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MEDITERRANEAN REGIONAL
AQUACULTURE PROJECT



37

**WORKING GROUP MEETINGS
ON THE DEVELOPMENT
IMPROVEMENT AND ADOPTION OF
SIPAM SOFTWARE PROTOTYPE**

Rome, April 19-21 1994

Nantes, November 29 - December 2 1994

Iraklio, April 4-7 1995

Nicosia, June 14-17 1995

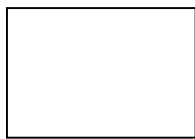
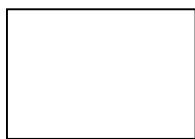


MEDRAP II
RAB/89/005-RER/87/009
FIELD DOCUMENT
95/37

**Working groups meetings on the Development,
Improvement and Adoption of the SIPAM Software
Prototype**

**Rome, Italy April 19-21 1994 Nantes, France
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14-17 1995**



**Edited by MEDRAP II Regional Center
Tunis - Tunisia**

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Preparation of this Document

This document is one of a series of documents prepared during the course of the Project identified in the title page. The conclusions and recommendations given were considered appropriate at the time it was prepared. They may be modified in the light of further knowledge gained at subsequent stages of the Project.

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This document was edited by Hassen AKROUT and Mohieddine BELKHIR in collaboration with Othman BÉJI and Neila KAFFEL, the revision was made by Michel LAMBCEUF.

Note from the reviser

The revision and publication of this document could only be done a long time after the closure of the project. This has led to some difficulties in finalising the documents and implementing corrections, because authors and contributors as well as some of the original material or files were no longer available.

Therefore contributions from participants and session papers annexed to most of the documents were left in their original form. No language corrections were introduced, the content was not modified and left under their respective authors¹ responsibility.

Considering the above, we hope that the reader will understand that a standard of publication could not be maintained on a level as high as we would have liked it to be.

The present document is a collection of four reports of successive Working Groups held during 1994 and 1995 for the design of the System of Information for the Promotion of aquaculture in the Mediterranean, SIPAM.

Working Group on SIPAM System Design Development
Rome Italy, 19-21 April 1994

Second Working Group on SIPAM System Design Development
Nantes, France, 29 November - 2 December 1994

Third Working Group on SIPAM System Design Development
Iraklio, Greece, 4-7 April 1995

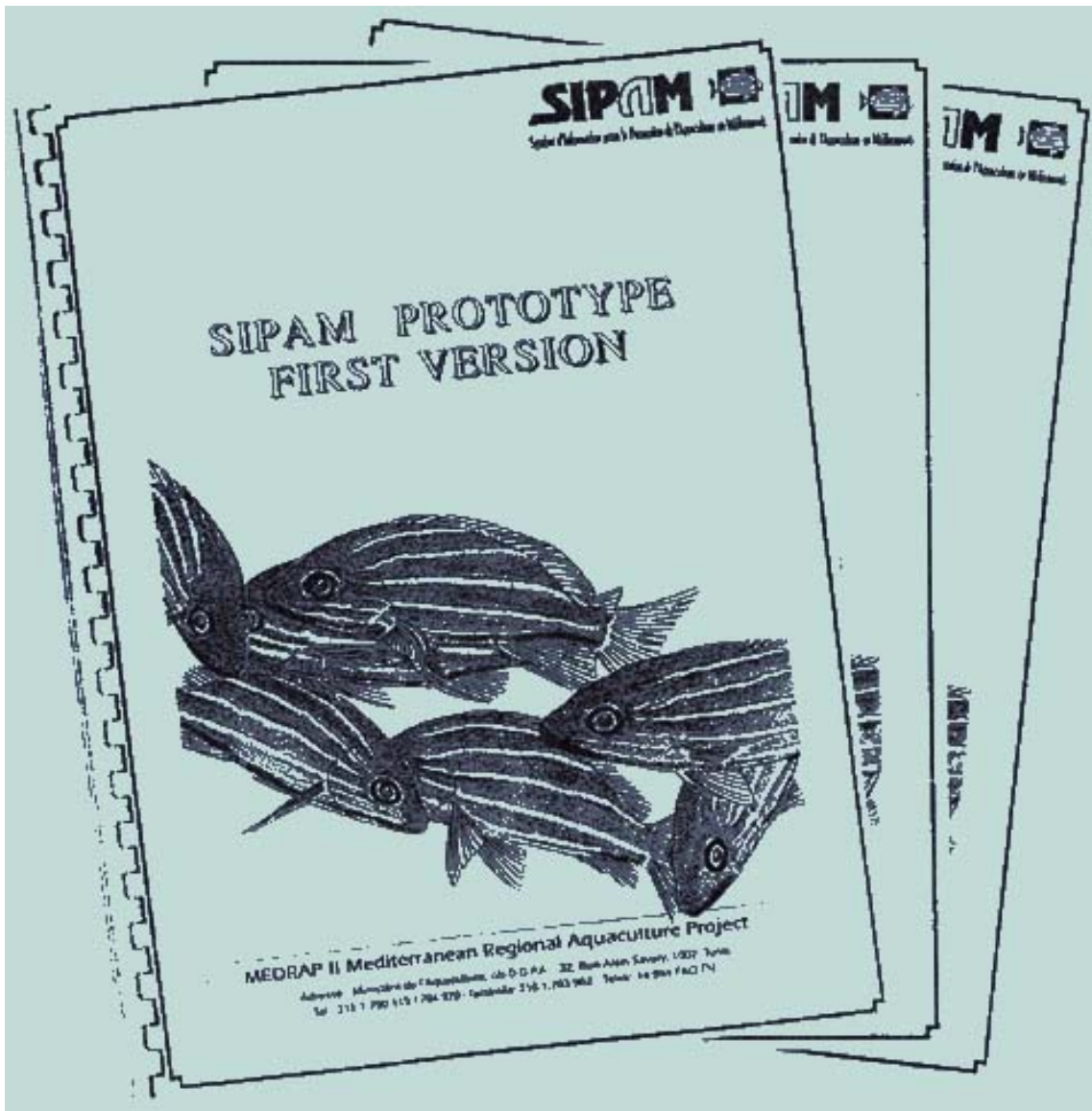
Fourth Working Group on SIPAM System Design Development
Nicosia, Cyprus 14 - 17 June 1995

Working Group on
SIPAM System Design Development
(Mid-Term Review)

FAO - Hq Rome, ITALY.

April 19-21,1994

Othman BEJI - Denis LACROIX



MEDRAP II / SIPAM

Mediterranean Regional Aquaculture Project

System of Information for the Promotion of Aquaculture in the Mediterranean

Résumé

Le projet SIPAM progresse en suivant le plan de travail prévu en 1993. **Six pays** sur les huit pays-pilotes de la phase expérimentale ont participé à la réunion du groupe de travail sur le développement du système prototype qui s'est déroulé à Rome, du 19 au 21 Avril 1994 (Chypre, Croatie, Egypte, France, Portugal, Tunisie). L'exposé et l'analyse de la situation de l'aquaculture dans ces pays ont démontré **l'utilité du SIPAM et le bien fondé de ses objectifs** pour lesquels les représentants du réseau SIPAM dans chaque pays ont déjà engagé nombre d'actions concrètes: inventaire des bases de données existantes en aquaculture, collecte de données correspondant aux sept thèmes prioritaires, acquisition de matériel, contact auprès des producteurs privés, etc.

Cinq fichiers ont été étudiés, discutés, modifiés et adoptés au cours des travaux. Ils seront complétés par six bases de données fournies par l'OAA (espèces, experts, bibliographie, législation, planification, contrôle sanitaire) et par deux bases préparées par le SIPAM (documentation, lois et normes).

Le programme permettant l'exploitation de ces bases de données sera testé au cours des prochains mois par les pays afin de pouvoir juger de la validité du prototype lors de la réunion de travail de novembre. Le système d'exploitation informatique actuel est MS-DOS. L'environnement passera en WINDOWS en 1995, logiciel très répandu et bien adapté à l'interface avec la langue arabe.

Un budget prévisionnel pour 1995 a été élaboré et approuvé. Il bénéficie de la **reconduction de principe du financement du "data manager" par la France ainsi qu'un appui possible** de ce pays à plusieurs actions complémentaires utiles au développement et à l'efficacité du réseau SIPAM.

L'évolution future de ce réseau peut suivre deux voies: soit le SIPAM reste une simple **banque de données** collectant, échangeant et redistribuant des données, soit le SIPAM devient un véritable **centre d'information** semi-privé capable de s'autofinancer en partie par le traitement et la vente d'informations intégrées et ciblées. Cette seconde option exigera un développement spécifique du réseau. Ce choix, qui sera à prendre à la fin de l'année en fonction du budget disponible, sera éclairé par l'expérience acquise au cours du second semestre 1994 par les pays et par l'équipe SIPAM de Tunisie.

MEDRAP II Mediterranean Regional Aquaculture Project - SIPAM Adresse: Ministère de l'Agriculture, C/O DGPA-32, Rue Alain Savary, 1002 Tunis Tél: 216-1-790 119.
Facsimile: 216-1-793 962. Téléc: 14 994 FAO TN

Abstract

The SIPAM project is on its way. The timetable shows to be quite realistic and the evolution of the project confirms the conclusiveness of the objectives. **Six countries** (Cyprus, Croatia, Egypt, France, Portugal, Tunisia) among the eight members of the pilot group attended to the working group in Rome, from 19th to 21st of April, 1994, which demonstrates the strong involvement of the governments in this project. The general review of the states of aquaculture in each country proves that **there exists an urgent need to proceed to the SIPAM network as it answers to the main problems faced by countries**. SIPAM representatives have already undertaken several actions to prepare the start-up of the network: inventory of existing databases on aquaculture, collection of data related to the seven priority topics, purchase of equipment, contact with private sector, etc...

Five files had been studied, discussed, adopted and approved. Six additional databases (species, experts, bibliography, legislation, planning, health control) will be soon provided by FAO and two other databases (documentation, laws and regulations) by MEDRAP.

The exploitation programme will be tested during the next months in order to evaluate the validity of the prototype at the working group for the adoption of the prototype in November. The system used today is under MS-DOS. It will be under WINDOWS in 1995, as this software is worldwide used and it fits well with Arabic language.

A provisional budget for 1995 was prepared and approved. It plans the renewal in principle of the data manager budget by France and a possible support of this country to few complement actions required for the improvement and the efficiency of the SIPAM network.

*The elaboration of this network is a kind of alternative: either SIPAM remains a **simple databank** collecting, exchanging and distributing data or it becomes a real **information centre** with a commercial activity (sell of integrated and processed data) in order to be partly self-sufficient. This second option will require a specific upgrading of the network. This choice has to be decided at the end of 1994 according to available external financial resource. It will be facilitated by the experience gained during the second half-year by the countries and the SIPAM team in Tunisia.*

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I. Introduction

The working group on SIPAM System Design Development (mid-term review) organised by MEDRAP II project in collaboration with FAO (FIRI) was held from 19 to 21 April 1994 in FAO Headquarters in Rome.

This meeting was attended by MEDRAP-SIPAM representatives of Croatia, Cyprus, Egypt, France, Portugal and Tunisia). Were also present:

- from FAO-Rome : S.R. Coppola, R. Ziesler, M. Pedini, U. Barg and Ben Aleya from GFCM
- from MEDRAP Centre : H. Akrouf, D. Lacroix, O. Beji and M. Zitoun.

Annex 1 gives the list of all participants.

The meeting was opened by Mr. H. Akrouf, Project Coordinator. He welcomed all participants wishing them success in their work and passed the floor to Mr. Pedini (FAO-FIRI) who thanked all the presents and stressed the importance of the objectives of this working group meeting. He wished to all the participants a fruitful and constructive meeting and a good stay in Rome.

The officials of the meeting were unanimously designated as follows:

- Chairman : Mr. S.R. Coppola
- Rapporteurs : • Mr. D. Lacroix
• Mr. O. Beji

The preliminary agenda was adopted with some modifications (annex 2)

II. SIPAM System Development

II.1 Situation in the pilot countries

The need of a general overview of the situation of the SIPAM project in the pilot countries was clear as no specific information on SIPAM evolution had been directly given from one country to another since the start-up of the project in October 1993. D. Lacroix, as data manager, screened the situation of the SIPAM in 7 of the 8 countries (except Croatia he had not visited yet) in relation with the status of aquaculture in each country. This presentation allowed a better preliminary understanding of the assets and constraints of each country involved in this project.

