SIPAM. Information System for the Promotion of Aquaculture in the Mediterranean

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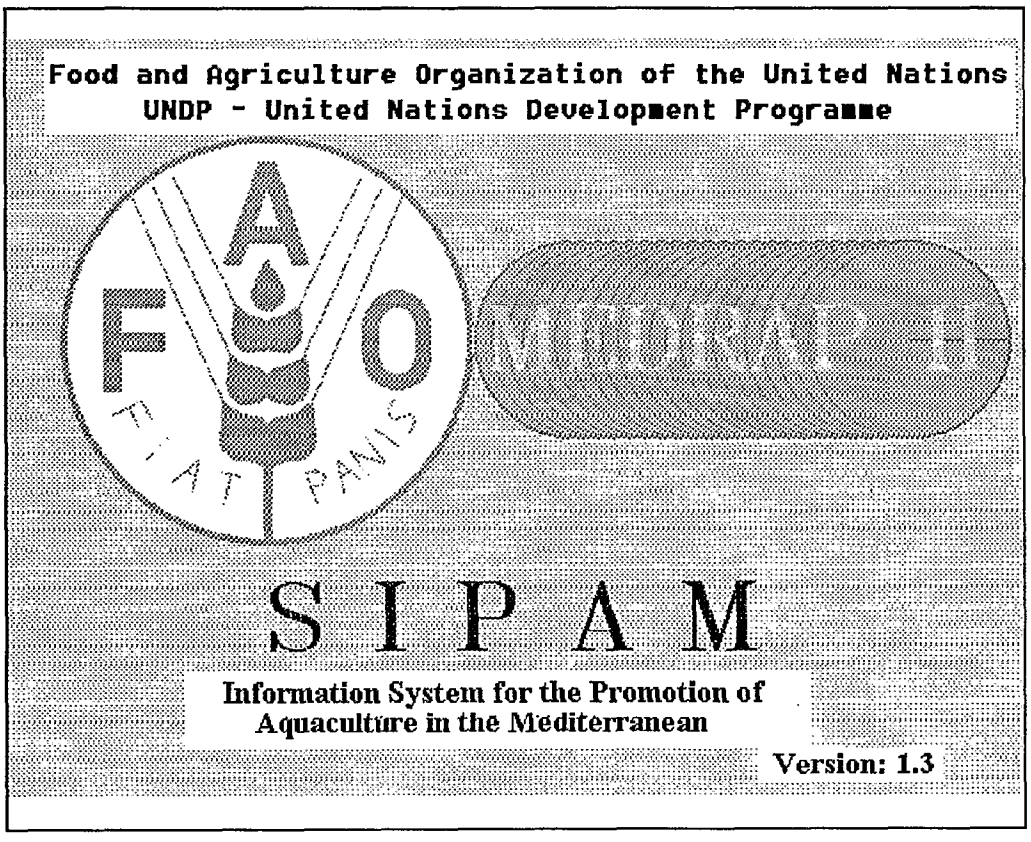
SUMMARY - This paper presents in summary the conceptual design, the background, the innovative approach and the main components and functions of SIPAM. In presenting this Information System care was also taken to explain the most qualifying characteristics related to it, and the managerial options, both of the Centre and of the Periphery. The objective of SIPAM is the establishment of a reliable and permanent regional aquaculture information system to facilitate the exchange of information regarding all domains (production, markets, regulations, technology, etc.) of interest to the beneficiaries with a view to increasing production and improving technology, the quality of the products and their marketing. My participation (as SIPAM System Designer) in this meeting was for three reasons: (i) to present to qualified forum an activity that is presently undertaken in the region in the field of Aquaculture, (ii) to start collaboration with SELAM in order to test the possibility of the SIPAM Network becoming the information vehicle of their needs in terms of data collection and information dissemination and, (iii) to meet the regional experts in aquaculture marketing problems to jointly verify the above possibility and decide if it is worthwhile including a SELAM Window in SIPAM at this time and, if so, take immediate action. The fast development of Aquaculture in this region, together with the massive need for data and information, has made this a timely initiative.

Key words: Aquaculture, Information System, Data base, Network, Mediterranean

RESUME - *"Système d'information pour la promotion de l'aquaculture en Méditerranée". Le document présente sommairement le concept, l'historique, une approche innovative et les principales composantes et fonctions de SIPAM. Lors de la présentation de ce système d'informations on a pris soin d'en expliquer les caractéristiques les plus pertinentes ainsi que les options directrices aussi bien au niveau du Centre qu'au niveau périphérique. L'objectif principal du SIPAM est l'établissement d'un système d'informations fiable et permanent traitant l'aquaculture au niveau régional, afin de faciliter l'échange d'informations pertinentes avec tous les domaines intéressant les bénéficiaires (production, marchés, réglements, technologie, etc.) en vue d' augmenter*

