIS and bibliographic MINISIS), publications, and audio-visuals.

While the coverage has expanded both in physical area and possibly in development needs/problems, the plan for the NACA information system however is not to spread and diversify the services but to unify the network information program. The five-year work program of the Intergovernmental NACA has placed emphasis on the collection of farm performance data to feed into both project planning, and development and research on the improvement of farm management practices. Having a few but high priority farming systems to cover will, in itself, serve as a unifying factor. Nodal centers will be identified to take care of each of the farming systems which the program will cover. This is a departure from the previous scheme in which several species commodities and culture systems were covered by each center.

2.13 Information Programs of SEAFDEC

The information programs of SEAFDEC include the publication, information, and audio-visual programs being carried out by the SEAFDEC Departments as well as the information project of the Secretariat, i.e., the Southeast Asian Fisheries Information System (SEAFIS), and the Brackishwater Aquaculture Information System (BRAIS) implemented by AQD.

As regards aquaculture information, the Information Division of the Aquaculture Department integrates the various units handling information-based services at AQD. Under the Division are three Sections: Documentation, Techno-Transfer, and Publications.

The Documentation Section operates the AQD Library and the BRAIS Project. The Techno-Transfer Section implements the Aquaculture Technology Outreach Program (ATOP), and the Publications Section produces the information materials.

The national program - the Aquaculture Technology Outreach Program (ATOP) - is a joint undertaking of the Philippine Technology and Livelihood Resource Center (TLRC) and AQD. ATOP became operational on 4 July 1987. It aims to produce the following outputs: technology communication materials of media such as publications, correspondence, films and video; training courses/seminars/forums/workshops; and information management and data banking activities. These outputs are derived from significant research results at AQD.

ATOP comprises four major activities: 1) Technology Training which is subdivided into outreach seminars for the small fish farmers and aquabusiness seminars for business and development workers; 2) Technology Publication which aims to disseminate technologies to the target audience in simple language to facilitate their widespread adoption. Three kinds of publications will be produced, namely, manuals, pamphlets, and leaflets; 3) Technology Films and Video which involves recording a complete training course (a maximum of 15 hours) on a video tape; 4) Technology Correspondence which uses the postal communications system in the transfer of technology and livelihood skills to entrepreneurs, farmers, workers, and other users. The implementation of ATOP activities was assessed in January 1989 as part of the project's evaluation process.

Southeast Asian Fisheries Information System (SEAFIS)

During its first phase, SEAFIS concentrated on the development of national networks for fishery information and coordination of these activities with other organizations, both within and outside the region. SEAFIS therefore acts as a regional focal point and makes available pertinent information on fisheries and related disciplines or technologies.

In cooperation with SEAFIS, national fishery information networks in Southeast Asia have been established, namely: the Thai Fisheries Information System (THAIFIS) with focal point at the National Inland Fisheries Institute (NIFI) of the Department of Fisheries, Thailand; the Indonesian Fisheries Information System (INFIS) with focal point at the Directorate General of Fisheries, Jakarta, Indonesia; the Philippine Aquatic Sciences and Fisheries Information System (PASFIS) with focal point at the University of the Visayas in Iloilo City, Philippines; and the Malaysian Fisheries Information System (MALFIS) in collaboration with the Fisheries Management Information System (FMIS) of the Fisheries Division, Kuala Lumpur, Malaysia.

The development of SEAFIS is contributing to the establishment of the regional databases for fisheries and aquaculture. It is hoped that the national focal points in the SEAFIS network will continue to collect the current fishery and aquaculture literatures published in their respective countries and make these available to SEAFIS for processing and dissemination.

Bibliographic records compiled by SEAFIS are published in a national fishery bibliography or a regional bibliography on fisheries and aquaculture in Southeast Asia which is issued annually by the SEAFDEC Secretariat.

Brackishwater Aquaculture Information System (BRAIS)

BRAIS is implemented by the SEAFDEC Aquaculture Department (AQD) with funding support from the International Development Research Centre (IDRC) of Canada. As a specialized information analysis project on brackishwater aquaculture, the activities of BRAIS include acquisition and computer-based processing of documents related to the subject of brackishwater aquaculture; publication of bibliographies and abstracts, state-of-the-art reviews, registers and newsletters; reprography,

clearinghouse, and networking. The Project has so far published 4 volumes of the Brackishwater Aquaculture Abstracts, 5 species bibliographies/abstracts on prawn, sea bass, grouper, mussel and mudcrab, a review on rabbitfish, and 3 volumes of the BRAIS Newsletter. A mailing list is maintained which includes 398 institutions and 100 individuals. The question and answer service receives a monthly average of 19 queries. Networking involved the establishment of national centers in Indonesia (Brackishwater Aquaculture Development Center, Jepara), Malaysia (Fisheries Research Institute, Penang), Thailand (Fisheries Science Society of Thailand, Bangkok), and the Philippines (SEAFDEC/AQD).

The survey on the utilization of BRAIS products and services has given encouraging and favourable results. It has shown that the Bibliographies/Abstracts/Newsletter are considered to provide a useful source of information on brackishwater aquaculture, particularly in the Asian region. BRAIS monitors source documents not covered by other abstracting services. Its products and services are used mainly for supplementing other information sources, identifying researchers/research centers, and for collection development. The distribution of its products has covered as many as 10 researchers in one institution. Foreign titles worth about $US 2,000 in annual subscriptions and Philippine titles worth about $US 200 in annual subscriptions have been received since BRAIS products and services became available.

2.14 Selective Fisheries Information Service (SFIS), Phase II: Project ADD (Analysis and Document Delivery)

The major objective of SFIS, Phase II, is to extend the capabilities of the existing information program of the International Center for Living Aquatic Resources Management (ICLARM) to users in tropical third world countries. Specifically SFIS II aims to assist in an advisory capacity in

strengthening the information capability of fisheries institutions, provide answers to inquirers on specific subject areas, analyse 50 selected topics, provide key literature to inquirers, and produce bibliographies and mini-reviews on important topics.

SFIS II is enhanced by library resources and the use of computerized literature searching of bibliographic databases. For its services, SFIS II collects payment from users in order to make the project self-supporting. Exchange of information is alsoencouraged.

A total of 181 in-depth inquiries from 49 countries/ territories were received during the period from May 1988 to January 1989. Requests outside ICLARM's area of expertise were referred to appropriate information centers. Queries were analysed and recorded to identify trends needed in the preparation of bibliographies and reviews.

In addition to answering requests, the current awareness service through NAGA's Information Department and distribution of the ICLARM Library's quarterly Acquisitions List to IDRC fisheries research grantees is being continued. ICLARM, which also serves as the Secretariat of the Asian Fisheries Society, has established networks of tropical aquaculture scientists, and of tropical fisheries scientists.

2.15 ASFIS Program

Recent developments in FAO fisheries information programs were discussed with emphasis on the Aquatic Sciences and Fisheries Information System (ASFIS). Inputs into the ASFIS database from the network of information centers have increased, while more institutions have expressed interest in collaborating in the ASFIS program.

Part of ASFIS database has been made available on CD-ROM (Compact Disk-Read-on Memory) together with search software. This medium, which can be searched on micro-computer, eliminates the need for access to and the expense of telecommunications facilities. Subscription to CD-ROM however is at present costly and beyond the means of many potential users in developing countries.

ASFIS produces the Aquatic Sciences and Fisheries Abstracts (ASFA), the hard copy of selected records from the database. To overcome the problem of diminishing returns in publishing the products of ASFIS, a proposal was made on the establishment of a fishery development information system which would focus on information materials needed by the developing countries and thus encourage accelerated participation of these countries in the system.

The system, in the form of a global database with corresponding print product, could be made an adjunct to ASFIS since most of the materials have already been embedded in the ASFIS bibliographic database. By simplifying input requirements and properly defining the coverage, the new and simplified database system could be workable within a cost affordable range by the developing countries.

3. FISHERY INFORMATION METHODOLOGY AND TRAINING REQUIREMENTS

In discussing accessability to fishery and aquaculture information sources among the various information systems in the region, the participating national systems identified problems and constraints that hinder the smooth flow of information among the systems. These include lack of trained personnel, difficulty in obtaining foreign journals (journals in local languages should be translated into the English language for wider dissemination to the other national systems), financial constraints, and the need to improve facilities, especially computer hardware and software.

In order to take an active role in the development of fisheries information in the region, the participating national systems arrived at a consensus to work closely together, and to coordinate and cooperate among themselves in this field of endeavour.

3.1 NATIONAL INFORMATION SYSTEMS (NIS)

Fully cognizant of the vital roles the systems should play in the area of fisheries development in their respective countries, the national information systems aim to operate effectively and efficiently at the national levels. The NIS in the participating countries noted that, since they have a similar target clientele, efforts could be made collectively in carrying out information activities, although with varying degrees of emphasis.

However, the national information systems acknowledged the need of having a regional focal point such as SEAFIS, and therefore recommended that the capabilities of SEAFIS be strengthened and that SEAFIS serve as a mobilizer of resources in order that information from the region or outside should reach the national centers for dissemination.

NIS proposed that there should be an effective two-way flow of information from the participating centers to the regional systems as well as to international systems. This consensus was reached after a consultation among the participating systems (see Annex 3).

3.2 Capabilities of the National Systems

In assessing the strengths and weaknesses of the national systems, specific suggestions were made. These included the suggestion that the activities being conducted by INFIS be used as a model to some extent; the suggestion of MALFIS that

MalayBRAIS work closely with MALFIS for better administration and management, and that AIBA include MALFIS in its activities specifically as regards training of personnel; the suggestion that PASFIS develop marine fisheries information since the Philippines was observed to be weak in this area; that THAIFIS initiate a program on translation of materials in Thai into the English language; and the suggestion that NIS take AQD's ATOP program as a model.

3.3 Training Needs

During the NIS consultation, the national systems identified various training needs which could facilitate the improvement of information systems in the region (See below). Training of trainers was considered a high priority that could be handled by some regional/international bodies. The core group of trainers in the areas identified could then conduct echo training programs in their respective information systems. The most important areas identified were: 1) information packaging, 2) indexing/abstracting, and 3) computerization (CDS/ISIS applications and ASFIS methodologies). The training needs in library management and input methodology were also identified.

TRAINING NEEDS BY AGENCY/SYSTEM

AGENCY/SYSTEM	TRAINING NEEDS	
1. INFIS	1.1	Library management and operation
	1.2	Computerization
	1.3	Production of extension materials
2. MALFIS	2.1	Filling up input sheets
	2.2	Computerization
3. PASFIS	3.1	Indexing/abstracting
	3.2	Printing/publishing
	3.3	Computerization
4. THAIFIS	4.1	Training of trainers
	4.2	Indexing/abstracting
	4.3	Computerization
	4.4	Library management
5. BRAIS	5.1	Training of trainers
6. MAARIS	6.1	Publication and production of audio-visuals
	6.2	Training of extension workers
7. SFIS	7.1	Training of trainers

To summarize, six training areas were identified for the improvement of the information systems in the region:

1. Training of trainers,
2. Computerization of services and products,
3. Library management,
4. Indexing and abstracting,
5. Information packaging, and
6. Input methodology.

4. INTERNATIONAL COLLABORATION IN FISHERY INFORMATION PROGRAMS

In order to use effectively the available resources in the region, ways and means to complement and strengthen the existing information programs at the national, regional, and international levels were discussed. The national centers identified their strengths and weaknesses, while the regional and international systems identified areas where possible collaboration with the national systems could be developed. A profile of the information systems at the national, regional, and international levels is shown in Annex 4.

Suggestions on how the regional systems could work closely with the national systems were made. Specifically, the BRAIS national centers were encouraged to implement question and answer services. For sustainability, the national and regional centers were encouraged to develop charging mechanisms for services rendered at rates affordable by the national systems in the region. In pursuing computerized data banking, a cost-sharing mechanism could be established. Non-commercial organizations would collect the information, while profit-maximizing private institutions would undertake computerization of the database. Processed information would be disseminated to the national centers.

At the national levels, efforts should be made so that all information-based services existing in one country could be integrated, and that information-based responsibilities be delineated from administrative services. The establishment of an Information Division at AQD intergreting all information units and ICLARM's move to merge all its information services into one division, were commended. At this point, it was suggested that libraries should be made separate units from administration.

Moreover, national centers were encouraged to carry out their activities with less support from the regional systems, except in such areas as technical assistance and training, when necessary. The regional systems could also assist the national systems in fund sourcing to enable them to continue collecting information at their levels.

To be self-sustaining, national and regional centers together should develop products that can sell in other regions, in a user-oriented approach. The quality and standard of information products should be improved by sustaining continuity of publication as well as coverage. Timeliness of the publication should be a consideration, while author affiliation and date of publication should be indicated in every publication.

Among the participating countries, there should be a good mechanism of information exchange and dissemination. To be able to realize these efforts, it was recommended that SEAFIS continue coordinating information programs, and be responsible for the development of information systems in the region. SEAFIS might act as mobilizer of resources so that information efforts at the national systems could be sustained.

To facilitate this effort further, a coordinating body might be established to formulate action programs which should include training of personnel and strengthening of information programs and facilities. SEAFIS could serve as the Secretariat for such a coordinating body.

In the ensuing discussion, the regional/international bodies offered to assist the national systems to some extent, and at a level that is affordable by the recipients as well as the donors. The services and resources available are indicated in Annex 5.

ICLARM could conduct training in computerization, more particularly in the areas of library management and computerization, when funds are available. The Asian Institute of Technology, for example, also offers courses on CDS/ISIS, production of information packages, and indexing/abstracting. These are offered at reasonable rates. It was however emphasized that these training courses might be offered free of charge for participants from the region who are involved in IDRC-supported projects.

The national centers of NACA could assist in disseminating information. The training of aquaculturists, as part of the NACA program, could be a forum for information exchange and dissemination.

AIBA also facilitates conduct of training courses in information-related areas at reasonable rates affordable by participants from the region. On the other hand, the national systems could avail themselves of AGRIASIA and its database, and document delivery system through microfiching.

IDRC, through AIBA, is setting up regional training centers for personnel from IDRC-funded projects. Participants from non-IDRC funded projects may however avail themselves of the training if slots are still available.

INFOFISH may not be able to provide funds and training, but can provide information to the national systems when necessary. It was also noted that ASEAN, through the Malaysian information system, is conducting training in information packaging for ASEAN member countries.

ASFIS recognized the need for the development of an information sub-program for the region. ASFIS holds annual meetings/seminars on information-based activities; however funds would be required to enable participation in these activities.

5. RECOMMENDATIONS

ESTABLISHMENT OF A COORDINATING COMMITTEE FOR REGIONAL FISHERY INFORMATION SYSTEM DEVELOPMENT

1) In order to minimize, if not eliminate duplication of efforts in the development of information systems in the region and because of the limited resources available, cooperation and coordination among the various information agencies/systems should be realized. To achieve this, a coordinating committee to take charge of the development of fisheries and aquaculture information systems and services in the region should be established.

2) Coordination of information programs in the region should be continued by SEAFIS. SEAFIS should facilitate regional action in providing assistance for the development of national information systems. As an interim measure, the secretariat of the Coordinating Committee should be provided by SEAFDEC. The Committee should comprise the participating countries of SEAFIS.

3) The Coordinating Committee should undertake the task of formulating policy and action programs for regional fishery information development. The Terms of Reference of the Coordinating Committee should be to develop a regional cooperative program of training, research on needs and impact, and development of products and services, as well as to act as a regional monitoring and review body, and as a catalyst to mobilize resources within and beyond the region.

STRENGTHENING OF NATIONAL CENTERS

4) In order to strengthen the national information systems, national ministries should commit adequate resources for the development of appropriate products and services until such time as they become essentially self-supporting. Donor agency support should be sought for regional and national development until they are self-sustaining.

5) To achieve standardization in data processing, the use of suitable software will be continuously evaluated. For the present, UNESCO's Mini/Micro CDS/ISIS software will be used by the cooperative information program.

6) To ensure the effective use of library resources, the utilization of journal subscriptions should be regularly assessed. Libraries of national institutions should be encouraged to develop cooperative programs to share the limited resources available.

7) National centers should look into the possibility of standardizing the English version of their own publications in order to enhance the document exchange program.

8) National centers could be requested for translation of documents in local languages into English at the expense of the requesting institute.

9) The document delivery system should be improved in a most cost-effective manner.

COOPERATION WITH ASFIS

10) To facilitate exchange of information among countries in the region, a standard methodology such as ASFIS should be employed. Institutions in countries which have the facilities and the capability to conduct ASFIS training should be tapped, with technical assistance from FAO's ASFIS program.

11) The Seminar noted the current financial difficulties in which FAO's ASFIS program finds itself and suggested that the proposed sub-program should cover all aspects of tropical small-scale fisheries. This, however, should eventually be incorporated in the main ASFIS program. FAO is urged to make the products and services from this sub-program available at a charge that will permit their widespread use in the region. In addition, the major ASFIS products should be made available at least at each of the national focal points.

Annex 1

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Annex 2

AGENDA

1. Opening Ceremony

2. Adoption of the Agenda and arrangements for the Seminar

3. Review of the Current Status and Activities of Fishery and Aquaculture Information Sources in Southeast Asia:

   3.1 ASFIS (Aquatic Sciences and Fisheries Information System) of FAO

   3.2 BRAIS (Brackishwater Aquaculture Information System) of SEAFDEC/AQD

   3.3 INFIS (Indonesian Fisheries Information System) of Indonesia

   3.4 MALFIS (Malaysian Fisheries Information System) of Malaysia

   3.5 NACA (Network of Aquaculture Centres in Asia)

   3.6 SEAFDEC (Southeast Asian Fisheries Development Center)

   3.7 SFIS (Selective Fisheries Information Service) of ICLARM

   3.8 THAIFIS (Thai Fisheries Information System) of Thailand

   3.9 Other information programs

4. Fishery Information Methodology and Training Requirements

5. International Collaboration in Fishery Information Programs

6. Other Matters

7. Conclusion and Recommendations

Annex 3

CONSULTATION AMONG NATIONAL INFORMATION SYSTEMS
9 February 1989

PRESENT : INFIS
MALFIS
PASFIS
THAIFIS

HIGHLIGHTS :

A. The different National Information Systems (NIS) are fully cognizant of their vital roles in fisheries development in their respective countries. It is therefore imperative that these NIS should be able to operate effectively and efficiently.

B. These NIS have similar target clientele, with varying degrees of emphasis.

C. Training needs in their order of priority:

Training	INFIS	MALFIS	PASFIS	THAIFIS
1. Training for Trainees	✓	✓	✓	✓
2. Information Packaging	✓	x	✓	✓
3. Indexing/Abstracting	✓	✓	✓	✓
4. Computerization CDS/ISIS ASFIS Methodologies	✓	✓	✓	✓

Code: ✓ needed
x not needed

Training for trainers is of the highest priority and should be handled by some regional bodies. The core group of trainers in the three areas will later conduct echo training programs for their NIS.

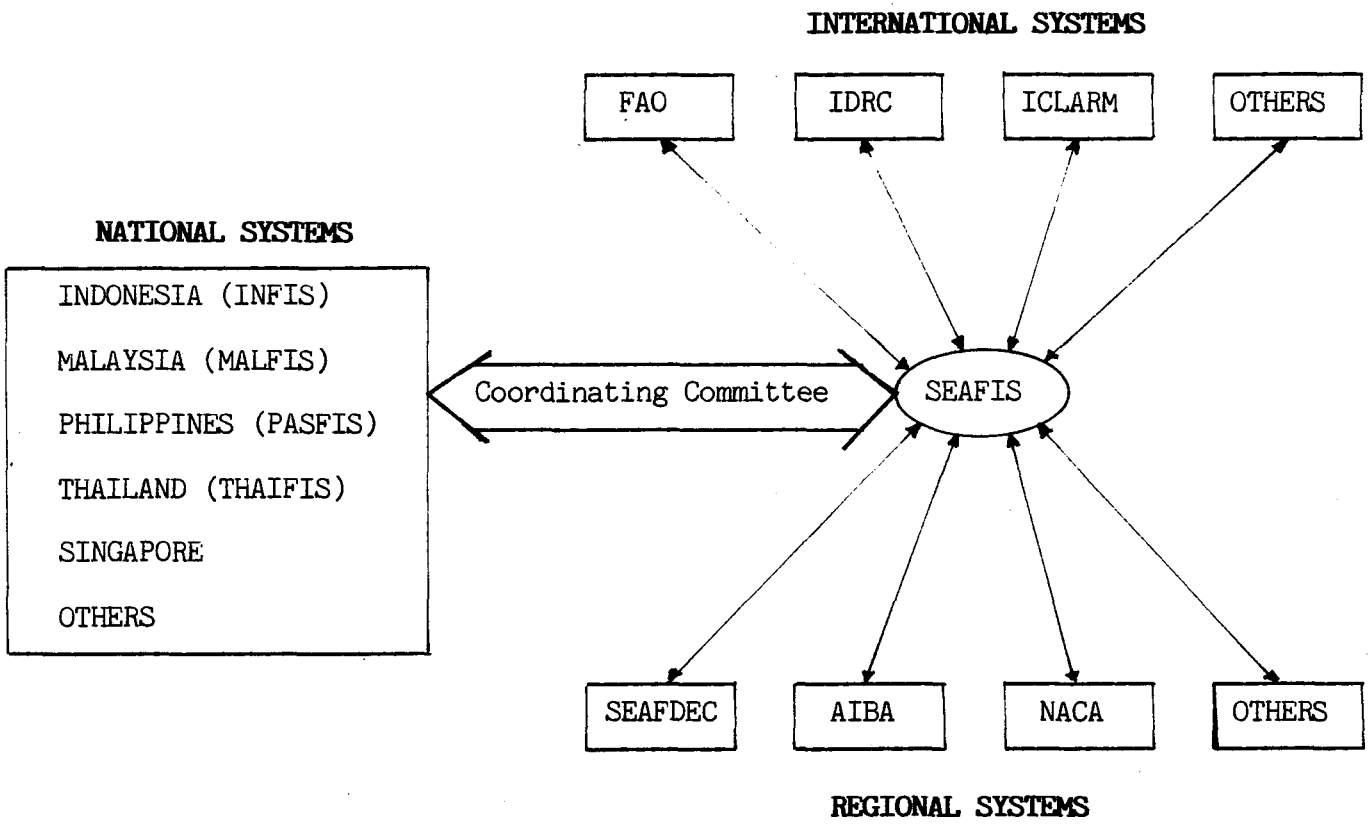
D. Exchange of Information

NIS look to SEAFIS as a regional focal point. There is therefore a need to strengthen the SEAFIS capability to serve as mobilizer of resources as well as to ensure that information from the region will reach the international information systems. (See the chart - Flow of Information).

F. Improvement of Infrastructure and other Facilities

The NIS would welcome assistance for the improvement/ upgrading of their facilities.

Flow of Information



PROFILE OF INFORMATION SYSTEMS

Agency	Activities undertaken	Method employed	Resources	Products
BFAR	a) Document delivery b) Preparation of reference texts	Standard library procedure	Government funds	a) Bibliography b) Comment awareness
BRAIS	Brackishwater Aquaculture Information System (BRAIS)	a) Collection of information b) Storage/retrievel c) Publications/reprography d) Clearinghouse - questionnaire/answering - document delivery - bibliography/literature search e) Abstracting/indexing f) Networking	SEAFDEC/AQD IDRC	a) Bibliographies/abstracts b) State-of-the art reviews c) Registers d) Newsletter

Agency	Activities undertaken	Method employed	Resources	Products
INFIS	a) Training b) Publications c) Building the infra-structures of the network d) Building the INFIS data-base	Micro CDS-ISIS	IDRC	a) National Bibliography b) Extension manual c) Translated foreign publica-tion/articles d) Skilled personnel in the field of library management e) Preparation of extension materials
INFOFISH	Information Collection and Dissemination for promotion of fishery exports	a) Via correspondence b) National liaison offices c) Governmental agencies d) Periodicals, books e) Paying for the informa-tion and on an exchange basis	a) Price infor-mation b) Fish export/ import statis-tics c) Post-harvest technologies	a) INFOFISH Market News, fortnightly for traders b) INFOFISH International, bi-monthly for the general public c) The Fish Inspector, quarterly for institutions

Agency	Activities undertaken	Method employed	Resources	Products
			d) Company directory and consultant directory	d) Globefish Highlight, quarterly, compiled by FAO/Headquarters e) Eurofish Report, bi-monthly compiled by FAO/Headquarters f) other publications such as importers/exporters directory, conference proceedings
MAARIS	a) Bibliographical database b) Repackaging c) Publishing and printing d) Extension	a) Use of CDS/ISIS b) Abstracting c) Use back-up publishing d) Produce A-V material	NARA IDRC ICOD	a) Abstracting journal b) Directory - Mar. Res. Project - Personnel c) Extension leaflets d) Newsletter e) Research journal f) Cruise reports g) Occasional papers h) Technical report i) Video films j) Posters k) Slides

Agency	Activities undertaken	Method employed	Resources	Products
MALFIS	Collecting, processing and managing of fisheries data on: a) fisheries resources, landings, boats, prices; b) aquaculture land/water use, productions, fry production; c) socio-economics of fishing communities; d) fisheries economic and financial performances	a) Sampling method b) census/listing, enumeration c) case studies d) ad hoc studies e) computerization of database	Department of Fisheries and relevant member agencies/ institutions	a) Annual report b) Extension brochures, pamphlets c) Information notes d) Reports, papers
NACA	a) Training b) Research c) Information Exchange	a) Networking and technical cooperation b) Computerized storage and retrieval (i.e. AQUIS) c) Development of manuals - Editing - Publishing - Distribution/exchange	Four regional centers Five national centers (Government center) UNDP funds Government contributions	a) Trained staff b) Publications - Manual - Working papers - Newsletter c) Audio-Visual - Training and briefing sets (video and slides)

Agency	Activities undertaken	Method employed	Resources	Products
PASFIS	a) Compiling bibliography b) Indexing c) Training - Cataloguing - Indexing - Use of some softwares applicable to library operations	a) Computerization b) In-house training work-shops	IBM-PC XT (3 units) Core group of trainers	a) Bibliographies b) Index to Philippine periodicals, specifically on fisheries aquatic sciences c) Trained library staff in fisheries aquatic sciences
PCAMRD	(Since 1988 only) 1. Literature search, journal etc. 2. Processing of on-going and completed researches 3. Packaging/repackaging aquaculture technologies 4. Directory of available manpower 5. Publication		Trained staff, Computers	Bibliography listing Publications Entries: 2,500 books, and monographs 98 theses 53 completed projects (1988) 150 ongoing projects

Agency	Activities undertaken	Method employed	Resources	Products
SEAFDEC/AQD	Aquaculture Technology Outreach Program (ATOP)	a) Technology training b) Technology publications c) Technology films and videos d) Technology correspondence course	AQD, TLRC/DA* (Government)	a) Aquaculture outreach seminars b) Manuals, pamphlets, leaflets, newsletters c) Training course in video tapes d) Training program through postal system
SEAFIS	a) Arrangements for closer cooperation among various libraries concerned with fisheries in Southeast Asia b) Establishment of a regional database	Micro CDS-ISIS	SEAFDEC Secretariat/TD/ MFRD/AQD IDRC INFIS MALFIS THAIFIS	a) National Bibliograph b) Regional Bibliography

* Technology and Livelihood Resource Center/ Department of Agriculture (Philippines)

Agency	Activities undertaken	Method employed	Resources	Products
	c) Compilation of information related to fisheries and aquaculture in Southeast Asia d) Dissemination of information through its products			
SFIS	Phase 2: Project ADD (Analysis and Document Delivery)	a) Analysis b) Question and answer service c) Document delivery	IDRC	a) Mini-reviews b) Bibliographies c) Serial holding list
THAIFIS	Compile fisheries information for publishing the bibliography	Micro CDS/ISIS	Participating libraries (16)	a) Bibliography 1980-1985 b) Acquisition lists

INFORMATION SERVICES

Service	Funding source	Hardware/ Software	ASFIS format (Y/N)	Nature of database	Size	Main users	Offer training (type)	Products & Costs
AIBA	SEAMEO	MINISIS CDS/ISIS	N	Biblio directory	80,000 + 6,000	Researchers	Y Var.	Biblio
BOBP	SIDA DANIDA	CDS/ISIS	N	Biblio directory	-	Researchers Administrators	_	Directories (Free)
BRAIS	IDRC	CDS/ISIS (MINISIS)	Y	Biblio	5,000	Researchers Administrators Industry	Y BRAIS Network	Biblio Books (Free)
INFIS	IDRC (SEAFIS)	CDS/ISIS	Y	Biblio	1,500	Researchers External	N	Var. (Free)
INFOFISH	Government	Lotus spread sheets	N	Num.	Var.	Industry	N	Books Directory (Pay)
MAARIS	IDRC ICOD	CDS/ISIS	Y	Biblio. Num.	100	Researchers External	N	Biblio, Directory (Free)

Service	Funding source	Hardware/ Software	ASFIS format (Y/N)	Nature of database	Size	Main users	Offer training (type)	Products & Costs
MALFIS	Government (SEAFIS)	CDS/ISIS	Y	Biblio	1,000	Researchers	N	Biblio
NACA	UNDP Government	AQUIS	Y	Num.	—	Industry Government	N	Publication (Private outside of region-exchange)
PASFIS	Government (SEAFIS)	CDS/ISIS	—	Biblio	900	Researchers	Y (Computer)	Biblio. (Free)
PCAMRD	Government	CDS/ISIS	—	Biblio	3,000	Researchers External Industry	N	Biblio. Directory (Free)
RAPA	FAO (Government)	—	—	—	—	—	—	—
REMIN/ REMIC*	IDRC	CDS/ISIS	N	Biblio	—	Researchers	N	Biblio (Free)

* Regional Mangrove Information Network - Regional Mangrove Information Center, (in the Philippines)

Service	Funding source	Hardware/ Software	ASFIS format (Y/N)	Nature of database	Size	Main users	Offer training (type)	Products & Costs
SEAFIS	IDRC	CDS/ISIS	Y	Biblio	4,000	Researchers External	Y Methods	Biblio (Free)
SFIS	IDRC	CDS/ISIS	N	Biblio	15,000	Researchers	Y -ISIS -Library	Reviews, Biblio (Pay)
THAIFIS	IDRC (SEAFIS)	CDS/ISIS	Y	Biblio	2,000	Researchers External	N	Biblio Acquisition (Free)

Annex 6

THE CURRENT STATUS OF INFIS*

1. Introduction.

It is well recognized that fisheries information service become very essential, especially when there an increasing need of fisheries information science and technology due to the rapid development of fisheries sector as now found in Indonesia within the last decade. For that reason INFIS - The Indonesian Fisheries Information System was set up in 1984, aimed to support the development of fisheries industries, especially the small-scale industries in term of transferring of appropriate technology to artisanal fishermen and small-holder fish farmers.