Before the national presentations, S. Coppola underlined the fact that the SIPAM project was in an experimental phase. Therefore, it was essential for each representative speaker to point out the goals sought by the country for this network and the means (hardware, software, data) that were already available or may be available in the future and put at the disposal of SIPAM.

a) Portugal

As preliminary remark, Mrs. Maria Joao Robalo noticed the lack of experienced people in data network management at IPIMAR, the national Institute for Marine Aquaculture. This explained why the existing facilities are not fully used. The general secretariat of the Ministry of sea collects all the data concerning fisheries and aquaculture. The computer system is a UNIX type with UNISYS terminals. Databases are managed through ORACLE software (4th generation) and are linked to "C" by a SQL-Type interface. Research and Development institutions, legislation, bibliography and experts can be soon computerized. Collecting data on the other topics

(productions, producers, experts, etc...) is hampered by the lack of direct and regular relation with the ground. She underlined the fact that the start-up of this network would undoubtedly improve the effort of data collection in aquaculture and make easier the exchange of information with the Ministry of Agriculture in charge of the inland aquaculture.

b) France

Mr. Charles de la Pomelie listed first the several institutions in charge of aquaculture research and development in France. Computerized networks are numerous and well equipped in quite all available software. Bibliography is very comprehensive and up-to-date. Production data is available but as total per region and per species because of the necessary confidentiality of producers results. Data on Research and Development institutions are easily accessible. A private software, "aquatool", gives the references of thousands of suppliers in aquaculture but it is limited to EC countries. The main interest of France in this network is the opportunity to develop scientific multilateral cooperation on the species (new species) and problems (pathology, environment) of major interest for the Mediterranean.

c) Croatia

Aquaculture in Croatia is quite unknown. That is why Mr. Vlado Dacic presented first the situation of aquaculture in his country. It can be summarized in few observations:

- the Croatian coast = 15% of the Mediterranean coast;
- more the 1000 islands;
- favourable climate and no problem of pollution;
- 20 freshwater farms (carps and trouts = about 5000 T);
- 23 marine water farms (sea bass/bream : 450 T to export which represents 4,5 million USD income);
- several mussel and oyster traditional farms;
- the Ministry of Agriculture and Fisheries is in charge of the sector of aquaculture including production recording and scientific research.

The research centres are linked through interest network using UNIX system managed by ORSCLE. Up to now, aquaculture remains a "black box" and Croatia is expecting a great deal from SIPAM services.

d) Cyprus

Mrs. Daphnee Stephanou pointed out first the fact that in Cyprus, farms must provide regular and precise data to obtain yearly license. The other sources of information are the Department of veterinary services, Department of Agriculture, and the Research and Development stations of the Fisheries Department.

The computer centre in Nicosia operates a 486 MITAC unit (350 MB) equipped with D Base IV, World Perfect 5.1, Lotus and Harvard Graphics. Detailed data on production statistics, legislation, suppliers and some aspects of Research and Development are already available. SIPAM could become a unique source of reliable information on scientific research (especially bibliography and research on diversification) and commercial development (markets and prices) all over the Mediterranean.

e) Tunisia

Mr. Zouhaier Saghrouni presented the situation in Tunisia, on behalf of Mrs. Missaoui, SIPAM official counterpart. Considering the production sector, an excellent network for data collection is functional. Data are compiled in the Ministry of Agriculture which is also conducting a comprehensive survey on the potential sites for aquaculture in order to plan the development of this new activity. Scientific research is conducted by INSTOP, the National institute, which efficiency is limited by the lack of information. Some diagnosis for the CNA, the national experiment centre of Monastir, which experimentation programme could be optimized by closer relations with other similar centres working on the same species. This general lack of information should be solved quickly by the set-up of SIPAM.

f) Egypt

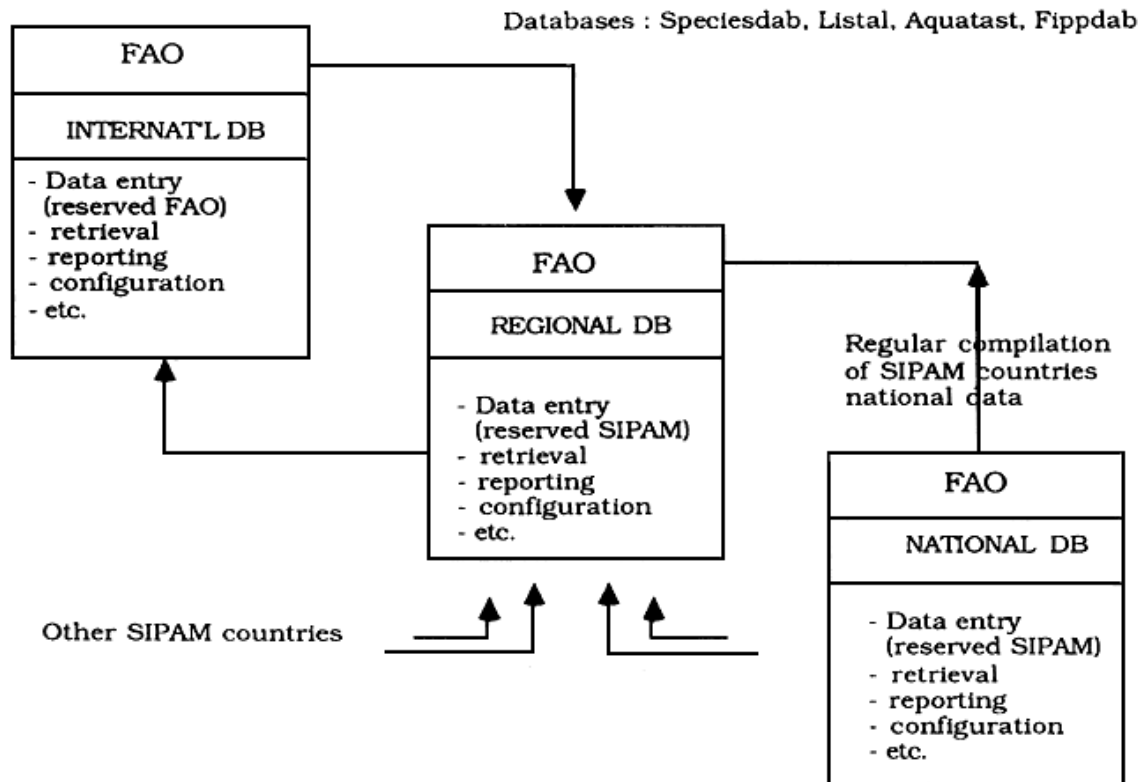
Mr. Magd El Baweb presented first the main results of aquaculture production in his country. Although Egypt is a major producer in aquaculture in the Mediterranean, data collection is difficult because of the wide scattering of farms and the low level of intensification of rearing which does not allow accurate control. Yet, a better information would be very necessary, especially in research centres and in experiment stations as the problem of technology adaptation is essential in Egypt.

A set of computers had just been installed in the GAFRD (General Authority for Fish Resources Development) head office in Cairo. Several softwares are available: D Base IV, WINDOWS, Quattro Pro and Nafitha 4.

II. 2 General observations on SIPAM project

S. Coppola seized the opportunity of this meeting to emphasize 5 observations:

1. Little time is available to demonstrate the feasibility of this network. So, **it is urgent to collect relevant and synthetical information** in each country in order to make this network attractive. Later, it will be possible to improve the system and enrich the databases.
2. SIPAM network is a regional database, i.e., it provides a link between the national databases and makes easier the access to FAO international services. To ensure the coherence and the long term reliability to the whole system, a part of the parameters will be reserved to SIPAM and to FAO control as shown on following figure:



3. In order to simplify the exchange of information, transfer of diskettes will be done by usual air mail until the functionality of the network is demonstrated. Then, a direct transmission by modern system will be used. Before this standadization, electronic mail can be used through internet network in order to save time during "tuning" phase.
4. WINDOWS will be the general environment of the software used in this network. Indeed, it is known and used worldwide and it is more suitable for Arabic language interface.
5. SIPAM language is English. Abstracts of national laws can be delivered in English or in French. It is also of major importance for the countries to give national statistics in international standard measures (ISM) : kilogram or metric ton, square meter or hectare.

II. 3 Main observations on the selected topics

Thw working group studied then each file prepared by the SIPAM team in Tunis and presented in booklet showing for each topic the structure of the file and the successive screens. An open discussion managed by S. Coppola led to necessary choices, obtained by consensus. This review was enriched and facilitated by the experience gained by S. Coppola in the SIPAL network launched in Latin America just one year before SIPAM project.

1. Production

This file is one of the most important file of the initial nucleus of SIPAM because it answers to the most frequent and usual questions people ask about aquaculture in the Mediterranean. Nearly each item is a key that can be used to obtain regional summing up: product (species) or group of species, system of culture, structure of rearing, aimed

market, sector type of water (“environment”). Product denomination was preferred to species which definition is very strict and implies 12 items within the “species dab” database:

- code
- family
- genus
- species
- taxonomy code (for group of species)
- trialfa code
- root (for unidentified group of species)
- scientific name
- FAO English
- FAO French
- FAO Spanish
- remark

Fry will be recorded in total of juveniles with an indication on the average weight range.

2. Producers

This file is entirely descriptive. The idea is to give an overview of the major producers of the country and make easier technical and commercial contacts. No numerical data is planned except for geographical identification parameters, ‘geolat’ and “geolon”, for possible GIS survey use.

3. Suppliers

This file will undoubtedly be useful for several types of users which explains the numerous keys: country, region (supra-national) servicing country, speciality. The date of the establishment of the company and the state (intra-national) were added.

4. Import/Export

The necessity to dissociate this file in two appeared quickly. The record of the data should be half-yearly in order to give a real up-to-date information to users. The type of packing was added as several customs patterns take it in account. A list of importers and exporters could be also useful.

5. Aquaculture Institutions

This important topic has to be completed (2nd working language, date of establishment, anonym, detailed facilities) in order to give a comprehensive information on the existing centres around the Mediterranean. The main key is the type of laboratories ruled by each institution.

6. (Aquaculture) On-going programmes

Programmes have to be separated from institutions because this file is a much more dynamic topic. Two key-elements appeared essential: a precise definition of each on-going programme including the species studied, the duration of the programme, the head lab and the links with other scientific research centres working in the same field.

7. Bibliography

Three options are available: first, the SIPAL system with a conversion programme to interface ASFA database; second, the Micro-Isis software given, free, by UNESCO but not well adapted to the SIPAM needs and finally, the PROCITE software, expensive but

very efficient. ASFA database has to be purchased by SIPAM after checking copyright procedures.

8. FAO databases

Six databases will be soon given by FAO:

- Speciesdab (see II.3.1)
- Listal (list of experts)
- Bibliography (SIPAL model)
- Legislation tentative database
- Fipp Dab (fish policy and planning)
- Health control (SIPAL model)

9. Next databases

Two other databases should be soon developed:

- laws and regulations
- documentation database including MEDRAP reports: exhaustive review of MEDRAP I and II activities reports: Steering Committees, training courses, workshops, seminars, study missions, etc.

Integration of a “technology” file would be highly commendable and could be decided when the priorities of TECAM will be selected.

II.4 Aquaculture planning simulator (APS)

The idea of an analytical module comes from the request of numerous countries in terms of choice of technology, and financing systems. The APS Module has operational characteristics and compares different results obtained with different sets of parameters.

It can be used by investors, planners and administration:

- to compare different types of aquaculture systems and technologies
- to analyse production costs;
- to conduct financial analysis.

It could assist the promoters in correcting one or many factors in their project plan. The proposition was to share the cost of the development of this software prototype (APS) between SIPAM and SIPAL (15.000 USD each) and to ask the French trust fund to support the SIPAM contribution in 1994. This prototype should be ready for the SIPAM evaluation meeting in France.