la production et d'améliorer la technologie, la qualité des produits et leur commercialisation. Ma participation (en tant qu'élaborateur du système SIPAM) à cette réunion est motivée par trois raisons, à savoir: (i) présenter à un forum possédant les qualifications désirées une activité qui est entreprise à l'heure actuelle dans la région, dans le secteur de l'aquaculture; (ii) initier une collaboration avec SELAM de manière à vérifier si le réseau SIPAM peut véhiculer les informations requises en termes de collecte de données et de dissémination des informations; et (iii) organiser des rencontres avec des experts chargés de traiter les problèmes relatifs à la commercialisation des produits de l'aquaculture et vérifier conjointement les possibilités ci-dessus mentionnées et décider ensuite s'il est rentable ou non d'inclure un volet SELAM dans le système SIPAM à l'heure actuelle et par la suite de prendre sans délais les actions qui s'imposent. Le développement rapide du secteur de l'aquaculture dans cette région, de pair avec le besoin sans cesse croissant de données et informations, ont rendu cela une initiative opportune.

Mots-cles : *Aquaculture, Système d' informations, Banque de données, Réseau, Méditerranée.*



BACKGROUND

At the time MEDRAP II (Mediterranean Regional Aquaculture Project - Phase II) was conceived, there was another regional Project under formulation - AQUAMED. Funded by the Italian Government, AQUAMED was intended to catalyse various activities, among which the Regional Information System for Aquaculture in the Mediterranean. To avoid overlapping of activities and initiatives, MEDRAP II, in its constitution, did not envisage any activity regarding Information Technology. AQUAMED did not materialize for various reasons, and MEDRAP II, already finalised and operative did not cover the Information sector at all.

After a few years, the need for an information tool for Aquaculture data and related information in the countries adhering to MEDRAP II became evident and soon after very urgent. Moreover, MEDRAP II, through its specialised networks (EAM, SELAM, TECAM)[1] was organising several seminars and technical consultations on the many aspects of Aquaculture development in the Mediterranean (Pathology, Marketing, Species Diversification, etc.) which because there was no information media, resulted to be of benefit only to the few fortunate persons who participated in such meetings. This limited dissemination was also due to an objective difficulty in preparing, finalising and distributing documents in more then one language. (Distributed to whom ? : to the same participants!).

In the Fisheries Resources Division (FIR) of FAO, we were in the process of experimenting a Regional Information System to Support Aquaculture Planning in Latinoamerica: SIPAL, using innovative and peculiar approaches leading to the introduction of new concepts and operative management favouring the periphery (end-user skills, knowledge, needs, etc.) against the classical Centralised Management Approach (see references). That system was designed and developed under the aegis of the AQUILA II Regional Project (Italian Trust Fund). The same FAO-FIR-based team of SIPAL was given the task of designing and developing a similar Information System for MEDRAP II. After appropriate investigation, the conceptual design of SIPAM was presented and discussed in Egypt. See References.

INTRODUCTION

The Regional Information System, SIPAM, originated mainly from four factors:

(a) the strong demand for corporate information from the many scientists and administrators involved in planning and promoting Aquaculture activities and evaluating projects at the national and regional levels;

(b) an urgent need of private and public investors, producers and suppliers for regional and international information, specifically (or especially) for this sector, in order to promote the import/export of aquaculture products and equipment;

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[1] EAM: Network on Environment and Aquaculture in the Mediterranean
SELAM: Network on Socio-Economic and Legal Aspects of Aquaculture in the Mediterranean
TECAM: Network on Technology of Aquaculture in the Mediterranean

training possibilities, prices, national and international rules and standards, legislation, feeding and pathology, etc., is also part of the above needs;

(c) the conviction that both public and private institutions possess an enormous quantity of data/information useful to administrators in the sector which, for various reasons, remain unused or only partially used because they are not appropriately compiled, processed or disseminated. This makes it difficult and often impossible to integrate and/or associate this data/information with other information of a different nature and source; and

(d) the constant requests from the public and private sectors for dedicated software to formulate and analyse research, planning and investment projects. This System will contain the instruments appropriate to this need using the databank content of the component as the comparative source of information and data.

The design and the development of SIPAM were influenced by several positive and negative constraints.

The experience gained in SIPAL and the interest shown by many MEDRAP countries in this project have definitely contributed positively to the success of SIPAM, while the initial lack of financial resources, the unavailability of a prefixed budget, the fragmented data/ information situation in the region, unbalanced national computer skills, and different levels of interest, languages, resources, etc., in the countries were definitely negative constraints to face.

MAIN BASIC CHARACTERISTICS

Having all the above as basic inputs, it was decided to launch a programme of work with similar characteristics to those of SIPAL. The most important are highlighted hereafter :

Definition: SIPAM is a tool conceived to allow the management, in predefined sub-systems, of data and information of a different nature though all pertaining to the aquaculture sector) retrieved from various national, regional and global sources. Its final objective is the establishment of a Decision Support System (DSS) for Aquaculture.