Consistent with the establishment of this information network, a project which is financially supported by IDRC was approved and implemented over the last three years. It is anticipated that the project will eventually enable INFIS to increase its acquisitions and its resources for repackaging, processing and disseminating the information required by fisheries extension workers who operate at the provincial and district level, the group leader of fishermen and fish farmers at the lower end of the user scale and the researchers who work in the fisheries research institutes at the higher end of the user scale.

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*Prepared by Alwinur for the Seminar on Fishery and Aquaculture Information in Southeast Asia, 7 - 10 February 1989, Bangkok, Thailand.

Evaluation upon the usefulness of information, especially the actual use of the extension manual by the extension agents at the provincial and district level was done annually and it was found that the beneficiaries were extremely enthusiastic and positive about the resource materials that have received. It is a fact that the existence of INFIS have given a good contribution to the national fisheries development, particularly in promoting the transfer of appropriate technology to various target groups and therefore it become more be recognized as a national information network by the Indonesian fisheries communities.

2. INFIS Network.

INFIS as a national information service is a cooperative action among various fisheries institutes in the field of fisheries information processing and dissemination. The main channel of the information flow are the libraries of the respective institutions, with DGF library serving as coordinating library.

Before the establishment of INFIS, these libraries were working independently of each other, there was no linkaged or cooperation among them and each lacked of skilled personnel, up-to-date collection and was poorly organized and utilized.

At the present, 18 small libraries specialized on fisheries were linkaged in the INFIS network. The improvement of management and utilization of the participating libraries was focused on the establishment of the uniform system and procedures. The DGF Library as a coordinating library is responsible to established a coordinated network utilizing the available information in each of the small existing libraries. These libraries are enable to work together toward achieving a common program, of gathering, organizing, repackaging and disseminating literatures to the various target groups.

Through the network, transfer of appropriate technology to the grass-root level significantly increased and it made a strategically significant contribution to the national fisheries development.

3. Training activities.

Training activities become a very necessary component in the INFIS programs, since that the lack of skilled personnel is one of the many constrains faced to develop the national fisheries information service. For that reasons, a series of training have been conducted over the last three years in order to enhance the skill INFIS personnel. The area of the courses covered information and library management, computerized information processing and the preparation of extension materials.

Up to now 21 library staff have been trained in library operation and management, 15 library staff were trained on ASFIS input methodology and 21 extension specialists responsible for the preparation of INFIS manuals have joined a 3 week training workshop on the preparation of extension materials.

To increase the quality of the services, especially the automation of the information processing, a short course was organized for INFIS personnel to introduce the network to concepts relating to information management on microcomputers and exposure on software programs such as dBase III and Mini/Micro CDS-ISIS.

Nevertheless, training opportunities for the staff still have to be strived, realizing the need of skillful personal for strengthening the network to enable the information flow covered all part of the country (27 provinces).

4. INFIS Publications.

In order to promote more rapid dissemination of information through the INFIS network, an INFIS Project which is financially supported by IDRC - the International Development Research Center - was implemented since 1985.

The foremost general objective of the project is to build up the capability of INFIS so that it can effectively respond to the information requirement of the fisheries

workers. The emphasis of the project therefore, is on the re-packaging of current literature in the local languages and into a more simple format to meet the requirements of different categories of fisheries workers.

For the purpose of supporting the activities of the extension specialists, a number of articles selected from fisheries research result was re-packaged into extension manuals. Fisheries research results are usually published in Journal/Bulletin in the form of scientific reports, Consequently, such reports tend to scientifically oriented and in most cases are not readily transferable to the research's end use. Therefore, it is utmost important that those issue should be transformed into manuals/practical hand books, which are easily understood by fishermen/fish farmers. On the other hand, the researchers, in planning their research project, should be aware of the current literature and should have timely access to scientific information produced by other researcher, both Nationally and Internationally. Hence, the flow of information of fishery science and technology have to be increased. INFIS, therefore have a program on the translation of foreign fisheries literature into Indonesian. This include journals articles, seminar papers, research report and other publication. Issued by international and regional agencies as well, such as SEAFDEC, FAO and ICLARM.

Dissemination of fishery information science and technology through the network were significantly increased over the last three years. More then 70.000 copies of INFIS publications, comprises of fisheries extension manual, translated publication, national fisheries bibliography and fisheries abstract, have been distributed widely through out the country. The distribution policy is generally to reach the fisheries development agent namely fisheries administrators, researchers, extension personnel, students and other fisheries institutions both at national and provincial level. Interested persons are also welcome to receive a copy from INFIS input centers.

5. INFIS Data Base.

To enable the DGF-Directorate General of Fisheries as the national vocal point, provide services to the users continuously, the Coordinating Library is responsible to collect all printed materials produced by the Input Centers and the Input Centers is requested to transmit through its library all additional information regularly to Coordinating Library to be circulated through the network. Based on that methodology, the DGF then can provide services to the clienteles in the form of :

- National fisheries bibliography,
- Collective accession list,
- Information searching,
- Exchange information upon request, and
- Photocopying upon request.

All the services mention above still have to be improved through the establishment of INFIS database. An efficient data base management that would provide the INFIS network with flexibility in the manipulation bibliographic record are being developed. Some of the INFIS input centers have already access to microcomputers and have started work on experimenting with database building, using mini/micro CDS-ISIS Software. In the long term period, all the input centers are expected to automate their library operations, send input on diskette to the DGF Coordinating Library and run searchers on the collective INFIS database. A machine-readable database of 1,500 bibliographical records has been established and is at present held at the DGF Coordinating Library. And also a number of INFIS INPUT SHEETS was sent to SEAFIS in Bangkok and ASFIS in Rome, to be filled in their database, in order to linkage INFIS with regional and international fisheries information system.

6. Future Development Programs.

At the present time, an information network has built up upon the strong foundations that have been laid on the national level institutions. INFIS have now the ability to deliver targeted goals in its program in term of information outputs and services.

The next phase, INFIS programs is focused on the strengthening of INFIS network so as to optimized its efforts in organizing, processing and disseminating

fisheries information in order to support the national fisheries development activities throughout the country. This objective will be achieved through the following activities :

a. Widening the network.

   To enable the information flow reach all part of the country, the number of input center/participating center in the INFIS network have to be extend. The ultimate is to have at least one Participating Center in each of the 27 provinces.

b. Improving the quality of INFIS Services through the automation of information processing and retrieval activities of the network.

c. Fine-tuning the outputs.

   - To produce extension leaflets for the fishermen and fishfarmers as the "down-stream" clientele and code of practice for the "upstreams" clientele e.g. the fisheries technicians who work at the Fisheries Development Centers and are responsible to test the research result to be re-package into extension materials.
   - To continue to produce annual bibliography, translation of importance foreign fisheries articles and extension manuals for the extension workers.

d. To increase the productivity of personnel in handling information by improving the physical infra-structure of the network.

e. Reinforcing and extending the information management skills of the INFIS Participating Centers and fostering a continuous staff development capacity within the INFIS network, through intensive training in three specific areas : library and information management ; computerized information processing and retrieval ; and preparation of extension material.

f. To develop collaboration with national, regional as well as international organization, to enable the exchange of publications and the linkage of INFIS with regional and international fisheries information systems.

g. to improve information services in the form of literature searchers and document delivery.

7. Conclusion and recommendations.

a. The establishment of national information service in fisheries sector, such as INFIS, is very essential for promoting the disseminations of fishery science and technology to the lower end user/the grass-root level.

b. National information system should be a cooperative action among the national fisheries agencies in the field of fisheries information processing and dissemination and should emphasize its services to the development agent, namely researchers, extension workers and the administrators as well.

c. The role of national fisheries information service can be successfully executed when there is a close collaboration and support from the international as well as regional agencies such as IDRC, SEAFDEC, ICLARM, etc. Therefore it is recommended to promote a coordinating activities among these regional/international agencies in the area of training, exchange of information and strengthening the national information service, especially in the developing countries in this region.

Bibliography.

1. Alwinur, 1987. The Indonesian Fisheries Information System, A working paper prepared for the Advisory Board of ASFA meeting, 1987. Rome-Italy, 9 pp.

2. Alwinur, 1988. Marine Fisheries Information Science in Indonesia, A working paper prepared for the IAMSLIC Annual Conference, October 1988, Miami - Florida, USA, 7pp.

3. Directorate General of Fisheries, Ministry of Agriculture Indonesia, 1988. Final Report of INFIS Project, 11 pp.

4. International Development Research Center, Singapore Regional office, 1988. INFIS Project Proposal phase II, 25 pp.

Annex 7

CURRENT STATUS AND ACTIVITIES OF FISHERY AND AQUACULTURE INFORMATION SOURCES IN SOUTHEAST ASIA - MALFIS

1. BACKGROUND INFORMATION

1.1 The paper outlines the current status and activities of fishery and aquaculture information in Malaysia. There has been set up in 1988 an information system known as MALFIS under the aegis of SEAFIS. The Department of Fisheries Malaysia with its Headquarters in Kuala Lumpur is the national focal point.

1.2 MALFIS acts as the national network of agencies concerned with fisheries related information. It serves not only as a storage of documents and publications relating to fisheries but also provides fisheries information services at various levels is Malaysia and to SEAFIS.

1.3 MALFIS has taken the main task of coordinating with relevant agencies/departments in Malaysia. Coordination is essential in obtaining information and data, and giving support and provide facilities for each other.

1.4 Computers are used for effective information storage and retrieval and speedy processing and management of information and data.

1.5 Prior to the setting up of MALFIS, DOF was sending fisheries data and information to SEAFDEC. Informal contacts between SEAFDEC and the local institutions may have been made too. With the setting up of MALFIS each members of the network will still be in a position to maintain contacts with SEAFIS and that it enjoys access to information in both MALFIS and SEAFIS. In essence, the focal point will be responsible to collect, collate, store and process vital fisheries information and statistics.

2. Progress To Date

2.1 MALFIS has submitted a list of Malaysian fishery bibliographies for 1985 to SEAFIS. It is now in the process of compiling 1986 bibliographies.

2.2 SEAFIS has made available the necessary package programme in order to facilitate automation of the processing of fisheries information. The information are entered on special worksheet and sent to SEAFIS for further action.

2.3 The bibliographies of 1985 include the followings:-

(a) culture of mussels in Malaysia.

(b) production of Barrumundi fries.

(c) The use of formulated feeds in fish/prawn rearing industries.

(d) Fish/prawn resource survey along the coast of Sarawak.

(e) Second prawn resource survey along the coast of Sarawak.

(f) Water analysis method.

(g) Fishing Gears in Peninsular Malaysia.

2.4 Proposal will be made soon to BRAIS for the coordination on aquaculture information be done by MALFIS. In Malaysia there is another information system known as MALAYBRAIS which is only responsible for aquaculture information. Since MALFIS is the national focal point, its coverage shall not only confine to marine capture fisheries but also aquaculture. A centralized coordination shall ensure better administration and management of the overall fisheries information in Malaysia.

3. Fisheries Information In Malaysia

3.1 The fisheries information in Malaysia includes the followings:-

(a) Marine fish landings in terms of quantity, value, species, regions and months.

(b) Fishing vessels/boats in terms of number, types of fisheries, tonnage, horsepower, distribution according to regions.

(c) Fishermen in terms of number, ethnic composition, distribution according to regions/districts.

(d) Fish prices in terms of use vessel, wholesale and retail, and according to months.

(e) Effort per unit of the main fisheries in terms of number of hauls, fishing days and fishing trips.

(f) Exports/imports of fishery commodities in terms of types, country of origin/destination, quantity and value.

(g) Fishery resources in terms of distribution, types and density.

(h) Socio-economic data on income level, demographic, ownership of assets etc.

(i) Fisheries establishments on ice factories, processing factories, net making factories, boat-building yards etc.

(j) Fisheries operation performance in terms of costs and earnings, benefits, financial returns.

(k) Aquaculture aspects in terms of production, fry productions prices, area of production, distributions of freshwater fry into public water bodies etc.

3.2 They are collected, compiled, processed and analysed by the relevant agencies or institutions, like the Department of Fisheries. Fisheries Development Authority of Malaysia, University of Agriculture etc. They are documented in various forms, like working papers, project briefs, annual report, thesis, report paper etc.

3.3 There are various fisheries information available in the country. They are found in different forms. Some are made available to the public and other interested parties, while others are not. Those informations not released to the public are treated as "confidentials" and classified. However, the disadvantage is that such treatment may lead to a lot of speculations, misconceptions, and wrong assumptions. Nevertheless, attempts are being made to disseminate information as much as possible and at the right time.

3.5 The setting of MALFIS will serve also as a counter-check on previous work done on a particular topic. It minimises duplication of work, waste of resources and time.

4. Conclusion

MALFIS is in the process of securing more hardware and software for better implementation of the system. The

system is now sharing the use of DOF computer time, which is found to be quite cumbersome. Therefore, the service will be greatly improved with the acquisition of its own hard disk, printer and monitor screen.

MALFIS does not forsee any problem in securing continued cooperation from member agencies/institution. However, it is the hope that continued assistance from regional organisation like SEAFDEC is forthcoming.

RM/sj.

Annex 8

FISHERY INFORMATION PROGRAM OF THE PHILIPPINES' BUREAU OF FISHERIES AND AQUATIC RESOURCES 1/

I. INTRODUCTION

The worlds' total fisheries production as reported by the Food and Agriculture Organization (FAO) in 1985 is 83 million metric tons contributed by 160 countries. Of these 160 contributing countries, the Philippines ranked 12th largest fish producer of the world.

Fisheries as an economic sector makes an important contribution to the economy in terms of employment and export earnings. Its contribution to the countrys' GNP in 1987 is five percent and 20 percent to gross value added of agriculture, fishery and forestry.

On export, the Philippines had a positive balance of trade in fish and fishery products since 1975 to present and the value of fisheries exports steadily increased from ₱532M (48,482MT) in 1978 to ₱6.44B (112,382MT) in 1987.

The annual growth rates achieved by the Philippine fisheries from 1978 to 1987 were registered at 3.8 percent and 16.4 percent in quantity and value, respectively. For 1987, the total fish production reached 2.2 million metric tons.

On employment, the fishing industry directly employs an estimated one million fishermen and fishfarmers throughout the country.

1/ Presented by Anselma S. Legaspi during the Seminar on Fishery and Aquaculture Information held at Bangkok, Thailand Feb. 7-10, 1989.

II. BACKGROUND

Prior to the implementation of Executive Order 116, reorganizing the Bureau of Fisheries and Aquatic Resources (BFAR) and converting it from a line to a staff bureau, two out of the 14 divisions, namely the Information Division and the Extension Division are responsible for information reproduction and dissemination, and technology packaging and transfer and/or extension.

In the present set-up of the BFAR, (Figure 1) the functions of the Information Division and the Extension were assumed by the Fisheries Development Support Services Division (FDSSD).

The Fisheries Development Support Services Division has four sections, namely, the Institutional Assistance Section, the Manpower Development Section, the Extension Development and Advisory Section and the Technology Packaging and Publication Section (Figure 2).

The Manpower Development Section assesses the manpower requirement of the fisheries industry to serve as basis in the formulation of manpower development programs. The Institutional Assistance Section establishes linkage with the research institutions and fisheries associations and cooperatives to facilitate the transfer of technologies through an effective feedback system. The Extension Development and Advisory Section serves as the broker of technologies that are ready for transfer to the end users. The Technology Packaging Section is primarily responsible for packaging appropriate fisheries technology for dissemination by the 13 regional offices of the Department of Agriculture to the fisheries clientele.

III. THE FISHERIES INFORMATION PROGRAM

Cognizant of the fact that extension is basically communication, the BFAR as a staff bureau through the FDSSD has for its information program several projects that are geared towards facilitating the flow of fisheries information and the preparation of technology packages for dissemination to the end users. Among these projects are:

1. Intensification of Fisheries Technology Transfer thru Packaging and Information Production
2. Fisheries Extension Development and Advisory Services
3. Collection and Evaluation of Fish Marketing Data
4. Fisheries Institutional Assistance
5. Strengthening the Governments' Support Services to the Fisheries Industry
6. Creation of a Technical Board to Review and Approve Technical Papers for Publication

In addition to the above on-going projects, the BFAR and the College of Fisheries University of the Philippines in the Visayas (UPV) submitted to the German government (GTZ) for financial assistance a project proposal entitled "Fisheries Information and Extension Program." This project has three main components namely:

1. Information Dissemination
2. Pilot Project
3. Human Resource Development

The proposed project aims to improve the standard of living in the fisheries community by increasing the income and profitability of the small-scale fishermen, fishfarmers and fish processors. The project is also envisioned to strengthen the information and extension capabilities of BFAR and UPV personnel. Likewise, it also aims to provide and disseminate appropriate fisheries technology as well as propagation techniques/schemes, marine resources/environmental management in specific pilot areas which can be replicated in other areas.

This proposal is still awaiting approval of concerned offices and governments.

IV. THE FLOW OF FISHERIES TECHNOLOGY FROM SOURCE TO END USER (Figure 3)

In support to policy formulation, four divisions of BFAR conduct studies and generate fisheries technology relating to aquaculture, fishing, post-harvest and marine resources. Technologies that need verification are field-tested in the different fisheries facilities.

The Aquaculture Division conduct studies on matters relating to the culture and development of cultivable fish and other aquatic resources which are verified either at at the Freshwater Research Center or at the Brackishwater Research Center. The research vessel is utilized for marine resources studies being conducted by the Marine Resources Division. The National Commercial Fishing Research Center serves as the verification facility for fishing technologies generated by Fishing Technology Division and the Pilot Fish Processing Plant for the verification of technologies generated by the Post-Harvest Technology Division. Technologies generated by other research institutions are also, jointly verified and packaged for distribution to our clientele.

The Fisheries Development Support Services Division in coordination with the technical divisions and Research Centers package and reproduce research papers in such a way that it will be easily understood by the field technician and the clientele.

The field technician of the Department of Agriculture in the 13 regional offices act as the transfer agents of the technology to the fisheries industry i.e., the fishfarmers, fishermen, fish processors/fish handlers and vendors and also the consumers.

On the other hand, problems of the industry that need to be studied by the research division are reported by the field technicians for appropriate action. The BFAR maintains a library which serve not only the BFAR personnel but also students and people engaged in fishing industry.

V. THE BFAR PUBLICATIONS

The BFAR publications include the following:

1. Fisheries Journal - This journal is a yearly technical publication which is composed of original Fisheries Scientific paper with new critical information based on original research and with conclusive results based on terminated study.
2. Fisheries Newsletter - This is a quarterly publication which include original articles on general information and technical subjects, precise writing of current trends and development in the fishing industry specially from abroad, observations, recent and planned activities of the Bureau of Fisheries
3. Technical paper series - This is published in memeograph form. The papers published are technical reports of BFAR personnel to the Director mostly results of specific studies, investigations and surveys undertaken, and constructive articles on organizational effectiveness, efficiency and economy.
4. General Information series - This is a monthly publication in memeograph form. This publication include original articles of general application to the industry or any industry information that will accelerate Philippine fisheries development both local and abroad and also the Fisheries Administrative Order's rules and regulation.
5. Extension Series - This publication is being produced by the BFAR Fisheries Extension Division now the Fisheries Development Support Services Division. The fisheries information published

are derived from other publications. The target audience are the industry people, students, housewives, and extension workers. Each publication is package of technology information for one specific commodity.

6. Handbooks/Manual - This publication are more of techniques or "how-to" in adopting a particular fisheries technology to guide the field technician as well as the clientele when they apply the technology.

7. Posters - These are printed information with illustration that are posted in stretegic places to disseminate the message to people in the fisheries industry and also to the general public who in one way or another are also concerned or have something to do with the message.

In addition to the printed materials/publication, BFAR also make use of other audio visual materials in the dissemination of fisheries information. Some of these are the following:

1. Slides and filmstrips and video tapes - These are used during training to supplement the lectures given by the resource person. Most of these slides and filmstrip are taken in actual work situations in the technology verification centers.

2. Mass media - The mass media such as radio, television and newspapers are also used to inform the public on matters that need immediate dissemination.

VI. PROBLEMS IN IMPLEMENTING FISHERIES INFORMATION PROGRAM

Disseminating information is not without problems specially if you are targetting a population of more than 57 million residing in more than 7,000 islands and speaking more than 70 dialects. Following are some of the problems that in one way or another hamper our information dissemination.

1. High cost of printing aggravated by limited funds allocated for this purpose
2. High cost of time slots for television and radio broadcast
3. Most of the fisheries technology print materials are in English and could not be effectively used by some target users
4. There is a poor linkage between research institution and the technology transfer agencies/ agents.
5. Some research output are not responsive to the needs of the industry
6. Target clients are in remote and isolated islands making it difficult for the field technicians or even print materials and radio broadcast to reach them
7. Transportation and communication in fishing communities are relatively poor.

Inspite of the above mentioned problems, fisheries information dissemination to the fisheries industry is being carried out by the BFAR and the Department of Agriculture extension workers.

BFAR ORGANIZATIONAL STRUCTURE
(AS REORGANIZED)

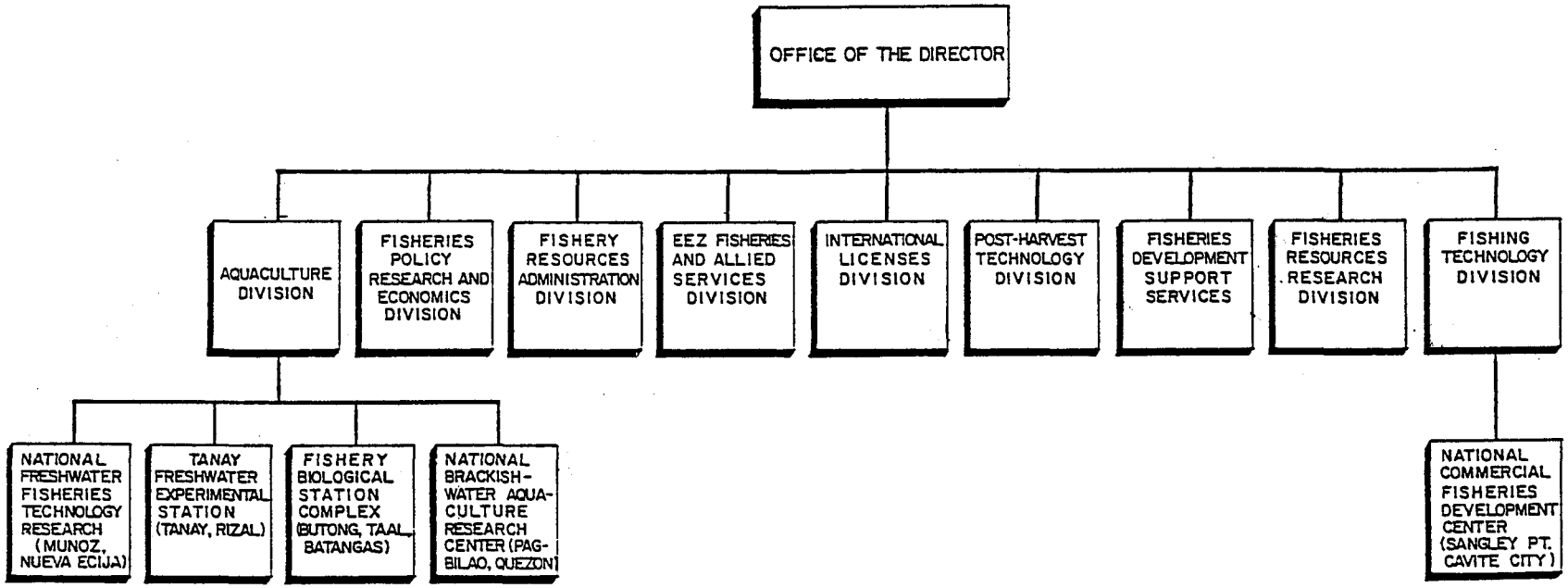

FIGURE 1

ORGANIZATIONAL CHART
FISHERIES DEVELOPMENT SUPPORT SERVICES DIVISION

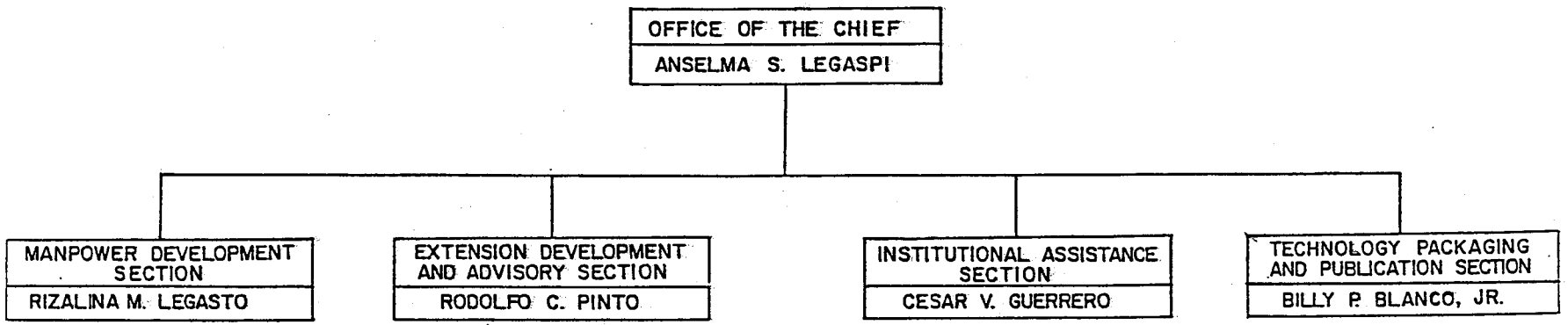

FIGURE 2

FISHERIES TECHNOLOGY FLOW CHART

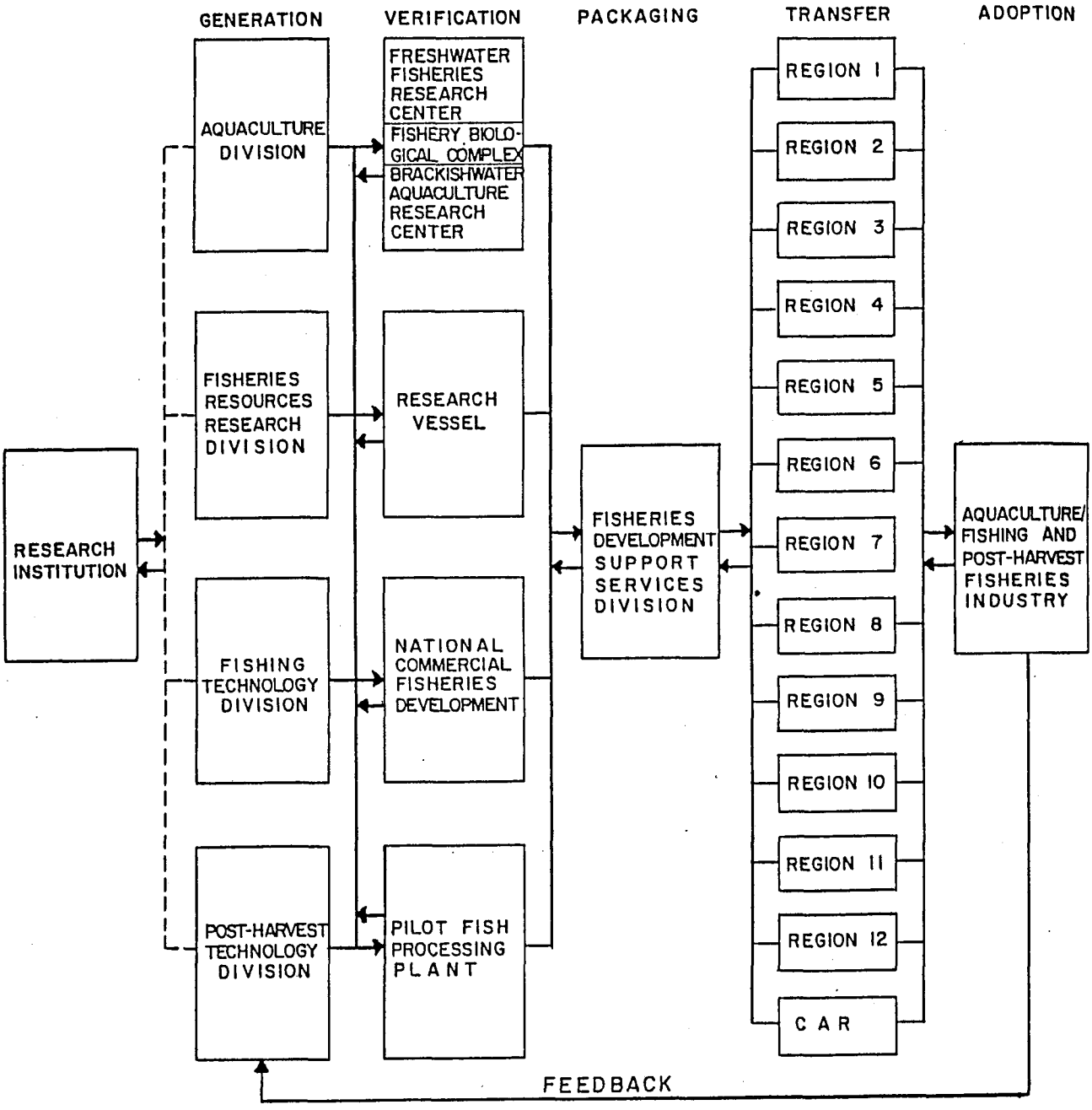

FIGURE 3

Annex 9

THE PHILIPPINE COUNCIL FOR AQUATIC AND MARINE RESEARCH AND DEVELOPMENT (PCAMRD) AND ITS NATIONAL INFORMATION PROGRAM[1/]

By

Julia B. Pantastico and Teresita A. Natividad[2/]

1. BACKGROUND INFORMATION ON THE PCAMRD

The Philippine Government established the Council under the Department of Science and Technology (DOST) by virtue of Executive Order No. 128 which became operational in January, 1988. As mandated, PCAMRD takes charge of the country's R and D in fisheries and aquatic resources in the: 1) formulation of the national program; 2) coordination and monitoring of projects; 3) gathering of database for various end users; and 4) packaging and dissemination of mature technologies.

Based on the foregoing, the Council is actively involved in a national information program on fisheries and aquatic resources that is aimed at strengthening the science community and spreading the benefits of research and development.

1/ Presented at the Second Seminar on Fisheries Information Science in Southeast Asia sponsored by SEAFDEC, Imperial Hotel, Bangkok, Thailand, 7-10 February 1989.

2/ Director and Information Specialist respectively, Research Information and Utilization Division, Philippine Council for Aquatic and Marine Research and Development (DOST), Los Baños, Laguna, Philippines.