II.5 Development strategy

SIPAM project is the first attempt to build a standard data collection system of several topics in the same field. That is the reason why this project has to proceed step by step. According to S. Coppola, the development strategy might be organised in three phases:

- first phase (**May–November, 1994**) : set-up and achievement of 6 to 8 databases;
- second phase (**December 1994 – end 1995**) : installation of the full configuration in all the countries interested in the network; improvement of the regional software. For the development of this second phase, the availability of an expert for 6 months is considered as a prerequisite.

- third phase (1996...) : consolidation and expansion of SIPAM as a valid tool for information and data synthesis.

It is useful to remind that the evolution of this project relies on the action of the partner countries and especially on national head offices. For this reason, a regular evaluation of the problems and results related to each phase is essential.

The representative of France, C. Berger (scientific Advisor of the french representation to FAO) underlined five key points related to the development strategy aimed by FAO:

1. Priority at this stage of the projects's time frame should be given to software development for the information network, in order to adequately prepare for the first evaluation meeting that is due to take place in France in November this year.
2. Considering the significant results obtained after only six months activity, **the principle of continued financial support to the project for a second year** (October 94 – October 95) has already been discussed and agreed among the french authorities, at the time a budget increase of 22.600 USD for the first year was also accepted.
3. **Support** for complementary actions, such as a possible contribution to the APS (Aquaculture Planning Simulator), may be examined in so far as these actions are clearly justified and new adequate involvement of counterparts is obtained. The planned budget for future activities has to be submitted to the french representation to FAO, in Rome, as soon as possible, in order to secure funds early on the 1995 budget.
4. The perennity of the project relies first on its usefulness for receipient countries and also on **an equitable sharing of the budget** involving the beneficiaries, i.e., the countries. This constraint has to be clearly notified to future member countries.
5. In order to save time and money, it is essential **to benefit from the on-going experience of SIPAL** and have regular information on the evolution of this project.

The representative of the General Fisheries Council of the Mediterranean, H. Ben Aleya confirmed that GFCM was ready to ensure the coordination of the information networks and especially SIPAM when the support of MEDRAP will end at mid 1995. The only problem remains the way to secure the budget for the next years. No doubt member countries will be asked to contribute more as the sale of services by SIPAM will probably increase slowly in the next 3 or 4 years. Additional sources of funding as European Community should be investigated early in order to minimize the countries contributions.

III. Work plan (April – November, 1994)

A work plan for the next seven months had been elaborated, discussed and approved.

For the period of May – June – July :

- **MEDRAP must :**
 - revise, linalise, and edit all the agreed databases and sent them to the countries to test and to fill with data (actually as soon as possible);
 - prepare a database on MEDRAP I and II activities.
- **FAO (Mr. coppola) must :**
 - finalise the draft of the system design;
 - send this draft and codifications for all databases to MEDRAP II project;

- send Listal, species DAB, bibliography (SIPAL model), health control (SIPAL model), legislation tentative database ad Fippdab to MEDRAP II project.
- **Countries must :**
 - collect data for the different databases;
 - send to MEDRAP II project abstracts and extracts of laws and regulations concerning aquaculture activity;
 - send to MEDRAP II project a report on aquaculture situation in their country (diskettes form).

For the period of September and October

- Countries will inform MEDRAP on any error found in the databases;
- FAO (Mr. Coppola) and MEDRAP will:
 - define the final prototype (mission to Tunis of Mr. Coppola);
 - build-up of the main structure of the DOS information system;
 - prepare technical notes and a demonstration of the system;
 - confirm the venue of the seminar of November in France.

November 1994 (probably November 29th to december 1st.) in Corsica (France)

Working group meeting for the adoption of the prototype.

IV. Previsional budget

Before the presentation of the previsional budget, few observation on items are necessary:

- **The expenses related to the participation of the country representative to the two working group meetings planned for 1995 will be charged on their own budget** in order to reduce the SIPAM operating cost budget. This necessary evolution was announced since the last Steering Committee of Byblos, Lebanon, in November 1993.
- The crucial phase in the SIPAM project is the second half-year of 1995 : at this time, UNDP funds will have ended and the network will prepare its financial autonomy. S. Coppola estimated that an expert in computer science will be required for the 6 last months of 1995 in order to finalise the "product" in close cooperation with the SIPAM team in Tunis and to make it "marketable" to countries, users, and donors. This support should represent an additional budget of about 85.000 USD.
- To all the participants, **the publication of a regular newsletter appeared to be of major importance**. It is untimely to define its characteristics but a rough minimum budget of 10.000 USD can be planned.
- The participation of SIPAM to the finalisation of the APS programme (Aquaculture Planning Simulator) is estimated at 15.000 USD; the same amount will be provided by SIPAL project. This type of action demonstrated the interest of a closer cooperation between SIPAL and SIPAM.
- It is equitable to estimate the national contribution to the SIPAM national centre in each country. A realistic estimation of the operating cost of a SIPAM

national centre averages 50.000 USD per country with foreseeable variations according to the development of aquaculture in the country.

On a total budget of 870.000 USD for one year operation (October 94 to October 95), a negative result of 50.000 USD is recorded. It is likely to expect a balanced budget thanks to some additional funding sources as this gap represents less than 6 % of the total budget.

Previsional Budget for SIPAM
October 1994 – October 1995
(in Thousands of US Dollars)

I. Expenses	Unit Cost	Sub-total	Total
I.1 Working group meeting			
• Working group № 1:	15		
• Working group № 2:	15	30	
I.2 Missions/Assistance			
• Legal office	3		
• System designer	3		
• Data manager missions	15		
• Assistance to software development	5	26	56
I.3 Salaries			
• Support programmer	2		
• "Upgrading" expert	85		
• Data manager (including FAO services)	150		293
• Documentation analyst (Tunisia)	5	242	298
I.4 Operating costs			
• News letter	10		
• Software + hardware equipment	5		
• Fax, phone, photocopies,...	15		
• User's guide (manual)	5		
• Aquaculture Project simulator (shared with SIPAL project)	15	50	348
I.5 Regional Centre staff and office rental (Tunisia)			
• Personnel + office rental + insurance + electricity,...	100	100	448
I.6 Sundry (5%)	22	22	470
II. National Centres Contributions			
Operating costs of a national desk for SIPAM (computer, software, collecting data cost, salary of a part-time biologist or programmer, etc) ± 50 × 8 countries		400	
Grand Total I + II			870
III. Credit			
• proposed: MEDRAP contribution	20		
• participation to working group meetings (countries)	30		
• member countries contributions for national desk	400		
• hosting country (Tunisia)	105		
• donor asked : France 150+15+15+85	265	820	820
Balance : 820 – 870			-50

V. Conclusions

The conclusions on this working group meeting may be summarised in 7 observations:

1. According to the programme of working planned for SIPAM network in its first phase (Oct. 94–Oct. 95), **the first version of the SIPAM Prototype elaborated by SIPAM Regional Centre is satisfactory** and all the participants express their optimism towards the SIPAM development in the future.
2. The five topics presented in the first prototype version were discussed, revised, finalised and agreed by the participants. MEDRAP activities database must be added to other databases.

Species dab, bibliography, legislation, Listal (expert DAB), pathology databases, when finalized will be sent to SIPAM centre with the condifications of all the databases as well as the System design in its new revision.
3. The countries representatives reconfirm their great interest in the SIPAM and **their disponibility and their willingness to begin to collect the national data** concerning the different databases adopted by the working group.
4. After the first year (by the end of Nov. 94) the prototype will be completed under Dos. **WINDOWS** had been selected as environment for the network.
5. Concerning the budgel, **France representative confirmed the principle of a continuing support of the project for a second year** (94–95) and a possible contribution to APS (Aquaculture Planning Simulator) shared with the sister system SIPAM in Latin America. Additional funds for justified complement actions may be studied and secured according to available resources.
6. Concerning the future of SIPAM, two options related with available funds were discussed:
 - SIPAM becomes a **simple data bank**, collecting, exchanging and distributing data.
 - SIPAM becomes a **commercial type information system** after upgrading its capacity and efficiency. The choice on the evolution is SIPAM could be decided at the end of 1995 after one year system running and according to availability of funds.
7. Concerning the legal aspects and the copyright of SIPAM software, MEDRAP/SIPAM regional centre wil contact FAO legal office to get some proposals on the budget.

Working Group Meeting on SIPAM
Prototype System Design Development
FAO-Rome 19 – 21 April, 1994

List of Participants

- Mr Maged El Bawab
Director General of Department of Information Centre
General Authority for Fish Resources Development
4, Tayaran Str. Nasr City
Caior -**EGYPT**
Phone : 20-22-62- 118
Fax : 20-22-620 117

- Mr. Valdo Dadic
Coordinator of Info System
Institute of Oceanography and Fisheries
Setaliste Ivana Mestrovica 63
Dubrovanik-**CROATIA**
Phone : 385-58-46 688
Fax : 385-58-46- 593

- Mrs. Daphneee stephanou
Head Aquaculture Division - Biologist
Ministry of Agricultur and Natural Resources
Department of Fisheries
13, Aeolou Str. Nicosia - **CYPRUS**
Phone : 357-2-30 35 26
Fax : 357-2-36 59 55

- Mrs. Mariza Joao Robalo Magalhaes
Economist
Secretariat General do Ministerio do Mar
Av. Brasilia 1400 Lisboa - **PORTUGAL**
Phone : 351-1-301 72 73
Fax : 351-1-301 66 33

- Mr Zouhater Saghrouni
Aquaculture Engineer
Ministère de l'Agriculture, Direction Générale de la Pêche et de l'Aquaculture
30, Rue Alain Savary 1002 Tunis. **TUNISIA**
Phone : 216-1-861 993
Fax : 216-1-891 993

- Mr Charles de la Pomélie
Assistance Technique Aquaculture Méditerranée
IFREMER - Station de Palavas
Chemin de Maguelone 34 250 Palavas-las-Flots
FRANCE
Phone : 33-67-68 08 33
Fax : 33-67-38 28 85

- Mr Rudi Ziesler
Fisheries Operations Officer
FAO/FIDO, NF 309
Via delle Terme di Caracalla - Rome-ITALY
Phone : 39-6-5225 6647
Fax : 39-6-5225 6445

- Mr Uwe Barg
Fisheries Resources Officer
FAO - Fisheries Department - Fishery Resources and Environment Division
Via delle Terme di Caracalla - Rome-ITALY
Phone : 39-6-5225 3454
Fax : 39-6-5225 3020

- Mr Habib Ben Aleya
Secretary of GFCM
FAO- NF 411
Via delle Terme di Caracalla - Rome-ITALY
Phone : 39-6-5225 6435
Fax : 39-6-5225 6500

- Mr Mario Pedini
Senior Adviser in aquaculture development
FAO/FIRI : NF 515
Via delle Terme di Caracalla - Rome-ITALY
Phone : 39-6-2552 6473
Fax : 39-6-5225 3020

- Mr S. R. Coppola
Fisheries Resources officer
FAO/FIRM - NF 511
Via delle Terme di caracalla - Rome-ITALY
Phone : 39-6-5255 3034
Fax : 39-6-5225 3020

- Mr Christian Berger

Rep. Per. France - to FAO

52, Corso del Rinascimento - Roma 00186

Phone : 39-6-68 65 305

Fax : 39-6-68 92 692

- Mr Enrico Ingle

Directorate/Veterinario

ICRAM (Istituto Centrale per la Ricerca Scientifica e Tecnologica Applicata al Mare)

Via L. Respighi S 00193 Roma-ITALY

Phone : 3 39-6--86 07 558

Fax : 39-6-86 07 559

- Mr Othmen Beji

Expert-MEDRAP II Project

FAO Tunis 61, Rue Alain Savary 1002 Tunis

Phone : 216-1-790 119

Fax : 216-1-793 962

- Mr Denis Lacroix

SIPAM Data Manager

FAO Tunis 61, Rue Alain Savary 1002 Tunis

Phone : 216-1-790 119

Fax : 216-1-793 962

- Mr Mahjoub Zitoun

SIPAM Data Programmer

FAO Tunis 61, Rue Alain Savary 1002 Tunis

Phone : 216-1-790 119

Fax : 216-1-793 962

**Working Group Meeting on SIPAM
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FAO-Rome 19 – 21 April, 1994**

Adopted Agenda

TUESDAY, 19

09.00 - Welcome address, by Mr. M. Pedini

- Designation of Officials
- Adoption of the agenda

10.30 Coffee break

10:45 • State of the art in SIPAM project

by S.R. Coppola

Situation in the pilot countries

by D. Lacroix

- Discussion
- SIPAM project situation in the pilot countries :
 - Portugal, *by M.J. Robalo*
 - France, *by C. de la Pomélie*
 - Croatia, *by V. Dadic*