End-user identification: SIPAM end users are classified by group according to their position and fields of interest. The primary end user is the staff of the fisheries and aquaculture services in the various national offices in the region, who will be using SIPAM mainly for reporting and planning purposes, but also to answer queries from the private sector. This group is also the most important one for data supply. Among a second group of end users are aquaculturists, economists, fishery specialists, traders and investors in the industry, trade and educational institutions, in both the public and private sectors. Each SIPAM national management unit will organize its own national end-user group.

End-user contributions: the end users will be called to actively contribute not only to the common user activities but also and most significantly to propose new applications

as well as modifications to the existing ones through the national coordinator. Such initiatives may materialise by submitting detailed requests to SIPAM.

Dissemination: it has to be highlighted that all countries adhering to SIPAM, regardless of whether they are data suppliers or just information recipients, will be provided with the same tools.

Regional format standardisation: in order to facilitate exchange of data within and between countries, the Regional sub-system, in addition to the automatic data transfer from national databanks to SIPAM, will provide the data entry and management procedures for each of the applications data bases. These data bases will be structured according to a standardised regional format. For each data base, the characteristics, definition, units, directories, etc., will be documented.

The regional codification: apart from saving time in development and maintenance, the agreed regional codification system will assure a minimum level of quality and consistency. It is therefore particularly important that standard tables are used in end-user computing as well (National Systems).

Country participation: it must be strongly emphasized that SIPAM is being developed with the essential and direct contribution of national staff. This will produce a transfer of know-how from FAO to the participants and promote circulation of information and familiarization at a regional level.

Management Options : SIPAM has been designed and is being developed to be given to the participating countries. The regional centre will only serve to coordinate the activities, the data collectors, and as an information distributor.

General Legal Framework: The institutional structure of SIPAM is currently in a state of transition. With the termination of the MEDRAP II project, responsibility for the co-ordination of SIPAM has been passed to the GFCM[2]. It is envisaged that SIPAM will come under the operational responsibility of the proposed GFCM Committee for Aquaculture Development.

Copyright: SIPAM is currently operating solely in the government/public-interest sphere; extension to the private/commercial sphere would involve additional legal considerations. As far as the Software Copyright, this remains with FAO, whereas copyrights on information produced must be finalized at national level.

Resources Management. The following were taken constantly into consideration: High involvement of end-users in their official as well as personal capacity and their interaction with the FAO Hqs. Clear though limited data and function definitions to be achieved with a high level of interaction between the design team, the development team and end users. Distribute many tasks among the developers and end-users in order to facilitate integration, users' interface developments, error debugging, speed up

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2 GFCM: General Fishery Council for the Mediterranean

the development process as well as the familiarization. Initiate, finalise and consolidate one phase at a time according to the available resources. Not having been appropriately budgeted initially for SIPAM did not have funds and secured financial resources to devote to this activity. The French Trust Fund agreed to financially assist MEDRAP II with a **yearly defined budged** that enabled FAO/MEDRAP to start this activity.

THE OBJECTIVES

The objective of SIPAM is the establishment of a reliable and permanent regional aquaculture information system to facilitate the exchange of information regarding all domains (production, markets, regulations, technology, etc.) of interest to the beneficiaries with a view to increasing production and improving technology, the quality of the products and their marketing. SIPAM was conceived to fulfill three phased objectives that also represented **short**, **medium**, and **long-term** goals.

1 - Short-Term Objective : Data Base System under DOS (prototype)
2 - Medium-Term Objective: Integrated Information System (IIS +GUI)
3 - Long-Term Objective : Decision Support System (IIS+ TOOLS)

Short-Term Objective
SIPAM DOS VERSION

DOS Architecture: in order to rationalise SIPAM development and implementation, to enhance its possibility of success, and to increase its immediate use and interest by all the concerned parties, it was decided to quickly develop the system in DOS, and divide it into Sub-Systems (substantial and accessory):