2. THE AQUATIC RESOURCES MANAGEMENT INFORMATION UNIT (ARMIU)

In pursuing its mandate, PCAMRD established the ARMIU in July, 1988. This information unit on fisheries and aquatic resources is envisioned to produce an immediate impact on the regionalization of R and D efforts in the country. Being the first of its kind in the Philippines, ARMIU is benefiting various sectors in terms of:

2.1 Regional dissemination of information on fisheries and aquatic resources.

This provides a solution to the existing imbalance in the information flow among the 12 regions in the country. The regions gain direct access to research results and aquaculture technologies through publications, computerized data bank and media.

2.2 Accelerated technology implementation in the regions.

With a highly efficient information system coupled with technical backstopping and close monitoring, technology application up to the grass-roots level becomes highly successful.

2.3 Economic upliftment of the rural poor.

Information on gainful livelihood projects in the countryside are encouraging fisherfolks to start their own backyard ventures. They are now able to augment their meager income in this way.

2.4 Heightened awareness among Filipinos on the need to protect our fishery and aquatic resources.

ARMIU initiated an information campaign on the need to save the coral reefs and increase the productivity of the oceanic waters, coastal and estuarine areas and mangroves.

ACTIVITIES

The National Aquatic Resources R and D System (NARRDS) including private sector and specialized agencies in the Philippines are provided with timely and updated information by ARMIU. The following services are covered in the national information program:

3.1 Research information system in fisheries and aquatic resources.

This includes processing and compilation of approved, completed and on-going researches funded locally or with foreign counterpart. This information is important to avoid duplication of efforts and optimize use of existing manpower and physical resources.

3.2 Literature search in fisheries and aquatic resources.

This information storage and retrieval system is computerized to facilitate literature search in journals, monographs, books, thesis/manuscripts etc.

3.3 Regional Fisheries Technology Information System.

Matured technologies are processed, packaged in layman's language and immediately disseminated to members of the NARRDS as well as private sector. This is in support of the government's all-out campaign to encourage entrepreneurship.

Technology updating is also a major focus in the national information program. The fast pace of development for some export commodities like prawn (Penaeus monodon) require constant monitoring. Modern methods of farming, availability of high quality feeds and marketing trends are some of the most-awaited publication needs of industry.

3.4 National Fisheries and Aquatic Resources Manpower Systems

Directory of available manpower in the NARRDS is being compiled for publication. Expertise to conduct researches relevant to fisheries and aquatic resources are identified. Availability of consultants in the aquatic sciences is also made known for local and foreign assignments.

A summarized listing of database which are being prepared for storage in the ARMIU's computer system is found in Table 1. These are categorized under the three technical divisions of PCAMRD: Aquaculture and Inland Fisheries Division, Marine Fisheries Division and Aquatic Resources Management and Oceanography Division.

4. STRATEGY FOR INFORMATION DISSEMINATION

4.1 Organizational Structure and Information Flow.

With the ARMIU as the focal point in disseminating information on the national level, members of the NARRDS consisting of State Colleges and Universities, research agencies and extension agents are given the necessary information inputs through broadcast and print media. Seminars are conducted on a monthly basis dealing with timely issues and recent advances in the aquatic sciences. The technical divisions of the Council also conduct workshops and conferences.

The NARRDS consists of 4 national centers, 6 regional centers and 34 cooperating stations spread out all over the 12 regions of the country (Fig. 1a & 1b). In addition, specialized agencies and private sectors are included in the system.

With the very limited resources of ARMIU at present, it could hardly cope with the information needs of NARRDS. ARMIU is relying heavily on using existing communication channels of the Department of Science and Technology. The information flow is depicted in Fig. 2.

4.2 Publication Lines.

During the last year ARMIU produced three types of publications specifically addressed to the needs of the scientific community as well as industry and fishfarmers in the various regions of the country.

4.2.1 PCAMRD WAVES

A quarterly newsletter in English which highlights current issues, developments and information on all aspects of fisheries and aquatic resources R and D. It includes bibliographies on recent library acquisitions and notices of meetings, conferences/workshops/seminars.

4.2.2 PCAMRD's "AGOS KAALAMAN" (CURRENTS)

A weekly publication featuring important issues and new aquaculture technologies. This is written in Filipino for easy understanding of fishermen, fishfarmers etc.

4.2.3 "BALITANG MANGINGISDA" (FISHERMEN'S BULLETIN)

A monthly publication which focuses on industry problems, protection and conservation of the aquatic environment and technology updates. This is also written in Filipino for the consumption of ordinary fishfarmers etc.

4.3 Collaboration with other Agencies.

4.3.1 Science and Technology Information Institute (DOST).

The STII has been extending assistance to ARMIU thru library loans, current awareness and selective dissemination information. Considering that both STII and ARMIU are under the Department of Science and Technology, sharing of facilities is often resorted to whenever necessary.

4.3.2 Technology and Livelihood Resource Center

A Memorandum of Agreement with the above government corporation provides for the implementation of a comprehensive technology dissemination and promotion program. Video courses on aquaculture technologies, practical guides, manuals, handbook etc. are being prepared jointly to accelerate this outreach program.

5. FUTURE PLANS

The ARMIU as an effective information arm of PCAMRD is envisioned to grow and expand in the next five years. This is in line with the Philippine Development Plan (1988-1992) which underscores the need to expedite technology flow for commercialization. In support of the plan, ARMIU shall undertake the following activities:

5.1 Strengthen the information processing unit to come up with computerized bibliographic searches etc.

5.2 Foster cooperation and linkages with national and international agencies.

5.3 Provide training of information personnel in the NARRDS on recent developments in Information Technology as well as standardization of basic indexing and abstracting procedures.

5.4 Provide referal services to identify experts and agencies for specific information needs.

5.5 Establish document delivery services for members of the NARRDS.

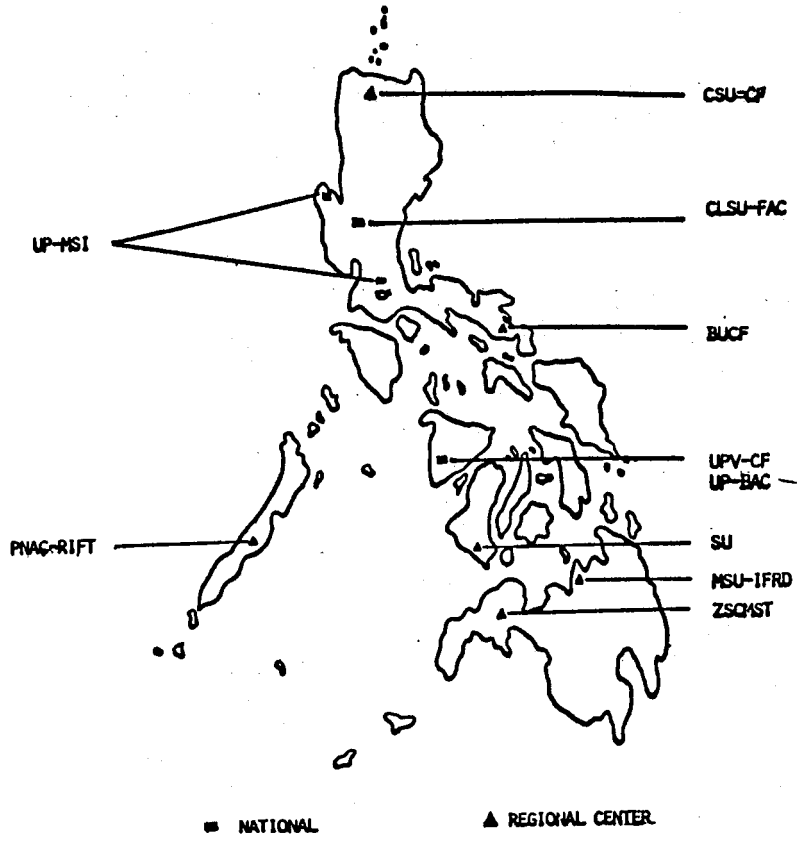

Figure 1a. National and Regional Centers for Aquatic Resources Management and Information Unit (ARMIU).

National Centers

UP-MSI - Univ. of the Philippines Marine Science Institute

CLSU-FAC Central Luzon State Univ. Freshwater Aquaculture Center

UPV-CF - University of the Phils. in the Visayas

UP-BAC - University of the Phils. Brackishwater Aquaculture Center

Regional Centers

CSU-CF - Cagayan State Univ. College of Fisheries

BUCF - Bicol University College of Fisheries

PNAC-RIFT - Palawan National Agr. Coll. Regional Inst. of Fisheries and Technology

SU - Silliman University

MSU-IFRD - Mindanao State University Institute of Fisheries Research and Development

ZSCMST - Zamboanga State College of Marine Science and Tech.

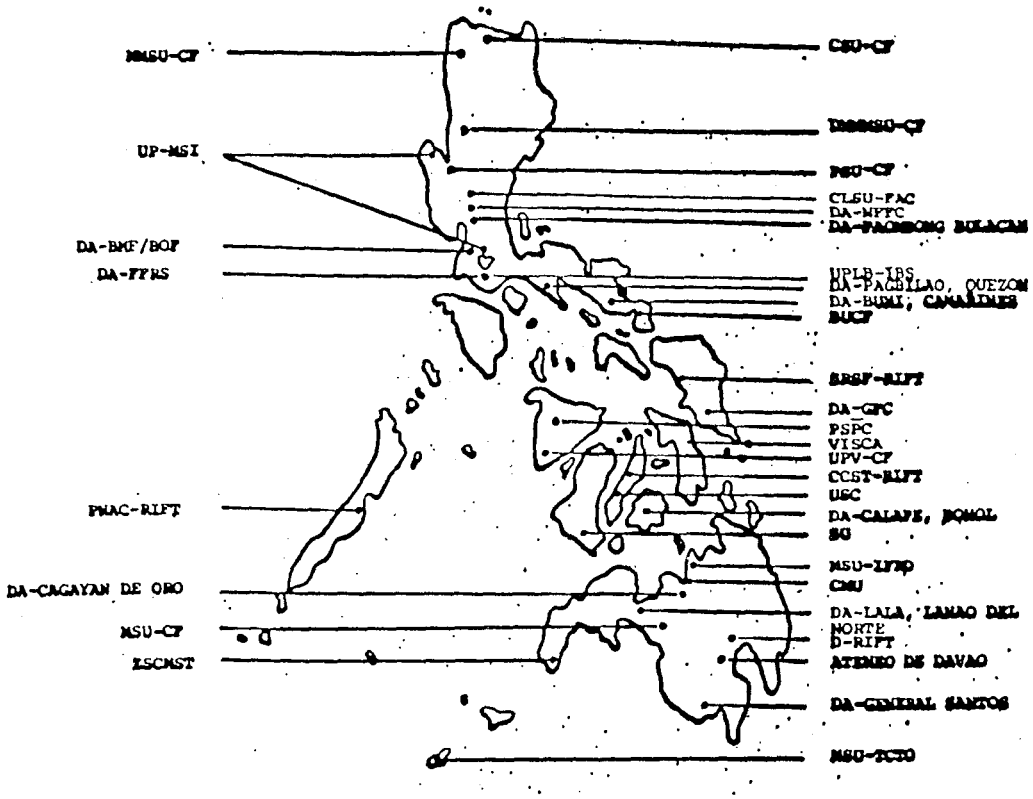

FIGURE 1B. COOPERATING STATIONS FOR AQUATIC RESOURCES MANANAGEMENT AND INFORMATION UNIT (ARMIU).

CSU-CF - Cagayan State University
College of Fisheries

DMMMSU-CF - Don Mariano Marcos Memorial
State University
College of Fisheries

CLSU-FAC - Central Luzon State University
Freshwater Aquaculture Center

MMSU-CF - Mariano Marcos State University
College of Fisheries

PSU-CF - Pangasinan State University
College of Fisheries

PNAC-RIFT - Palawan National Agricultural
College
Regional Institute of Fish. Tech,

UP-MSI - University of the Philippines
Marine Science Institute

UPLB-IBS - University of the Philippines
at Los Banos
Institute of Biological Sciences

BUCF - Bicol University College of Fish.

SRSF-RIFT - Samar Regional School of Fisheries
Regional Institute of Fish. Tech.

PSPC - Panay State Polytechnic College

VISCA - Visayas State College of Agriculture

UPV-CF - Univ. of the Philippines in the Visayas
College of Fisheries

USC - University of San Carlos

SU - Silliman University

CMU - Central Mindanao University
Musuan, Bukidnon

MSU-IFRD - Mindanao State University
Institute of Fish. Res. & Dev.

MSU-TCTO - Mindanao State University
Tawi-tawi College of Technology &
Oceanography

MSU-CF - Mindanao State Univ.
College of Fish.

ZSCMST - Zamboanga State College
of Marine Sci. & Tech.

D-RIFT - Davao Regional Institute
of Fish. Technology

DA - Department of Agricultu
National Freshwater
Fisheries Center

- Pagbilao, Quezon
- Pacabong, Bulacan
- Buhi, Camarines Sur
- Freshwater Fisheries
Research Station
Los Banos, Laguna
- Binakayan Mussel/Oyster
Farm
Binakayan, Cavite
- Guian Fishery Complex
Guiuan, Eastern Samar
- Calape, Bohol
- Lanao, Del Norte
- Cagyan de Oro City
- General Santos City

CSCT-RIFT - Carmen State College
of Technology-RIFT
Carmen, Cebu

Ateneo de Davao

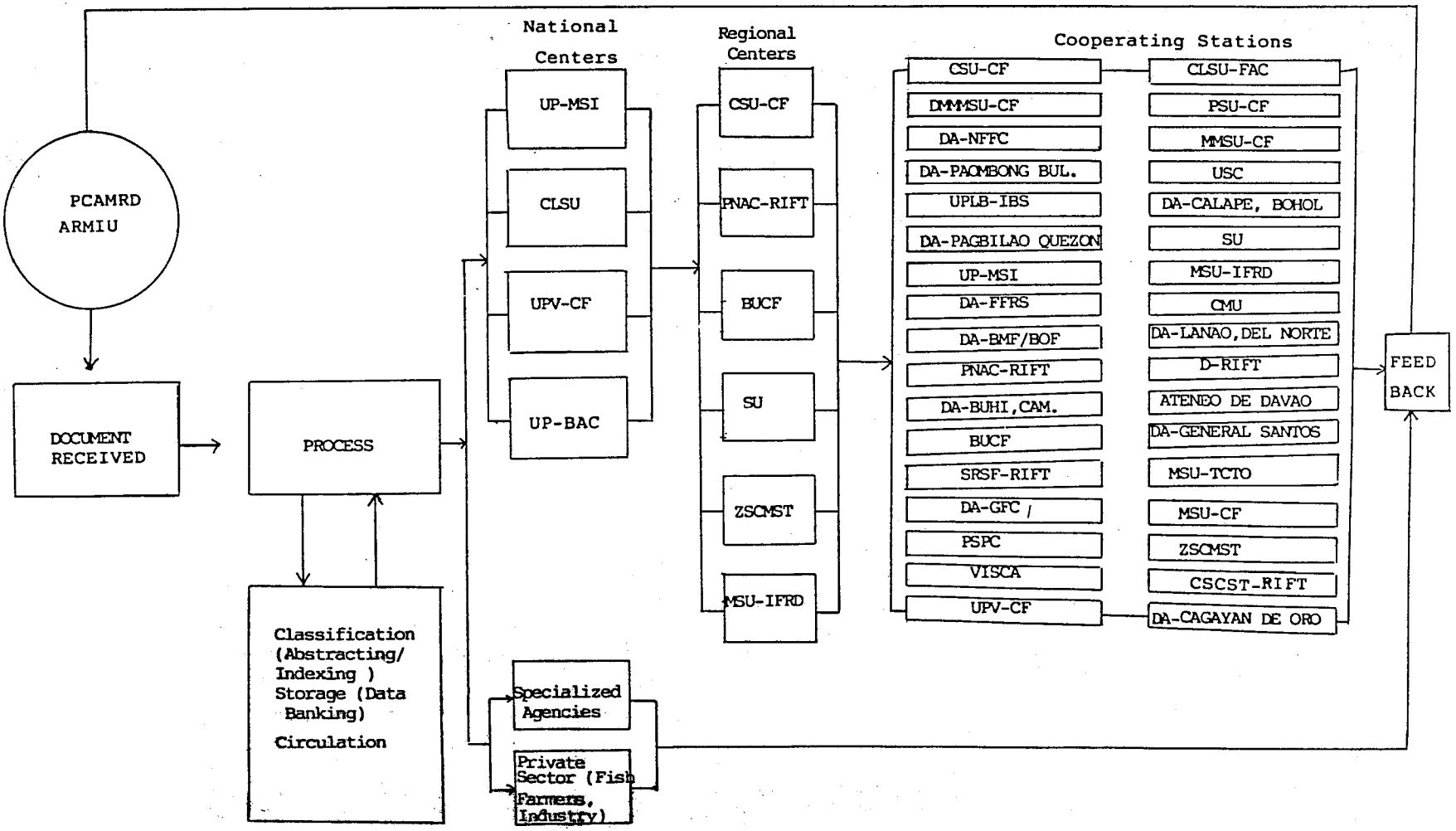

Figure 2. Information Flow in the National Aquatic Resources Research and Development System (NARRDS).

Table 1. DATA TO BE STORED IN THE ARMIU'S COMPUTER SYSTEM

A. Marine Fisheries

1. Abstracts of Technical papers/Reports (State of the Art and Bibliography) by Research Area
2. Directory of Experts/Scientists
3. Directory of Ongoing and Completed Researches by Commodity, by Implementing Agency and by Source of Fund
4. Marine Fisheries Division Mailing List
5. Demographic Data on Fishing Communities
6. Marine Fisheries Statistics
7. Mangrove Development Program of the National Marine Research Network
8. Seasonality, Distribution and Abundance of Important Fisheries in the Various Fishing Grounds
9. Production by Gear of the Various Fishing Grounds

B. Aquatic Resources Management and Oceanography

1. Directory of Researches by Status, by Agency, by Commodity, etc
2. Directory of Manpower in the Network
3. Directory of Available Literature, References by Commodity/ Research Areas
4. Terminal Reports
5. Coastal Resources Management Strategies such as:
   a. Searanching
   b. Artificial reefs
   c. Open water stocking
   d. Habitat restoration
   e. Seagrass transplantation
   f. Marine parks development
6. Oceanographic data
7. Remote sensing data

C. Aquaculture/Inland Fisheries

1. Directory of projects by status, by agency, by commodity, etc.

2. Directory of manpower in the network

3. Directory of available literature, references by commodity by research areas

4. Terminal reports

5. Commodity profiles

   a. Technology packages
   b. Production statistics
   c. Resource base
   d. Economic analyses

6. Directory of support services and facilities

   a. R & D institutions
   b. Fishfarmer/fishermen associations
   c. Hatcheries by region
   d. Commercial farms by region
   e. Consultancy firms
   f. Training facilities for various aquaculture areas/ disciplines
   g. Suppliers of aquaculture material/equipment
   h. Exporting and trading firms
   i. Post harvest and processing facilities

Annex 10

The Establishment of the Philippine Aquatic Sciences and Fisheries Information System (PASFIS)

EXECUTIVE SUMMARY

A. Introduction

In December 1982, a National Consultative Workshop on the establishment of a National Fisheries and Marine Sciences Information Network representing 34 institutions, and sponsored by the Ministry of Natural Resources (MNR), the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the University of the Philippines in the Visayas (UPV), unanimously agreed on the need to develop a national information system in fisheries and aquatic sciences. That workshop provided broad guidelines for the development of such a system and appointed a ten-agency working group to develop a detailed proposal for its implementation. The resulting development plan was for an information system to be called the Philippine Aquatic Sciences and Fisheries Information System or PASFIS, to be established within the University of the Philippines in the Visayas as an independent program, with funding to be provided by both UPV and other agencies.

B. Objectives

The long term objective is the development of an aquatic sciences and fisheries information system for the Republic of the Philippines.

The over-all objectives of the PASFIS program are:

1. To develop an information system (PASFIS) based initially on existing infrastructure in the 13 regions, which will coordinate the various information systems and services; develop the areas of strength, identify and correct deficiencies within the system and services; and interact productively with international and regional information systems and programs.

2. To provide development planners, policy makers, entrepreneurs, industrialists, extension workers, researchers/scientists, fish farmers, municipal fishermen and KKK participants with reliable and timely information and data at reasonable cost.

3. To ensure that the specialized and professional knowledge and expertise on aquatic sciences and fisheries available within the country and elsewhere in the world will be effectively and efficiently utilized in guiding the development of aquatic-related sectors in the national economy.

4. To obtain public and private sector collaboration and financing of the system components.
5. To ensure cohesiveness and sustained growth of the components of the system by formulating and prescribing guidelines for assigning areas of responsibility, financial arrangements and coordinating machinery in conformity with the country's development objectives and plans.

C. Expected Outputs

1. Regular information services to the private sector in the forms of searching-service, packaging of information in forms usable by the fishfarmers and dissemination of technology through popular publications.
2. Regular production of basic information tools - abstract journals and current awareness materials - as well as special subject monographs.
3. Preparation of national PASFIS inventories dealing with development and research activities carried out nationwide.
4. Preparation by the lead center and by commission to other agencies of "value added" publications, such as reviews and digests, aimed at managers, policy-makers, extension workers, etc.
5. Use and adopt appropriate international standards, codes and guidelines in information management.

6. Closer interaction/cooperation between PASFIS and other existing national/regional and international fisheries and aquatic sciences documentation and information centers.

7. Training of information personnel/technicians in the various aspects of fisheries information handling and management as well as of users of information systems and services.

D. Organization and Management

UPV as Lead Center

The operation of the PASFIS shall be performed by a network of coordinating and cooperating institutions headed by the national or lead center within the University of the Philippines in the Visayas. Its locale shall enable the national center to utilize the UPV's existing library and computer facilities. On the other hand, the existence of the national center shall greatly bolster the present collection capability of UPV.

As an independent entity within the UPV, it shall maintain a separate budget and could be endowed from external sources directly. At the initial stages of its development, much of its housekeeping functions, i.e., recruitment, staffing, accounting, auditing, procurement, etc., shall be integrated with the existing offices within the UPV. It is envisioned, however, that at the later stages of the planned period, some of the functions performed for it by the host institution will be devolved to the lead center. As the funding

operations of the lead center stabilize, the continuing support shall be incorporated into the regular budget of the UPV.

The PASFIS lead center, shall be headed by a Director, and shall have the following functions:

1. Administration and coordination
2. Monitoring and evaluation to ensure quality control and feedback
3. Resource generation and allocation
4. Information generation and packaging
5. Manpower development and training
6. Linkages with regional, national and international information centers
7. Publication of PASFIS outputs

Sub-Centers

Twelve sub-centers have been tentatively identified. These will comprise the support network to the lead center, serving as an intermediate conduit for PASFIS operations and management. These sub-centers will ensure that information requirements of users and member agencies are served through a smooth flow of information to and from various sources.

The proposed sub-centers are the following:

National Capital Region (NCR) - Bureau of Fisheries and Aquatic Resources

Region 1 (Ilocos) - Mariano Marcos State University

Region 2 (Cagayan Valley) - Cagayan State University

Region 3 (Central Luzon) - Central Luzon State University

Region 4 (Southern Tagalog) - Palawan National Agricultural College

Region 5 (Bicol Region) - Bicol University

Region 6 (Western Visayas) - University of the Philippines in the Visayas (National or Lead Center)

Region 7 (Central Visayas) - University of San Carlos

Region 8 (Eastern Visayas) - Samar Regional Institute of Fisheries Technology

Region 9 (Western Mindanao) - Mindanao Regional Institute of Fisheries Technology

Region 10 (Northern Mindanao) - Xavier University

Region 11 (Southern Mindanao) - Davao Regional Institute of Fisheries Technology

Region 12 (Central Mindanao) - Mindanao State University

The above institutions have been proposed as sub-centers in view of their meeting the following requirements: adequate library/ information services; accessibility; and current involvement in aquatic sciences and fisheries research and development activities.

Personnel

A total of 19 position titles headed by a Director and an Executive Director will be required for PASFIS operations. The UPV Chancellor becomes the ex-officio Director of PASFIS. Administrative and day-to-day operations shall be the responsibility of the Executive Director.

Governing Board

PASFIS shall have a Governing Board, chaired by the Ministry of Natural Resources and co-chaired by the University of the Philippines in the Visayas and the following institutions as members: National Economic and Development Authority (NEDA); National Science and Technology Authority (NSTA); Ministry of Agriculture and Food (MAF); and Private Sector.

The Governing Board shall outline the general policies of PASFIS and will be responsible for operations pertaining to funding. It will meet every quarter.

PHILIPPINE AQUATIC SCIENCES AND FISHERIES INFORMATION SYSTEM

(PASFIS)

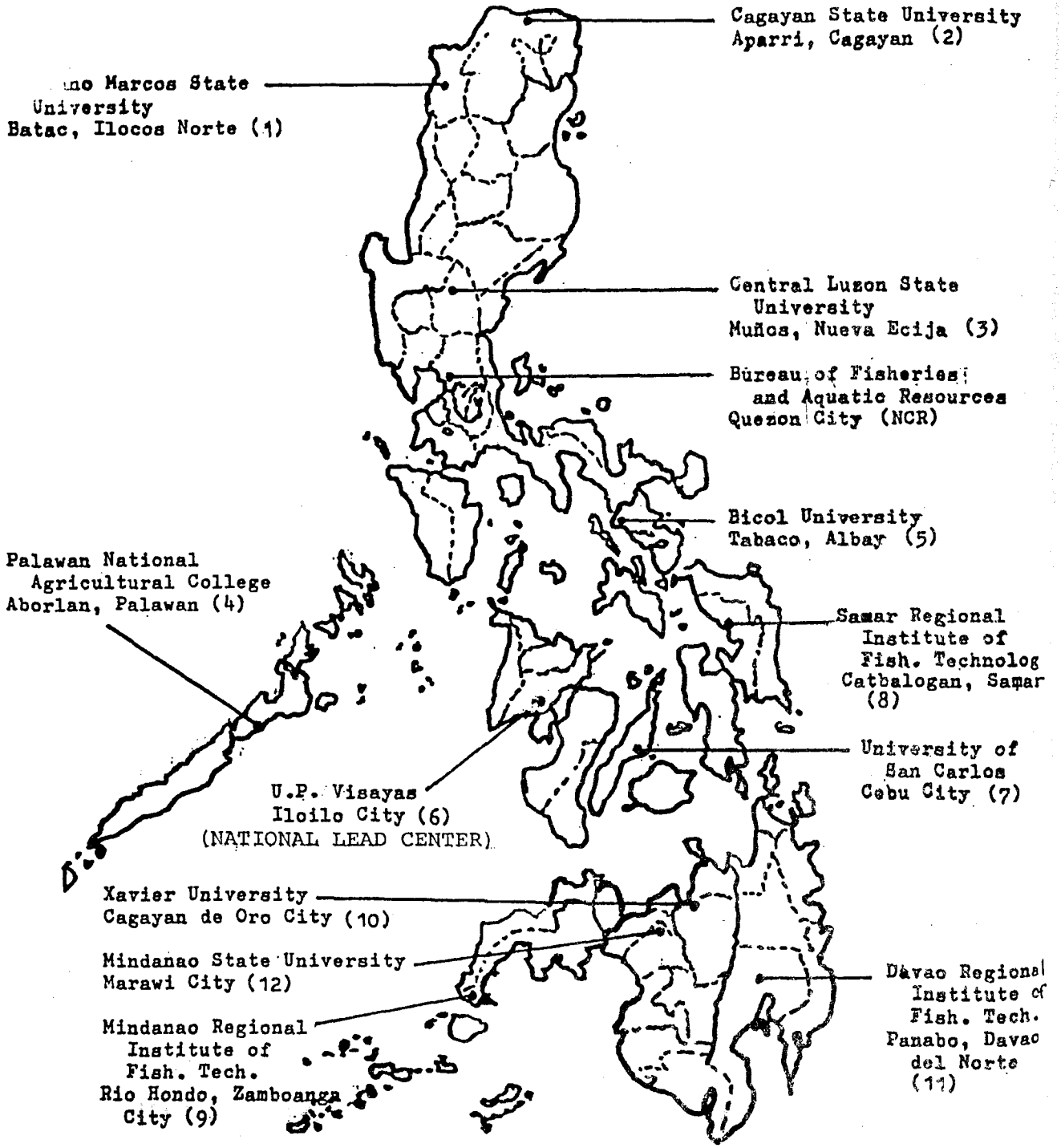

Figure 1

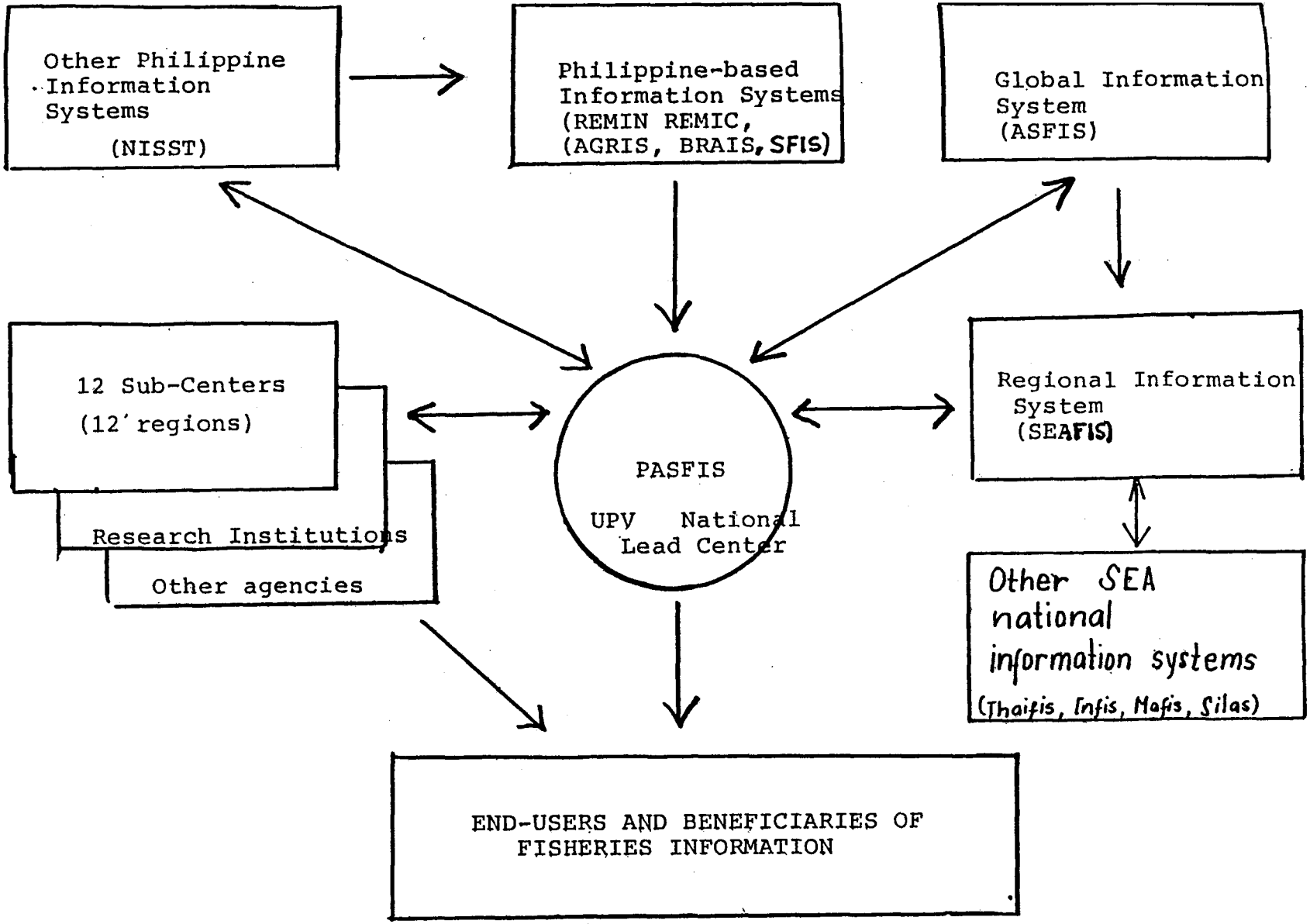

Figure 2, Inter relationships between PASFIS and national/regional information systems.