13.00 Lunch

15.00 • SIPAM project situation in the pilot countries ;

- Cyprus, *by D. Stephanou*
- Egypt, *by M. El Bawab*
- Tunisia, *by Z. Saghrouni*

Discussion

Coffee break

Presentation of the SIPAM regional preliminary prototype

by O. Beji

Demonstration of the prototype

by M. Zitoun

Discussion

Study of the databases and directories moderator

by S.R.Coppola

- **Suppliers**

WEDNESDAY, 20

09:00 • Study of the databases (second part)

- **Production/statistics**
- **Centre/institutions**
- **On-going programmes**

10:30 Coffee break

10:45 - **Experts (Listal)**

- **Import**
- **Export**
- **MEDRAP activities/documentation**

Discussion

13:00 Lunch

15:00 - **Producers**
 - **Legislation**
 - **Bibliography**

Coffee break

Presentation of an analytical module APS: Aquaculture Planning Simulator
by M. Pedini

Discussion

THURSDAY 21

08:30 • Synthesis of the evolution of the prototype
by S. R. Coppola

- SIPAM support programme of France
by C. Berger

Discussion

Coffee break

- Similarities, differences and potential synergies between SIPAM and SIPAL
by S.R. Coppola and M. Pedini

Discussion

- Visit to aquaculture data collection office (M. Perreotti)

Lunch

15:00 • SIPAM work plan (April – November 1993)
by O. Beji

- Screening of previsional SIPAM budge
by D. Lacroix
- Final synthesis and plan of final report of the working group
by H. Akrouit
- Adoption of the work plan and the budget

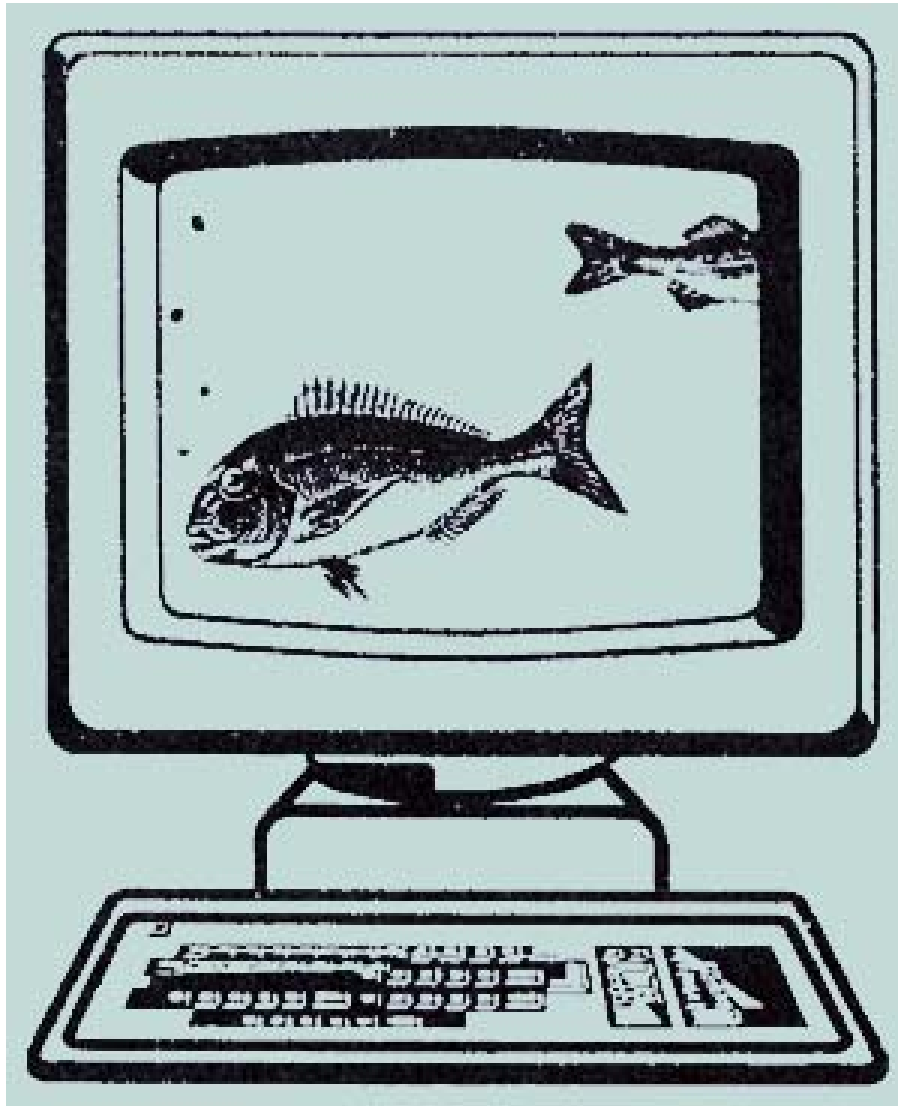
- Conclusions and recommendations

**2nd Working Group on
SIPAM System Design Development**

Nantes, FRANCE.

Nov. 29 – Dec. 2, 1994

Denis LACROIX - Othman BEJI



MEDRAP II/SIPAM

Mediterranean Regional Aquaculture Project
System of Information for the Promotion of Aquaculture in the Mediterranean

Abstract

SIPAM project has progressed in accordance with the workplan proposed in 1993 and revised in April 1994 in Rome at the end of the first working group. Seven countries attended this second meeting (Cyprus, Croatia, Egypt, France, Greece, Turkey and Tunisia) which demonstrated that governments involved in this experimental phase now trust in this project. Indeed, the review of the status of aquaculture in the various countries revealed the SIPAM project was an excellent mean to stimulate and improve existing data collection systems.

The study of the 10 main existing databases allowed first, to better explain the consistency of the system and second, to clarify the choice of parameters and to collect the suggestions from the country counterparts. The experience of software use showed to be a key factor for a better understanding and improving of the system.

The SIPAM software will be then modified in order to benefit of all the improvements decided during the meeting and it will be sent back to the countries for ultimate test. (February 95) before its final adoption (early April). Then, this fully operational software called "mulleto" will be used as the interim system as well as a training and demonstration tool while its adaptation into WINDOWS system will be undertaken.

The provisional budget is divided in two parts: the first one is limited to a minimum activity cost to ensure only basic functions of SIPAM. The second one is related to SIPAM applications and remain depending on country members decisions inside the GFCM management board.

This project shows to be already attractive and useful at this present time. Its development potential is huge. However, SIPAM network will secure its efficiency and its sustainability only through a second phase which will activate technical, financial and human means. This important second step is crucial for its evolution and maturity.

Résumé

Le projet SIPAM poursuit son évolution conformément au plan de travail prévu en 1993 et revu en Avril 1994 à Rome, lors de la réunion du premier groupe de travail. Sept pays ont participé à cette seconde réunion (Chypre, Croatie, Egypte, France, Grèce, Turquie et Tunisie) ce qui montre que les pays engagés dans cette phase expérimentale ont désormais confiance dans ce projet. En effet, la revue de la situation de l'aquaculture dans les pays a montré que le projet SIPAM EST d'abord un excellent moyen de stimuler et d'améliorer les réseaux de collecte de données déjà en place dans le secteur de l'aquaculture.

L'étude des dix principales bases de données a permis d'abord, de mieux démontrer la cohérence interne du système et ensuite, de clarifier le choix des paramètres au cours de l'analyse de propositions émises par les correspondants du SIPAM dans les pays. L'expérience de l'utilisation concrète du logiciel est apparue comme un facteur essentiel de compréhension et de progression du système.

Le logiciel sera donc modifié pour intégrer toutes les améliorations proposées durant la réunion, puis il sera renvoyé aux correspondants nationaux (Février 95) avant son adoption définitive prévue début Avril 1995. Ce logiciel opérationnel appelé "mulet", sera alors disponible comme outil intérimaire de démonstration et d'entraînement, en parallèle de sa transformation sous WINDOWS.

Le budget prévisionnel distingue deux niveaux: le premier est limité aux activités indispensables au fonctionnement minimal du SIPAM; le second est fonction de l'importance des applications (réunions de travail, lettre de liaison, cartes,...) et reste dépendant des décisions des pays membres au sein de la structure de coordination du CGPM.

Ce projet a démontré son intérêt et son utilité dès la première phase. Son potentiel de développement est considérable. Cependant, ce réseau ne pourra assurer son efficacité, son développement et sa pérennité que si les moyens techniques, financiers et humains nécessaires sont, mis en place rapidement. Aussi, cette seconde phase est cruciale pour la maturité du projet.

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MEDRAP/SIPAM Ministère de l'Agriculture c/o DGPA
32, rue A. Savary 1002 Tunis. Tel: 216 179 01 19 Facs: 216 1 79 39 62

I. Introduction

The second working group on SIPAM system design development organised by MEDRAP II project in collaboration with FAO (FIRI) was held from November 29th to December 2nd, 1994 in IFREMER centre in Nantes, France. This meeting was attended by representatives of SIPAM in seven countries: Croatia, Cyprus, Egypt, France, Greece, Tunisia and Turkey. Were also present:

- from FAO-Rome : S. R. Coppola
- from MEDRAP Centre : H. Akrouf, D. Lacroix, O. Beji and M. Zitoun.
- from IFREMER : Ph. Ferlin (DRCI)

Annex 1 gives the list of participants and corresponding address.

The meeting was opened by M. Ph. Ferlin, national coordinator of MEDRAP networks for France and director for International Relations and Cooperation in IFREMER. He welcomed all participants and explained the choice of Nantes centre to host this meeting as it is located in a region where aquaculture has a long history (mainly bivalves production). Moreover, this centre has a library specialised in aquatic living resources which is of strong interest for SIPAM network. He underlined the fact that SIPAM is a key-system for the three other specialised networks and consequently it has to become quickly operational. He is aware of the possible adherence of Spain to SIPAM through IEO (Instituto Español de Oceanografía) for 1995. He passed the floor to M.H. Akrouf.

As MEDRAP coordinator, M. H. Akrouf thanked IFREMER for hosting SIMPAM working group and FAO for its permanent and efficient support to this project.

The officials of the meeting were then designated as follows:

- Chairman : Mr. S. R. Coppola
- Rapporteurs : Mr. D. Lacroix
Mr. O. Beji

The preliminary agenda was adopted with some modifications (see annex 2).

II. SIPAM system development

II.1 Situation in the pilot countries

As relations between SIPAM countries and SIPAM head office in Tunis were more difficult than expected, an exhaustive overview of the situation of the project in each participating country was necessary. D. Lacroix showed on a table the follow-up of diskette and user guide mailing to all countries: the diskettes were sent in mid-August and the new user guide one month later. They were received within 1 to 4 weeks later, with few misunderstandings about software installation procedure. Conclusion was that good follow-up requires a special care in mailing (right address, rapid post procedure) and in regular information from both sides about work progress.

Croatia

Mr. Vlado Dadic received the diskette and manual quite late. Some bug in the software did not allow him to enter data about import/export statistics. Anyhow, the experiment of this software was very fruitful for two reasons: first, it led to imagine several improvements in order to make the software more efficient and clear; second, it gave an interesting methodology of data collection and synthesis process which could be applied in various sectors especially in oceanography. He added that the data manager mission

in Croatia in October had been also helpful to better understand the goals of the network about aquaculture and to improve data selection.

Cyprus

Mrs. Daphnee Stephanou complained about mailing problems (user guide and filled diskettes sent two times). Several problems and questions had been solved through fax and phone relations between Cyprus and Tunisia.