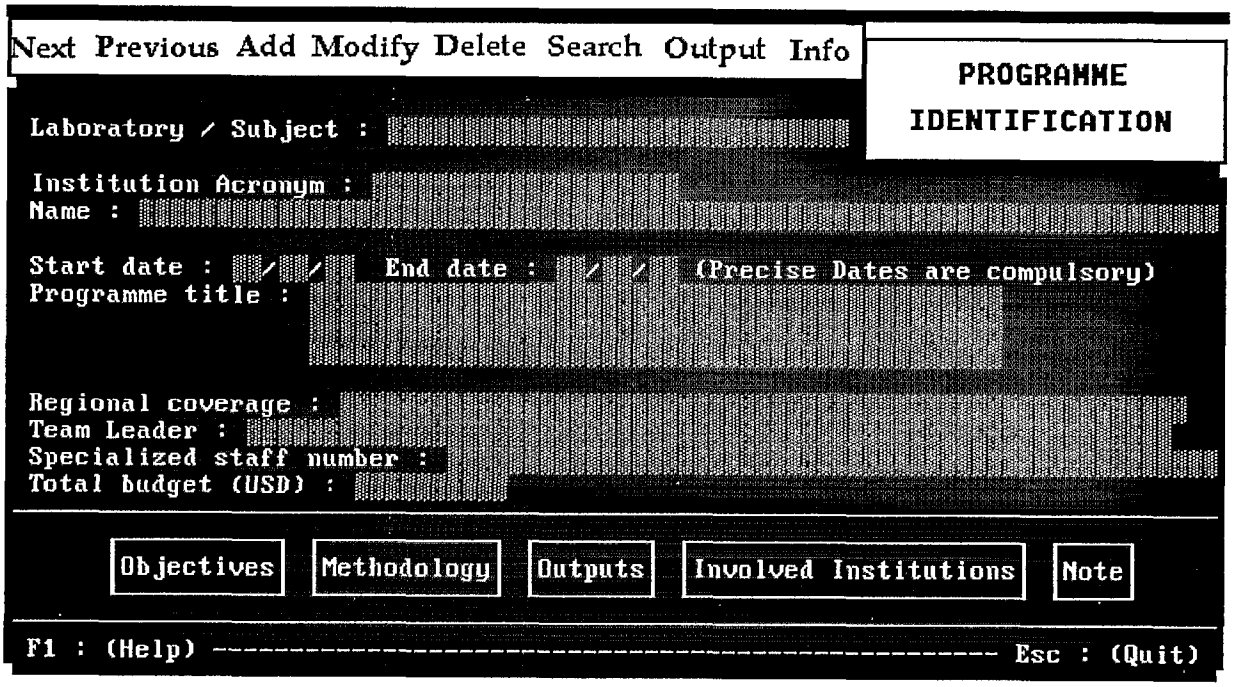
National Sub-System
Regional sub-system
FAO sub-system
Analytical Tools
Extended sub-system
Data Processing Tools
System Management Module
Network Access
On Line Technical Documentation

PRINCIPAL FUNCTIONS

Each of the data bases contain the following basic functions:

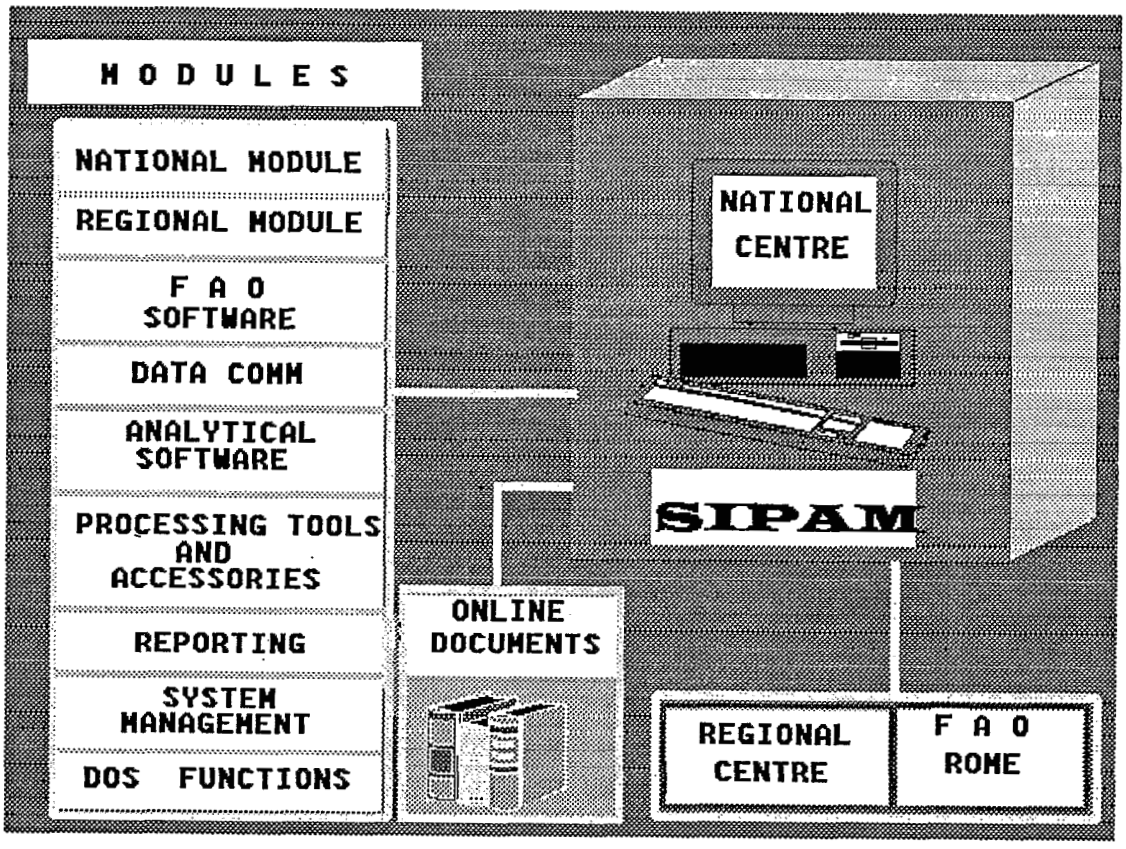
Next-See Next Record
Previous-See Previous Record
Add-Add a New Record in the Data base
Modify-Modify existing records in the Data base
Delete-Remove existing records from the Data base