WORKPLANS/ACTIVITIES

YEAR 0

1. Training of anchor person and back-up staff on ASFIS and SEAFIS methodologies.
2. Submission of revised development proposal and review of the same by proposed funding agency.
3. Initial assessment of lead center's resources and capabilities including the information needs of the Philippine fisheries (private sector).
4. Liaison with national and international centers for information exchange and other collaborative undertakings.
5. Formulation of programs for the initial operating period of PASFIS.
6. Intensive training and observation tours of lead personnel in operations and management of existing national and regional information systems, e.g. INFIS, SEAFIS, BRAIS.
7. Training of cooperating institutions designated as sub-centers for PASFIS on methodologies of the system.

YEAR 1

1. Identification of support personnel for the lead center and sub-centers.
2. Visit to sub-centers.
3. Publication of extension materials for the private sector.
4. Preparation of national bibliographies.

YEAR 2

1. Provision of reference services, current awareness services, and other information activities.
2. Promotion of PASFIS and its services through participation in workshops, seminars, and other activities.
3. Development of bibliographic data base and services in coordination with SEAFIS.
4. Provision of information analysis activities.

YEAR 3

1. Publication of PASFIS monographs and reviews.
2. Provision of referral services at the national and regional levels for the sub-centers and initiation of the PASFIS function as information clearinghouse for fisheries and the aquatic sciences.

YEAR 4

Full operation of PASFIS.

Initial evaluation of the system.

YEAR 5

Continuous operation of PASFIS

Expansion of information activities and services.

Annex 11

THE MARINE AFFAIRS & AQUATIC RESOURCES INFORMATION SYSTEM (MAARIS)

By

Lalitha Dias Bandaranayake

Director Information

NATIONAL AQUATIC RESOURCES AGENCY

(NARA)

SRI LANKA

SEAFIS SEMINAR ON FISHERY AND AQUACULTURE INFORMATION IN SOUTHEAST ASIA

Bangkok, 7 - 10 Feb. 1989

BACKGROUND

The successful completion of the UN Law of the Sea Convention endowed Sri Lanka with jurisdiction over 25 times the sea area as land. In 1981 the National Aquatic Resources Agency (NARA) was set up to fulfil the need for institutional structure and to develop technical expertise for surveying these resources. Around 1982, a need was felt for the establishment of a national information system capable of providing the information necessary for the management of the resources of this extended Exclusive Economic Zone of Sri Lanka. The Marine Affairs and Aquatic Resources Information System (MAARIS) which commenced operating this year at NARA is a direct result of this. MAARIS is funded by two international organizations, namely IDRC & ICOD.

The International Development Research Centre (IDRC) of Canada which has established its role as one of the few agencies in South East Asia supporting development research in fisheries, devotes a significant portion of its annual budget to information programmes. The idea being the information generated by development research if not properly handled get misplaced and becomes a perishable commodity in the development process. NARA as an organization contributing significantly in terms of development research and seeking to enhance the dissemination of knowledge in fisheries focussed the attention of IDRC to lend its support for the setting up of MAARIS.

The International Center for Ocean Development (ICOD) was established in 1985 as a Crown Corporation in Canada with a mandate to promote and facilitate transfers of technology, information & expertise on a "South-South" basis. Thus ICOD attempts where possible to focus assistance at the regional level. MAARIS being a concept which integrates institutional and national priorities and needs that could easily be expanded upon to meet regional needs, ICOD funds the Extension/Outreach unit of MAARIS.

ORGANIZATION OF THE SYSTEM

The objectives of MAARIS is the collection, storage, repackaging and dissemination of information useful for the development of aquatic resources and marine affairs in Sri Lanka. Its activities to be progressively broadened from national to regional and international coverage. For this purpose 'information' is defined as published & unpublished products of analysed and recorded data, in documentary, audio-visual or electronic form. Once these objectives are realised we should have a fully operational Marine Affairs & Aquatic Resources Information System (MAARIS), as an effective mechanism for controlling documentation, data, and technical information.

The progressive steps in the establishment of this system are as follows:

1 The establishment of an automated national repository and research library in marine affairs.

2 Create a computerised data base of national marine & aquatic resources literature, which could provide search and bibliographic output services with back up document delivery services.

3 Establishment of a Documentation Unit which could process, repackage & publish the information gathered, at national, regional & international level. Reports, abstract ing journals, Directories, Leaflets & Information packages are output of this division.

4 Establishment of an Extension Services Unit to provide current awareness and out reach services to the user community.

MAARIS has 3 functional units. The library, Documentation & Extension. Transfer or dissemination of technical information now make use of all relevant means of communication. The medium of storage of information has changed over the years. The development technology in information goes hand in hand with development technology in communication and cannot be considered separately. As the medium of storage determines the form of inputs and outputs of any information system, this has been taken well into consideration in the designing of MAARIS. The overall mandate of dissemination of information is shared by all three units at different levels of communication, the library to its visitors, documentation unit through mailings, and the extension unit by production of audio-visual and its outreach activities.

The system would harness all bibliographical information available in the country on marine affairs through its contacts that have been already established with all relavent libraries in the country. A national depository library and a data base housed at NARA is the most significant contribution that is made by MAARIS to the management of aquatic resources and marine affairs in Sri Lanka.

Under MAARIS the library will make an attempt to collect and store all national literature which comes within the purview of aquatic resources and marine affairs, with retrospective effect. The bibliographical information pertaining to these, both published and unpublished documentation, will be recorded with an abstract, and indexed under a subject heading from the ASFIS thesaurus. These recordings, computerised, will constitute the MAARIS national data base. Computerised literature searches, bibliographies, abstracting journals are some of the outputs from this data base.

The activities of the MAARIS project made it necessary for us to move into more spacious accomodation with better reader facilities arrangements and, holdings divided into "Subject Bays". This is being done with the appreciation of the need for speed in retreiving the material for quick reference in the limited time available to the researchers in this discipline who are mostly on the field.

Documentation Unit, manned by an Abstractor and a Publication Officer, analyse the information gathered by the library, to compile bibliographies, directories, information packages etc., which are now in great demand. Inclution of aquatic resources and marine affairs related subjects in the school projects from last year has increased the demand on the NARA library with repeated requests for "take away information packages". Fortunately this need was foreseen in the designing of MAARIS and we hope our information products to be put out would satisfy the information needs of the schools. Communication by mail of these information products is the second level of communication utilised for dissemination of information.

The third unit of MAARIS, the extension unit is designed to take, the dissemination of information a step further; in reaching out to the users in their own place of work or study. The information collected and repackaged by the other two units would be translated into a more useful way to the user concerned, such as the fish culturist, the sea-food exporter, the fisherman, and even the housewife and the children in schools. Outreach activities such as talks, demonstrations, exhibitions and film shows make use of AV material such as posters, charts, video- films and documentaries, designed and produced as outputs from this unit. The latter will be based on information generated by the research done at NARA. Public awareness activities such as the education of the public on conservation of wetlands, corals, mangroves, turtles and marine mammals are given high priority in its dissemination programme. Thus MAARIS utilizes a combination of paper and electronic based elements for organizing information.

CURRENT STATUS & ACTIVITIES

MAARIS project commenced in Jan. 1988, with recruitment of staff and installation of the computer facilities. As computer hardware had reduced in price MAARIS was very fortunate, that with the same amount of money available in the project for the computer requirements for the data base, the purchase of a fully operational desk-top publishing system with all relevant hardware and software, was also possible.

This desk-top publishing system is capable of providing "lay-out" of documents by use of "Ventura" desk-top publishing software with a camera ready copy of the document printed by use of a Laser Beam Printer, to be used as "art-works" for printing. This eleminates the time consuming task of type setting, saving time and money in printing and publishing our information out puts. The NARA journal, the cruise reports, the internal manuals, occassional papers, technical reports are some of the publications that would be published by this process.Though no provision was made for a printing facility in the project, as a result of the lay-out facilities available from the computer unit of MAARIS, by the end of 1988, it was possible to offer NARA a complete documentation service, from lay-out to printing, using the heavy duty photocopy machine available.

The MAARIS Data Base of bibliographical references with abstracts is being stored in an IBM PC micro computer using UNESCO/CDS ISIS software. In the designing of the system effort was made to conform to common formats of data-entry and communication in order to facilitate exchange between the library and the information centres within the country, regionally and globally.Though the inputs to the Data Base is considerably slow on account of the abstracting that has to be done by one of the staff in addition to her normal duties, MAARIS does have a mini data base ready for searches. Work is now rapidly proceeding towards the generation of an abstracting journal.

The housing of the computer also necessitated the expansion of the library into more spacious accomodation to house the equipment, furniture and stocks to be purchased under the MAARIS Project.The Laboratory adjoining the Library was redecorated and organized to house the computer facility, the publishing facility and staff cubicles.

The unrestricted reference facilities available to the public from the MAARIS library is being made use of presently, largely by school children. The inclusion of subjects on marine and aquatic resources in the school curricula, is bringing in an influx of school children. A demand is also being made by the parents for publications, that could be purchased, which could provide the necessary information for the children in simpler form. Two information leaflets are being prepared for this purpose, one on the 'fishing industry' and the other on 'aquatic resources' soon to be printed in the local languages, Sinhala and Tamil.

The newly appointed publications officer took over the editorial functions for the printing of the NARA journal volume 32, which has now come out in print. This unit is also handling the layout and printing of the Divisional Manuals which are restricted to internal circulation. Two information leaflets prepared by the researchers of the Institute of Post Harvest Technology (IPHT), one on 'preparation of dry fish' and the other on 'proven procedures for icing of fish", are being edited for printing in Sinhala under the MAARIS Project.

Apart from traditional services such as lending, reference, inter library loan services, and answer to technical queries normally associated with information services, the computerised literature searches and the consequent document procurement service are the highlights of this system. MAARIS make available retrospective searches from the FAO/ASFA database from Rome almost on-line by means of the CD-ROM Laser Disc technology. Laser technology though sophisticated, has cut down on time and money by saving on search time and cost of annual subscriptions to abstracting journals which are quite costly.

Users of MAARIS have now got used to the idea of requesting the procurement of reprints, of relevance to their work. This service introduced last year will be augmented with MAARIS funds which have been provided for the purchase of (NLL Coupons) from the National Lending Library of Great Britain which provides reprints of any reference to any periodical article that may be requested from it. "REPRINTS" a valuable research resource was underutilized so far. This is now being remedied, and the library reprint collection has grown at the rate of about 60 per year through exchange aggreements and requests by officers. The reprint will remain the most important supplement to the main collection of journals, and would be for a long time the most economical way to up date information with the diminishing numbers of periodical titles being subscribed each year due to the rising cost of subscription. An ernest request was made to the researchers to make use of this facility provided so that the library holdings also grows while satisfying their information needs.In addition to the SDI service of contents pages now being provided to NARA staff a Selective Dissemination of Information Service (SDI) which will provide information to every one of the NARA officers according to their profiles of interests would be initiated soon.

The proper establishment of the Extension Unit of MAARIS commenced in Jan 1988, with recruitment of staff which consistunt of an Extension officer and a Liaison officer. In addition the service of the two photo technicians of NARA were also made available to the unit.

With establishment of the unit it plunged headlong into the controversy resulting from the announcement of the proposed Coal Power Plant in Clapenburg Bay in Trincomalee, N.E. of Sri Lanka. This is one of the most beautiful and abundent habitats of marine life and a whale watcher's paradise. NARA was required to provide information on the possible and potential environmental damage from coal-fired electricity generation especially its effect on marine life. The Extension Unit initiated and provided background material for newspapers, radio and TV coverage for this controversial topic. It also completed production of a 45mt. documentary entitled "Price for Power: two sides to the question on Trincomalee coal power station".

Media coverage was also given to conservation of sea-turtles and mangroves. Contributions were also made to the press on the Ocean Drilling Program (ODP) of the sophisticated deep-sea drillship "JOIDES RESOLUTION" on its survey in the Indian Ocean.

Following TV productions were made at the Sri Lanka Broadcasting Corporation with information, background material and TV footage whenever required being supplied by the extension unit:

1. The Indian Ocean: a shared heritage
2. Managing the seas: a new perspective
3. Pulsation of life in the inter-tidal zones
4. "The lewaya" (salterns) program on Salt Corporation
5. Mangroves - a Dateline program
6. News clip on prawn farm at Kalpitiya
7. News clip on Joides Resolution, drilling vessel
8. Footage on the second standing committee meeting of the Indian Ocean Marine Affairs Co-operation (IOMAC)

A NARA photo technician is now engaged in the production of life sized models of well known species of marine fish to be exhibited in the NARA Museum and also to be used as extension materials for schools.

In Sri Lanka, a new continuous assessment scheme of education was introduced into the schools from 1988, in which children are entrusted with projects under various titles. As, 'Aquatic Resources', 'Fisheries', and 'Marine Life' are some of the more popular titles of projects, information is sought by school children on these for their assignments. As a result requests for visits of school children to NARA sometimes in batches of 50 and 100 and more are made almost every month. These visits are co-ordinated and organised by the extension unit of MAARIS. MAARIS leaflets would cover some of these topics.

Arrangements are being made for a information liaison officer of the extension unit to participate in the mobile extension program of the Ministry of Fisheries. It is anticipated that this could be the best method available for feed back on the information needs of the fishermen to MAARIS. NARA also collaborates on work that has commenced on the compilation of a glossary of fisheries terms in Sinhala, to be used in extension material. The above two projects come within the UNDP funded extension project of the Ministry of Fisheries.

For promotion of NARA activities video footage on the following have been produced:

- activities of the National Hydrographic Office (NHO)
- NARA/FAO sea weed project
- lobster and crab project
- mussel culture project

For the same purpose, preparations are being done for 1) film 2) slide show, on a script written by the extension officer and visuals and slides by the photo technicians of NARA.

PROJECTED PLANS

Library and information systems were historically based on paper. Decades of tradition helped develop, methods, standards, for handling paper work. Electronic Systems, however developed so fast that the user is left bewildered. The task which lies ahead for MAARIS is to guide the users steadily in this transition from paper to electronic systems for handling information.

Introduction of CD-ROM form of the FAO/ASFIS database to our users was a definite help in this direction. Sri Lankan researchers have now come to appreciate the value of the ASFIS and all global electronic systems thereby, interest being created now for the input of their own papers to the ASFIS data base. An indirect service available to a researcher from an information facility, hitherto not utilized by the Sri Lankan users, is the dissemination of the information generated by their own work via any information system. Thus creates interest on another user in their work, which would in turn invarialably lead to an exchange of communications with each other.The appreciation of Sri Lankan users in the ability of an information system to enable users to communicate with one another is definitely a step in the direction, of rapid information exchange.

A search of the ASFIS database has revealed only 256 papers from Sri Lanka, and only 26 from NARA, the premier national institution responsible for R & D activities in aquatic resources in Sri Lanka. MAARIS hopes to remedy this situation, as the ASFA Board at its annual meeting in 1987 recognized MAARIS centre as an ASFA Related Centre, and we hope soon to qualify to be an input centre. As mentioned earlier this is why the worksheet and other formats have been designed for the MAARIS data base in keeping with ASFIS Guidelines and the ASFIS thesaurus is used for its descriptors. The Common Communication Formats being developed by ASFIS for CDS/ISIS users would enable MAARIS to communicate its inputs even electronically.

It is proposed to expand the extension unit of NARA, to include a 'display and reception' facility to receive and introduce the current activities in marine affairs and aquatic resources at NARA and the country to the public. More and more people are making their way to NARA in search of information in this sphere. An information desk and conducted tours are being planned. Awareness programs for schools will be given priority with a program for schools to be organised at NARA every month. Each program will include about 100 school children who will spend the day at NARA familiarising themselves with the research going on and also on general awareness on this discipline. Collaboration with Zoological gardens and the Education Department will be sought in designing the 'NARA DAY' for schools. An information centre especially to serve the school children at 'Kadolkelle' a mangrove cite, (the conservation of which is being promoted by NARA), in the West Coast of Sri Lanka, is being designed. As excursion to this cite will be includeded and is envisaged to be an educational experience for school children as part of the awareness programme at NARA for their school projects.

It is realized that the need for the printing of the large volume of leaflets hand outs now necessary for the MAARIS extension activities, if done in-house would save much time and money. Therefore the present publications and printing facility would be strengthened into a fully equipped publications unit with an offset printer, plate maker, binder and laminator.A manuscript received at the documentation unit of MAARIS after editing and layout done at the computerised desk-top-publishing system would be handed over to the printing facility as a camera ready copy, for printing, assembling, binding and finishing.

MAARIS hopes to participate in regional information activities via the Indian Ocean Marine Affairs Cooperation (IOMAC) activities now being coordinated by its Secretariat in Colombo.

The Second Standing Committee of the IOMAC which met on 7-9 September 1987 had before its consideration a report of the Joint IOMAC/UNCTAD/UNDP Mission, on the establishment of a Màrine Affairs Information Network for the IOMAC Region (IOMAC- 1/A/SC/3). In approving this scheme, the Committee noted that requisite provision had been made for support of this

activity in its preliminary phase, through the proposed UNDP core support project as outlined in the IOMAC-1/A/24/Rev. 2. In order to ensure closer integration within national systems and to maintain a resource orientation, it was decided to designate the system the **Indian Ocean Marine Affairs and Aquatic Resources Information System, IO-MAARIS.**

This regional information system would create three Marine Affairs & Aquatic Resources Information & Data Processing facilities in the three IOMAC countries. One such facility now being developed with the IOMAC Secretariat in Colombo, has identified the MAARIS library as its reference library as it is housed at NARA which is the IOMAC Focal Point for Sri Lanka. The "documentation & publishing unit" of MAARIS now services the IOMAC Secretariat with regard to its documentation & printing requirements, and will continue to be the repackaging unit of the IOMAARIS Node in Sri Lanka, in this net-work.

The computerized Data Centre for IOMAARIS, which will set up the in-house data files is also to be integrated within NARA making use of already existing computer facilities. MAARIS already has capabilities in terms of equipment, personnel and expertise in programming/system design, to receive data in electronic media and disseminate it to the region. The Bibliographical Data Base of MAARIS uses internationally accepted software (UNESCO/CDS/ISIS) which ahas facilities for processing numerical data and net-working facilities. In the design of the MAARIS data-base at NARA beginning from the input sheet, provision has been made for acces and dissemination of information regionally.

MAARIS, node of this net-work at NARA, operating directly in conjunction with the IOMAC Secretariat; would when fully operational, act as a switch board service for exchange of information, for referal purposes. Though not designed as a repository, its in-house regional bibliographical data file, would contain references to publications from all IOMAC countries. A few more data-files would be set up, including a register of experts, now being processed at NARA.

Annex 12

The Fishery Information of The Department of Fisheries, Thailand

by

Ms. Sumalee Yuktanonda, Chief Administrative Officer

The National Inland Fisheries Institute

Miss Natha Rattakanokporn, Librarian, National Inland Fisheries Institute

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Introduction

Fishery information in Thailand could be obtained from two main sources that is the Department of Fisheries, Ministry of Agriculture and Cooperatives and the Faculty of Fisheries, Kasetsart University. Both institutions are not only prepare, collect and provide information and library services on fishery aspects but also use the information as well.

In the case of the Department of Fisheries, the responsible units for its information system are the Documentation and Information Unit under the Fishery Extension Division and the Libraries. As for the technical papers, the technical divisions produced that papers will be the responsible units.

Type of Information produced

Various types of information are produced in the Department of Fisheries such as Extension pamphlets , Manuals, Newsletters, Annual reports, Proceedings, Technical papers, Occasional papers. Thai Fisheries Gazette etc.

Producers of fishery information

1. The Documentation and Information Unit, Fishery Extension Division

The main function of this unit are to disseminate fishery information and to carry out public relation for the Department of Fisheries through the various media and publications. Thus activities could be described as follows.

(1) preparation of press release and press conferences, collection and compilation of news clippings on fisheries from daily newspaper and periodicals for circulation to the superior administrator

(2) Preparation of Radio Broadcasting which include writing articles on fisheries, tape recording

(3) Preparation of Television Broadcasting

(4) Preparation of articles for newspapers to publicize the accomplishment and activities of the Department

(5) Produce extension pamphlets on specialized subjects such as aquaculture, fish processing and conservation for free distribution to fish farmers

(6) Produce Department of Fisheries Newsletter, a semi-monthly publication, published for officials in the Department to inform them the activities in the Department. The Newsletter is distributied free of charge to all units under the Department. SEAFDEC has partly supported this programe by contributing ₱ 10,000 annually since 1981

(7) Other publications which are published on special occasions including annual reports.

2. Technical Divisions covering freshwater, brackishwater marine, exporation and post-harvest technology also produce the following information

(1) Technical papers which cover report on research projects in all topics in the field of fisheries and those technical papers will be published by individual technical divisions and institutes

(2) Proceedings which is subsequent to technical conferences

(3) Manual : handbooks of technical know-how in certain areas

3. National Inland Fisheries Institute (NIFI) is assigned to undertake the following activities :-

(1) Publication of Thai Fisheries Gazette which is the bi-monthy journal issued by the Department of Fisheries since 1948, contains articles on various aspects on fisheries, particularly on Thai fisheries. The annual subscription rate is ฿ 60 for Thai Officials and US $ 25 (including postage) for overseas subseribers.

(2) Technical papers which cover topic in the field of fisheries undertaken by NIFI.

Libraries Services

At present there are four libraries in the Department of Fisheries. Two libraries located in Bangkok at the National Inland Fisheries Institute (NIFI) and at the Marine Fisheries Division. One located in Phuket at the Marine Biological Center (PMBC) and another one at the National Institute for Coastal Aquaculture (NICA). These libraries work independently but in the near future when the reorganization of the Department is completed there will be only one Central library located in Bangkok but the other two at PMBC and NICA still open to provide information on new technology and technical knowledge to the research personnel working in those research institutes Each library will concentrate on each field but the working system is similarly, that is to provide library services and fishery information services. They collect information on fisheries and other related fields in the form of books, journals, technical reports, annual reports, reprint, pamphlets theses and dissertations. Services will be given to fishery officers, research personnel, fishery extension workers ., local fish farmers, students and other interested individual . Type of services are regular circulation, interlibrary loan, reference service, current awareness, circulation of new periodicals and accession list.

Thai Fisheries Information System (THAIFIS)

1. Background

The Thai Fisheries Information System (THAIFIS) was established with the support and assistance from the Southeast Asian Fisheries Development Center (SEAFDEC) under the Southeast Asian Fisheries Information System Project (SEAFIS). Under this network, THAIFIS would coordinate with

SEAFDEC Secretariat in compiling and exchanging fishery information both within and outside the region.

During 12-14 December 1984, a workshop on the Thai Fisheries Information System was organized by the SEAFDEC Secretariat in Bangkok to formulate a long term plan for the establishment and operation of a national fishery information network as an integral part of the SEAFIS. The workshop has agreed that the Library of the National Inland Fishery Institute (NIFI) of the Thai Department of Fisheries would serve as the National Center for THAIFIS. Consequently, NIFI Library was designated as the national focal point on thai fisheries in 1985. At present, the system has sixteen participating libraries. The list of the libraries is appended to this paper.

2. Operation

The first activity carried out by THAIFIS was to collect and compile existing literature, both published and unpublished, on the aquatic resources and the fisheries of Thailand. The bibliographic citation system was developed for computerization with the assistance of Mr. Ronald Needham, Editor in Chief of the Aquatic Sciences and Fisheries Abstracts (ASFA) who served as SEAFIS Project Advisor at that time.

THAIFIS has requested the cooperation from the participating libraries in submitting their acquisitions list and slips of new arrivals for inclusion in the THAIFIS Acquistion List.

However, due to budgetary constraint, limited personnel and lack of knowledge in computerization, SEAFDEC has assisted NIFI in paying for a temporary librarian to work with the NIFI librarian and also funded for operating supplies and equipment during the beginning period.

3. Service

The first bibliography produced by THAIFIS is "Thai Fisheries Bibliography 1981-1985" which contains materials on aquatic resources and fisheries issued during the period stated. The next volume covering the years 1976 to 1980 is still in print. It is hoped that another volume of the bibliography containing literatures published before 1976 will be compiled and printed in the near future.

THAIFIS Acquisition List is issued bi-monthly containing titles of new arrivals on aquaculture and fisheries of Thailand of the sixteen participating libraries.

The documents are prepared for the use of academician, research workers, and interested persons in searching for literature on fisheries of Thailand and related fields.

4. Future Projects

4.1 Compilation of directory on fisheries trade in Thailand, to collect names of hatchery, exporters and local salers, fish feed manufacturers, local distributors and frozen fisheries exporters etc.

4.2 Establishment of a data base on fisheries information resources in Thailand, to collect names and addresses of organizations, agencies, and individuals.

4.3 Establishment of a data base on specialized subjects on fisheries of Thailand to assist the researchers and academicians in searching for research topics and for problems solving.

From time to time, THAIFIS has received inquiries on these subjects but unable to provide accurate information. Therefore, these projects would serve the requirement of the users, whether they are businessmen, researchers, or laymen.

5. Problems

5.1 Lack of Publicity

THAIFIS is not widely known becouse the informations are published in English language so there are limited number of users. Thus the services of THAIFIS are not fully utilized.

5.2 Lack of Personnel

NIFI Library which serves as the national center for THAIFIS has only one librarian who is already occupied with the work of the Library. A temporary librarian was hired only for a short period at the beginning of the operation. This matter is being solved by requesting for assistance from the other two librarians of the Department of Fisheries. A training Programme was convened for the two librarians so that they could perform the tasks for THAIFIS.

5.3 Budget Constraint

NIFI Library, the focal point of the System is only a unit in the National Inland Fisheries Institute which is the research institute so major portion of the budget will be used for research work and the library receives very limited funding support so some programme could not be developed as planned

Although THAIFIS faces with the afore-mentioned problems, it has tried its best to fulfill its objectives. It is hoped that with the strong support of SEAFDEC and of the Department, the THAIFIS could be strengthened to perform its tasks completedly and provide more services to the users.

List of Participating Libraries to THAIFIS

APPENDIX

Library
Bank of Agriculture & Agricultural Cooperatives
469 Nakhon Sawan Road
Dusit, Bangkok 10300
Thailand

Library and Documentary Service Division
National Research Council of Thailand
Bangkhen, Bangkok 10900
Thailand

Thai National Documentation Centre
196 Phahonyothin Road
Bangkhen, Bangkok 10900
Thailand

Academic Resource Center
Chulalongkorn University
Phyathai Road
Bangkok 10500
Thailand

Main Library
Kasetsart University
Phahonyothin Road
Bangkhen, Bangkok 10903
Thailand

Library
Faculty of Fisheries
Kasetsart University
Phahonyothin Road, Bangkhen
Bangkok 10903
Thailand

Main Library
Ramkhamhaeng University
Ramkhamhaeng Road, Huamark
Bangkok 10240
Thailand

Main Library
Thammasart University
Taphrachan Road, Phranakorn
Bangkok 10200
Thailand

Library
Faculty of Economics
Thammasat University
Taphrachan Road, Phranakorn
Bangkok 10200
Thailand

Library
Srinakharinwirot University
Eastern Campus, Bangsaen
Chonburi 20131
Thailand

Institute of Marine Science
Srinakharinwirot University
Bangsaen, Chonburi 20131
Thailand

Library
FAO Regional Office for Asia and the Pacific
Maliwan Mansion
39 Phra Atit Road
Bangkok 10200
Thailand

Faculty of Natural Resources
Prince of Songkla University
Hatyai, Songkla 90110
Thailand

Mekong Documentation Centre
Mekong Secretariat
Pibultham Villa, Kasatsuk Bridge
Bangkok 10500
Thailand

Phuket Marine Biological Centre
P.O. Box 60
Phuket Province 83000
Thailand

Marine Fisheries Division
89/1 Chareonkrung Road
Yanawa Bangkok 10120
Thailand

Annex 13

THE FISHERIES INFORMATION SERVICE OF RAPA

The FAO Regional Office for Asia and Pacific (RAPA) covers 30 countries in the Region which produce 42 percent of the world's fish production. One of its functions is to monitor and report major development trends in food and agriculture, including fisheries, in the Region. In carrying out this function RAPA collects, produces and disseminates information to different countries. The servicing of fisheries information at RAPA is undertaken by 2 units, namely: 1) the Fisheries Section and 2) the RAPA Library. This paper summarizes the activities carried out.

1) The Fisheries Section

The Fisheries Section of RAPA is a very small unit and comprises two professional officers, the Regional Fishery Officer and the Regional Aquaculture Officer, a Technical Assistant and two secretaries. The Section is also the seat of the Indo-Pacific Fishery Commission Secretariat which has been active in dissemination of fisheries information since the establishment of the IPFC in 1949. The information dissemination activity of IPFC was carried out on a quite extensive scale in its early years upto the establishment of the FAO Fisheries Department in Rome in the mid 1960's. At that time the IPFC had a specific budget and a bigger staff posted in Bangkok. After the establishment of the FAO Fisheries Department some of the IPFC activities relating to servicing of fisheries information were transferred to the Fisheries Department. At present, there is neither a separate budget nor full-time staff assigned for the IPFC in RAPA. The Technical Assistant works part time on the servicing of fisheries information mostly by supplying copies of papers/reports, etc. and limited search/photo copying upon request, in addition to the servicing of sessions of the IPFC and some of its subsidiary bodies.

The types of materials distributed are classified into a) IPFC publications and b) RAPA publications concerning fisheries. These are referred to below.

A worldwide mailing list which includes about 700 addresses of government fisheries departments, research institutions, libraries, museums, etc. has been built up over the years on the basis of exchange of IPFC publications. As a result of this, a large collection of reference materials, fisheries papers, reports published by non-FAO sources has been accumulated. These materials were earlier kept in the Fisheries Section but are now kept in the RAPA library for proper cataloguing and filing. This mailing list also serves as the basis for the distribution of IPFC publications.