Confidentiality about productions and condification about import/export remain the only major problems. The fact that annual activity licence for producers depends on regular data delivery to the Ministry of Agriculture is an essential factor for the reliability of updating.

Egypt

After some trouble in software installation, Mr. Magd El Bawad was able to test the system. He succeeded to fill all databases except. "production" for which he was hampered both by lack of precise data about several important productions (carps, mullets) and by the structure of the database.

France

Mr. Ch. de la Pomélie received the diskette on the first September. He had some problems for installation until direct explanation from Tunis solved them. Actually, the major problem was the lack of time as several urgent tasks were asked from him at this time. Confidentiality, poly-activity of farms and confusion between products from aquaculture and fisheries in import database were the main problems faced in the use of the software. He had summarised all its observations and suggestions in a memorandum sent to Tunis in December. Those observations may be discussed during this meeting when databases will be studied one after another.

Greece

Mrs. Maroudio Kendouri expressed her pleasure to participate to this working group as her institute (IMBC in Iraklion, Crete) is already involved in data collection from sea bass and sea bream producers in the Egean sea. She received diskette and user guide together on the 21st of September. The general impression on software is that it is powerful but difficult to manage. Some tables are not precise enough especially about "food". Import/export database is difficult to fill because of the mix of certain species (trout for example).

Tunisia

Mr. Zouhaier Saghrouni highlighted the good cooperation between the Ministry of Agriculture and SIPAM office in Tunis which allows to save time and improve efficiency. He notified that there is no import of any product from aquaculture in Tunisia (except food). He met some problems in research and development programmes definition as the tunisian administration is preparing a new organisation of research for this sector in relation with the development plan of aquaculture which is on the way to be published.

Turkey

When testing the software, Ms. Oya Ersan was hampered by the lack of data as aquaculture in a recent activity in Turkey. There is no obligation of data collection and transmission by the private sector to administration. For this reason TUBITAK (research and development organisation for Turkey) is preparing a specific inquire with an adapted form in order to regularly collect data from the producers. This explains why the

contribution of Turkey to the network remained limited up to now. But significant progress are expected from near future.

MEDRAP / SIPAM

MEDRAP reports (41 reports from 1991 to 1994) have been partially recorded in the MEDRAP database. Missing reports will be soon added to the database.

Few national aquaculture reports had been sent to Tunis by member countries. It is necessary to obtain a complete collection as soon as possible. The updating of those national reports is an important task of each SIPAM representative. The collection of the national reports of one country will allow interesting opportunities of trend analysis about several items: production, research policy, consumption, balance between fisheries and aquaculture or import and export, etc...

II.2 General observations on SIPAM project.

II.2.1 general overview from FAO expert

Mr. Coppola reminded then the organisation of the network and the characteristics and relations of the different sub-systems. 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, it 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 summarises the information supplied by countries according to a given methodology. It is a collection of all the selected databases, customised 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 database 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 data entry. 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 databases obtainable from FAO HQs and relevant to SIPAM. Most of them are part of the FAO Computerised Information Series.

The Extended Module will contain an abstract prepared by SIPAM of information collected through the linkage 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 finalised in the third. Also, SIPAM will contract access and authorisation 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 analyse 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, spread sheet, 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 prefixed Reference File System.

Each of the databases contain the following basic functions:

Next	See Next Record
Previous	See Previous Record
Add	Add a New Record in the Database
Modify	Modify existing records in the Database
Search	On-line Search for records meeting multiple criteria
Output	Output Search Results to Screen/Paper/File meeting multiple criteria
Info	Read Information about the Database in use and on line help.

The databases included in the prototype are the following:

a-Statistics	:	Production statistics Import statistics Export statistics
b-Directories	:	National experts in aquaculture Production centres Equipment and services suppliers Aquaculture institutions
c-Laws & regulations	:	National laws and regulations abstracts
d-Reports	:	MEDRAP activities and reports produced Aquaculture country reports
e-Research & Programmes	:	Ongoing research programmes
f-Technology	:	Fish pathology database
g-Bibliography	:	

All these databases have to be now discussed in order to collect all observations and suggestions made by pilot-countries and improve the SIPAM databases structure and their content as well. Finalization of Legislation and pathology databases was postponed in order to consult FAO Rome.

II.2.2 Complement observation on SIPAM project

Information supports distribution met difficulties in some countries. Rapid post procedures and FAO pouch opportunity should solve those problems for the future.

- An active participation of the SIPAM representatives is necessary to build a good tool (SIPAM software) and to answer to the urgent needs of the Mediterranean countries which are willing to develop aquaculture.
- The problem of the confidentiality of some data was discussed (centre of production, production cost, conversion rate, etc...). The solution could be to classify the production centre by their size in four categories (see production centre characteristics data file) and to let optional the production of the farm (quality and value).
- Some problems are expected when filling import/exports databases as new European Union regulations will allow a free circulation of products between this countries.
- Concerning the evaluation of different data coming from various sources, a methodology will be soon discussed and adopted during the next SIPAM working group in order to standardise the validation process for uncertain data.
- The relations between SIPAM and others specialised networks have to be clearly defined in order to secure the maximum of efficiency and avoid overlapping.
- The problems of copyrights, relation between SIPAM national coordinators and end users etc, have not been clarified. The Legal Office of FAO must be consulted in order to prepare precise proposals to GFCM.

II.3 Main improvements in selected topics

II.3.1 Improvement samples in the databases

Concerning the tables in SIPAM software several modifications have been introduced. It is not possible to list them. Few examples may be presented:

- adding another table for Mediterranean SIPAM countries classified in an alphabetic order;
- the table of "product" must take in charge all the species produced by aquaculture including ornamental fishes and other groups;
- in the table "type of facility" it was recommended to add library and E-mail connection;
- the content of the table "structure of culture" must be revised to standardise the terminology of this table with the terminology of FAO;
- the table "presentation" has been simplified as all the young stages of fish and crustaceans were gathered under fry.
- A long discussion took place on the distribution of the different categories of food. At the end, it was decided to gather them under the item "food".

Concerning the "tools" used by the SIPAM software, the main changes have concerned : "Modify-Search-and output". They have been adapted to facilitate the manipulation and to answer to the requirements.

II.3.2 Aquaculture national report

The participants agreed to standardise the structure of the yearly Aquaculture National Report planned to figure in SIPAM regional module. This report must indicate the following items :

- Country:
- Year:
- Summary: (20 line maximum with normal interling)
- 1. Introduction : it is a brief description of the sector in which one can find:
 - the production statistics for fisheries (catch and aquaculture with their value etc...;
 - import fish statistics (quantity and value etc...;
 - apparent consumption of fish (kg)/habitant/year:

$$\frac{(\text{Fishing qq} + \text{aqua. produc.} + \text{import}) - \text{export}}{\text{population}}$$

- 2. Description: this part summarises the actual status of aquaculture in the country in comparison with the situation in the previous year:
 - new projects and technologies;
 - research programmes;
 - recent legislation and new laws including incentives, code of investment
- 3. Constraints and problems (diseases, markets, standards, etc...)
- 4. Future: major trends, discussion and evaluation;

NB : This report has to be written in english, although other versions in different languages may be available. It should not exceed 5 pages with normal interline;

II.4 Development strategy

It may be organised in two phases named phase 2 and 3 as phase one is now ending.

Phase 2: The second phase is characterised by five independent and parallel activities which at the end should originate a single product.

The prototype developed during the first phase, from now on called "Muletto" (little mule), will be the starting point for this phase.

Activity 1:

- Revise the Muletto to the eight countries which participated in its development and where collection of all the data requested for all the years in question will be initiated.
- Nationalise the elementary databases. SIPAM will be responsible, where possible, for restructuring the elementary data bank of the national module to cover the needs of each country. This operation, undertaken at the request of the countries and involving direct collaboration with the national programmers and coordinators, will

guarantee a major interest in the system and will increase the level of consistency of the data and their accuracy also through a mechanism of cross checking.

Regionalisation of the data and beginning of the collection, verification, and dissemination of the regional sub-system.

- Provision to all national centres of finalised FAO software and of the summary of remote databases.
- Use of the Muletto as a working tool, data entry, retrieval, documentation, etc...
- Continuous monitoring of the system, revision and immediate distribution.
- Installation of the system in other countries of the Mediterranean which request it.

The budget for this activity is now totally secured.

Activity 2 :

- Equip the SIPAM workstation with WINDOWS software.
- Design and develop SIPAM in WINDOWSO with provision for on-line data communication beginning with the structure of the Muletto. Among other things, this advanced system will have:
 - graphic interface with the possibility for GIS utility;
 - expert mode data/information retrieval and document processing including free texts, tables, graphs, figures, objects management, etc., and e-mail facilities;
 - assisted mode data/information retrieval and document processing including free tests, tables, figures, graphics, objects management, etc., and e-mail facilities. Assisted Query definitions and linkages;
 - totally automated pre-established format document processing through direct linkages to source databases and data files;
 - production and diffusion of a regional electronic bulletin.

This activity will be carried out mainly in FAO-HQ with the assistance of a consultant.

Activity 3 :

Installation and configuration in all participating countries of INTERNET both for e-mail facilities and for FTP (File Transfer Protocol) procedures. Establishment of a "Postmaster" for an electronic conference agreement. Train the project staff in the use and management of INTERNET.

This activity will be carried out, with the assistance of a consultant, mainly in SIPAM HQ, in FAO HS, and in the countries concerned.

Activity 4 :

At the end of this phase, assemble all the procedures under the advanced system WINDOWSO, download all the data from the DOS version, test the system and repropose it to the countries as the new advanced system.

- distribute the advanced system to all interested countries;
- establish network procedures.

This activity will be carried out mainly in SIPAM HQ with some assistance from the consultant who has worked for the advanced system.

Activity 5 :

This is a purely consultative and managerial activity which will be undertaken by the organisation of and participation in three meetings:

a. Participation of the SIPAM coordinator at the GFCM Board of Directors meeting. It is under this activity that, from time to time, the technical/legal situation and the context in which SIPAM operates and will continue to operate will have to be defined;

b. organisation and conduct of an annual meeting of aquaculture and informatics experts for a constant monitoring of the development of SIPAM, to propose new applications, changes, raising funds, etc..., and

c. organisation and conduct of an annual seminar-type meeting, for end users, potential end users, donors, etc., for training, promotion, discussion, etc. In this context the Aquaculture Planning Simulator (APS) and other analytical tools should be presented and discussed.

Phase 3: In this phase, the final configuration of SIPAM will be decided. Activity 5 of phase 2 will be institutionalised.

Activity 1 : Maintenance of the Muletto (DOS) for these countries or users who do not have access to high capacity work stations.

Activity 2 : finalisation of the advanced system introducing improvements according to the functions and new technology (CD-ROM, etc...).

Activity 3 : Produce quality documentation.

Activity 4 : Operate the network as a working tool for capturing data, information, etc...
Connect to remote databases and external information systems for dynamic data such as marketing data, press reports, etc...

Activity 5 : Install a tele-maintenance system.

Activity 6 : Establish an Electronic Conferencing Centre on Aquaculture at SIPAM with a List Custodian and Moderator.

Activity 7 : Make up, promote and commercialise SIPAM according to the directives of the GFCM Board of Directors.

III. Workplan

A workplan for the next 8 months had been discussed and approved:

December 94–January 95:

- SIPAM software reprogramming
- 2nd version of user guide including all improvements adopted in Nantes.

Mid-February 95:

making last version of SIPAM (software and user guide) to countries.

Mid-February–end March:

- Data entry in the new software.

- Study of data collection process and methodology and identification of possible sources of error.

April (possible 4–7th, in Portugal):

- **Working group meeting** for final adoption of the prototype.
- Study of data collection methodology in order to secure reliable data.

April–June:

- Exhaustive data entry in each country.
- Use of Muleto as working tool.
- Search of new databases according to national and networks priorities.

June (possibly middle of June in Cyprus):

Working group on software evolution and improvement.

IV. Budget

As the working group of Nantes had taken place before the MEDRAP Steering Committee meeting, the participants had not the elements from the different contributions involved in SIPAM such as Tunisian government contribution as hosting country, GFCM/FAO as coordinating institutions, the members of SIPAM and the donors to elaborate a detailed budget for SIPAM. Discussion was limited to the structure of the budget, which was divided in two components.