Search-On-line Search for records meeting multiple criteria
Output-Output Search Results to Screen/Paper/File meeting multiple criteriaInfo-ReadInformation about the Data base in use and on-line help.



For SIPAM DOS software development, xBase Format was selected for the Relational Data Base Management System, not only because it is an internationally accepted de facto standard, but also because many FAO applications, as well as national applications, have already been developed using xBase engine.

The DOS Version contains a series of subsystems organised by homogeneous data or functions Domains. The **National Sub-System** will provide SIPAM with direct access to national databases. However, this option will be available only for those countries where a national information system exists and the national coordination staff are able to develop the appropriate communication protocols. Alternatively, this module will contain the same software as the Regional Module managing data at a lower level of aggregation and having all the typical functions of data entry. This option **National Write Read Use DB** (NWRUDB) is reserved for the country's own use and management; it will reside only in the National Module of SIPAM given to the Countries. For the prototype development, this will be similar to the regional one (RWRUDB), but in the second phase countries will be invited, and possibly assisted, to expand the data coverage to be closer to their realities and at the same time be colloquial/compatible/comparable with SIPAM. However, it is worth noting that this will be entirely at the choice of the countries.



The **Regional Sub-System** is a corporate system which summarizes the information supplied by countries according to a given methodology. It is a collection of all the selected Data Bases, customized to allow all the typical retrieval functions: Select, Search, Print, Save, Export, Configure. Two types of system are foreseen:

(i) **Regional Read Only Use** (RROU). This version will reside in the Regional Module of SIPAM distributed to the countries. Its content will be an aggregated Data Base made up from all the National ones that are received in SIPAM on time. It will contain all the retrieval/output functions of the application. It does not contain the Data Entry Procedures.

(ii) **Regional Write Read Use** (RWRUDB). This version will reside in the Regional Module of SIPAM installed at SIPAM Headquarters and at FAO Rome. It is very similar to the previous one (RROU) but will contain all the functions available, including DataEntry. The Data Uploading / DownLoading and Data Security functions will be performed under a different system segment.

The **FAO Sub-System** will contain some of the officially published software and data bases obtainable from FAO Hqs and relevant to SIPAM. Most of them are part of the **FAO Computerized Information Series.**

The **Extended Module** will contain an abstract prepared by SIPAM of information collected through the link with world-wide commercial and non-commercial networks.

As far as networking with remote sources is concerned, this task is foreseen in the second phase and finalized in the third. Also, SIPAM will contract access and authorization to redistribute data.

The **Analytical Module** will contain various programs for the analysis of the data/information processed through SIPAM or gathered from other sources specifically obtained or developed to assist in the technical and financial management of aquaculture production projects.

The **Data Processing Module** will enable the user to process and critically analyze the information retrieved through SIPAM. In fact, one of the characteristics of the system is that it will not be dependent upon pre-determined models. This Module will therefore contain all the commercial software which the user might need to carry out the analytical studies (word processor, spreadsheet, DBMS, project management tool, graphics, statistical package, etc.).

The **System Configuration Module** will assist in configuring SIPAM according to the different hardware/software platforms where it is installed. It will also contain and manage the overall codification system based on a prefixed Reference File System.

The **System Management Module** strongly depends on whether SIPAM is working as a Regional or National centre.

The national centres will manage the flow of the data between the various national sources of data and themselves and will be responsible for the interfacing procedures to the Regional Module and the associated automatic and routine data-quality control and verification of the input data.

The national coordinators evaluate the quality of the data received by classifying them into: data not reliable (therefore to be either revised or rejected), data reliable but confidential (therefore not to be distributed) and, data reliable that can be sent to the regional centre. In the National module of SIPAM many applications are foreseen, and appropriate software delivered and given to the countries. However the countries are free to use, if available, their own software and databases. Countries that intend to use the DataBases developed under SIPAM for their national use in a more customized way, may request SIPAM management to modify the structure, the coverage, the interphases, and the software accordingly.