An average of over 500 requests for information/publications are received annually by the IPFC Secretariat and the Fisheries Section and every effort is made to provide the information. In cases where requests for reference materials on specific subject matters are not available at RAPA, these are referred to the FAO Fisheries Department

library in Rome for on line-bibliographical retrieval from the FAO data base.

a) IPFC publications

The Indo-Pacific Fishery Commission has been instrumental in the development of data and information. The Commission, with 19 member countries, conducts regular sessions every two years to review the state of development of the fisheries of the Region, the problems involved and the needs of its member governments for fisheries management and development. The proceedings of these sessions are published and distributed on the basis of the worldwide mailing list of the Commission. Copies of working papers presented at IPFC Sessions are kept in file and are provided on request.

IPFC also conducts symposia in conjunction with most of its sessions on a wide variety of topical fisheries subjects identified by the Commission. Reports of these symposia and the papers presented are published and distributed.

In addition to these publications, reports of meetings of the six IPFC Subsidiary Bodies are published and distributed to member countries and are also available upon request.

A collection of all IPFC publications is maintained by the IPFC Secretariat. The publications are available for reference.

Fishery Reports, Technical Papers, Fisheries Statistical Yearbooks, etc. published by the Fisheries Department in Rome are also available with the Secretariat. These are available for reference but not for distribution.

A list of recent IPFC publication is given in Appendix 1.

b) RAPA publications

From time to time RAPA publishes and distributes reports/studies on fisheries subjects of topical interest generally based on the work of consultants. RAPA also publishes reports of seminars, expert consultations, etc. organized by RAPA. A list of recent RAPA reports relating to fisheries is also given in Appendix 1.

2. RAPA Library

The Library contains over 16,000 titles in the field of agriculture, fisheries, forestry, and related subjects, 300 periodicals, maps, pamphlets, microfiches, etc. Out of this total, books, serial periodicals, etc. directly relating to fisheries comprise about 1,500. The subject coverage includes fishing technology, fisheries biology, oceanography, limnology, aquaculture, post-harvest technology, fisheries socio-economics and stock assessment, mostly concerning the Asia and Pacific Region.

Some of the publications are obtained by purchase, though a large number are acquired through exchange and gifts.

The Library also keeps a special collection of FAO reports, projects reports, documents from United Nations bodies and related international research institutions.

The services offered by the library are as follows:

a) Information on publications

i) issue of a monthly list of library accessions;

ii) issue list of periodicals received by the library; for in-house circulation

iii) preparation of bibliographies upon request;

iv) circulation of publications to RAPA Officers.

b) Making publications available

i) loan from the library collection;

ii) interlibrary loan;

iii) placing of acquisition requests; and

iv) photocopying service.

Appendix 1

A List of Recent IPFC Publications:

1. Report of the 5th Session of the Committee for the Development and Management of Fisheries in the South China Sea, Bangkok, Thailand, July 1985.

2. Report of the 3rd Session of the IPFC Working Party of Experts on Inland Fisheries and Workshop on Strategies for the Management of Fisheries and Aquaculture in Mangrove Ecosystems, Bangkok, Thailand, June 1986.

3. Report of the Twenty-second Session of IPFC, Darwin, Australia, February 1987.

4. Report of the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia, Darwin, Australia, February 1987.

5. Volume of papers presented at the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia, Darwin, Australia, February 1987.

6. Report of the 5th Session of the Standing Committee on Resources Research and Development (SCORRAD), Darwin, Australia, February 1987.

7. Report of the Seventh Session of the IPFC Working Party on Fish Technology and Marketing, Bangkok, Thailand, April 1988.

8. Report of the 4th Session of the IPFC Working Party of Experts on Inland Fisheries, Kathmandu, Nepal, July 1988.

9. Report of the 7th Session of the IPFC Working Party of Experts on Aquaculture, Bangkok, Thailand, August 1988 - (in press).

10. Report of 6th Session of the Committee for the Development and Management of Fisheries in the South China Sea, Manila, Philippines, December 1988 - (in press).

A List of Recent RAPA Publications Relating to Fisheries:

1. Aquaculture in Asia-Pacific Region, 1983

2. Fisheries Sector - National Development Plan Strategies of Developing Countries in Asia-Pacific Region, 1984.

3. Marine Small-scale Fisheries of the Maldives, 1986.

4. Marine Small-scale Fisheries of Indonesia, 1986.

5. Directory of Marine Fisheries Training and Education Institutions in Countries Bordering the Bay of Bengal, 1986.

6. Field and Laboratory Investigations into Ulcerative Fish Diseases in the Asia-Pacific Region, 1986.

7. Report of the Expert Consultation on Ulcerative Fish Diseases in the Asia-Pacific Region, 1986.

8. Fishermen and Fishing Communities in the Asia-Pacific Region, 1987.

9. Seaweed Culture in the Asia-Pacific Region, 1986.

Annex 14

INFOFISH

INFOFISH Information System

by

Ichiro Kano
Economist
INFOFISH

Presented at SEAFIS Seminar
on Fishery and Aquaculture
Information in Southeast Asia

organized by SEAFDEC
Bangkok, Thailand
7-10 February 1989

- contents -

I. INTRODUCTION

INFOFISH is unique in a sense that

(i) as the name shows, it deals with only information on fish and fishery products

(ii) all compiled fishery information, e.g. import/export prices of fishery products, quantities and values of imports/exports, cold storage holdings and production are directly channelled to the fishery industry, i.e. importers, exporters, processors, etc

(iii) selling information to the industry is the major source of revenue for the organization and will become dominant in a few years

(iv) the terms of reference of the organisation is very specific to promote fishery exports from developing countries to developed countries within the region through information dissemination.

II. WHAT INFOFISH IS ALL ABOUT

INFOFISH, an intergovernmental organisation specialising in marketing information and advisory services for fish products in the Asia/Pacific region, has been in operation in Kuala Lumpur, Malaysia since July 1981. It was established to promote trade in fish and fishery products from and within this region.

INFOFISH collaborates closely with the network of similar services established by FAO throughout the world - in Latin America (INFOPESCA), Africa (INFOPECHE) and the Arab World (INFOSAMAK). It also has direct access to GLOBEFISH, the computerised system of fish marketing information maintained by FAO at its headquarters in Rome.

INFOFISH provides several services, namely:

(i) **The Trade Promotion Service** assists the day-to-day fish trade by identifying new marketing opportunities and new sources of supplies for companies in the Asia-Pacific region.

The INFOFISH Trade News (published fortnightly) which contains current information on prices and market trends.

(ii) **The Technical Advisory Service** provides technical information on all post-harvest aspects of fisheries plus basics on fish farming. It covers fish handling and processing, quality control, packaging plant organisation and hygiene, fish inspection and training.

- The Fish Inspector (published quarterly) aimed at promoting international cooperation among fish inspection services and providing general information.

(iii) **The Marketing Information Service** provides regular information on world and regional fish markets through.

- The INFOFISH International (published six times a year) focusing on market trends, new products, processing equipment and other post-harvest aspects of fisheries as well as harvesting features.

- Special studies on products and markets

- Fish Exporters and Importers Directory.

III. INFORMATION SYSTEM AND RESOURCES OF INFOFISH

INFOFISH collects information regularly from the following sources:

(i) Market News Correspondents (40)
(ii) National Liaison Offices (10)
(iii) Non-member governments (10)
(iv) Other FAO fishery marketing projects (3)
(v) FAO Headquarters
(vi) Periodicals (140) and books

Besides, regular visitors and correspondences provide us with additional and latest information. The information is compiled and analysed by three divisions before being disseminated mainly via three periodicals to the following:

(i) Fishery Product Traders (500)
(ii) National Liaison Offices (10)
(iii) Other Governmental/International Agencies (10)
(iv) Companies related to the fishery industry (7,000)
(v) FAO Headquarters.

The following information resources are maintained and updated at INFOFISH:

(i) Importers, Exporters Register in and outside the region (2,000)
(ii) ITN subscribers list (770)
(iii) II subscribers list (7,500)
(iv) Consultant register (600)
(v) Equipment register (1,500)
(vi) Fish Inspector subscribers list (600)
(vii) Audio visual library (slides/videotapes)
(viii) Fishery library (140 periodical plus books)
(ix) 200 statistics tables (1983 to date) in the INFOFISH computer.

IV. GLOBEFISH COMPUTERISED DATA BASE

INFOFISH offers access to the resources of this computerised data bank of fisheries information, operated by FAO headquarters in Rome. GLOBEFISH presents detailed information for medium to long term analysis, on the market situation of commercial species, and publishes the quarterly "GLOBEFISH Highlights" on the basis of this information.

GLOBEFISH is a computerised data base which can be easily accessed by users through a data terminal equipment.

The data base consists of several sections such as:

- Statistics
- Price information
- Factors influencing supply
- Factors influencing demand
- General fishery news
- Other trade related information

Total datalines are currently about 120 000.

INFOFISH and three other FAO regional projects, INFOPESCA, INFOPECHE and INFOSAMAK, are responsible for information collection in their respective areas. Information is obtained through their liaison offices, correspondents and governments and industry connections.

Once the information is stored in the data base, key words can be typed on a computer terminal to access specific information. And within seconds, all the required information will appear on a screen or be printed out.

It is intended that INFOFISH and other regional market information services will eventually make the system accessible to private companies and other institutions, probably for a fee to cover the costs of collecting and processing the information in the data base. Users who are unable to access GLOBEFISH directly, due to telecommunications or other reasons, may be able to obtain the information in printed form from INFOFISH or the other regional marketing services. However, due to the lack of availability of access services through personal computers in many countries, this service has not yet been realised.

From the past 5 years experience, the following problems are evident:

(i) "Apple" as data terminal equipment was initially employed, but soon became obsolete. Presently, though data can be retrieved via an IBM-compatible.

(ii) Complicated, eas y-to-forget procedure to access the data base may be a deterrent to users.

(iii) Trial and error time to retrieve the data you want, may prove costly.

(iv) There were not many requests for this (one request per month).

FAO is currently planning the next stage i.e. replacing the host computer with IBM PC. In its proposal is stated the following:

> Problems with the keyboarding which has to be done on an obsolete MDS computer have been experienced. Some already keyboarded data was lost, misplaced, etc. The BRS input format for tables is very cumbersome. The up-dating is done only once a month, whereas for the loading, a tape has to be prepared in FAO (a process which requires half a day of staff time), mailed by courier (coasting US$87 and requiring 2-3 days in travel time), and the loading itself takes up to one week.
>
> The access to BRS host computer has improved over the past 5 years; data lines are generally better now, and noise on lines has decreased substantially. In addition, BRS is now operational 24 hours a day - but not on Sundays. However, for the access process: dialing local PTT number, inputting PTT password plus BRS number, BRS passwords, etc. is still lengthy in most countries, as autodialing modems are not available on the market.
>
> The lay-out of the out-put from the BRS databank is not very attractive, no paging is possible and it is quite difficult to see at one glance the important issues of the document. Headlines of the news items could not be searched and printed. Revision of search terms and inclusion of new search terms are quite lengthy and costly with the BRS host computer.
>
> The use of the remote host for the databank creates some main problems in the final use of data. For the production of newsletters or periodical reports, the data have to be re-keyboarded. The cost for the storage of the databank has increased over the years, in addition user time costs - at present fully paid by GLOBEFISH - is running up to a substantial amount now that the number and the user-time of subscribers is increasing.
>
> Most of the above disadvantages can be overcome by storing the GLOBEFISH databank on the IBM PC in Rome.
>
> Keyboarding can be done directly on the computer (all information is searchable on the PC in Rome as it is inputted, thus no lapse of time between the keyboarding and the loading).

Users could receive up-to-date information twice a month instead of only once a month. Access is direct, therefore no lengthy dialing plus password inputting is necessary.

The lay-out can be made quite attractive by using Venture software for the design of the output. Paging is finally possible together with the printing of titles - to be used as an index to screen the information.

The final use of data is more efficient as the databank can be fed directly into programmes like Ventura, which produces graphs, newsletters, etc. Last but not least, the coast will be reduced as fees to the local PTT, leasing of modems, local telephone call, etc. have no longer to be paid by the subscribers. However, the monthly (fortnightly) courier service of the diskettes (streamers) to the different users (presently 8) will cost about US$100/month.

Thus, GLOBEFISH is presently testing the storage of its databank on an IBM PC. If the system proves to be an alternative to the BRS host computer, speed-wise and quality-wise, the options for subscribers to the *GLOBEFISH databank are:*

(i) Databank is loaded on subscriber's IBM PC (or compatible computer), thus facilitating production of news-letters, news-flashes, graphs, etc. Up-dates will come from Rome on diskettes, streamers, or other electronic means once or twice a month.

(ii) The IBM PC in FAO, Rome, becomes a host computer and subscribers access it through a modem with almost the same procedure as for BRS.

V. EXPERIENCE FROM FISHLINE

FISHLINE, a telex service started by INFOFISH in 1984. The system involved sending out compiled information on fish prices and news not through mail but through telex to the industry, which would surely cut the mailing time. The service was open to ITN subscribers only.

Data is first sent by the data equipment terminal, i.e. office computer via the telephone line to the national packet service. Then, it is relayed and stored in the main frame computer, which is operated by the computer/telecommunication service company in, eg USA. The user in any one region can get access to the main frame in USA to retrieve the data he wants, via telex.

However, this service was soon terminated in the mid-stage (1984-85). The major reasons for the failure are:

(i) The costs incurred both for the initial and operational stage were more than budgeted for. In particular, rental of the data storage space and data usage in the main frame computer had to be born by INFOFISH. This cost increased as users and usage time increased.

(ii) Rearranging the data compiled to suit the format was time-consuming.

(iii) The number of users did not increase as planned. Some of the traders simply did not have telex facilities.

As an alternative, the feassibility of setting up a service whereby users can request specific pages of the ITN via fax, is being explored.

VI. REMARKS

Based upon, the experience of the two computerised data base, namely GLOBEFISH and FISHLINE, the following remarks are noted:
For a non-commercially oriented institution,

(i) It is difficult to operate the costly system within a sound financial background. It is rather likely to run at a loss.

(ii) There is always a possibility that the information on the computer is not all that useful, perhaps rather secondary to the industry or policy makers.

(iii) Cumbersome and time-consuming procedures to follow prove discouraging for users. Thus, the number of users are inevitably limited. It is difficult to modify the system into more user-friendly.

Thus, it is prposed that, if institutions like INFOFISH pursue such system as GLOBEFISH and FISHLINE further, division of labour is to beconsidered, i.e. a non-commercial organisation collects information while a profit-maximising private institution undertakes the operation of the computerised data base.

Note: the views on the computerised data base in this paper are solely my own, not any institution's.

Annex 15

AGINFONET-SEA: A Resource for Fisheries Literature

Josephine C. Sison
Project Officer

Agricultural Information Bank for Asia

Paper Presented at the SEAFIS Seminar on Fishery and Aquaculture Information in Southeast Asia, Bangkok, Thailand
7-10 February 1989

AGINFONET-SEA: A RESOURCE FOR FISHERIES LITERATURE

Josephine C. Sison
Project Officer

Agricultural Information Bank for Asia

Introduction

In the six years since the Seminar on Fisheries Information Science in Southeast Asia held from 16-20 August 1982, the Agricultural Information Bank for Asia or AIBA has undergone significant changes in terms of structure and functions, which will be reported on in this brief paper. The 1982 seminar, which was jointly sponsored by the SEAFDEC Secretariat and the International Development Research Centre (IDRC) of Canada, brought together the existing fisheries information systems in the region at the time, and sought to see how all these could share resources and thereby avoid costly duplication of effort.

It is indeed heartening to see that in the interim, national fisheries information systems have been developed and made operational. This attests to the key role that information gathering and disseminating activities play in development programs on this important commodity.

Restructuring of the AIBA Network

In 1984, the Governing Board of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), AIBA's present institution, decided to limit the membership of the AIBA network from eight to five, namely,

Malaysia, Thailand, Singapore, Indonesia and the Philippines. This was for reasons of manageability and financial constraints, inasmuch as IDRC funding for the project had ceased by that time. It was felt that limited resources had best be concentrated on the five member countries of the Southeast Asian Ministers of Education Organization (SEAMEO).

Then in 1986, SEARCA requested for an external evaluation of the AIBA project, to which IDRC responded. One of the most significant results of the evaluation study was the restructuring of AIBA from a centrally directed network to one which is non-directed. This is because the national participating nodes have developed to such an extent that they no longer need as much outside help as they did in the early years of the network's development.

The new network that evolved was called AGINFONET-SEA (Agricultural Information Network for Southeast Asia), with AIBA now just a member of it rather than its central node. AIBA's functions vis-a-vis the other member countries remains those of coordinator, provision of training in information handling, and provision of information services, but with the last two receiving more emphasis than the first one.

The implications of this new configuration are significant on two counts: (1) AIBA now has a freer hand in pursuing an independent path of development; and (2) it exhibits the degree of maturity now attained by its member countries in the bibliographic control of their agricultural literature.

The AGRIASIA and CARIS-SEA Databases

The AGRIASIA database is composed of the agricultural scientific literature of the five member countries from 1975 to the present. It has grown to 78,513 records as of January 1989. Of this, 5,473 records are on fisheries, or 6% of the database. Outputs from the database are available in printed format which comes out quarterly, in magnetic tape, or in floppy diskettes. It can also be searched online, although not yet by remote users.

For its part, our CARIS-SEA database is a small file, composed only of 7,950 entries of on-going research in the region covering the years 1987 and 1988. Of this, 550 are on fisheries, or 6%. This is because once a research project or program is completed it would automatically be merged with the AGRIASIA file. This database is also searchable online, and updates are published annually in printed form.

Suggestions for Possible Linkages

How can the resources of AIBA and AGINFONET-SEA be made use of by users of fisheries literature in the region? The following are some ways by which meaningful linkages could be achieved:

1. **Literature Searching and Document Delivery** - since AGINFONET-SEA catches fisheries literature as part of its coverage of the broad field of agriculture, the fisheries information systems in the countries of Southeast Asia may wish to search the AGRIASIA and

CARIS-SEA databases through the following national focal points of the network in their own countries: Kasetsart University Library in Bangkok for Thailand; the National Library for the Agricultural Sciences in Bogor for Indonesia; National University of Singapore Library for Singapore; Universiti Pertanian Malaysia and Malaysian Agricultural Research and Development Institute, both in Serdang, for Malaysia; and the University of the Philippines at Los Baños and the Philippine Council for Agriculture, Natural Resources Research and Development (PCARRD), both in Los Baños, Laguna for the Philippines.

The former plan of AIBA to publish annual updates of our Fisheries Bibliography (published 1982) was abandoned in view of the continued strengthening of the fisheries information programs in each of the Southeast Asian countries as backstopped by SEAFDEC's initiatives. We still maintain, as we did then, that where resources are scarce (as they are in our region), wasteful duplication of effort has no place.

Access to copies of documents found through searches of our databases can also be greatly facilitated through the participating countries of AGINFONET-SEA. Because this is an important companion service to literature searching, our national centers strive to have all copies of documents they enter into

AGRIASIA available in their library collections.

2. **Microfiche Service** - this is another avenue through which our information network can be availed of by national and regional fisheries information systems. Microfiche offers a cheap means of document delivery, and for this reason, some of our clients (the International Center for Living Aquatic Resources Management or ICLARM) had their publications and other outputs microfiched by us. Aside from us at AIBA, each of our participating countries have fully equipped microfiching libraries with trained technicians to handle requests for microfiching.

3. **Training** - this is a growing concern of AIBA and AGINFONET-SEA, as we are increasingly being tapped for training in the more advanced aspects of information handling. Again, this is an important avenue for linkages with us. For this year alone, for instance, AIBA's training program is on the following:

    - Micro CDS-ISIS (Version 1), in May and September
    - Management of Information Centers
    - Training of Users of Scientific Agricultural Literature
    - Training on Indexing and Abstracting
    - Desktop Publishing together with applications software like Pagemaker and Ventura

Annex 16

INFORMATION ACTIVITIES OF THE BAY OF BENGAL PROGRAMME (BOBP)

BACKGROUND

The Bay of Bengal Programme (BOBP) is a regional programme of the FAO. Seven countries - Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand participate in the programme. Its main component is the project 'Small-Scale Fisherfolk Communities in the Bay of Bengal' funded jointly by SIDA and DANIDA. It began in 1987 for a duration of 5 years. It succeeds the SIDA-funded FAO project 'Development of Small-Scale Fisheries in the Bay of Bengal' which was operational 1979-86. Another BOBP component is a project on post-harvest fisheries technology executed and funded by ODA(UK). Besides, national projects such asReef Fishery in the Maldives(fundedby UNDP) also function under the BOBP umbrella.

The BOBP seeks to develop and demonstrate new technologies and methodologies to improve the conditions of marine small-scale fisherfolk. It also assists member-countries in wider-scale application of successful technologies and methodologies (See Appendix 1).

The project's basic approach is to examine major problems and constraints in small-scale fisheries which hinder improvement and development. These are tackled through pilot-scale activities undertaken on the basis of their relevance to the project's objectives; their apparent technical, economic and social feasibility; a reasonable time frame; government priorities and support. Applying solutions and findings frompilot activities is the responsibility of governments and of national agencies in member countries.

The BOBP has carried out in member-countries several score activities relating to fishing technology, brackishwater culture, extension and fishery resources. Several activities have been initiated in post-harvest technology. A sampling of past and present activities is found in Appendix 2.

INFORMATION RESOURCES AND SERVICES

Awell-equipped library helps to meetthe information needs of BOBP by establishing a knowledge base on the small-scale fisheries and the fisherfolkof member-countries. Socio-economicswith a special emphasis on women, extension techniques, fishing technology, aquaculture, fishery resources and post-harvest technologies are the main subject areas. The library has some 6000 publications; more than 1000 FAO reports and documents; plus government documents, reports and reprints on small-scale fisheries, fishing communities and community organization.

BOBP receivesseveral journals andnewsletters through subscription and exchange. A microfiche reader with printer is available; a microfiche library onappropriate technology wasacquired recently. NTIS reports and FAO fed documents in microfiche are being added. A microfiche set of all BOBP publications have been acquired.

Often BOBP activities began with literature searches and reviews to establish current knowledge on the subject. Contacts are made with scientists and institutions dealing with the subject. Database searches, bibliographies and resource investigations are undertaken to meet specific needs.

BOBP is a significant information generator. The information output includes a quarterly newsletter, Bay of Bengal News (32 issues as of date); technical reports (more than 120); audio-visuals, video programmes and photo exhibitions. BOBP's photo collection includes several thousand slides and black and white/color photographs.

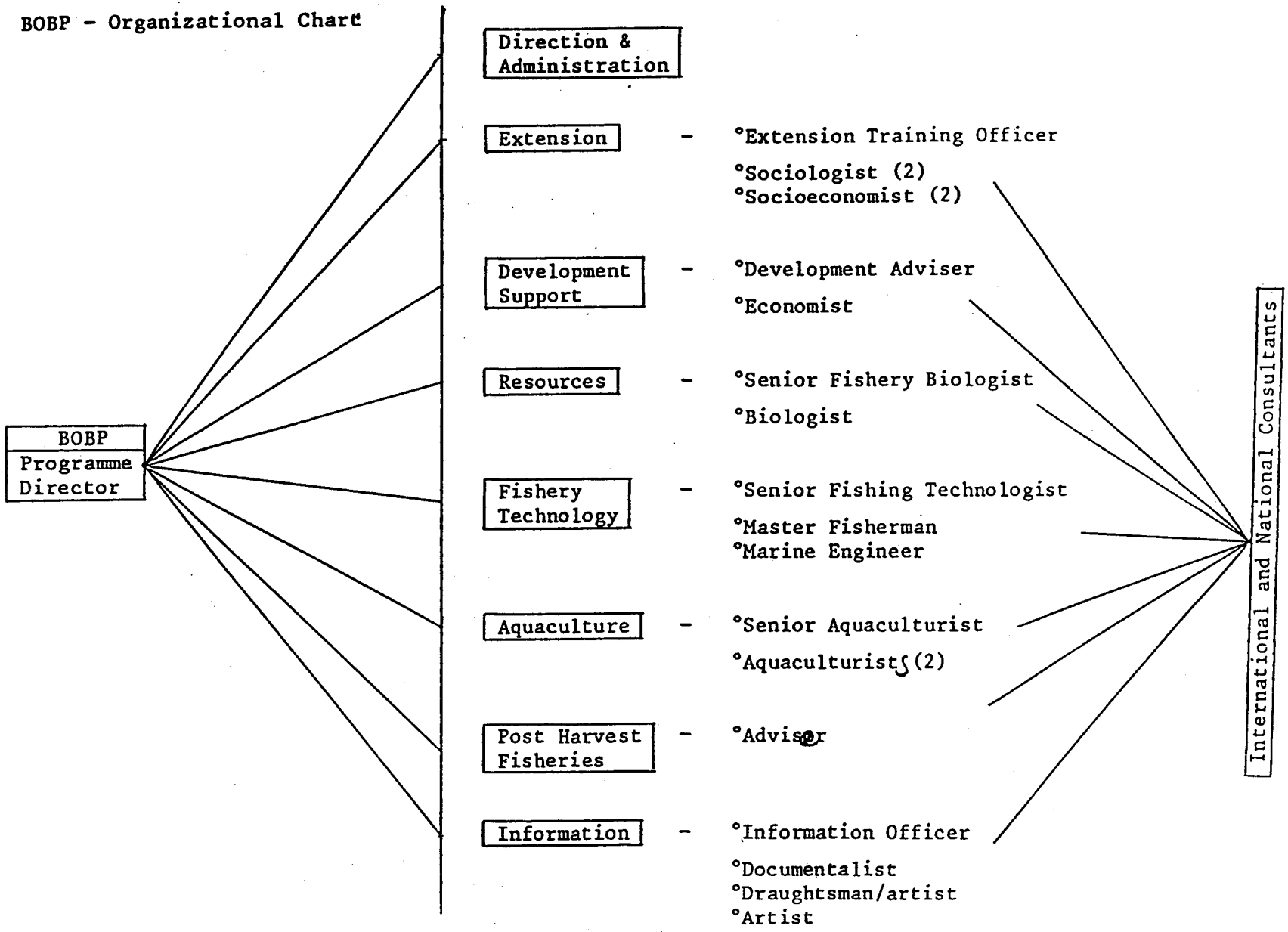
Information generated by BOBP is directed to users at various levels; researchers and scientists, planners and decision-makers, fisheries officials, mass media professionals, international development and funding agencies, fisherfolk.

A major problem faced by BOBP staff is that very often, needed information is either not available or difficult to access. Most relevant information is with government departments and research institutions; it is not published, or its availability not publicised. When published, the information is generally not distributed or disseminated as a matter of routine, immediately after production. BOBP has exchange arrangements with most fishery institutions in the region, but their publications arenot received regularly.

Another difficulty is in getting copies of journal articles from other institutions, as information on availability of these journals (Union catalogue of serials) is sparse, and organized document-delivery procedures do not apparently exist in those institutions.

To identify ways and means of improving the information flow, a regional consultation was organized by the BOBP in October 1988. Representatives were invited from Bangladesh, India, Maldives and Sri Lanka. The consultation recommended that a regional organization should take the responsibility of developing a continually updated database of data sources in the region. BOBP has approached the SAARC Secretariat seeking its advice on coordination of effort and hopes for a positive response.

BOBP - Organizational Chart

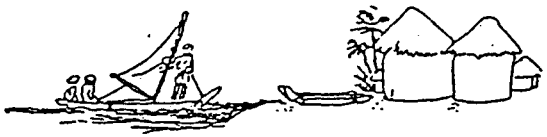


BOBP SCOPE, OBJECTIVES & INFORMATION NEEDS

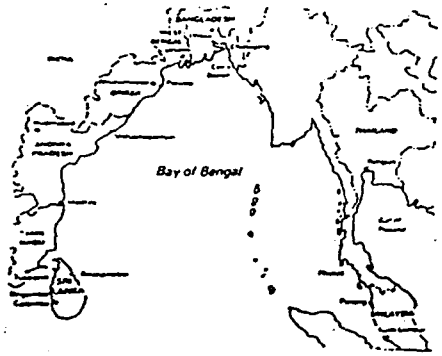
SCOPE

SUBJECT: SMALL-SCALE FISHERIES AND FISHERFOLK COMMUNITIES

ENVIRONMENT: MARINE

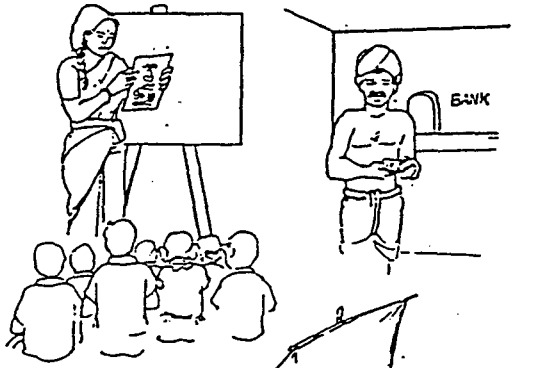


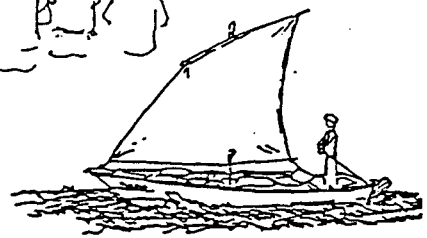
GEOGRAPHY: COUNTRIES BORDERING THE BAY OF BENGAL

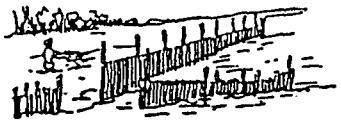


OBJECTIVES

BETTER LIVING STANDARDS FOR SMALL-SCALE FISHERFOLK THROUGH COMMUNITY ORGANIZATION AND TECHNOLOGY DEVELOPMENT







INFORMATION NEEDS

EXTENSION

TECHNOLOGY TRANSFER
DEVELOPMENT COMMUNICATION
COMMUNITY ORGANIZATION
WOMEN'S ACTIVITIES

AQUACULTURE

ENVIRONMENT/ECOLOGY
TECHNIQUES/METHODS
MARINE BIOLOGY
NUTRITION /FEED
DISEASES

FISHING TECHNOLOGY

FISHING GEARS & METHODS
FISHING CRAFT
PROPULSION SYSTEMS

RESOURCES

ECOLOGY/ENVIRONMENT
MARINE BIOLOGY/TAXONOMY
FISHERY STATISTICS

POST-HARVEST TECHNOLOGY

FISH HANDLING
PROCESSING
MARKETING

INFORMATION DISSEMINATION

COMMUNICATION TECHNIQUES & TECHNOLOGIES
TRADITIONAL AND MODERN MEDIA
FISHERFOLK-MEDIA INTERACTION

BOBP ACTIVITIES - PAST AND PRESENT APPENDIX 2

1. Finfish cage culture, Thailand : Initially demonstrated in selected coastal villages of Phang Nga province, later extended to all six provinces of Southern Thailand.