1. **Minimum cost for the survival of SIPAM**

1.1 Fixed costs

- Hosting the regional centre and its maintenance (electricity, water, cleaning,...);
- Senior Research Aquaculturist;
- Programmer;
- Secretary;
- Factotum;

1.2 Variable costs

- Communications (telephone, fax, E-mail)
- Maintenance of the equipment;
- Office small supplies.

2. **Cost related to SIPAM application**

- Newsletter, updated maps of aquaculture;
- Documentation centre (including one librarian)
- Internet cost;
- Consultancy;
- Complement and improvement of hardware and software;
- Meetings (workshop, training course,...)

Those activities are very important for any information system

Their realisation depends on funds availability.

FAO contribution to this budget could be:

- backstopping for the system development
- Cost for the SIPAM coordinator to attend to the management board meeting;
- Some support according to available resources for the installation of SIPAM in new countries.

V. Conclusion

SIPAM project has progressed in accordance with the workplan proposed in 1993. The seven member countries actively participated to the Nantes workshop about the adoption of the prototype. The analysis of the status of aquaculture in those countries demonstrated the usefulness of SIPAM and the conclusiveness of its objectives. The review of the status of aquaculture in the various countries revealed that SIPAM project was an excellent mean to stimulate and improve existing data collection systems.

This project shows to be already attractive and useful at this present time. Its development potential is huge. However, SIPAM network will secure its efficiency and its sustainability only through a second phase which will activate technical, financial and human means. This important second step is crucial for its evolution and maturity.

It is interesting to underline that SIPAM was designed and is being realised with a futuristic view of a world network for aquaculture in order to allow "twin" systems operating in different nations and regions to "converse" with each other.

From the point of view of investment of human and technological resources assigned to this project and characterised by its unique approach, it should be emphasised that it is a low-cost financial project with a high level of coordination and backstopping.

**Working Group Meeting on SIPAM
Prototype System Adoption**
Nantes 29 Nov. 3 Dec., 1994

List of Participants

• **Mr Magd El Bawab**

Director General of Department of Information Centre
General Authority for Fish Resources Development
4, Tayaram Str. Nasr City
Cairo-**EGYPT**

Phone : 20-22-620 118/119

Fax : 20-22-620 117

• **Mr. Vlado Dadic**

Coordinator of info System
Institute of Oceanography and Fisheries
Setaliste Ivana Mestrovicvevo 63. P.O. Box 500.
58000 Split-**CROATIA**

Phone : 385-58-355 688

Fax : 385-58-46 593

E-mail : DADIC JADRAN. IZOR. HR

• **Mrs. Daphnee Stephanou**

Head Aquaculture Division - Biologist
Ministry of Agriculture and Natural Resources
Department of Fisheries
13, Aeolou Str. Nicosia-**CYPRUS**

Phone : 357-2-30 35 26

Fax : 357-2-36 59 55

• **Mr Zouhaier Saghrouni**

Aquaculture Engineer
Ministère de l'Agriculture, Direction Générale de la Pêche et de l'Aquaculture
30, Rue Alain Savary 1002 Tunis. **TUNISIA**

Phone : 216-1-891 993

Fax : 216-1-891 993

• **Miss. Oya Ersan**

TUBITAX (the Scientific and Technical Research Council of Turkey). Atatürk Bulvari
№221

06100 Kavaklıdere - Ankara - **TURKEY**

Phone : 90-312-468 53 00/11 83

Fax : 90 312 427 05 36

• **Mrs. M. Kendouri**

Institut of Marine Biology of Creic. PO. Box 2214 Iraklion
Crete - **GREECE**

Phone : 30-81-242 022/241 543

Fax : 30-81-241 882

• **Mr. S.R. Coppola**

FAO - NF 511 - Viale delle Terme di Caracalla, 00100
Rome-**ITALY**

Phone : 39-6-522 53034

Fax : 39-6-522 53020

• **Mr. Philippe Ferlin**

IFREMER, DRCI
Technopolis 155, rue JJ Rousseau
92138. ISSY les Moulincaux **FRANCE**

Phone : 33-1-46 48 21 00

fax : 33-1-46 48 22 76

• **Mr. Charles de la Poméle**

IFREMER, Chemin de Maguelone 34250 Palavas-les-Flots
FRANCE

Phone : 33-67-68 07 64/67 68 08 33

Fax : 33-67-68 28 85

• **Mr. Hassen Akrouit**

• **Mr. Othmen Beji**

• **Mr. Zitoun Mahjoub**

• **Mr. Denis Lacroix**

MEDRAP II. Ministère de l'Agriculture, c/o Direction Générale de la Pêche et de
l'Aquaculture

30, Rue Alam Savary 1002 Tunis. **TUNISIA**

Phone : 216-1-784 979/790 119

Fax : 216-1-793 962

**Working Group Meeting on SIPAM
Prototype System Adoption**

Nantes 29 Nov. 3 Dec., 1994

Adopted Agenda

Tuesday 29th November

10:00–13:00

- Welcome address, by Mr. Ph. Ferlin (IFREMER/DRCI)
- Designation of Officials
- Adoption of the agenda
- State of the art in SIPAM project
- Problems faced by the countries for data entry and software use.

15:00–18:30

- Analysis of the problems
- Integration of the national data in the regional module (data quality and validation)

Wednesday 30th November

9:00–13:00

- Welcome address, by Mr. H. Durand (Nantes centre manager)
- SIPAM overall system design
- Review of existing databases
- Definition of the standards

15:00–18:30

- INTERNET presentation
- Review of the definitions in the user guide
- Procedures of data collection in the countries and interaction with SIPAM
- Finalisation of the prototype architecture

Thursday 1st December

9:00–13:00

- Proposals of new databases and potential synergies with SIPAL
- Prototype newsletter presentation
- SIPAM workplan for 1995 and budget structure

15:00–18:30

- Final synthesis and proposition of the meeting plan report
- Adoption of the workplan, budget and SIPAM prototype

- Conclusion and recommendations

Friday 2nd December

9:00–17:00

- Visit tour in Noirmoutier island turbot farm (France-Turbot) and IFREMER research centre of Bouin (shellfish intensive culture and study on aquaculture impact on environment)

**Visit to Turbot farm and IFREMER research center
(Friday, December 2nd, 1994)**

1. France-Turbot

France-Turbot is a farm located on the island of Noirmoutier, about 100 km in the South-west of Nantes, along the Atlantic coast of Vendée.

It belongs to the ADRIEN group which is a diversified holding in agro-industry.

1.1 Hatchery

Site is remarkable as it benefits of a stable source of water which temperature is stabilised at 15°C all yer round. This water is filtered naturally as shown on following drawing:

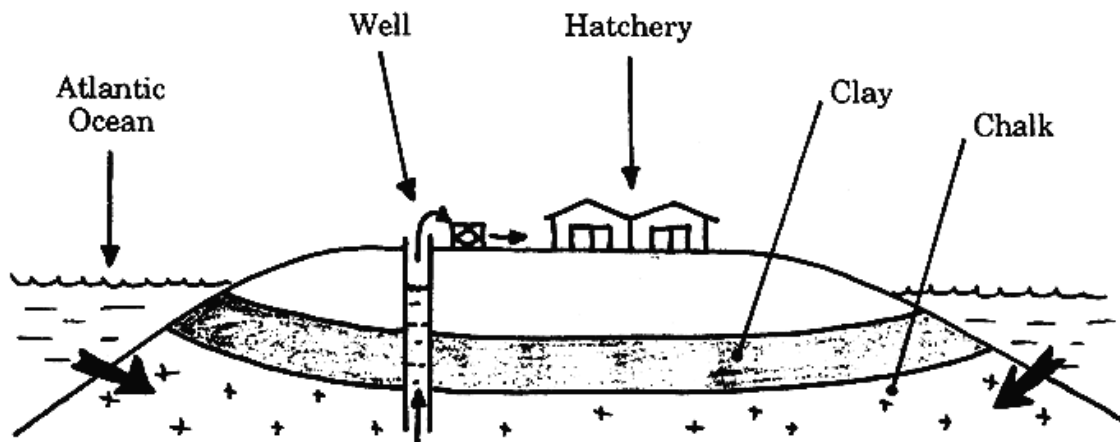


Figure 1 : Geological structure of Noirmoutier Island

This water has to be treated as it is too low in oxygen and too high in CO² (300%) and N² (150%)

Breeders are kept under controlled conditions in 16 tanks which light and temperature are strictly controlled. Natural spawning starts in mid-May and ends in mid-July with 7 to 10 spawning per season. Only one third of the larvae are kept after selection bases on morphological and color criteria.

Feed sequence is classic : algae (Tetraselmis) Artemia (without selco) and rotifers.

Rearing occurs at 25 larvae/liter at 18°C. Water quality is strictly controlled in order to ensure a reliable flow of 100 m³/hour.

Fingerling production reached 1,4 millions units in 94 which is interesting to compare with the 0,16 millions produced 5 year ago. This production represents half of the total production of fingerlings of turbot in France.

1.2 Grow-out

The production cycle lasts about 28 months:

- 4 months from 1g to 10 g;

- 2 years from 10 g to 1,3–2 kg;

Feed is expensive (15–18% of the production cost) because its high level in protein (55%).

ADRIEN owns two grow-out sites, one in Noirmoutier in tanks (250 t/y cap.) and one in cages in North Brittany (300 t/y). Water is a mix of marine and earthen sources in order to ensure 19°C all year round. Density is ranging from 50 to 75 kg/m². FCR is about 1,25 with a global survival of 90%. Pure oxygen is regularly added.

1.3 Processing

The yield in flesh of the turbot is relatively low. Flesh is usually vacuum packed and sold fresh or frozen. Research has started about boneless and steak fillets in order to try to increase the yield.

1.4 Research

Research is active in 3 fields:

- closed systems;
- genetics (triploids, all-female sex-reversed population);
- zoo technics.

1.5 Economics

France-Turbot is a technical success (no fish had ever been lost for technical reason) but financial results remain half-successful. Indeed price of fingerling dropped from 2,5 to 1,3 USD in a year and wholesale price for adult never exceed 9 USD/kg. Cost structure can be summarised as follows:

• fingerling	15–18 %
• feed	15–18 %
• labor	10 %
• financial costs	18 %
• research	5 %
• amortisation	15 %
• commercialisation	10 %
• miscellaneous	10 %

Financial success in marine fish aquaculture in France is difficult for two main reasons: high labor / service costs and risks of extrema in temperature (especially Frost in winter). Nevertheless, excellent productivity and reliability of production can partly balance those constraints. But profitability remains highly dependent on permanent improvement from research.

2. IFREMER Research Station of BOUIN

IFREMER is conducting research on shellfish culture, mainly japanese oyster *Crassostrea gigas*, in the centre of BOUIN (80 km South-west of Nantes) as it is located in the heart of the major producing region of France for shellfish.

Recent efforts have been devoted to better understand the effect of the watershed input on the quality and productivity in the shellfish producing bays of the seashore. This problem is complex as it involves a huge number of various activities which type and intensity are difficult to identify exhaustively.

The main research program is now about the final fattening of oyster few weeks before sale in order to ensure the best quality product as regards to the sanitary requirements and also to provide a special "walnut" taste which could be labelled on the market.

This can be done through intensive culture of algae on which adult oysters are fed for some weeks. Technical problems are now solved. Economic and financial analysis is planned for the near future with the cooperation fo two farmers and with the support of service of economics of IFREMER (SEM). This region is strongly depending on shellfish culture as few alternative are available for the marshes. sociologic studies had shown that profitability is decreasing while mean age of farmer increases. Therefore, new options have to be proposed to professionnals in order to avoid socio-economic problem in the future.