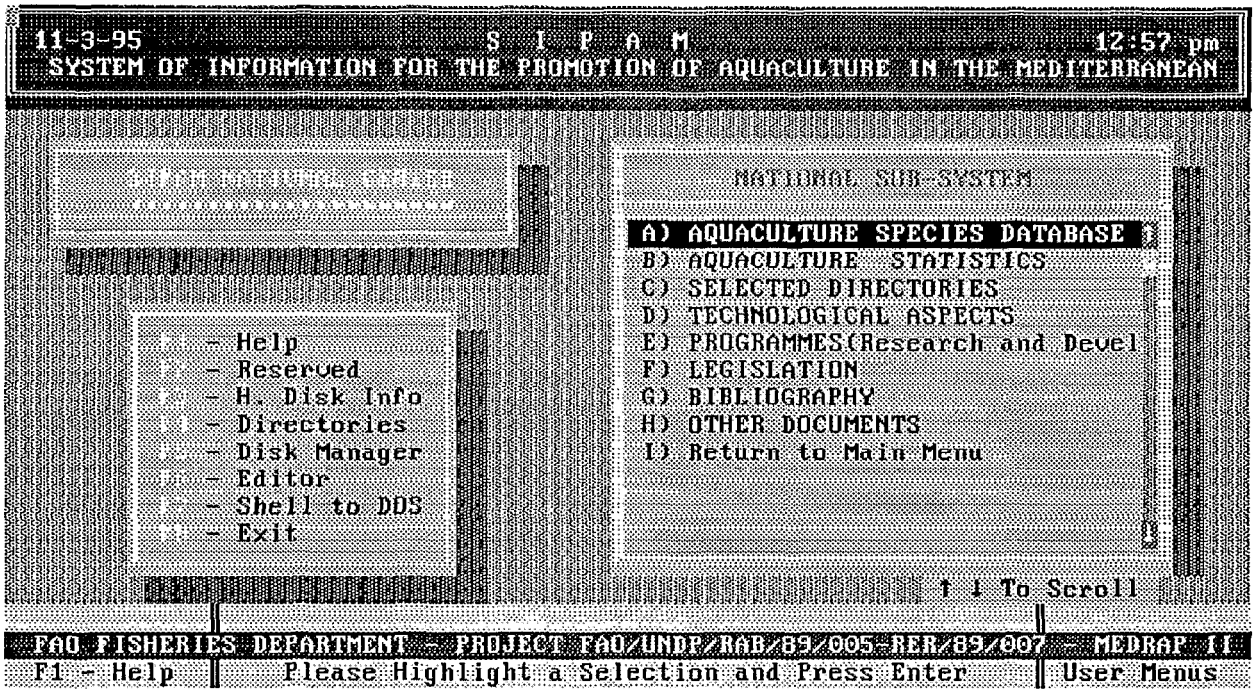
The SIPAM data manager at the Regional Centre will ask to download national data from national Databases. The downloaded files from all national centres will be sent to the SIPAM Regional Centre where this data will be merged to generate the Regional Database which will be redistributed to the National Centres for access under the Regional Module. It is obvious that the task of the Regional Data Manager will not simply be collating the datafiles, but will mainly be checking the consistency and accuracy. The normalization is secured by the System itself through a well-defined regional codification system and a series of reference tables and heavy debugging routines.

Network Access. The networking capability of SIPAM depends strongly on two factors:

1. Whether it is working as a Regional Centre or a National Centre, and
2. The environmental technological level of the country/city where it is physically located.

In principle the Regional Centre will be connected with INTERNET Full Facility, (E-Mail, FTP, Navigation Tools, W.W.Web, Gopher), Point-to-point Connection via Modem and pcANYWHERE(Symantec), to some commercial and non-commercial Remote DataBases and Information Systems (GLOBEFISH-FAO is foreseen). The National Centre will be given the software and the tools with the same possibilities but contracts and costs will be under total national control and budget. On-Line Technical Documentation

All SIPAM-produced documentation manuals and the help screen is incorporated in the System. It is in Read/Browse format for ASCII files in this DOS version, whereas it will be in HyperText format WINDOWS Help type for the WINDOWS Version.



Medium term Objective
SIPAM WINDOWS

The re-elaboration of the system taking into account its expansion and consolidation has been envisaged as a future development to be carried out under the WINDOWS environment. The main objective is to provide the users with a better user interface with all the functionalities the new platform may allow, especially in terms of data/information integration and data communication. In particular the exploitation of the Dynamic Data Linkages throughout the system which should greatly improve the

production of automated multi-disciplinary reports directly "linked" to internal databases. Moreover, the whole search process may be replaced by a global system interface using SQL (Structured Query Language) which should lead to a reduction of redundant data associated to a faster and wider search capability.

Through a Graphical User Interface (GUI), an integrated Suite of data processing tools, and data communication facilities the following features will be available:

At the system architecture level national, international and FAO environments used will be made colloquial.

At the structural level, different connecting protocols (interfaces) to manage products coming from different environments will be internally managed both for the input/output procedure and for the format and structure of the data.