2. High-opening bottomtrawling, India : Introductionin Tamil Nadu was highly successful. It was later extended to Gujarat and Orissa by CIFNET (Central Institute for Fisheries Nautical & Engineering Training) to whom BOBP transferred the technology.

3. Credit for Small-scale Fisherfolk in Orissa : Nearly 2500 fisherfolk families in Orissa received loans worthRs.7 million in two years in the form of fishing craft, fishing gear and bicycles for marketing. The credit methodology was formulated by BOBP.

4. Non-formal Primary Education for Fisherfolk Children, Orissa : A curriculum tailored to the needs of fisherfolk children aged between 7 and 15 was formulated by BOBP; text booksfor fisherfolk children were prepared and seminars to train teachers in the use of the curriculum organized. 40 NFE centres in four coastal districts were established.

5. Non-formal Adult Education, Tamil Nadu : Booklets have been prepared for adult fisherfolk, for their teachers and animators and for the trainers ofanimators. These have provedvery popular; they are found useful for rural folk worldwide not merely for fisherfolk.

6. Beachlanding Craft, India : Nearly 200 beachcrafts designed and developed by BOBP and built at national boatyards are fishing in Orissa, Andhra Pradesh, Tamilnadu and Pondicherry. They help increase catches and incomes, and expand jobs in boatbuilding, fishing, fish processing and marketing.

7. Motorization of Chandis, Bangladesh : Initiated by BOBP in Bhola district of Bangladesh in 1981. The motorized Chandis netted catches twice as high as that of traditional Chandis. Some 50 motorized Chandis now operate in Bhola district, and the process is gathering momentum.

8. Cockle Culture, Malaysia : In cooperation with ICLARM, Manila, BOBP executed several activities to expand the knowledge base and thereby improve managementof the cockle, whichis Malaysia's chief aquaculture product.

9. Fishing Boat Development, Sri Lanka : The BOBP has redesigned andre-equipped two popular Sri Lankanfishing craft in the 30-foot operations. These are the 9.65m SRL-15 described as Sri Lanka's smallest offshore fishing craft, and the 10.3 m SRL-34. A motorized fibreglass outrigger canoe has also been designed for small-scale fishermen.

10. Resources : During 1983-86, a UNDP-funded project of the BOBP helped strengthen the capabilities of six member-countries in assessing fishery resources. The project also reviewed fishery resources of the region and current assessment and management practices. Special investigations were conducted on the hilsa, tuna and mackerel resources. During the post-1987 phase of BOBP, the work on resources is being integrated with that of the small-scale fisheries project.

Three FAO fisheryresource projects have beenimplemented with BOBP expertise in Sri Lanka and Maldives. For two of these projects (FAO/TCP), BOBP organized exploratoryand demonstration fishing to probe the abundanceof tuna in the offshore watersof Sri Lanka and the Maldives. Thethird project, reef fishery in the Maldives, is being funded by the UNDP. It will determine theabundance of reef stocks and the best way to develop the fishery with an eye to export.

11. People's Participation (PEP): is a major concern at BOBP, and a special one-year SIDA-funded project (1986-87) which consisted of field work, case studies, and consultation with fishermen's groups, concludedwith a well-attended seminar. Factors that help or hinder PEPwere systematically studied. The whole exercise may help promote a more conscious participatory relationship between projects and fish workers in the region. PEP is already an integral part of all BOBP activities.

Current activities of BOBP include:

- Design and demonstration of extension services in coastal districts of Bangladesh.
- Assistance to NGOs (non-government organizations) in India through training and technology inputs infishing technology, aquaculture and extension.
- Scheme to increase fisherfolk earnings in Langkat districtof North Sumatra, Indonesia by developing entrepreneurial capabilities in fishing, fish processing and non-fishing activities.
- Extension services for fisherfolk in Ranong Province, Thailand.
- Demonstration of beach-hauling devices in the Maldives.
- One-year study-cum-training project in Sri Lanka to design a bankable credit scheme for fisherfolk.
- Radio programmes for Sri Lankan fisherfolk, covering news, weather forecasts, entertainment and education.
- Improved technology for shrimp seed collection in coastal villages of West Bengal.
- Setting up of backyard hatcheries in West Bengal (India) and Bangladesh
- Viable technology for small-scale family based oyster farms in Malaysia.

- Seaweed culture demonstration in Ramanathapuram district, Tamil Nadu, India and Chilaw, Sri Lanka.
- A comprehensive one-year study of Kattumaram fisherfolk communities in two centres of Andhra Pradesh.

Post-harvest technology activities:

- Demonstration on the use of ice aboard Navasand beachlanding craft in Andhra Pradesh.
- Fish marketing studies in east coast states of India.
- Studyon conversion of waste fishor low-value fish at fishing harbours in east coast states of India into prawn feed, and on local manufacture of nutritionally balanced prawn pellet feed.
- Seaweed marketing studies in India and Sri Lanka.

Annex 17

STATUS OF THE INFORMATION PROGRAMME OF THE NETWORK OF AQUACULTURE CENTRES IN ASIA (NACA)

P.B. Bueno and Rebecca R. Cajilig

Introduction

In 1982, a similar forum was held -- the SEAFDEC/IDRC Seminar on Fishery Information Science in Southeast Asia. The NACA presentation focused on an account of the aquaculture information programme, then in its initial stages, and at that time part of the inter-regional aquaculture information programme coordinated by the Aquaculture Development and Coordination Programme (ADCP) of FAO Rome. The main objective of that programme was the implementation of a strategy for rapid development of aquaculture in the Third World.

Today, six years since that gathering we meet again to take stock of progress made, targets fulfilled, and projects to be developed consonant with the development of fisheries and aquaculture region-wide. The Network of Aquaculture Centres in Asia has kept pace with progress in the aquaculture sphere and, in this connection, can cite further information developments other than those mentioned in 1982. At the same time, in keeping abreast of changing priorities, the Network is also re-aligning its information objectives through the revitalization of its computerized information activity.

Overview

The purpose of this paper is to provide a comprehensive view of the information programme of the Network of Aquaculture Centres in Asia. This will require an understanding of both the nature of NACA and the objectives of the organization, particularly in promoting expanded development of aquaculture in the region.

NACA by 1990 will become a regional intergovernmental organization. The effect of this development on the information programme is mainly that it will have a wider geographical coverage and a more diverse information needs to cater to. But the planned revision in the information programme provides not so much for diversifying its services as unifying the system. This thrust is elaborated elsewhere.

Meanwhile, as a backgrounder and to place the information programme in context, NACA started as a regional project of the UNDP/FAO. It was recommended for establishment during the 1976 Kyoto Technical Conference on Aquaculture convened by FAO. As a project, it has 11 member governments, namely Bangladesh, China,

India, Indonesia, Hongkong, Malaysia, Nepal, the Philippines, Singapore, Sri Lanka and Thailand. NACA also manages another UNDP/FAO regional programme, the Seafarming Development Project, with eight member governments from the region two of which, DPRKorea and Republic of Korea are not members of the NACA Project. DPRK however has signed the NACA Agreement and ROK has strongly expressed its intention to sign, while China, Nepal, Sri Lanka, and Vietnam have signed the Agreement. This illustrates how the coverage of NACA is greatly expanded.

Very briefly, the rationale for NACA is as follows: Asia has vast and varied aquaculture resources and aquafarming systems. While it holds high potentials, fish farming among the countries in the region are at different stages if development. Because of the variety of species, farming systems and national and regional priorities, past attempts made by FAO and other organizations to attract the support of the Consultative Group on International Agricultureal Research (CGIAR) to set up an international centre for research on aquaculture had not been successful. Fish in its broadest form is unlike some major food commodities such as rice and poultry; it covers aquatic organisms in the plan and animal kingdoms, with the latter comprising bothe veterbrates and invertebrates.

Under the circumstances, FAO considered that the pooling of resources available in the region through collaboration among countries would be an effective way of expanding the development of aquaculture. It would be done by the countries sharing responsibilities in research, training and information exchange. This would allow optimum use of existing capabilities with minimum duplication of efforts. Since none of the exiisting national aquaculture institutions in Asia has all the facilities and staff needed to carry out the essential activities, and in response to national needs, a networking mechanism that would follow the principle of technical cooperation and developing countries was thus proposed to be established.

NACA aims to promote expanded development of aquaculture to increase production, improve rural income and employment, diversify farm production and increase foreign exchange earnings and savings. Collaboration among members has been perceived as a cost-effective means of pursuing the objectives.

The Network immediately addressed the following objectives: (1) conduct interdisciplinary research on selected farming systems for improvement and adaptation of existing technologies and development of new ones; (2) train core personnel; and (3) establish a regional information system to provide data for development planning, research and training. It is the third objective that is the concern of this presentation.

Objectives and Nature of the Information Programme

An information system is necessarily a supportive mechanism for research and development programmes.

NACA's information programme has three components: publications, audio-visuals in support of training courses, and a computer-based information system for numeric and bibliographic information. The exchange of information is effected in meetings and workshops, and through dissemination of materials among centres and participating institutions, within training courses and workshops and through personal exchanges among the workers. The programme aims to provide development support for planning, research and training in aquaculture. One feature of the information programme of the Network is that, as in research and training, the national and regional lead centres share responsibilities in the implementation of the information activities.

1. Publications component

The publications component of the NACA information programme consists of working papers (more than 70 to date) representing status or results of research conducted in the four Regional Lead Centres and other national aquaculture centres; the World Food Day publications series (represented by six technical manuals published to date), training reports and the Newsletter (three volumes published by the Regional Lead Centre in the Philippines; and the fourth volume published by the NACA Secretariat in Bangkok).

The working papers, manuals and other publications are intended to keep the participating governments abreast of the status of research going on in the various centres; while the manuals are intended to extend to the end-users the technologies developed as a result of continuing research. While demand for the working papers is high, circulation has been limited due to publications costs. However, the Network is making an effort to print the manuals and provide this at minimal cost to end-users (technicians, fishfarmers, and the private sector, aside from the government agencies), as part of the development objective of making information more easily available for the purpose of promoting production increases in aquaculture.

2. Audio-Visuals Production

The Project helped the RLCs strengthen their production systems for sudio-visuals and encouraged the development of slide-sets and instructional video tapes. The Regional Lead Centre in the Philippines (the SEAFDEC Aquaculture Department in Tigabuan), has prepared a number of video films on various

aspects of aquaculture. As a direct support to this activity, the Network has sponsored the training of audio-visual/training staff members of the AQD on development communication support methodologies. The Regional Lead Centre in China has produced several instructional tapes for the training course on integrated fish farming; the Regional Lead Centre in India has also completed audio-visuals on carp farming; and the National Inland Fisheries Institute (Regional Lead Centre in Thailand) also has developed short films on prawn farming.

3. AQUIS: Nature and Purpose

The Information System (AQUIS) initiated by NACA as part of a global information network was meant to generate the essential farm and technology pe4rformance data required to develop and refine farm management methods. Such data was envisioned to form the basis for developing farm management methods and would have provided producers or investors the type of information they need in planning and managing their activities. However, the AQUIS Programme was started with funding only for the essential hardware and went into operation with the optimistic expectation that assistance would be readily available in the countries to collect the nenessary data dn maintain the system. The other problem was that it attempted to cover all systems of aquaculture. A considerable amount of data was collected during the short period that the system was in operation. Data on many parts of the system were inadequate for proper analysis and conclusions.

AQUIS is the software designed for the numeric information system and MINISIS the software for the bibliographic information installed in the NACA lead centres (RLCC, RLCI, RLCP and RLCT). The hardware system is the HP-3000 minicomputer. The lead centres have also used the computer for other applications. A constraint in the AQUIS has been the difficulty in getting the data inputs. What this implies is that the data collection end has been the bottleneck.

Plans for AQUIS

The Project is now in the process of modifying the applications for the existing information system. We have, at this stage, planned the activities required to re-work the system for these new applications. We intend to revitalize the programme and use it to obtain the basic data for farm management. Its focus will be narrowed down to a few but high priority species of farming systems in the region. Studies will be carried out on a

smaller number of aquaculture systems. Special attention is proposed to be given to the following priority farming systems:

(1) Shrimp Culture
(2) Pen and Cage Culture of Finfish
(3) Carp Culture
(4) Integrated Fish Farming
(5) Mollusc Culture
(6) Seaweed Farming

The main aim in each case, and for which the information system will be targetted, is to develop technology packages suited to typical farming conditions. Data collected will be confined to farm performance indicators.

NACA's objectives in revitalizing AQUIS are to collect and analyze information on the farm performance of high priority aquaculture species, commodities and production systems to guide producers and investors in planning and managing their aquaculture production activities; and to provide an information service to the aquaculture industry by acting as a clearing house for various types of aquaculture research and industry development information in the region. The processed data will enable the identification of strong and weak aspects of farming practices used at present and guide appropriate research for develo[ping these farming practices into dependable technologies to accelerate aquaculture development.

There are two distinct but interrelated purposes of the proposed application: (1) it will serve applied research for the improvement and development of aquaculture production systems; and (2) provide an information support service to investors, planners and developers, managers as well as fishfarm operators. The same data collection and slightly different processing activities will fulfill these two purposes.

To re-orient the system towards the proposed applications and prepare for its implementation, the Network ihas on the drawing board the following activities:

1. A consultation among the heads of the Regional lead Centres and concerned staff of the NACA Coordinating Unit on this proposal, particularly to agree on the concept and decide on the set of guidelines for its implementation.

2. A regional workshop involving the appropriate Regional Lead Centre and National Aquaculture staff, representatives of national nodal centres under the Seafarming Project, and other relevant personnel for the purpose of developing and agreeing on a programme of work.

3. Re-designing appropriately the data collection form as well as the saoftware, if required, for which the services of an information systems expert will be engaged. One weakness of the AQUIS is the felt or perceived difficulty in filling up the data collection form. A well-trained enumerator would not face this difficulty; however, efforts must still be made to make it convenient for the enumerator. After all, if the bottleneck in the system is at the collection end, it is there that efforts at improving and facilitating the process should be concentrated. In any case, the existing form must necessarily be designed according to the objectives of the information system.

4. National training workshops for personnel of concerned centres and institutions thjat will be involved in the project will be conducted. NACA will not be able to field its own staff to collect all the information needed so that the collaboration of fisheries agencies in the countries will be sought for this purpose. However, it will organize training workshops for field personnel and participate in establishing procedures for data collection at the farm level.

A Unified Network Information Pogramme

The 5-year work programme for the Intergovernmental NACA has put emphasis on the collection of farm performance data to feed into both project planning and development and research on the improvement of farm management practices. Having a few but high priority farming systems to cover will, in itself, serve as a unifying factor. Nodal centres will be identified to take care of each of the farming systems which the programme will cover. This is a departure from the previous scheme in which several species, commodities and culture systems were covered by each centre. As a result, a lot of data were inputted but not enough for a meaningful analysis of individual culture systems. This new scheme should provide a focus to the information gathering effort and, obviously, service.

On another area, unifying the programme will involve the integration of the information system and development support communication component. The concept is not new, it is normally done within organizations: the information system is the main source of raw materials for the development support communication arm. Development projects usually have a built-in information system for monitoring and evaluation purposes. The idea of integrating the information system and development support communication component is to be able to precisely identify the problem areas that need information support.

Finally, unification of the network information programme means working out a scheme of sharing responsibilites and benefits. This is in keeping with the networking concept and the principle of technical cooperation among developing countries.

In the same spirit, the information programme of the intergovernmental NACA expects to work out collaborative arrangements with other national, regional and global systems. For this reason, activities of this nature are most welcome; each of us working in separate agencies and institutions but having similar, related or parallel objectives welcome this exchange of information so that the programmes we set out to do can be complementary and, even collaborative where feasible, rather than competitive or conflicting.

Annex 18

INFORMATION PROGRAMS OF SEAFDEC

INTRODUCTION

The information program of SEAFDEC has expanded rapidly since the first Seminar on Fisheries Information Science in Southeast Asia, organized by the SEAFDEC Secretariat, in collaboration with the International Development Research Centre (IDRC) of Canada, in Bangkok from 16 to 20 August 1982. Several countries in the Southeast Asian region are now cooperating with SEAFDEC to promote an effective transfer of fishery and aquaculture information both within and outside the region.

This paper presents the progress of the activities of SEAFDEC concerning the information programs which include the publication, information, and audio-visual programs being carried out by the SEAFDEC Departments as well as the information projects of the Secretariat and the Aquaculture Department, in cooperation with IDRC, i.e., the Southeast Asian Fisheries Information System (SEAFIS) and the Brackishwater Aquaculture Information System (BRAIS).

PUBLICATIONS OF THE SEAFDEC DEPARTMENTS

In general, each Department of SEAFDEC carries out an information program as part of its administrative function. Requests for information concerning its activities such as publications, training programs, etc., are dealt with by the respective Department and/or the Secretariat.

General information on the activities of the Center is provided quarterly to the general public through the SEAFDEC Newsletter, compiled and issued by the Secretariat in close cooperation with the three Departments. The current subscribers to the Newsletter include all member countries of SEAFDEC and ASEAN, and non-member countries in Asia, the Middle East, Europe, North and South America, Australia, New Zealand and Africa.

In addition, the Secretariat has compiled and published the annual official reports on the operation of the Center, the reports of the SEAFDEC Program Committee and the SEAFDEC Council meetings as well as the annual fishery statistical bulletin for the South China Sea area. Special publications on fisheries and aquaculture in Southeast Asia are prepared and published by the Secretariat as and when appropriate.

The Training Department has been issuing several series of technical documents and reports since 1975. The technical series include Text and Reference Books (TD/TRB series), Current Technical Papers (TD/CTP), Cruise and Practice Reports (TD/CPR), Joint Research Papers with Thai agencies (TD/JRT), Special Publications (TP/SP), Research Papers (TD/RES), Miscellaneous Papers (TD/MP), and Circulars (TD/CIR). The reports of various technical meetings organized by the Department have been published in the TD/RP series since 1968. However, only the TRB, RES, SP, CIR and RP series continue to be published in the interest of economy. To date, 196 titles of these documents and reports were published by the Department. In addition, 83 titles of lecture notes were published for use as in-house documents for training courses. The updated list of these publications was compiled by the Secretariat in November 1988.

As for the Marine Fisheries Research Department, technical documents published include a laboratory manual on analytical methods and procedures for fish and fish products; an inventory of fish products in Southeast Asia; a handbook on processing of surimi and fish jelly products; a report on the use of trawl by-catch for fish jelly products; and the proceedings of the Seminar on Development of Fish Products in Southeast Asia, held in Singapore in October 1987. MFRD also prepares and distributes its Library Accessions List to all interested parties for information.

As regards the Aquaculture Department, the expansion of the information and publications program led to the establishment of the Information Division of the Department in December 1986. This Division is assigned to undertake a well-coordinated system of information gathering, processing and dissemination in order to ensure effective transfer of aquaculture technologies developed at AQD to the fishfarmers and to other specialized users, as well as to intensify the exchange of information on aquaculture research among SEAFDEC Member Countries and with other organizations/agencies.

Most of the AQD scientific reports have been published in international scientific journals. The Collected Reprints of these scientific publications from 1976 to 1986 was published by the Department in 1988. Those of 1987 are being compiled and will be issued in 1989. Some specific technical reports, extension manuals and training manuals however were published and issued by the Department. AQD also issues a bi-monthly Aqua Farm News and a quarterly SEAFDEC Asian Aquaculture on current activities of the Department. In addition, AQD published the proceedings of the technical meetings organized by the Department such as Aquaculture Engineering (1977), Pen and Cage Culture of Fish (1979), Advances in Milkfish Biology and Culture (1983); Culture of Penaeid Prawns/Shrimps (1984); Prawn Industry Development in the Philippines (1984) and Aquaculture Development in Southeast Asia (1987). It is encouraging to learn that the proceedings of the 1st international conference on the culture of penaeid prawns/shrimps were translated into Japanese and published as the Japanese edition in 1988.

INFORMATION PROJECTS OF THE SEAFDEC DEPARTMENTS

The first information project of SEAFDEC was the Southeast Asian Fishery Information Service (SAFIS), which was implemented by the SEAFDEC Secretariat, in cooperation with IDRC, from April 1982 to March 1986. The objective of this project was to promote an effective linkage between fishery extension officers and small-scale fishermen/fishfarmers in the region by preparing and providing extension literature according to their requirements. By the time the project closed, SAFIS had

collected, stored and disseminated some 800 fishery extension materials from various sources and prepared 40 manuals on fishing technology and aquaculture. In addition the revised Directory of Fishery Scientists and Technologists in Southeast Asia and a Handbook for Fishery Extension Workers in Southeast Asia were published. SAFIS also formulated a network of fishery information among the Southeast Asian countries and other organizations which formed the basic structure for its successors, the SEAFIS and BRAIS projects. As noted by one collaborating organization, INFOFISH, "the SAFIS Manuals have proved quite popular with users of our Technical Information Centre, especially in the field of aquaculture. It is sad that these final publications mark the close of the SAFIS program".

The current information projects of SEAFDEC are the Southeast Asian Fisheries Information System (SEAFIS) and the Brackishwater Aquaculture Information System (BRAIS), which are supported by IDRC. These two systems are closely related but differ in their approach. Both systems however aim to provide for fishery scientists and aquaculturists a convenient and updated source of information on fisheries and aquaculture in the region.

1. SEAFIS Project

The SEAFIS concept was first submitted to the Seminar on Fisheries Information Science in Southeast Asia in August 1982. The overall objective of SEAFIS is to contribute to fisheries development by facilitating the exchange of and access to fishery information and data, as well as to share available information resources and experiences within a framework of regional cooperation. The Seminar endorsed the concept and recommended that SEAFDEC serve as a regional coordinating center to promote the establishment of referral units in the region concerned with various aspects of fishery information.

The SEAFIS project was started by the SEAFDEC Secretariat, in cooperation with IDRC, in April 1984. During its first phase, the program concentrated on developing the national networks for fishery information and coordinating these activities with other organizations, both within and outside the region. Specifically, SEAFIS aims to provide a facility which can act as an impetus to decision-making and planning for fisheries and aquaculture development. It also acts as a regional focal point and makes available pertinent information on fisheries and related disciplines or technologies. It is designed to collect, store, analyse and disseminate such information and provide access to current regional fisheries information as well as to serve as the Southeast Asian regional input center for the FAO Aquatic Sciences and Fisheries Information System (ASFIS) for a broader dissemination of fishery and aquaculture information at global level.

In implementing the SEAFIS project, it is recognized that the fishery libraries existing in the region are at different levels of development and that there is a lack of coordination not only among the countries but also within the countries themselves. Since SEAFIS is not in a position to assist all libraries, as it would wish to do if it could, the assistance to national fishery information centers provided under the program concentrates on the development of a selected library in each country. As an example, the Workshop on the Thai Fisheries Information System was organized in Bangkok from 12 to 14 December 1984 to discuss the arrangements for establishing a Thai fishery information network with its center at the NIFI Library. The development of this network, as well as computerized technology for the SEAFIS acquisition and retrieval system, then served as a pattern for other networks in the SEAFIS and BRAIS systems.

At present, the national fishery information networks in Southeast Asia that have been established and/or strengthened with the assistance or cooperation of SEAFIS, are:

1. Thai Fisheries Information System (THAIFIS), with a focal point at the National Inland Fisheries Institute (NIFI) of the Department of Fisheries, Thailand;

2. Indonesian Fisheries Information System (INFIS), with a focal point at the Directorate General of Fisheries, Jakarta, Indonesia;

3. Philippine Aquatic Sciences and Fisheries Information System (PASFIS), with a focal point at the University of the Philippines in the Visayas, Iloilo City, Philippines; and

4. Malaysian Fisheries Information System (MALFIS), in collaboration with the Fisheries Management Information System (FMIS) of the Fisheries Division, Kuala Lumpur, Malaysia.

In addition, SEAFIS, through the Secretariat, also cooperates closely with the SEAFDEC Departments and other organizations/agencies concerned with fisheries information in the region. The interrelationships between SEAFIS and national/international organizations/agencies are given in Annex 1.

The development of SEAFIS is contributing to the establishment of the regional data bases in the region for fisheries and aquaculture. In order to standardize the methodology employed in this system as well as to facilitate the information flow within the network and among the national focal points collaborating with SEAFIS, a regional training course in SEAFIS methodology was organized by SEAFIS, in Bangkok, from 22 April to 2 May 1986. SEAFIS also assisted in training national network personnel, e.g., in Thailand in July and September 1985, in Indonesia in November 1985, in the Philippines in October 1985 and December 1986, and in Malaysia in 1986.

It is envisaged that the selected national focal points and collaborating agencies in the SEAFIS network will continue to collect the current fishery and aquaculture literature published or prepared in their respective countries and make it available to SEAFIS for compilation and computerization. The compiled bibliographic records will be published as a national fishery bibliography (e.g., Thai Fisheries Bibliography 1981-1985 published by SEAFIS in December 1986) or a regional bibliography on fisheries and aquaculture in Southeast Asia. The first regional bibliography covering the 1985 literature was issued by SEAFIS in November 1988. The second volume of Thai Bibliography (1976-1980) and the 1986-1987 regional bibliographies are expected to be published in 1989.

2. BRAIS Project

The Brackishwater Aquaculture Information System (BRAIS) was started by the SEAFDEC Aquaculture Department, in cooperation with IDRC, in March 1984, to serve as a regional network of library/information centers in support of research and development on tropical aquaculture, with particular emphasis on brackishwater aquaculture.

The overall objective of the BRAIS project is to provide for the training of personnel and the organization of a specialized information center for brackishwater aquaculture at AQD.

During its first phase of operation (March 1984 to April 1989), BRAIS established a network of aquaculture information centers in Southeast Asian countries, namely: the Brackishwater Aquaculture Development Center at Jepara, Indonesia; the Fisheries Research Institute in Penang, Malaysia; the Fishery Science Society of Thailand in Bangkok; and the Philippine center for BRAIS at AQD, Tigbauan, Iloilo. These centers assist the Project in collecting and disseminating aquaculture literature in the region. The information obtained has been computerized and

compiled into specific bibliographic series. To date, twelve issues of the Brackishwater Aquaculture Bibliography were published in 1984 and 1985. Brackishwater Aquaculture Abstracts succeeded the Bibliography in 1985, with 18 issues printed from 1985 to 1988.

Specific bibliographies compiled and published by BRAIS include: (1) Sugpo and other Philippine penaeids; (2) Mud Crab Bibliography; (3) Seabass Abstracts; (4) Mussel Abstracts; (5) Grouper Abstracts; and (6) Milkfish Abstracts. In addition, the state-of-the-art review on the aquaculture of siganids was published in 1987. Reviews on tiger prawn and grouper culture are being printed by the Project. BRAIS also issues the BRAIS Newsletter and provides information on aquaculture upon request.

More details on the BRAIS project of the SEAFDEC Aquaculture Department are given in a separate working paper (SEC/SEM.89/WP 4)

AUDIO-VISUAL PROGRAMS

The use of modern audio-visual technology to assist in the training and information programs was pioneered by the Aquaculture Department in producing the video programs on aquaculture technology in the early 1980s. Documentaries consisting of 10 to 20-minute video programs on various aquaculture technologies or practices were produced to promote current awareness and stimulate interest among the public to enhance their adoption of such technologies or practices.

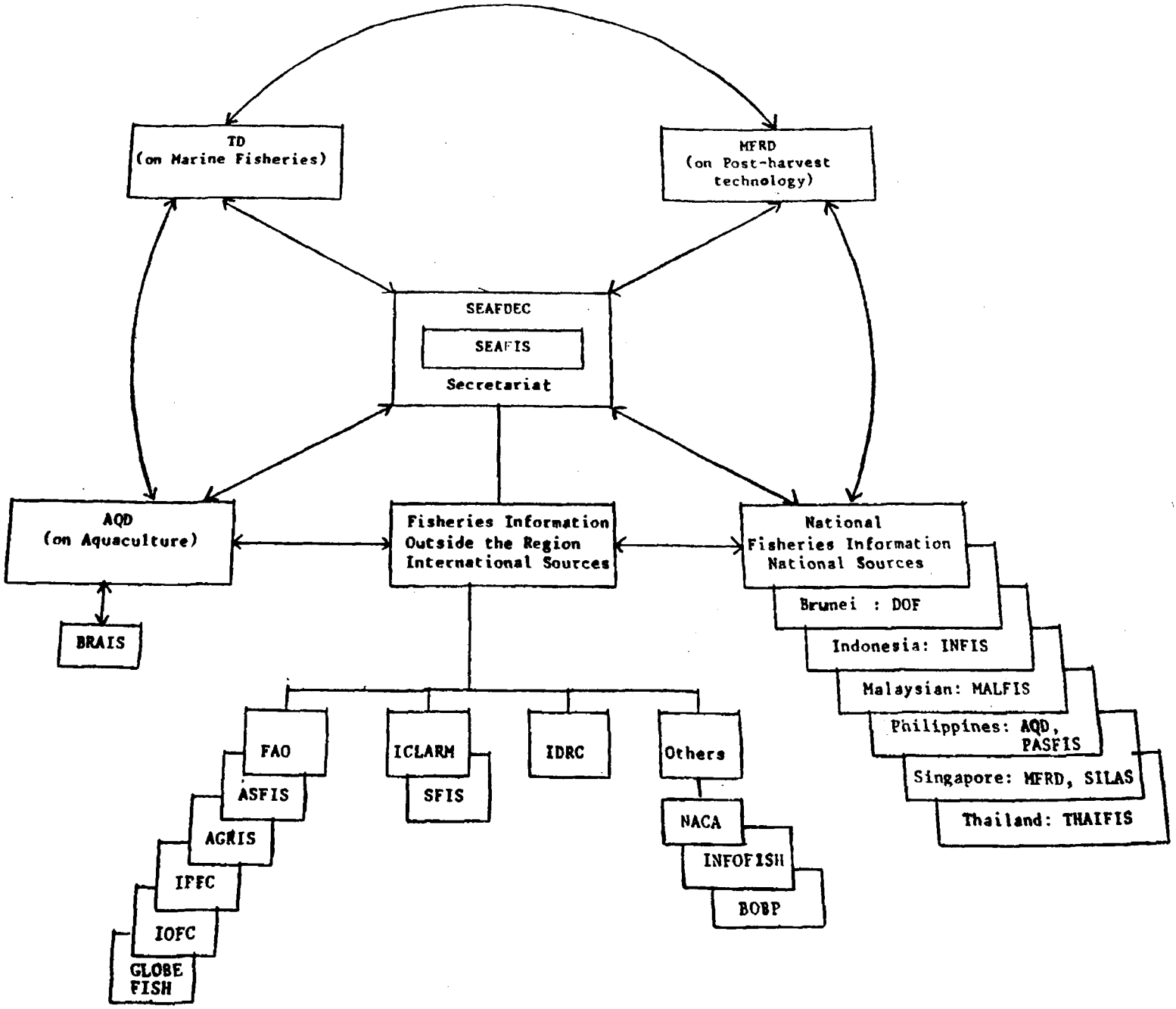
With the establishment of the Training Aids Unit in the Training Department in 1985, an audio-visual studio was set up in the Department in 1986 to produce video programs for training and information purposes. To date, the Training Department has produced light video programs on the general activities of the Department, the regional training courses for fishery extension

officers, shellfish culture in Thailand and marine fishing technology. These video cassettes are released for use by the national training institutes in the SEAFDEC Member Countries as part of the external training program offered by the Department. The list of the video programs produced by SEAFDEC is given in Annex 2.