Third Working Group on SIPAM System Design Development

Iraklio, GREECE 4th – 7th April, 1995

Denis LACROIX - Othmen BEJI
Mikos PAPANDROULAKIS - Bruno MENU

ΤΡΙΤΗ ΣΥΝΑΝΤΗΣΗ ΤΗΣ ΟΜΑΔΑΣ
ΕΡΓΑΣΙΑΣ ΤΟΥ ΣΙ ΠΑΜ ΓΙΑ
ΒΕΑΤΙΩΗ ΤΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ



FAO/MEDERAP/SIPAM
MEDiterranean Regional Aquaculture Project
System of **I**nformation for the **P**romotion of **A**quaculture in the **M**editerranean

Abstract

SIPAM project ends now the first phase of experiment as this third working group meeting may be considered as **the milestone of the adoption of the prototype**.

Eight countries attended this meeting (Cyprus, Croatia, Egypt, France, Greece, Spain, Turkey and Tunisia) during which the final approval was given to the structure of the various databases, the choice of parameters and the definitions of all table elements.

The two lectures allowed to better evaluate first, the difficulty of data management with several levels of collection for several types of end-users (J. Bostock, Stirling University) and second, the minimum legal frame that has to be discussed and precised in order to clarify SIPAM legal status for future scientific and commercial relations (L. Hefferman, FAO Legal Office).

As the development of SIPAM network remains dependent on external financial supports, **the search for permanent** (countries and/or institutions) **and start-up support** (European Union) is **a necessity**. If a newsletter is not justified at the moment, a yearly map of aquaculture was considered to be a valuable sign of SIPAM usefulness.

It clearly appeared that **the interest of SIPAM is directly related with the combination of two elements : quantity and quality of data**. Both have to be now tested at the real scale of an operational system through exhaustive data entry. Both can be improved by the demand of exacting end-users.

The role of GFCM merges to be now essential in several fields : constitution of SIPAM coordination committee, approval of the budget and support proposals, agreement of legal requirements. Its relay of MEDRAP II should become effective at the next GFCM meeting (MAY 1995) which would ensure a better responsibility endorsement of the development of SIPAM by all actors.

Résumé

Le troisième groupe de travail du projet SIPAM peut être considéré comme la clôture de la phase expérimentale du projet car **il s'est terminé par l'adoption définitive du prototype du logiciel**. Les huit pays présents (Chypre, Croatie, Egypte, Espagne, France, Grèce, Tunisie et Turquie) ont donné leur accord final à éléments des tables référence.

Les deux conférences données au cours de cette réunion ont permis d'une part, de mieux évaluer la difficulté de gérer des données complexes à partir de différents niveaux de collecte et pour différents types d'utilisateurs (J. Bostock, de l'Université de Strirling), et d'autre part, de [précise le cadre légal indispensable à proposer pour le SIPAM afin de lui permettre de mener à bien sa double mission scientifique et commercial (L. Hefferman, bureau juridique de l'OAA).

Comme le développement du réseau SIPAM reste dépendant des sources de financement extérieures, **la recherche de financements permanents** (Etats et/ou institutions) **ou limités dans le temps** (aides européennes) **est une nécessité**.

Par ailleurs, si la diffusion d'une lettre de liaison est considérée comme prématurée, la préparation d'une carte annuelle de l'aquaculture en Méditerranée a été décidée en raison de sa double valeur d'utilité et d'image.

Il est également clairement apparu que **l'intérêt du réseau SIPAM est directement lié à la conjoncture de deux éléments clefs: la quantité et la qualité de l'information**. Ces deux éléments doivent maintenant être testés en vraie grandeur sur un système désormais opérationnel par l'entrée de toutes les informations disponibles pour chaque banque de données dans chaque pays. Les deux éléments pourront aussi être améliorés en fonction de la demande des utilisateurs finaux.

Le rôle du CGPM est désormais essentiel: il intervient dans la création du Comité de Coordination du SIPAM, dans l'approbation du budget et des propositions de financement, dans l'accord des propositions de cadre juridique à l'action du SIPAM. Sa prise de relais du SIPAM devrait être effective à l'occasion du prochain conseil (Mai 95) ce qui permettra une meilleure prise de responsabilité du développement du SIPAM par tous ceux qui en sont les acteurs.

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NB: From page drawing is the logo of IMBC (courtesy of A. Eleftheriou, IMBC)

I. Introduction

The third working group meeting on SIPAM system design development organised by MEDRAP II project in collaboration with FAO (FIRI) was held from the 4th to the 7th of April, 1995 in the Institute of Marine Biology of Crete (IMBC) centre of Iraklio (Greece, isle of Crete). This meeting was attended by representatives of SIPAM from eight countries: Croatia, Cyprus, Egypt, France, Greece, Spain, Tunisia and Turkey.

Were also present:

- from FAO - Rome : S.R. Coppola (System designer)
Liz Heffernan (Legal Office)
- from Stirling University : John Bostock
- from MEDRAP centre : Il. Akrou, D. Lacroix, O. Beji and M. Zitoun.

Annex 1 gives the list of participants and corresponding address.

The meeting was opened by Mr. A. Eleftheriou, Director of the IMBC. He welcomed all participants and underlined the fact that IMBC has already started to run a database program, named "Aquabank" with the financial support of the European Union and gained some experience of data collection and processing. He expressed his wishes that Greece and especially IMBC would bring a valuable support to SIPAM.

As SIPAM data manager, D. Lacroix thanked M. Eleftheriou for hosting SIPAM working group and, as Mr. Coppola's arrival was expected to be very soon (delay due to strike on Athens airport), D. Lacroix proposed to start working by a brief summary of the present situation of SIPAM. This seemed all the more justified as SIPAM group welcomed a new member, Spain, represented by Dr. Ignacio Arnal from the Spanish Institute of Oceanography (IEO) and as Mr. Bruno Menu was representing France instead of Mr. Ch. de la Pornélie. He presented to all participants what had been done since the previous meeting in Nantes. The planned workplan was globally achieved although numerous improvements had to be integrated into the 2nd version of SIPAM before distribution to the countries. Therefore, this meeting in Greece may be considered in charge of the final adoption of the prototype before exhaustive data entry in each country as planned in Nantes report.

The officials of the meeting were then designated as follows:

- Chairperson : M. Kentouri
- Rapporteurs : SIPAM : D. Lacroix
O. Beji
assisted by : N. Papandroulakis (IMBC)
B. Menu (IFREMER)

The preliminary agenda was adopted after some minor modifications (see annex 2).

II. SIPAM System Development

II. 1 Situation in the pilot countries

It was proposed to start examining the situation in the pilot countries in order to benefit of a good knowledge of the problems and constraints that could have hampered the use of SIPAM software.

Croatia :

Mr. Vlado Dadic met some problems in the installation of the software. He had limited time to test it with real data except for production which database is now complete. Some colleagues biologists experimented its use and found it "friendly". "modify", "delete" and "search" functions showed to be inconvenient as too many references are required to obtain an answer.

Cyprus :

Mrs. Daphne Stephanou received the diskettes on early March. No major problem was encountered neither in the installation nor in the use of the software, but the programme has to be tested with more entries since there was not enough time available to do so. Although some refinement seems necessary especially concerning the "search", "modify" and "delete" functions. She highlighted the fact that the laws and regulations database should be tested also by specialised lawyers and not only by biologists because those options are not user friendly. She complained about the lack of time between receiving SIPAM 2 software and reporting at the Crete meeting. In addition, some functions were not found so friendly to use although a better interface with user would be useful.

Egypt :

Mr. Magd El Baweb underlined the fact that nay software import in Egypt was controlled by customs and this filtering procedure caused and important delay in the transmission of document. Thus, he asked to use preferably the FAO pouch, much more rapid and reliable. When loading the software, he found that the content of the diskette № 5 was not available. He appreciated this new version, much more colloquial than the previous one and although some definitions remain uncertain (brackish/marine/fresh waters), he took advantage of this software data collection in Egypt and the quality control of those data.

Consequently, he was not able to present standardised and precise data on aquaculture production in Egypt.

France :

On behalf of Ch. de la Pomélie, Bruno Menu reported that no particular problem was met in the use of the software. Few bugs appeared notably in "programmes" database. The lack of time had unfortunately limited the test.

Greece :

Although limited time could be spared for the test of the software, Nikos Papandroulakis noted with great interest the potential of this program especially as an international complement of the existing national network called Aquabank (see annex 4). He noticed that some table lists were not complete (country for example).

Spain :

Mr. Ignacio Arnal was happy to participate as Spain representative to this SIPAM working group. As the adherence of Spain to this network was recent, he had received through CIHEAM the copy of the diskette only one day before leaving Madrid to go to Greece. So he only had time to check that installation was easy and to estimate that requested data represent an important and specific effort for Spain as detailed and reliable data about all sectors of aquaculture are not available at the moment.

Tunisia :

Mr. Zouhaier Saghrouni underlined that he benefitted of the proximity of SIPAM office in the Ministry of Agriculture in Tunis. He noted that some species reared in aquaculture were not found in the "product" table such as "sea bream" and but were easily solved with the help of the programmer Mahjoub Zitoun.

Turkey :

Miss Oya Ersan met no problem when installing and using the software except with diskette № 4 in which a virus ws detected. She complained about the impossibility to pass though some areas without giving a data or select an answer in table. As numerous data are missing in Turkey, the fulfillment of a complete record in any database is not easy. Anyhow, she greatly appreciated the opportunity that gives SIPAM to start an exhaustive data collection in all fields related to aquaculture in Tukey.

II.2 Situation in the SIPAM Regional Centre

The SIPAM regional centre work has progressed in accordance with the workplan established by the two working groups of Nantes (Nov./Dec.94). The team of Tunis has introduced the modifications and the improvements in accordance with the recommendations of the working group.

Seven diskettes representing the second version of the SIPAM software including executable programmes, their auxiliaries, the datafiles to run the sustom (and on installation procedure guide) were sent to all the SIPAM representatives. A user's manual "pre-alpha release" was prepared in Tunis and was distributed to the participants of Iraklion SIPAM working group. This document collects all the standard definitions, tables used by the software and the database with the different screens and the selected Directories.

In order to support the project, some equipments were purchased by the SIPAM regional centre such as:

- 1 Modem Robotics 14,4
- 1 "lecteur" of laser disk.

Concerning Internet connection a preliminary contract was established in Tunis with the head office (IRSIT) who will connect the regional centre to Internet. E-mail facilities and FTP (file transfer protocol) procedures were discussed. The contract was sent to FAO Hq (system designer) for advice. In Crete, the decision was to continue the discussing with IRIST, in order to find the best way to cooperate. Other possibilities in cooperation with FAO representation in Tunis and another FAO project were suggested and will be explored in order to share installation cost of Internet.

The "pathology" database had been prepared by SIPAM team from the basic model of "SIPAM" pathology database. Checking and improvement will be done by FAO expert before transfer to SIPAM module.