At the function/service level data format interchange with applicative software (standard commercial software) and connection to different peripherals such as printers, scanners, modems, as well as electronic mail, is foreseen. At this level the different national working languages to be used in the system may also be taken into account. For the prototype development English was selected as the first language, and an English version was also prepared. In its final version, the system will be provided with a multi-language data dictionary to allow quick and standardized user interfacing.

At Data/Functions integration level, the System will be able to query and process data at DataBase level, at Domain level, and at Corporate level and process the query results into a predefined or free-hand space/time Models.

SIPAM WINDOWS should help in the following activities:

1. Reduced information overload. Planning involves a large number of variables which must be simultaneously considered. Using GUI interface and Corporate DataBase the information processing will be quick and efficient.

2. Information selection. Key procedures identified within pre-defined processing models, can assist in defining information to be pulled out from the data base.

3. Economic solutions. By enabling users themselves to process data, make experiments, produce reports, and provide answers at low cost and with a minimum of human resources.

4. Fast turnaround. Pre-defined Routines will perform reporting operations from Corporate without special knowledge.

5. Interaction with planning systems. Pre-defined models to be developed will facilitate the incorporation of operating results into the planning systems (i.e APS).

6. Communication aid. Data Communication performed automatically or semi-automatically within the System.

7. Direct involvement. Interactive search and processing capacity can be used directly by decision makers, bypassing the obstacles of communicating planning needs to operators.

Long-Term Objective : A DECISION SUPPORT SYSTEM

Preliminary Concepts

Decision Support Systems (DSS) are sub-systems of the management information system which support analysts, planners, and managers in the decision-making process. Decision support systems are especially useful for semi-structured or unstructured decision making process where problem solving is enhanced by an interactive dialogue between the System and the user.
SIPAM as decision support systems should allow easy data access to systems which help a decision. Its characteristics will be that it may be used directly by the decision maker, or indirectly with clerical assistance, or through a specialist. We strongly believe that interactive capabilities are essential in a system to support the decision making process when the search model is totally unstructured.

SIPAM will contain facilities to transfer data from internal data bases and external data banks to build models, feed GIS Thematic Data Banks, Build time series to perform planning analyses etc. SIPAM will also produce regular reports, ad hoc reports, aids to forecasting, and aids for monitoring systems.

The strategic location of SIPAM

SIPAM can be seen in two different (though complementary) Functions occupying well defined strategic positions:

(a) DataBase System - Physical Strategic Location

SIPAM is intended to be located in between the national data structure (very desegregated) and the World Information Centres - FAO (Aggregated Data). The flow of the data and information would go from the Data Producers to the Information Recipients according to the following table:

Data Producers

Research Centres
Institutes and Institutions
Production Centres
Individuals
News Networks
Etc.

National Coordinators

National Information Systems

Mediterranean Countries

S I P A M

FAO

(International World Data

Dissemination Centres)

S I P A M

National Coordinators

National Information Systems

Information Recipients
(Data Producers)

Research Centres
Institutes and Institutions
Production Centres
Individuals
News Networks
Etc.

(b) SIPAM as Decision Support System (DSS)
Intellectual Strategic Location

In a typical Management Information System SIPAM would occupy the bottom layer; it will be the reservoir of the data and information needed to support planning and management options for activities regarding Aquaculture. It will integrate data typical from the Aquaculture Sector, with those from different Sectors as well as results from analytical studies.

Development strategy

This System will be designed as an integrated information system, i.e., a homogeneous system in which the end user is not aware that it is built of different basic elements. It is important to note that in designing this System the end user and his needs, and not the wish to produce one more instrument of data dissemination without a pre-established target, are the main consideration.

For reasons of compatibility with FAO standards, and for other technical and operative reasons, the networking hardware is configured around a platform based on the INTEL 80x86 micro-processor family. The elements that need to be integrated to constitute the network through non-rigid connections are of a different nature and effort. This was also due to the fact that because of technical and operational reasons the Client/Server approach was not considered feasible.

The System architecture has been designed on a "STAR" pattern with non-rigid connection in which the centre of the STAR represents the Regional Centre (manager) and the points represent the users. The System will have two operational levels, one at the Centre and one at the periphery. In this particular case the System is developed around a network in which the centre of the STAR is represented by the MEDRAP Project headquarters where the System Manager pilots all the applications at regional level. At the edges of this STAR are the countries and other end users in the region. The network is complete with two more connections, one representing the link to the FAO Fisheries Department SIPAM back-stopping team, and a second one to a hypothetical node to connect remote databases and networks.

The first-level network which covers the Project headquarters, FAO-HQ and the remote centres applies a so-called "TOP-DOWN" strategy. This strategy is typical of a vertical initiative in which, without taking too much account of the final characteristics of the user, the application is developed and imposed. For the second-level network covering the National Centres a "BOTTOM UP" strategy was applied . For the application of this strategy the initial components of the System are known beforehand, but its structure and implementation need to be defined case by case stepwise.