SUMMARY

The information programs of SEAFDEC have been rapidly expanded since the early 1980s in response to the increasing need of Member Countries for information concerning fisheries and aquaculture development in the region. Technical publications are compiled, published and distributed by the SEAFDEC Departments. The list of the publications issued from 1968 to 1988 was published by the Secretariat and is available upon request. The Secretariat also issues the Newsletter and the official reports of the Center as well as other relevant publications such as the annual regional bibliography on fisheries and aquaculture in Southeast Asia, the annual Fishery Statistical Bulletin for the South China Sea Area; special technical publications and others.

Since 1984 SEAFDEC has implemented two information projects, namely SEAFIS and BRAIS, which serve as regional information sources for fisheries and aquaculture in the region. It is expected that SEAFDEC will continue to play a leading role in the exchange of fishery information with other organizations at both the regional and global levels to fulfil the needs for updated information by all users. In addition, SEAFDEC will continue the production of audio-visual materials, such as video programs, posters, and manuals on the current technology employed in fisheries and aquaculture, to assist national training programs and to promote current awareness for further development of fisheries and aquaculture in the region.



Interrelationships between SEAFDEC and national/international organizations/agencies under the SEAFIS project

LIST OF THE VIDEO CASSETTES PRODUCED BY SEAFDEC*

1. Southeast Asian Fisheries Development Center (TD, 31.30 min).
2. A Decade of Aquaculture Research and Development (AQD, 21 min.)
3. Binangonan Research Station (AQD, 11.15 min.)
4. Leganes Research Station (AQD, 11 min.)
5. Developing the Mollusc Farming Industry for Coastal Villages and small-scale fishermen in the Philippines.
6. Mollusc Culture in Thailand (TD, 17 min.)
7. Milkfish Fry Collection, Handling and Storage (AQD, 16.30 min.)
8. Milkfish Fry Acclimation and Fingerling Production in Freshwater (AQD, 10.30 min.)
9. Milkfish Fingerling Productions (AQD, 10.20 min.)
10. Milkfish from the Wild to the Farm (AQD, 16 min.)
11. Milkfish Culture Systems (AQD, 10.20 min.)
12. Tilapia Cage Farming (AQD, 7.12 min.)
13. Tilapia Cage Farming for Lake Shore Communities (AQD, 8.12 min.)
14. Farming the Tiger Shrimp (AQD, 20 min.)
15. Brackishwater Pond Preparation for Prawn Farming (AQD, 6.47 min.)

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* These video cassettes available in PAL/VSH system; AQD video cassettes also available in NTSC/β system

16. Water and Soil Analysis for Brackishwater Ponds (AQD, 21 min.)

17. Proximate Analysis of Nutrients in Fish Feed (AQD, 21.13 min.)

18. Dissolved Oxygen Determination in Freshwater Bodies (AQD, 4.32 min.)

19. Determining Ammonia Nitrogen from Water Samples (AQD, 4 min.)

20. Biology of *Penaeus monodon* (AQD, 12 min.)

21. External and Internal Anatomy of *Penaeus monodon* Fab. (AQD, 16.40 min.)

22. Prawn Hatchery and Nursery Operations (AQD, 10 min.)

23. Culturing of Microorganisms for Feed (AQD, 12 min.)

24. Prawn Feed Preparation (AQD, 7 min.)

25. Prawn Processing (AQD, 14 min.)

26. Limnological Studies in Laguna Lake (AQD, 10 min.)

27. NACA-RLCP (AQD, 14 min.)

28. World Food Day 1986 (AQD, 11.23 min.)

29. Trawl Fisheries (TD, 30 min.)

30. Purse-seine Fisheries (TD, 31 min.)

31. Squid Fisheries (TD, 12 min.)

32. Line Fisheries (TD, 26 min.)

33. Fifth Regional Training Course for Fishery Extension Officers (TD, 20 min.)

34. Sixth Regional Training Course for Fishery Extension Officers (TD, 30 min.)

35. Eighth Regional Training Course for Fishery Extension Officers (TD, 19 min.)

36. Ninth Regional Training Course for Fishery Extension Officers (TD, in Preparation)

37. Gill Net Fisheries (TD, in Preparation)

38. Collapsible Crab Trap (TD, in Preparation)

Annex 19

INFORMATION DIVISION OF SEAFDEC AQUACULTURE DEPARTMENT

1. INTRODUCTION

One of the main functions of the SEAFDEC Aquaculture Department (AQD) is to disseminate and exchange information on aquaculture. Its two other functions are to promote and undertake aquaculture research and to develop human resources for aquaculture development. The information functions is discharged by AQD's Information Division created in November 1986, integrating various AQD units handling information-based services.

Before the Information Division was created, the then Training and Extension Division (now Training Division) handled dissemination of aquaculture technology to fish farmers through outreach seminars. Library and documentation activities, including implementation of the Brackishwater Aquaculture Information System (BRAIS) Project, was under the operational control of the Office of the Chief, and then later, the Training and Extension Division. The then Research Information Services Unit, under the Research Division, processed, stored, and retrieved AQD research data. The former Publications Office was a unit under the Office of the Chief and, then later placed under the Training and Extension Division which also directly related with the Network of Aquaculture Centres in Asia (NACA) Regional Lead Center in the Philippines in the area of information activities, particularly the FAO Aquaculture Information System (AQUIS). Briefing of visitors and distribution of information materials to guests were handled by the then General Affairs Office of the Administration Division. All these information-based services and activities are now being implemented by the Information Division.

2. FUNCTIONS OF THE INFORMATION DIVISION

The Division acquires, processes, and disseminates information on tropical aquaculture. This includes relevant information on breeding, feed development, fish health, and farming systems of aquaculture species such as finfishes, crustaceans, molluscs, and seaweeds. Research results including processed research data, are stored in a data bank.

The Division disseminates technologies developed at AQD to fish farmers through outreach seminars, lectures, and the print media. It produces techno-packages and assesses their utilization. It implements the Brackishwater Aquaculture Information System (BRAIS) Project, with funding support from IDRC. It also implements the Aquaculture Technology Outreach Program (ATOP) with financial assistance from the Philippine Technology and Livelihood Resource Center (TLRC). In January 1989, the implementation of ATOP activities was being evaluated. (Separate documents on BRAIS and ATOP have been prepared for this seminar).

3. PROGRESS OF ACTIVITIES

Under the Information Division are three Sections, namely, Documentation, Techno-Transfer, and Publications.

3.1 Documentation Section

Total AQD Library acquisition at present is 8,688 monographic volumes, 4,531 pamphlets, 1,780 SEAFDEC publications, and 3,346 journal volumes. Operational since 1984, the three-year BRAIS Project has been extended for two years until April 2, 1989. BRAIS has published the Brackishwater Aquaculture Abstracts; Special Bibliographies on prawn, milkfish, mussels, mud crab, sea bass, and grouper; State-of-the-Art Reviews on siganids and prawns; and the BRAIS Newsletter. It will soon publish Directories of Aquaculture Scientists/Experts and Aquaculture Institutions. The ongoing survey of BRAIS utilization seeks to assess the importance of BRAIS to users of brackishwater aquaculture information. The BRAIS Clearinghouse Service is fully operational to serve the need for aquaculture information at the regional and international levels. BRAIS was spawned from the Library's AQUADOC Project which aimed to locate, collect documents, organize and disseminate pertinent information to the clientele; and to provide a mechanism for national cooperation among libraries and information centers in the field of aquaculture.

3.2 Techno-Transfer Section

From its inception in November 1986 until 1988, the Section has conducted aquaculture outreach seminars and lectures through the *Alay Palaisdaan* project in ten regions of the Philippines, involving 28 sessions and benefitting more than 1,200 small fish farmers. The seminars were conducted in coordination with the regional offices of the Department of Agriculture (DA) with funding assistance from TLRC. Through the Section, AQD also participates in agro-industrial caravans and fairs organized by DA.

3.3 Publications Section

The following information materials have been published by AQD through the Publications Section: 10 extension manuals, 5 aquaculture technology modules, 13 technical reports, 5 volumes of quarterly research reports, a quarterly newsletter that carries aquaculture research and industry development information, a bi-monthly news service for fish farmers and extension workers, posters on prawns, various proceedings and brochures, and compilations of research publications previously published in scientific journals or edited proceedings, authored by AQD researchers and visiting scientists.

4. RELATIONSHIP WITH OTHER AGENCIES

Through the Information Division, AQD regularly contributes to the SEAFDEC Newsletter published by the SEAFDEC Secretariat. Exchange of information at the national, regional, and international levels is carried out via document exchange programs, the Library's Clearinghouse Service, the BRAIS networking activities, and ATDP activities.

As an attached agency of DA, AQD relates closely with DA central and regional offices and other units and contributes to the publication of DA's *UNLAD-ANI* Magazine, participates in the newly organized EDP Circle of DA, and coordinates with DA on the implementation of its Agriculture Information Network (AGRIN).

AQD serves as the Lead Center for the BRAIS network. At one time, it has also served as Lead Center for AQUIS which has not been operational since 1985.

5. FUTURE ACTIVITIES

The Information Division will intensify document acquisition and processing, continue computerizing collections, and pursue information networking activities. Exchange of information will continue to be undertaken at the national regional, and international levels.

The Division will continue the aquaculture outreach seminars and assess dissemination effectiveness of technologies and information materials on small fish farmers. To further serve the information needs of fish farmers, more techno-packages will be produced from significant research results at AQD. These techno-packages will take the form of manuals, pamphlets, leaflets, technical reports, video coursewares, and correspondence coursewares.

Prepared by:

V.T. SULIT
Head, Information Division

AQUACULTURE TECHNOLOGY OUTREACH PROGRAM

1. INTRODUCTION

The Aquaculture Technology Outreach Program (ATOP) is a joint undertaking of the Technology and Livelihood Resource Center (TLRC) and the Aquaculture Department (AQD) of SEAFDEC. The Memorandum of Agreement for the implementation of ATOP was signed on May 4, 1987 by *Mr. Jose M. Kalaw, Jr.*, TLRC Director General for TLRC, and *Dr. Veravat Hongskul*, SEAFDEC Secretary-General for SEAFDEC and AQD. The program was however, launched only upon the signing of the Supplemental Agreement by *Mr. Kalaw* and *Dr. F.J. Lacanilao*, AQD Chief on July 4, 1987.

ATOP was conceived to come up with the following outputs: technology communication materials for all forms of media; technology publications, correspondence, films and video; trainings/seminars/forums/workshops; information management and data banking activities; and financing program for aquaculture technology livelihood projects. More specifically, ATOP seeks to hasten countryside development in aquaculture through a series of seminars, and production of manuals, pamphlets, leaflets, and audio-visual materials on fishfarming techniques.

2. ATOP ACTIVITIES

ATOP comprises four major activities, namely: Technology Training, Technology Publications, Technology Films and Video, and Technology Correspondence Course.

2.1 Technology Training

*2.1.1 Outreach Seminars for Small Fish Farmers Also Known as **ALAY PALAISDAAN***

Alay Palaisdaan is a series of aquaculture outreach seminars for the small fish farmers. It seeks to bring the benefits of modern and improved aquaculture technologies to the countryside through on-the-spot farm consultations, lectures, and informal discussions with the fish farmers.

The project was formally launched on February 17, 1988 in coordination with the Philippine Department of Agriculture (DA). Aquaculture outreach seminars were conducted in ten regions throughout the Philippines, involving 28 sessions and benefitting more than 1,200 small fish farmers.

2.1.2 Aquabusiness Seminars

These seminar courses, conducted in Metro Manila, were addressed to big business and development workers already engaged in, or intending to go into fish or prawn culture.

From July 1987 to May 1988, ten seminar sessions were conducted on the following topics: Prawn Hatchery and Nursery Operations, Prawn Culture (Grow-Out) and Management, Marine Finfish Hatchery, and Freshwater Aquaculture.

2.2 Technology Publication

This activity aims to disseminate technologies to the target audience in simple language, to facilitate their widespread adoption. Three kinds of publications will be produced, namely: manuals, pamphlets, and leaflets.

As of December 1988, three manuals were scheduled for production, while two pamphlets and five leaflets were being readied for publication.

2.3 Technology Films and Video

This activity involves recording a complete training course (maximum of 15 hours) in a video tape. The lecture of the resource person(s) shall be recorded in a tape together with some background footage on specific aquaculture activity.

Five video coursewares are scheduled for production in February 1989, while another five are tentatively scheduled for production in July 1989.

2.4 Technology Correspondence Course

This is a training program that uses the postal communications system in the transfer of technology and livelihood skills to entrepreneurs, farmers, workers, and other users. Training materials are self-instructional and self-contained.

Production of the initial five coursewares were finalized. Each courseware consists of modules, the first of which is an introductory module. This module covers a brief introduction of a courseware, learning objectives, and industry study. Each module is subdivided into lessons which contain self-testers and answers to self-testers.

3. STATUS OF IMPLEMENTATION

The implementation of ATOP activities was being assessed in January 1989 as part of the project's evaluation process. Results of the evaluation will be used as basis for the possible revision of forthcoming ATOP activities.

Prepared by:

V.T. SULIT
ATOP Lead Person for SEAFDEC AQD
and Head, Information Division

Annex 20

The BRAIS Project
Current Status, Activities and Assessment

Introduction

The Brackishwater Aquaculture Information System is a project implemented by the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC AQD) in Tigbauan, Iloilo, Philippines. The Project is supported by the International Development Research Centre (IDRC) of Canada since March, 1984 upon the signing of Memorandum of Agreement. The first phase of the project ran from March 16, 1984 through April 2, 1987, and the extension phase covers the period from April 3, 1987 to April 2, 1989.

Objectives

The over-all objectives of the BRAIS project (phase I) may be summarized as follows:

> to provide for the training and organization of SEAFDEC Aquaculture Department to act as a specialized information analysis center for brackishwater aquaculture.

The specific objectives include:

1. to collect significant documents on brackishwater aquaculture,
2. to set-up an appropriate document storage and retrieval system,
3. to issue special bibliographies:
    a) brackishwater bibliography
    b) species bibliography
4. to provide bibliographic searches.
5. to provide a question and answer service
6. to provide a document delivery service
7. to publish a current awareness newsletter (quarterly)

8. to maintain an up-to-date directory of researchers and research centers (2)
9. to publish state-of-the-art reviews (3)
10. to cooperate, through the SEAFDEC Secretariat with international systems, such as, the Aquatic Sciences and Fisheries Information System (ASFIS)
11. to establish and consolidate a cooperative regional network of information on all brackishwater species.

For the extension phase of the project, the above-mentioned objectives were retained and all the activities initiated in the first phase were continued.

Organization and Activities

The BRAIS activities are grouped into the following areas:

A. Documents Acquisition and Survey

B. Organization and Documentation

   1. Abstracting/indexing; Data-entry into the data bases; Computer generation of bibliographies; and
   2. Data base design and management.

C. Reprography and Publications

   1. Bibliographies and abstracts
   2. State of the Art Reviews
   3. Directories
   4. Newsletter
   5. Printing/lay-out
   6. Reprography: Microfiching and Photocopy

D. Clearing House

   1. Question/Answer
   2. Mailing Lists
   3. Document Delivery

E. Networking, including BRAIS national centers—IndoBRAIS, MalayBRAIS, ThaiBRAIS and PhilBRAIS.

Acquisition of documents on brackishwater aquaculture is done mostly by survey and acquisition activities undertaken thru in country travels by the BRAIS national centers, including PhilBRAIS which is based in SEAFDEC AQD where Library's specialized collection on aquaculture contains a considerable number of documents related to the brackishwater aquaculture environement. In-country travels revealed that about 80% of the country's collection on aquaculture may be found in SEAFDEC AQD Library. The other methods of acquisition include purchase/subscription using BRAIS Reference Collection fund and gift/exchange agreements.

Computer based processing of acquired documents including those which are scanned from SEAFDEC AQD Library collection is employed using MINISIS software (until mid 1988) and Micro CDS/ISIS (from late November 1988 to present). Abstracts are prepared by the project staff. Bibliographic information are recorded in input sheets and entered into the data base. The BRAIS data base contains about 5000 entries.

Responses to written-in queries are provided by way of bibliographic searches, referrals to appropriate specialist or institution, and document delivery. A mailing list of regular recipients of BRAIS publications is maintained. Through the mailing list, a continuous stream of documents arrive either as gifts or exchange materials.

The Project networks were established with Indonesia (September 1985), Malaysia (May 1985) and Thailand (February 1985). Memoranda of agreement were signed between SEAFDEC and the Brackishwater Aquaculture DEvelopment Center, Jepara, Indonesia for IndoBRAIS, the Fisheries Research Institute, Fisheries Division, Ministry of Agriculture, Malaysia for MalayBRAIS and the

Brackishwater Fisheries Division, Department of Fisheries at Kasetsart University Campus, Bangkok (until June 1988) and Fisheries Science Society of Thailand (FSST) (starting July 1988) for ThaiBRAIS. As mentioned, PhilBRAIS, the national center for the Philippines, is also located at SEAFDEC AQD.

These institutions serve as national centers which undertake to:

1. Arrange in country travel to relevant research organizations for acquisition of information,
2. send originals of acquired materials to SEAFDEC AQD,
3. send input sheets with English translations and abstract of documents in local languages,
4. organize and integrate materials acquired with the national center collection, and
5. provide photocopies of documents to requestors at cost.

BRAIS has established/arranged linkages with other regional and international information system like SFIS (Selective Fisheries Information Service, ICLARM, 1985), SEAFIS (1986), and REMIN-REMIC (Regional Mangrove Information Network-Regional Mangrove Information Center, National Management Resource Center, Philippines, 1986).

Personnel

The activities, preparation and production of information products of BRAIS are carried out cooperatively by staff members of the Library, Computer and Publication Units of SEAFDEC AQD. The preparation of special bibliographies and literature reviews is contributed to and reviewed at different stages by AQD subject specialists and publication committee to ensure the quality of the products.

Abstracting and indexing work is usually handled by persons with background/basic qualifications in fisheries and training in such work as well as in computer applications, data base management and related work. Staff members have had professional training in library/documentation work and others have gained on the job experience.

The personnel development/training programs have been mostly carried out with international assistance but not directly under the BRAIS Project. For example:

1983 November: A 2-week training program on MINISIS application provided to selected AQD staff by an expert supported by IDRC.

1985 December: A staff member from SEARCA/AIBA, Los Banos, provided a further one week course on MINISIS.

1986 April: The BRAIS Project Coordinator and a staff attended a workshop on SEAFIS methodologies in Bangkok.

1987 April: The BRAIS Project Coordinator and Data Base Manager attended the month-long course on Regional Training in Library Automation at Universiti Sains Malaysia, Penang.

1987 October: Two BRAIS staff attended a 2-week training course on Desk Top Publishing software in Iloilo City.

In 1988, under BRAIS sponsorship, six members of the staff had training in technical writing, communication and media relations, at the Development Academy of the Philippines, Tagaytay and Manila. Training in computer applications was also conducted in SEAFDEC AQD for MalayBRAIS and IndoBRAIS Project Coordinators. A workshop on Micro CDS/ISIS application was conducted with the assistance of Prof. Neelameghan, BRAIS Consultant, for the benefit of the BRAIS staff, from November 21-25, 1988.

Performance

The following is a summary of the work done under the BRAIS project during its two phases (up to December 1988).

Particulars	Phase I (16 Mar 1984/ 02 Apr 1987)	Extension (3 Apr 1987/ 31 Dec 1988)
A. a) Documents acquisition:		
Through PhilBRAIS	1480	3047
Other nodes	337	421
b) Reference collection fund (IDRC)		
New journals	6	10
Monographs	49	73
c) SEAFDEC Library collection		
B. Data Base Development	3322	5000+
C. Brackishwater Aquaculture Abstracts	V.1. No. 1-12 (Jul 84-Jun 85) V.2, No. 1-6 (Jul 85-Jun 86)	V.3. No. 1-6 (Jul 86-Jun 87) V.4, No. 1-3
D. Special Bibliographies & Abstracts		
a) Sugpo ..... (abstr.)	704 abst.	
b) Mud crab .. (bibl.)	211 entr.	
c) Seabass ... (abstr)	311 abst.	
d) Mussel .... (abstr.)	181 abtr.	
e) Grouper ... (abstr)		179 abst.
f) Milkfish .. (bibl.)		217 entr.
E. Bibliographic Searches and Question & Answer Service	239	376
- Bibliographic search		
- Request for materials		
- Referrals		
- Short reference quest.		
Photocopies		
- Titles	680	1327
- Pages copied	12758	32031
F. Mailing list (69 countries)		
- Institutions	382	398
- Individuals	35	100
G. BRAIS Newsletter	V.1. No.1 (Apr-Jun 86)	V.1, No. 2/3, 4 (Jul-Dec 86) V.2, No. 1-4 (Jan-Dec 1987) V.3, No. 1-4

		(Jan-Dec 1988)
H. Directories		
- Directory of specialists		c.200 entr.
- Directory of institutions		c.50 entr.
I. State-of-the-Art Report		
- Siganid		Published
- Sugpo		Under preparation
- Grouper		Under preparation
J. Cooperation with ASFIS		initiated
K. Regional Network Nodes	IndoBRAIS	
	MalayBRAIS	
	ThaiBRAIS	
	PhilBRAIS	

BRAIS Utilization Assessment

This section summarizes the survey and studies, together with the findings, undertaken for BRAIS Utilization Assessment. Advice and assistance to the Assessment Survey were provided by the BRAIS Consultant, Prof. A. Neelameghan.

The objective of the assessment was to examine the extent of utilization of the products and services by BRAIS since the start of the Project in March 1984.

Three interrelated approaches were used:

1) survey through questionnaire

2) analytical studies

3) study of relevant reports and discussions with BRAIS staff and some of the local users of the service.

The users of BRAIS products and services are spread out in 400 centers in 70 countries. In addition, there are individuals who use/have requested for and received directly BRAIS products and services. This group includes persons who become associated with SEAFDEC AQD by their involvement in scientist exchange program, joint projects, seminars, workshops and training courses or other meetings or had come to know about SEAFDEC AQD/BRAIS services through colleagues, materials received in the library of their respective institutions, etc. We needed to know how the products/services were being used by the library/information center

receiving them to get comments/opinions about the service from individual users. Therefore two questionnaires were prepared—Questionnaire A for institutions and Questionnaire B for individuals. Several questions are common to both questionnaires. The questions focussed on:

1) the environment in which BRAIS products were used:

country, institution type, fields of specialization, etc.

2) for what purposes?

3) how did they come to know about the BRAIS services?

4) what do they do with the products?

5) did they disseminate the products, if so, how?

6) views and comments on quality of the products/services,

7) suggestions for improvement.

Questionnaire A was mailed to 429 institutions (Foreign 323; Philippines:106) and Questionnaire B to 100 individuals. Following are the findings of the survey:

1. Over 41% of 429 institutions responded
2. 90-98% are government institutions
3. A majority (55% in Asia-Pacific Region and over 86% in Europe-North America) of the institutions are involved in research. Academic/teaching activities, information service and data base preparation, and extension work are the next most important areas of activity which need good information support such as those produced by BRAIS especially covering the Asian region.
4. A majority of the institutions receiving BRAIS products have indicated specialization in Aquaculture: (57% in Africa-Middle East region, 75% Asia Pacific, 90% in Europe-N American region).

5. Training courses and joint meetings form the predominant channels of contact for other institutions especially in Asia with SEAFDEC/BRAIS.
6. BRAIS announcement brochures and information provided by colleagues account for the highest percentage among the sources of information about BRAIS. In the Asia-Pacific region, "Saw it in another library" and "cited in another document" also constitute important sources of information.
7. Most of the institutions receiving BRAIS services and products are government institutions and carry on research or academic activities. In terms of percentage of the number of institutions from which materials are received by SEAFDEC AQD in exchange, those outside the Asia-Pacific region (i.e. Europe, North America and Africa) have more to offer that those within the Asia-Pacific region. The SEAFDEC AQD library has been receiving either free of cost or through publications exchange arrangements some 345 foreign and 100 national periodical titles. Of these, 124 foreign titles (worth about US$ 2,000 in annual subscriptions) and 75 Philippine serials (worth about US$ 200 in annual subscriptions) are being received since BRAIS publications and services became available. This is an important impact of the BRAIS Project considering the limited financial resources available to SEAFDEC for acquisition of serials, especially those to be paid in foreign exchange (hard currency).
8. A majority of the responding institutions apparently consider Brackishwater Aquaculture Abstract (BAA) as a useful source of information in brackishwater aquaculture, particularly about the Asian region. This is further confirmed by the pattern of responses from the institutions to the question on the purpose of their using BAA . The number of users to whom BAA current issues are circulated in the respective institutions is about ten, that is, specialists/researchers in brackishwater aquaculture.

9. A majority of the responding institutions apparently consider Brackishwater Newsletter (BN) as a useful source of information in brackishwater aquaculture, particularly about the Asian region. The number of users to whom BN current issues are circulated in the respective institutions is over 10 in the Asian region and less than 10 in other regions.

10. The distribution pattern of the Special Bibliographies (SBs) indirectly indicates areas of interest in the different regions (Table 1). In relation to the number of institutions receiving BRAIS services/products in the different regions, the distribution of the SBs in the respective regions is more or less even. The SB on Grouper has the lowest distribution, but it is the most recent and the demand for it will grow in the coming years as more and more institutions come to know about it.

Table 1. Distribution of Special Bibliographies

Subject of SB	Asia	:Pacif	:Mid-East	:Africa	:Eur	:N.Amer	:LAC
Sugpo	51	6	2	2	8	15	3
Mud Crab	50	7	..	4	5	17	3
Sea Bass	45	9	2	3	8	18	3
Mussel	47	7	1	3	8	17	3
Grouper	38	7	1	3	6	12	2

It may be worth noting that the SBs on Sugpo and on Sea bass received relatively higher rating in the Asia-Pacific region while the SB on Grouper gets highest rating in the Europe-N.America region. Most of the institutions excepting those in Europe indicated that they either circulate, notify in their current awareness service or in their publications when an SB is received.

11. Almost all the responding institutions receive other secondary periodicals abstracting and indexing periodicals covering aquaculture, etc., such as ASFA. The institutions were requested to rate the usefulness of BRAIS products and services in relation to those secondary periodicals. Although some of the institutions did not respond to this query, those who did considered the BRAIS products either "useful" or "very useful".

12. The institutions mainly in Asia, particularly those in the Philippines, used the Referral, Document Delivery services and Query-Answer services of BRAIS. Those that have availed ofsuch services generally felt that their requests were responded to adequately. Some have indicated that the answers from BRAIS did not reach them in time.

13. Table 2 presents data on the different purposes for which the institutions are using BRAIS services and products. The preferred use pattern is similar in the different regions: Firstly, for supplementing other information sources; secondly, for identifying other researchers/research centers; and thirdly, for collection development. In this context, BRAIS fulfills the major functions of a specialized information service in brackishwater aquaculture with particular reference to research in Asia. Use of BRAIS products in the preparation of bibliographies and data bases is also an activity associated with the primary functions just mentioned.

14. With a view to ascertaining that BRAIS does cover information materials not covered by other international abstracting services so that it does in fact constitute a useful supplementary source of information in aquaculture as mentioned by significant number of the respondents, the serials monitored by ASFA and BRAIS were analyzed and compared. It was found that during the period under review BRAIS indexed 90 serial titles not included in the list of serials indexed by ASFA.

Table 2. Purpose of Use of BRAIS Services and Products

Purpose	Asia	Pacif	Mid-East	Africa	Eur	N.Amer	LAC
Supplement other info sources	57	9	2	3	6	18	3
Prepare bibliog.	21	3	..	2	1	6	3
Collection dev.	32	7	..	4	1	13	2
Database dev.	25	..	..	..	..	2	..
Identify other researchers	35	8	..	4	3	6	3
Research planning	4	2	..	..	..	1	..
No indication	..	..	..	..	4	1	..

Table 3 presents data on the country of origin/publication of these serials. Out of the 90 serials, 77 (85.6%) are from the Asia-Pacific region, of which 77 serials, 32 (35%) are from the Philippines; and 12 (13.3%) are from Europe-N. America region; and 1 from Africa.

Table 3. Country of Origin/Publication of the Additional Serials

Region/Country	No. Serial Titles
Asia	72
China ...	3
India ...	9
Indonesia ...	6
Japan ...	7
Korea ...	1
Malaysia ...	4
Pakistan ...	1
Philippines...	32
Taiwan ...	3
Thailand ...	5
Vietnam ...	1
Pacific	5
Australia ...	2
New Zealand .	3

Europe		9
Belgium ...	2	
Germany (FR)	3	
Italy ...	1	
Poland ...	1	
United Kingdom	2	
North America		3
Canada ...	1	
United States .	2	
Africa		1
South Africa..	1	

15. Another analysis was done on the coverage of non-serial materials in BAA Vol. 4 No. 1, July-August 1987 and Vol. 4 No. 2, September-October 1987. Table 4 presents data on the items included in BAA also indexed in ASFA. BAA abstracted 63 additional non-serial items not included in ASFA during the period under review. These items, published mainly in Asia, were not included in any of the earlier issues of ASFA.

Table 4. Additional Non-Serial Items Indexed in BAA

Type of Materials	BAA	ASFA
Conference papers	57	6
Theses	2	..
Reports/separates	5	..
Monographic analytics	6	1
	70	7

16. On the views of the library/information specialists of the responding institutions regarding the quality of abstracts and indexes in BAA & Special Bibliographies produced by BRAIS, a majority of the responding institutions consider the abstracts to be of good/very good quality; the arrangement of the entries quite satisfactory and helpful; the indexing and the data elements included in the entry adequate. There were few suggestions: the

one mentioned by several of the respondents being that the affiliation of the author should be given in the entry. BRAIS has accepted this suggestion and will implement it as far as practicable.

Analysis of individual responses showed very similar findings as with institutions. The final report is being readied for submission and dissemination.

