

.....The ADCP Aquaculture Information System.....

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Major increases in aquaculture production in the near future are expected to be obtained through the transfer of existing technologies and their improvement. A free flow of the required information is admittedly of crucial importance in technology transfer to achieve aquaculture expansion worldwide. Therefore the FAO/UNDP Aquaculture Development and Coordination Programme (ADCP), which has, as its main objective, the implementation of a strategy for the rapid development of aquaculture in the Third World, has undertaken the establishment of an interregional information system in cooperation with the Fishery Information, Data and Statistics Service of the FAO Fisheries Department.

Working Group on Aquaculture Information

As a first step, ADCP organized a meeting of the Aquaculture Information Group consisting of aquaculturists and information specialists in April 1979 in Rome, for the purpose of determining the types of

conventional and unconventional information required for aquaculture development and formulating a coordinated program of collection, processing and dissemination of information. The aquaculturists identified the types of information needed and where to find them. The information specialists discussed hardware and software required for processing, storage and retrieval of information. Besides aquaculture statistics, the collection of which on a continuing basis is now under the consideration of the Statistics Group in the FAO

Fisheries Department, the two major types of information that are of importance are bibliographic information and data on aquaculture operations.

Of higher priority in development planning are numerical data on aquaculture operations, which lie buried mostly in unpublished reports or publications in local languages. The network of regional

the Working Group, plans were formulated for developing a specialized aquaculture information system. This gave birth to AQUIS. AQUIS is an integrated set of computer equipment and programs which provide the services required for the systematic collection and dissemination of aquaculture data. With the assistance of a small team of analysts and programmers, the necessary input forms and a manual of procedures were prepared. The International Development Research Centre of Canada (IDRC) offered the use of the MINISIS software

developed by them for processing, storage and retrieval of bibliographic information. The Hewlett Packard HP 3000 computer system was selected as the most suitable hardware for the regional lead centers, as it could also be used for research purposes, such as biological modelling, least-cost feed formulations and analysis of experimental data.

The computer hardware consists of Hewlett Packard

processors. The peripheral units comprise video terminals for data entry and queries, mass storage devices for data storage, printers for online/offline prints and tapes for back-up functions and data exchange. The uniformity and exchange of data are assured by the compatibility of the equipment and the sharing of common software.

The hardware is presently being installed in the Regional Aquaculture Lead Centers at CIFRI Dhauri (Bhubaneswar, India), NIFI, Bangkok (Thailand), SEAFDEC, Iloilo (Philippines), and Wuxi



The HP 3000 minicomputer—for installation at Regional Aquaculture Lead Centers.

aquaculture centers established under the framework of ADCP and the national centers that will be linked to these in the future, was considered a suitable mechanism for collection, processing, storage and dissemination of data. The bibliographic information relating to aquaculture presently disseminated through the Aquatic Sciences and Fisheries Abstracts (ASFA) could be enlarged and also included in the system.

Aquaculture Information System (AQUIS)

Following up the recommendations of

(China). It is expected that by early 1983 the African Regional Aquaculture Center in Port Harcourt (Nigeria) and the Latin American Regional Aquaculture Center (CERLA) in Pirassununga (Brazil), will also have the necessary equipment for participating in the information system.

The AQUIS software consists of the Technical Data System which is application-oriented and handles alphanumeric and numeric data, and the MINISIS package for documentation and bibliographic reference applications.

AQUIS Technical Data

This system creates and maintains a database compiled from different sources of information, such as reports, case studies, publications, etc.

The data are organized into so-called "Data Units" consisting of "chapters" which cover specific subjects such as geographic/climatic data, species, diseases, culture systems, economic data, etc. A Data Unit, which is identified by a unique code, is the lowest addressable part of the database. Its structure is flexible and the user may complete a data unit in various stages according to the availability of data. The data units can also be concatenated, thus allowing for the combined coverage of different species and different culture systems and/or different time intervals.

The basic characteristic of the system is that the data must be presented to the computer operator in a set of forms (AQUIS input forms) specially designed for the data entry.

The computer procedures are completely interactive and guided by the system itself. The user is prompted to respond to questions referring to the desired basic function (insert, modify, delete) or to auxiliary operations such as search and print.

Key data items such as species, culture systems, countries and regions are validated against "authority lists," thus preventing the storage of erroneous search items.

All the computer programs are written in FORTRAN, but also make use of the standard HP database management facilities and access methods.

MINISIS Bibliographic Information

MINISIS, which will be essentially dedicated to the bibliographic information retrieval, is a database management

system which runs exclusively on HP 3000 Family computers. Although the system was created primarily for use in a library environment, its structure does not limit it to library applications. As and when the trained staff in regional centers develop experience in its use, other applications of the package also may become possible. The aquaculture-related data from the ASFA Database will be extracted by FAO and the information will be transmitted to Lead Centers on magnetic tapes to be converted to MINISIS format. Such information will be provided bimonthly or trimestrally. The available back information on the aquaculture in the ASFA Database, which now is estimated to be around 6 to 8 thousand references, will also be provided in order to build up a good bibliographic time series to enable users to have access to the database back to 1978 publication year.

Collection and Processing of Data

The most difficult part of the endeavor is recognized to be the collection of appropriate data. Some of the efforts started earlier to identify unconventional literature are expected to be of some help.

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Although the input stations would be the regional centers, the participation of other national centers and agencies will also be needed to obtain data, and their assistance will be sought for this purpose. Besides finding existing sources of information, it may be necessary to undertake case studies to collect appropriate data.

The data collected will be entered in the AQUIS input forms, which will enable their consistency to be tested. The data can be stored only if they fit into the standard "Chapters" of a data unit. The data will be transferred to magnetic tapes and each of the regional Centers will

receive a copy of each tape, ensuring that each one of the Centers has an identical pool of total data for retrieval.

As in the case of numerical data, bibliographic information also will be partly based on existing compilations. FAO, in cooperation with some of its member nations, presently compile bibliographic information on aquatic sciences and fisheries. The Aquatic Sciences and Fisheries Information System (ASFIS) includes also bibliographic information on aquaculture. ADCP is now assisting in the extension of this system. The Regional Aquaculture Centers will identify additional sources and prepare the relevant information in them in the ASFA formats. The ASFA unit in FAO will receive these and as mentioned earlier transfer them to magnetic tapes, for distribution to the Centers for running through HP 3000 computers for dissemination.

Retrieval and Dissemination

The main users of aquaculture data are expected to be planning and development agencies, investors, financing institutions and aquaculturists. Similarly, the main users of bibliographic information are likely to be research and extension workers and scientific institutions. In the initial stages, the regional Centers would undertake to search for information (both data and bibliographic information) for users in the participating countries free of charge.

Data capture will be performed through the AQUIS query sub-system. The user may request the system to extract data according to search criteria related to any combination of species, culture systems, countries and regions. The data extracted can be viewed and printed using the AQUIS reporting services. Retrieval of bibliographic information will also follow the same procedure. In both cases, each regional Center will be able to retrieve the total information, based on inputs from the entire network of stations. Print-outs of information will be made available on request.

Although there are presently no plans to issue a centralized information bulletin, the regional Centers will endeavor to identify information of special significance in their respective regions and disseminate such information as widely as possible through appropriate means, including publication of newsletters or bulletins. **A**