The following implementation strategy accompanied the development of SIPAM:

- At the system architecture level national, international and FAO environments used have to be made colloquial.
- At the structure level different connecting protocols (interfaces) to manage products coming from different environments need to be developed both for the input/output procedure and for the format and structure of the data.
- At the function/service level data format interchange with applicative software (standard commercial software) and connection to different peripherals such as printers, scanners, modems, as well as electronic mail, must be foreseen.
- At this level the different national working languages to be used in the system must also be taken into account. Therefore, the system will be provided with a multi-language data dictionary to allow quick and standardized user interfacing.
- The System will be developed, both at the Centre and at the periphery, on identical hardware in order to optimize the products and ensure the network performance.

SIPAM Development Process

Following the consensus on the conceptual design, the System Design foresees implementa-tion based on the following major steps:

- fixing the methodology to providing a tool to collect and process in a systematic way information useful for aquaculture development in the region. In addition to their own compiled data, the countries will have direct access (from the same National Centre work-station) to regional data and FAO data
- designing and implementing a Regional Module to put regional information at the disposal of the countries in a readable and comparable format. The Regional Information System will be fed with non-confidential national data of regional interest which each country has put at the disposal of the Project
- designing and implementing an FAO Information Module which will incorporate some of the available authorized FAO data-bases and other software of interest to this programme of work
- designing and implementing a network linking remote sources of data and networks with the EXTENDED SIPAM Module through automatic data transmission
- preliminary evaluation on the usefulness of designing and developing an analytical tool for aquaculture planning

- assisting the selected countries in the use and maintenance of the system
- extending the network whenever possible to other countries and other selected end-users, and individuating the best network approach taking into account all the various possibilities and constraints.
- developing WINDOWS Versions with GUI Facilities
- merging Data/Information from the DOS Versions
- development of various Analytical Tools
- integration of WINDOWS Version with tools
- expansion of the coverage
- Servicing the System

Human Resources and responsibility Involved (DOS Version)

System Design (FAO-GFCM)

System Management (FAO-GFCM)

Regional Data Management (Regional Centre)

National Data Management (National Coordinators)

FAO Data Management (FAO-GFCM)

Documentation (Regional Centre)

Installation, Maintenance (Regional Centre)

Analytical Tools (FAO- GFCM/ National Coordinators/ External Specialists)

Regional Coordination (Regional Coordinator)

The Present Contents of the DOS Version

The data bases included in the DOS Version are the following:

National Sub-System Domains:

a - AquaDab	Aquaculture Species DataBase (FAO)
b - Statistics:	Production Statistics
	Import Statistics
	Export Statistics

c - Selected Directories:

National Experts in Aquaculture

Production Centres:

Aquaculture Institutions

d - Laws and Regulations:

National Laws and Regulations Abstracts

National laws and regulations By keywords

e - Reports: Aquaculture Country Reports (Text)

f - Research and Development Programmes:

g - Technology: Fish Pathology Data base

h - Bibliography

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f - Research and Development Programmes:

g - Technology: Fish Pathology Data base

h - Bibliography

i - MEDRAP Activities and Reports produced

FAO Software

The FAO software accessible directly from SIPAM- "FAO Module", have been selected from among those officially distributed by FAO that have a direct or indirect interaction with the aquaculture sector. The first SIPAM release will then contain the following Software:

SPECIESDAB	Global Species DataBase for Fishery Purposes
AQUADAB	Aquacultured Species Parameters for Researchers
AQUASTAT	Time Series of Aquaculture Production
FIPPDAT	Fisheries Policy and Planning DataBank
LISTAL	Directory of Aquaculture Experts in Latin America
AGRIS-Fishery	Fisheries Bibliograhic Reference DataBase
APS	Aquaculture Planning Simulator
AGROSTAT	World Agriculture Statistics (limited to the development phase)
GLOBEFISH	Fishery Markets Data Base (limited to the development phase)
SOFA93	The State of Food and Agriculture
COSTAB	PC_COMPASS module for project costing.
COSTBEN	PC-COMPASS module for the cost benefit analysis

CONCLUSIONS

The participation of the SIPAM System Designer at this meeting was for three reasons:

To present to a qualified forum an activity that is presently being undertaken in the region in the field of Aquaculture in the hope of passing the right message across.

To start collaboration with SELAM in order to verify the possibility of SIPAM Network becoming the information vehicle of their needs in terms of data collection and Information Dissemination.

To meet with the regional experts in Aquaculture Marketing problems to jointly verify the above possibility and decide if it is worthwhile including a SELAM Window in SIPAM at this time. If found appropriate, to start immediately work on the Design of this component (in the spirit of the SIPAM approach).

"Late News: A mixed group of regional Experts (SELAM - SIPAM - CIHEAM) met after the Seminar and lay down the basis for initiating a joint programme that should lead to the Design and Development of a SELAM Module into SIPAM.

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