Prepared by:

Marubeth C. Ortega
Project Coordinator
BRAIS

Annex 21

Project Title	:	Selective Fisheries Information Service Phase II: Project ADD (Analysis and Document Delivery)
Cooperating Institution	:	International Development Research Centre (IDRC), Canada
Duration	:	2 years beginning March 1988
Key Personnel ICLARM	:	Mrs. Rosalinda M. Temprosa Ms. Georgina C. Luis Mr. Marcos Jose M. Vega

Major Objective

To extend the capabilities of the existing ICLARM Information Program to users in tropical third-world countries.

Specific Objectives

- To assist in an advisory capacity in strengthening the information capability of fisheries institutions in third-world countries.
- To provide answers to specific questions to researchers working in subject areas in which ICLARM has special expertise -- finfish and mollusc aquaculture, integrated farming, small-scale fisheries and resource management.
- To analyze 50 selected specific topics of the literature built up over the first three years of the SFIS.
- To provide key literature to enquirers
- To produce bibliographies and mini-reviews on important topics as identified by trends in enquiries.

Results

The recommencement of ICLARM's Selective Fisheries Information Service (SFIS II) was first announced in the April 1988 NAGA, the ICLARM Quarterly. Since then, SFIS II has been republicized through publications in national,

regional and international newsletters and personal contacts. In addition, a new and revised brochure was produced to facilitate publicity.

Project ADD: Analysis and Document Delivery have been added to SFIS II which is to analyze 50 selected specific topics of the literature built up over the first three years of the service and to provide key literature to SFIS enquirers.

A new policy was also established in SFIS II. IDRC has indicated that while it desires to support fisheries research and development work with timely and appropriate information, it is concerned that scientists and researchers in third-world countries should be made more conscious about the need to budget for access to information to support their work. Thus, a fee for services was required. Details are given below.

The average cost to the Service for materials and postage per enquiry is about US$30, without accounting for time spent searching and preparing each report.

Some form of payment, cash or in kind, is requested from users to help the service become self-supporting eventually. Here is the scale of fees.

- Requests from developed-country individual researchers and institutional enquirers, and consultants from all countries:

  US$20 plus cost of materials and postage.

- Other enquirers;

  US$5 plus cost of materials and postage.

If the materials and postage cost more than $30 we will advise you of the likely cost in advance. If less than $30 an invoice will accompany the package.

o Or we can exchange information.

If you don't have a research grant or are in a country where foreign exchange is impossible, let us exchange information. Send your enquiry together with some information that will help the Service, e.g.,

- reprints of scientific articles
- research reports
- a brief essay on the information available in your institute or on your research and its relevance to national goals
- photographs or slides of your research or fishing activities.

We might publish your essay or photographs in a future issue of Naga.

This issue of charging for services is being studied. We are carefully monitoring the user's response so that by the end of the project we can make statements on what percentage of SFIS II can be recovered through the pricing of information. We also hope to be able to make recommendations to IDRC in this regard. Any income received from this two-year project will go into a revolving fund for financing the continuation of Project ADD or any other external information activities following the termination of IDRC assistance.

During the period May 1988 to January 1989, a total of 181 in-depth enquiries from 49 countries/territories were received as shown in Table 1. Queries from Nigeria were the most numerous (34) followed by India (22) then the Philippines (20) and USA (15). An average of 20 enquiries is received each month.

From the total number of enquiries received, 9.4% were "user pays" while 45% were still free and 21.5% availed the exchange procedure from which we received 30 reprints and 5 monographic/technical reports.

Moreover, the other requests (13.87%) which were outside ICLARM's areas of expertise were referred to other appropriate information centers such as BRAIS, NACA, FAO in Bangkok, INFOFISH and the Seaweed Information Center.

Fig.1 shows the geographical pattern of enquiries received. More than a third came from Asia, a quarter from Africa, a little less than a tenth from North America, Latin America, South Pacific, and other regions (Europe, Australia, Caribbean and Indian Ocean) combined.

A detailed record of each enquiry is continued as a means of identifying trends to define other subject matter for bibliographies and reviews. Table 2 shows that requests for information on various culture systems were most numerous (38). Fish biology (32), general fisheries (32) and crustaceans (25) were the next most numerous group. This pattern differs from the initial phase of the project were tilapia, integrated farming and socioeconomic aspects, respectively, in order of numbers of requests, were the most requested subjects of enquiry.

An analysis of occupation or position held of the enquirer was also made. Fig.2 shows (n = 97) that most of the requests were from Administrators (38.1%), followed by academic/library personnel (24.7%), researchers (14.4%), growers (10.3%), students (10.3%) and volunteers (US and VSO) 2.1%.

SFIS II is enhanced by the expertise of the Center's scientific staff, the full resources of the library and the use of computerized literature searching of bibliographic databases. Additional two staff were hired to fully meet the objectives of the service : Mr. Marcos Jose M. Vega, Project Information Officer prepares mini-reviews on important topics as identified by trends in enquiries and Miss Georgina Luis, Project Librarian, indexes journal articles for inclusion in NAGA's Information Department. Both of them also assist in the question-and-answer service of the project.

In addition to answering specific requests, two of the major activities of the project are also being continued. A current awareness service through NAGA's Information Department and the distribution of ICLARM Library's quarterly Acquisitions List to IDRC fisheries research grantees.

Assistance in information use and handling has been provided through attendance and participation in local and international conferences, workshops and meetings. Short-

term training in fisheries librarianship, online searching and non-technical library activities were also conducted to various groups and individuals both local and foreign.

Cooperative information activities have also been strengthened with other specialized information centers like the Brackishwater Aquaculture Information System of the SEAFDEC Aquaculture Department, Seaweed Information Center of the UP's Marine Science Institute and the Indonesian Fisheries Information System.

ICLARM's information capabilities have also been strengthened to carry out project activities through wide contacts to foreign marine science librarians via electronic mail.

Fourteen mini-reviews on various topic were prepared, four of which have been published in the NAGA. Prior to publication, each article is sent to two experts identified during the literature surveys.

The following publications have resulted from the project:

1. Publicity and Information

SFIS brochure, No.5 May 1988. Total 2,000 copies

Questionnaire card. Total 2,000 copies

ICLARM's Selective Fisheries Information Service 1988-1990. NAGA, the ICLARM Quarterly 11(2): 16. 1988.

ICLARM's Selective Fisheries Information Service 1988-1990. IAMSLIC Newsletter 29: 12. 1988.

ICLARM's Information Service Revitalized. Aginfo Link 2(3):2-3. 1988.

ICLARM's Selective Information Service. ASTINFO Newsletter 3(4): 9. 1988.

ICLARM's Selective Fisheries Information Service 1988-1990. BRAIS Newsletter 3(2):3. 1988.

ICLARM's Selective Fisheries Information Service Renewed for 1988-1990. IAALD Quarterly Bulletin 33(3):135. 1988.

ICLARM's Selective Fisheries Information Service. AFSIB Newsletter Oct. 1988 - Mar. 1989:23-24.

ICLARM's Selective Fisheries Information Service Phase 2. Ang Mamamalakaya UP KATIG'88. College of Fisheries, University of the Philippines, Diliman, Quezon City.

2. Mini-Reviews

Who's working on aquaculture in mangroves? Naga 11(3): 18. (M.J.M. Vega. 1988).

Who's working on tilapia and carp diseases? Naga 11(3):18-19. (M.J.M. Vega. 1988)

Who's working on fish aggregating devices? Naga 11(4):16. (M.J.M. Vega. 1988)

Who's working on reservoir fisheries in developing countries? Naga 11(4):17. (M.J.M. Vega. 1988)

3. Translations (Unpublished)

Hiranwat, S., Y. Leenanond and C. Wongsongsarn. 1982. Pen culture in reservoir by using water hyacinth as supplementary feed. NIFI Technical Paper No. 12. 22p. Translated from Thai by Thiraphan Bhukaswan.

Tanomkiat, T. and T. Pimoljinda. 1986. Experiments on nursing brown spotted grouper (Epinephelus tauvina Forskal) with artificial diets in various protein levels and minced fish. Thai Fish. Gaz. 39(6): 603-614. Translated from Thai by Thiraphan Bhukaswan.

Conference, Workshop Attended

Seminar-Workshop on Classification and Cataloging of Books, Serials and Non-Book Materials, Manila, 25-27 May 1988 (G.C. Luis)

14th Annual Conference of the International Association of Marine Science Libraries and Information Centers

(IAMSLIC), Miami, Florida, USA, 2-7 October 1988 (J.L. Maclean and R.M. Temprosa)

Training Conducted

Lecture-Demonstration on Fisheries Information System and Management for the Participants (6) of the AIBA/SEARCA Training Course on Agricultural Information Management on 22 April 1988

Lecture-Demonstration of Computerized Library Operation and Database Management Information System for the Participants (15) of the 7th Summer Institute on Information Science, Institute of Library Science, University of the Philippines, Diliman, Quezon City on 6 May 1988

Lecture-Demonstration of ICLARM's Information System and Management for the Participants (33) of the Summer Institute on Managing and Servicing Information, Institute of Library Science, University of the Philippines, Diliman, Quezon City on 20 May 1988

Technical Assistance to UN-ESCAP Regional Network for Agricultural Machinery (UP at Los Banos) in the initial development of their database on agricultural machinery, 29 May 1988

Lecture on ICLARM's Information Sources and Services for Prawn Farming Development Group (7 Chinese; 1 British) as part of their Technical Study Tour to Philippines, sponsored by EEC Assistance Programme for Dalian, China on 6 June 1988

Introduction to Online Searching via DIALOG for a Professor of Library Science, Manila on 6 June 1988

Fisheries Information System and Management for Senior Indonesian Fishery Officer on 5 July to 31 August 1988

Introduction to Electronic Mail System for the Foreign and Local Participants of the Small Industry Information Management (SINFOMAN) Course, UP, Institute for Small-Scale Industries, Diliman, Quezon City on 19 October 1988.

Training on the Design of Computerized Bibliographic Database for a Filipino Fisheries Librarian, ICLARM, Manila on November 7-18, 1988

Online Searching via DIALOG for the Computer Staff of Technology and Livelihood Information Dissemination Department, TLRC, Manila on November 21-25, 1988

On-the-Job Training Apprentices for Three Graduating Students (Associate in Computer Science) from Pamantasan ng Lungsod ng Maynila for a total of 120 hours each starting 12 December 1988

COUNTRY	NUMBER
NIGERIA	34
INDIA	22
PHILIPPINES	20
USA	15
INDONESIA	6
MALAYSIA	6
SRI LANKA	6
FIJI	5
BANGLADESH	4
MAURITIUS	4
SOLOMON IS.	4
THAILAND	3
UNITED KINGDOM	3
ZIMBABWE	3
AUSTRALIA	2
BOLIVIA	2
BRAZIL	2
COSTA RICA	2
EGYPT	2
FED. REP. OF GERMANY	2
FRANCE	2
GHANA	2
MICRONESIA	2
PERU	2
SWEDEN	2
ARGENTINA	1
BRUNEI	1
CANADA	1
CHILE	1
COLUMBIA	1
COOK IS.	1
CUBA	1
ETHIOPIA	1
GUATEMALA	1
HONDURAS	1
KENYA	1
MARIANAS IS.	1
MEXICO	1
MOZAMBIQUE	1
PAKISTAN	1
PAPUA NEW GUINEA	1
SAUDI ARABIA	1
SOUTH AFRICA	1
ST. LUCIA	1
SULTANATE OF OMAN	1
SURINAME	1
TANZANIA	1
TONGA	1
TRINIDAD	1
TOTAL	181

Table 1. No. of requests received per country (May 1988 to January 1989)

TOPIC	No. of enquiries
CULTURE SYSTEMS	38
FISH BIOLOGY	32
GENERAL FISHERIES	32
CRUSTACEANS	25
TILAPIA	13
MOLLUSCS	13
SOCIOECONOMICS	11
CARPS	11
RESOURCE MANAGEMENT	11
INTEGRATED FARMING	8
ECOLOGY	7
NON-FISH CULTURE	6
SEAWEEDS	4
FISH/SHELLFISH NUTRITION	4
PROCESSING	3
OTHERS	18

Table 2. SFIS enquiries by major subject
(May 1988 to January 1989)

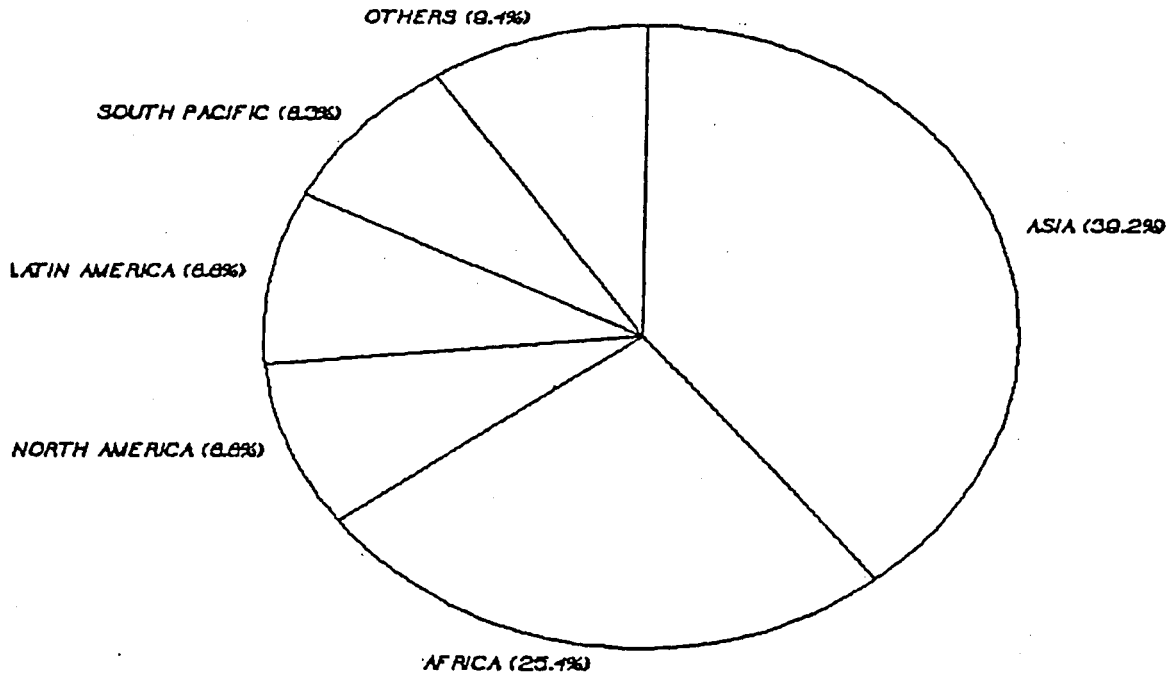

Fig. 1. Geographical spread of SFIS enquiries (May 1988 - January 1989)

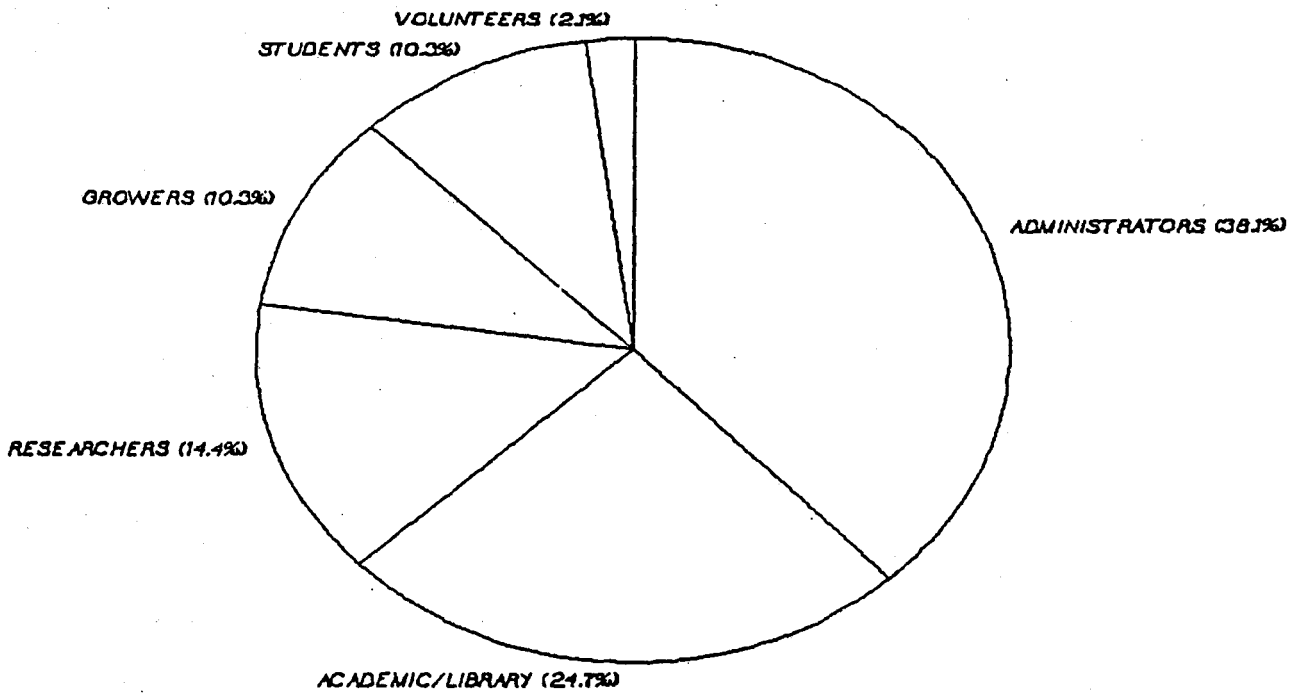

Fig. 2. Occupation or position of enquirers
(May 1988 - January 1989)
(N=97)

Annex 22

Recent developments in the ASFIS programme

R. Needham

Fishery Information, Data and Statistics Service
FAO, Rome

Introduction

It will soon be seven years since SEAFDEC hosted the seminar: "Fisheries Information Science in Southeast Asia" (Bangkok, August 1982). As far as I have been able to ascertain, it remains the only seminar dedicated to the broad spectrum of fishery information problems at regional level ever held anywhere in the world. Those of us who participated in that seminar are very much indebted to SEAFDEC for the important initiative.

Although it was my first visit to this region, I had long been in correspondence with several of the other participants, and had held discussions with a few of them on their infrequent visits to and through Rome, almost invariably in some other connection. Uppermost in my mind as I returned to Rome was how much time we had lost, prior to the seminar, due to the lack of even the modest resource needed to "get something moving". Perhaps because fishery industries offer a much smaller potential contribution to overall economic development, fisheries development has been, historically, very much the poor cousin when compared with, for example, agriculture and forestry. And in most sectors information programmes have long been seated on the bottom rung on the scale of budgetary allocations.

But as the expression "fisheries exploitation" is being increasingly replaced by "fisheries management" in official statements, so even fisheries information activities should assume more respectability and thus deserving of higher levels of support. For "management" in its manifold aspects is, by its very nature, the assembly, processing and analysis of assorted kinds of information.

Much has happened in Southeast Asia since that 1982 meeting. This is manifest not only in the steadily growing number of outputs that you have kindly sent to Rome, and what I have read in your various newsletters and in exchanges of correspondence, but also what this reflects - namely, a growing confidence that your efforts are bearing fruit. I look forward to discussing with you details of your

achievements, your problems and your plans during the course of this week. Meanwhile, in this paper I shall outline recent developments in FAO fisheries information programmes, with particular reference to the core activity of special interest to participants in this seminar, namely ASFIS - the Aquatic Sciences and Fisheries Information System.

Trends in the Fisheries Department of FAO

Visitors to FAO during the last 7-8 years will have noticed a growing preponderance of people sitting in front of microcomputer keyboards and monitors at the expense of people working with pencil, paper, calculators - the traditional office environment. This, of course, does not reflect a change in the FAO Regular Programme which, in accordance with the Organization's mandate, retains its major functions as a clearing house for agricultural information. Rather it reflects a change in the manner in which the programme is implemented, through ever increasing application of modern information technology.

The change-over is not uniform throughout the Fisheries Department. It is most evident in the Fishery Resources and Environment Division where microcomputers are used, inter alia, in software development, the analysis of stock-assessment data, modelling, converting remotely-sensed data into a geographically referenced database and the creation of a machine readable species catalogue. It is least evident in the Policy and Planning Division for the obvious reason that there are fewer potential applications. Between these two we find the Fishery Industries Division where the major applications are the marketing information database "Globefish", which is undergoing transformation to microcomputer environment, and the development of computerized registers of equipment and suppliers under the auspices of a UNDP project entitled "Clearinghouse for Fishery Advisory Services".

I note these developments here simply to inform you that FAO is establishing a basis from which it will provide a growing volume of information - data sets and software - in machine readable format, to those institutions with the requisite hardware and know-how. The clearing-house functions of the Organization should thus be significantly enhanced, though matters of policy and copyright, and problems such as abuse of proprietary packages and eventual interpretation of machine readable data in such large scale dissemination are yet to be clarified.

The core information activities of the Fisheries Department remain the responsibility of the Fishery Information Data and Statistics Service - FIDI - where microcomputers are increasingly supplementing FIDI's traditional use of the Organization's mainframe computer, for, inter alia, the maintenance of FISHDAB - the Fisheries

Statistical Database, and its access to external databases via telecommunications networks. Thus, a microcomputer system is being used for the development of a Fishery Investment Project Information System (FIPIS), and a micro-CDS-ISIS based system is being evaluated for the exchange of machine-readable bibliographic information. Publications in the ASFIS Reference Series are now being prepared on microcomputer to facilitate updating and their enhancement through the use of word-processing/desk-top publishing software. These positive developments in the work of FIDI are, however, accompanied by developments in the information industry which are forcing us to re-examine the direction in which the ASFIS programme has been moving.

ASFIS update

You must surely all know that ASFIS is the name we have given to a modular information system for the collection and dissemination of information on all aspects of the science and technology of marine and freshwater environments, including socio-economic and legal aspects. Details on the evolution of the system were presented at the 1982 seminar, and have been the subject of many other papers prior to and since that seminar.

In terms of resource involved, the most significant module of ASFIS is the bibliographic database, the monthly updates to which are published in print-format as ASFA - Aquatic Sciences and Fisheries Abstracts. Since the 1982 seminar, access to the database has been broadened through its leasing by two more database vendors, the European Space Agency located at Frascati, Italy, and BRS Information Technologies located at Latham, New York. Thus the database can now be interrogated world-wide via telecommunications through six suppliers located in five countries - Canada, France, Germany F.R., Italy and the United States. In Mexico, the database is accessible in a national on-line system supplied by Servicio de Consulta a Bancos de Informacion - SECOBI. It is also the basis of national SDI services in Canada and Spain. Before too long, it is expected that Japan and the Soviet Union will be added to this number, which then must surely be approaching an information-industry record.

Perhaps more significantly for participants in this 1989 seminar is the fact that the portion of the database published from 1982 onwards is now available on CD-ROM (Compact Disk, Read-only Memory) together with search software. This medium, which can be searched on microcomputer, eliminates the need for access to and the expense of telecommunications facilities. Although subscription to the CD-ROM version costs only little more than the print-product, it is a hard currency cost, at present beyond the means of many potential users in developing countries. However, the technology is quite new; further advances and broader acceptance should reduce costs substantially, as indeed has already happened in the compact disk music industry.

The network of centres contributing input to the database continues to expand. After a short absence, Japan has now rejoined the partnership, as was anticipated in 1982. Norway is now participating individually, but strong interest in Denmark holds out the promise of a Scandinavian network. The People's Republic of China has been contributing at a growing level during the past three years, and is in process of organizing a national network of fisheries and marine science institutions to further enhance coverage of Chinese sources. IMSTI, the Chinese "Institute for Marine Scientific and Technical Information", is using the CD-ROM as a basis for some of its information services. Agreement has recently been reached with Cuba, and by twinning the Cuban "Department of Fishery Industries" with the long-experienced ASFIS centre in Mexico, the eventual provision of input should be facilitated and enhanced.

Institutions in many other countries have expressed an interest in associating themselves with the ASFIS programme, some of them multinational/regional bodies such as the Baltic Sea Commission, the prestigious International Council for the Exploration of the Seas (ICES), and the recently established Pacific Islands Marine Resources Information System (PIMRIS), a cooperative venture of the University of the South Pacific, the South Pacific Commission and the Forum Fisheries Agency. We are deeply gratified by this growing recognition of the system. But problems of an unexpected nature have recently surfaced, and these are causing us to re-examine the concepts under which ASFIS has evolved to it pre-eminent position.

There is no question that, heretofore, the economic viability of ASFIS has been positively influenced by two factors which are unique to the system. First is the fact that in a single database can be found good coverage of the literature dealing with all aspects of the science and technology of the aquatic environment; this is certainly what the major users of the database have deemed beneficial. But, of course, we recognize that most of the major users are in industrialized countries, where research programmes are much more extensive than in the Third World. The second factor has been the involvement of a commercial publisher who, on the promise of a fair return on his investment, has borne the major responsibility for marketing the ASFIS products, and keeping the system abreast of advances in information technology, such as CD-ROM.

Unfortunately, however, as the information industry has developed and diversified in recent years, ASFIS has reached the point of diminishing returns. The growing problem was described in a recent article in "NACA - the ICLARM Quarterly" (Freeman, R.R., Bibliographic coverage of the growing fisheries literature in ASFA. NAGA, January 1988, p.5). In summary, the existing partnership generates some 32000 records per year, but it appears to be impossible to sustain publica-

tion of more than about 25000 records per year on the income derived from subscriptions. The cost of subscription to the products has reached the limit that the specialized market can bear. Increasing this cost is counterproductive since it leads to cancellation of subscriptions. Narrowing the scope would detract from a feature which has lead to the broad acceptance of the database among its present users. Certainly increased use of the database "on-line" to large-scale vendors, and on compact disk, has jeopardized subscriptions to the print-product, but we can hardly protect the conventional medium at the expense of taking advantage of new technology.

Consequently, FAO has had to recompense the publisher for the diminishing return by accepting a fairly substantial increase in the contractual cost of producing a comprehensive database, and this situation has emerged at a time of unprecedented financial crisis in FAO. While there are signs of recovery from this crisis, we do not envision any substantial increase in the ASFIS budget in the next few years. Conversely, a significant increase in the growth-rate of the database is in the offing. The potential levels of input from new centres and the proliferating marine science literature in regions already covered suggest growth leading up to a total of perhaps 40000 records per year about five years from now. Clearly, unless greater economies of scale can be realized, and at present this cannot reasonably be envisioned, then the original expectation of running an economically viable information system covering all aspects of aquatic resources and environment, and with equity for all participants, can no longer be realized.

A Fishery Development Information System?

In seeking a palliative for this difficult situation it appears that the most viable of the available alternatives will be to develop a subprogramme, or sister-programme, focussed on information products to meet the needs of developing countries for the development of their fisheries. A combination of circumstances lead to this conclusion:

(1) The broad subject scope which has led to such wide acceptance of the database in developed countries, is less relevant to the needs of the majority of potential users in developing countries. There, the major interest lies in fisheries development.

(2) In recent years, citations relevant to fisheries development per se have been diluted by the more rapidly growing volume of citations in other areas such as the biology of aquatic organisms, pure marine science and non-living resource aspects. Thus the increasing cost of subscrip-

tion has not been matched by a proportionate increase in access to literature relevant for fisheries development. This puts the major interests of developing countries at a disadvantage; ironically, it also handicaps FAO's major programmes of action resulting from resolutions of the FAO World Conference on Fisheries Management and Development, and the deliberations of FAO's governing bodies.

(3) Growth in the volume of fisheries-development relevant material entering the database will inevitably result from the growing participation of developing countries in the system. But institutions in developing countries certainly need cheaper, less diluted, access to these sources than appears feasible through the constraints under which the system is now developing. This suggests South-South information transfer on topics of special interest to the South to keep the need for North-South transfer to a minimum.

(4) Finally, to implement the action programmes mentioned above in a reasonable time-frame, we must accelerate the participation of developing countries. But experience is teaching us that the stringent requirements which have lead to the broad acceptance of the SAFIS bibliographic database are not so quickly met in most developing countries - for instance, the requirement for an English language abstract when a large part of the developing country literature carries no abstract whatsoever, and the quite sophisticated indexing needed to facilitate retrieval from a comprehensive database when simpler indexing would suffice for a more sharply focussed database.

Thus accelerated participation of developing countries will have to be founded on a simpler approach which can be progressively amplified to higher levels of sophistication as infrastructure develops and experience accrues. What should be the scope of "fisheries development" in the developing country context? There are a number of ways of looking at this problem. The FAO action programmes emphasize small-scale fisheries development, reduction in post-harvest losses, fisheries planning and management, and the socio-economic aspects of fishing communities. Bearing in mind that most developing countries lie within the tropics, a broader view would include all aspects of tropical fisheries. An alternative definition might well be all aspects of fisheries development and management - that is, the information needed to develop and sustain a viable fishing industry. Your advice on the question of scope and the priority areas for a phased implementation, would be most welcome.

The basis of a fisheries development database is already embedded in the existing ASFIS bibliographic database. On average one thousand records per year dealing with various aspects of artisanal/small scale fisheries could be filtered from the existing flow of input. The collective total of citations dealing with other areas of interest surely adds several hundreds more. Through simplifying the input requirements your accrued experience here in Southeast Asia could add several hundred more records per year in short order, and PIMRIS may very well be able to deliver basic bibliographic information within a relatively short time frame. Evolving systems in Africa and Latin America will have inputs.

Whereas a mainframe computer is needed for the creation of the existing ASFIS bibliographic database, a microcomputer system would be sufficient to develop the envisaged subsystem. Micro-CDS-ISIS software is appropriate and already widely used. Print-products could be processed through desk-top publishing software and distributed at a relatively low cost. Periodic updates to the machine readable version could be distributed on diskettes. It is perhaps not a forlorn hope that much of the work could be carried out in a developing country institution to take advantage of lower costs as well as develop indigent expertise with modern information technology. In other words, the operation would develop rather as a field project than an FAO Regular Programme activity. As such, it should be possible to obtain "seed" support from donor agencies. One of the most serious constraints under which the ASFIS programme has evolved has been the almost total lack of extrabudgetary support, for it is not within the mandate of most donor agencies to directly support a core and continuing Regular Programme activity such as ASFIS.

In summary, we believe that a global database and corresponding print-product relevant to the needs of fisheries development will be an important adjunct to the existing ASFIS database to the user community in developed countries, and to the evolving regional systems such as SEAFIS and PIMRIS in developing countries. On scientific/technical grounds, it is difficult to justify a separate database; indeed cynics might view this proposal as a manifestation of the widening gap between North and South. But we live in a world where economic realities have to be faced - in this case the fact that ASFIS can no longer develop as a comprehensive system without rapidly escalating costs that put its products and services further beyond the reach of the vast majority of institutions in developing countries.

The ideas presented in this paper offer a potentially viable alternative. But at present they are only ideas. I should be grateful for your frank opinion and your suggestions so that this time around, as I return to Rome, I shall hopefully not feel that we are again losing valuable time.