II.3 Overview from SIPAM system designer

a) Methodology

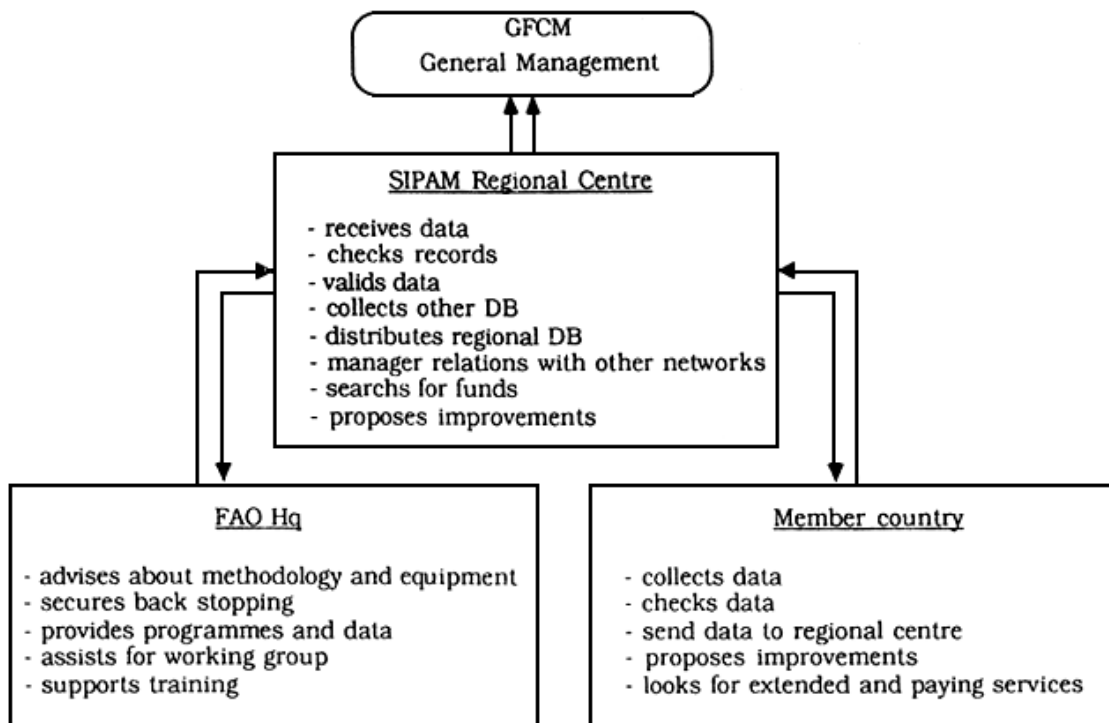
The value of the methodology is directly linked with two key-elements: quantity and quality of data;

This implies that three elements are essential in the process of networking:

- the country which commitment has to be sincere and concrete: financial, technical and administrative support of the national counterpart;
- the national representative in charge of the collect and the management of all data related to aquaculture in his country. Its exactness and intellectual honesty are crucial;
- the end-users who are also the sources of data who have to be convinced that the quality of what they are expecting from the network is related to the quality of the data they give to the national representative. For several reasons (political, financial, economic,...) they are not so often disposed to deliver real data.

b) Operational frame

It can be summarised by the following figure:



c) Technical aspects

Several aspects have to be clarified as many participants asked precise questions on technical aspects:

- **“What to do when data are unprecise?”**. The answer is simplification. The essential task at the moment is the demonstration that SIPAM can run. Therefore, if precise checking of data is not possible, its record under a more general item has to be found. Refinement will be undertaken in the future.

- **“What to do when some data are not available in a general package of precise data?”**. The answer is estimation with a precise rule which has to be explained and justified. Later, it will be possible to adjust the estimations.

- **“What to do when the acronym doesn't exist?”**. The acronym is a compulsory key in two tables (suppliers and institutions). Hence, it has to be filled. It is proposed to use a pseudo-code to be defined according to countries suggestions.

- **“What is the frequency of data collection?”.**

It is obvious that data collection frequency depends on the type of data. **Most of the databases have to be updated on a yearly basis** ("Experts, Institutions, Suppliers, etc..."). "Production" could be updated every half-year but it is untimely to ask for this constraint now. Participants were asked to prepare propositions to be examined during the next meeting. Later on, when data about marketing and prices will become available, a monthly frequency could become necessary.

- **“Is it possible to add specific databases in the national module?”.**

Each country has the possibility to replace an usual file by another one or even a complete package through the "BAT" procedure (command "call" in DOS). For example, France can replace "suppliers" by "Aqualog" after checking the copyright and the interface procedure. Similarly, a national system for bibliography can be installed as a package. Interface routines with "Procite" regional bibliography system will be installed later.

New references can be added in the national program such as new species when needed. They will be screened and added if justified in the regional module. Additional footnotes would help to select relevant new references.

The responsibility for the selection will be assumed by the SIPAM coordinator under the control of the coordination committee with a regular open discussion during the two yearly workshops.

- **“How to finance the development of SIPAM after MEDRAP's end?”.** It has to be clear that even if SIPAM is supported by donors for some additional years, the goal is to become financially autonomous. As previous networks (Infopesca, Infosamak, etc...) have met some difficulties in balancing their budget, SIPAM must integrate the demand of potential end-users since the beginning. All those end-users such as banks, engineering officers, investors are ready to pay for good quality data but they want value added information.

- **“How to gain time and efficiency in data transfer?”.** The answer is INTERNET. Up to now only five country representatives are connected: Croatia, France, Greece (IMBC), Spain and Turkey, FAO Hq will be soon connected to all regional centres. The regional office in Tunis should be soon connected also which will facilitate exchange of information and data especially when the File Transfer Protocol will be installed. However, E-mail and FTP remain only telecommunication tools which utility depends first on the relevancy of the message.

II.4 Finalisation of definitions and tables

It was agreed by the participants to adopt the definitions of Aqua.stat (FAO software) and to complete what is missing. concerning "pathology" and "Legal aspects", participants are requested to wait for final modification by FAO office in order to fit with FAO usual standards.

a) Environment

1. Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. farming also implies individual or corporate ownership of the stock being cultivated. For statistical purposes, aquatic organisms which are harvested by an individual or corporate body which has owned them throughout their rearing period

contribute to aquaculture, while aquatic organisms which are exploitable by the public as a common property resource, with or without appropriate licences, are the harvest of fisheries.

2. By freshwater environment, it is understood the cultivation of aquatic organisms where the end product is raised in freshwater; earlier stages of the life cycle of these species may be spent in brackish or marine waters.

3. By marine environment, it is understood that the cultivation of the end product takes place in sea water, earlier, stages in the life cycle of these aquatic organisms may be spent in brackishwater or freshwater.

4. By brackishwater environment, it is understood the cultivation of aquatic organisms where the end product is raised in brackishwater; earlier stages of the life cycle of these species may be spent in fresh or marine waters. Brackishwaters are characterised by large seasonal fluctuations in salinity. If these conditions do not exist or have no effect on cultural practices, please record production under either “freshwater culture” or “mariculture”.

b) Type of product:

1. **Flesh:** Animal product destined to direct human consumption.
2. **Seed:** Living organism at various steps of development used for grow-out in aquaculture farm and natural waters. This class included breeders and eggs.
3. **Derivated product:** Product or sub-product obtained from cultured organisms for industrial purposes or jewellery but never for direct human consumption.
4. **Ornamental:** Living organisms (mostly exotic fishes) used for ornamental purposes only (aquaria).

c) Structure of culture

1. Ponds and tanks: artificial units constructed above or below ground level capable of holding and interchanging water. Rate of exchange of water is usually low, i.e. not exceeding 10 changes per day.

2. Enclosures and pens: Water area confined by net, mesh and other barriers allowing uncontrolled water interchange and distinguished by the fact that enclosures occupy the full water column between substrate and surface, pens and enclosures will generally enclose a relatively large volume of water.

3. Cages: open or covered enclosed structures constructed with net, mesh or any porous material allowing natural water interchange. These structures may be floating, suspended, or fixed to the substrate but still permitting water interchange from below.

4. Raceways and silos: artificial units constructed above or below ground level capable of high rates of water interchange in excess of 20 changes per day.

5. Dam/reservoirs: semi-permanent or seasonal enclosures formed by impervious man-made barriers and appropriate natural features.

6. Suspension culture: artificial device for the production of macro-algae or molluscs, equipped with systems for floating and anchoring. Cultured organisms can be exposed temporarily to sun and air. The main characteristic of this type of culture is the benefit of the tri-dimensional space of the water column.

7. Bottom culture: system of culture for the production of algae and molluse on the ground. Special equipment as net set or liners can be used to facilitate manipulations.

8. Fish and rice culture: it is a pond used initially for the culture of rice and in which fishes are added for grow-out purpose.

Concerning the tables used by the software, few modifications has been introduced according to the suggestions of the working group.

III. Methodology of data collection (Stirling University experience)

John Bostock is project officer at Stirling University and especially in charge of the follow-up of data collection at the institute of aquaculture. A summary of his paper is presented in annex 5.

IV. observations on the legal aspects of SIPAM.

IV.1 lecture from FAO legal office (Liz Hefferman).

The lecture is sammarised in annex 6.

The discussions were centred on three topics: the general legal framework; the copyright implications; and the legislative database.

IV. 2 Main comments on FAO Legal Office lecture

After the communication of Miss Liz Hefferman, three points were discussed by the participants :

- Legal general framework

The mandate of GFCM of SIPAM is given. Some problems remain about the situation of countries which are not members of GFCM and members of MEDRAP II project. They have eithr to ask to become member of GECM before entering SIPAM or aks to FAO a special authorisation to become directly member of SIPAM. The commercial aspect of SIPAM has to be also taken in account in the latter of agreement between the different parts involved in SIPAM.

- The copyright of SIPAM

The main question remains who has the “property” of any SIPAM product? It was mentioned that three is few general laws concerning the copyright at an international level and recogising the intellectual protection of databases and computer softwares for a certain duration (20 years).

As Tunisia is the hosting country of SIPAM, the tunisian laws concerning this protection must be harmonised with the laws of other countries members of SIPAM in order to adopt the same licence for the use of SIPAM.

Waiting for a final decision, L. Heffernan suggested to secure the copyright of SIPAM by “@ SIPAM, year” and to transfer to the countries the right to prosecute locally illegal end-using.

- Legal situation of SIPAM

Proposals were discussed and agreed by the participants:

- the legal situation of SIPAM has to be clarified;

- under the umbrella of GFCM, letters of agreement have to be signed between the GFCM and the tunisian government and between GFCM and other member countries.

Concerning the SIPAM database called "laws an regulations", some discussions has taken place especially about the classification of the legislation, the guidelines for keywords and official or non-official abstract of the laws and the language to be used for this purpose. A proposition will be submitted soon by the Legal Office after checking the existing database.

V. Development programme

V.1 Immediate tasks

The immediate task to be achieved as soon as possible are summarised in the following table.

	SIPAM Team	Coppola	Countries
1 <u>Database copy procedure</u>			
- List of files to be recorded for each DB before sending copy from the countries to the regional centre (fax to countries).	*- - - - -		>
2 <u>Software modification</u>			
- Modifications in tables and definitions	*		
- Aquastat definitions	< - - - - -	*	
- Copy by fax to countries	*- - - - -		>
- Automatic installation procedure	< - - - - -	*	
- Uploading/downloading	< - - - - -	*	
3 <u>Data entry/collection</u>			
- Country report	< - - - - -		*
- Data recording (reg. & nat.)	*		*
- Data collection	< - - - - -		*
4 <u>User guide improvement</u>			
- User guide copy	*- - - - -		>
- Proof reading	< - - - - -	*	
- Conceptual design (diskette)	< - - - - -	*	
- Updating of user guide and distribution	*- - - - -		>

Mr. Coppola underlined that the first priority is data entry. Even if small modifications are introduced later, the structure of the software will not change.

V.2 Workplan

A workplan for the next 3 months had been discussed and approved:

- April : - Data entry for countries and regional centre.
- Preparation of presentation of SIPAM, uploading/downloading procedures, proof reading of user guide by FAO Hq. expert.
- Preparation of support proposal to European Union.
- May : - National Data collection and processing in the regional centre.
- Constitution of SIPAM team to relay MEDRAP team in Tunisia.
- Presentation of SIPAM to SELAM working group (17–19 May) and GFCM meeting. Creating of aquaculture committee and SIPAM coordination committee.
- Invitation to new potential member countries to next meeting.
- June : - Joined working group meeting TECAM-SIPAM in Cyprus.
- First meeting of SIPAM coordination committee.
- Presentation of SIPAM to new potential members (Morocco, Malta,...).
- Support proposal to European Union.
- July and onwards : - Improvement of the software through Windows. Study of new DB and development of relations with other networks.
- MEDRAP closure and transfer of administrative management to GFCM.

Concerning the adherence of new members in SIPAM, Mr. Akroust stressed that precise conditions have to be given in order to “filter” candidates such as:

- ad hoc computer equipment (minimum power and memory requirements, softwares availability, E-mail connection through INTERNET, etc...);
- qualified and available personnel;
- existing data network about aquaculture in the country;
- will be play an active role in the network.

V.3 Budget

Aquaculture Committee Meetings

For the regular meetings of the GFCM Aquaculture Committee, it is proposed to hold one meeting per year, the duration of which would not exceed three days. FAO would cover the attendance of the SIPAM Regional Coordinator and two/three FAO headquarters staff, depending on the agenda. The participation of country representatives would be covered by the countries themselves as in the case for other Committees of the GFCM. The annual cost of the Aquaculture Committee Meeting is estimated at US\$ 3500–5000.

Participation in Management Meetings of EAM, TECAM and SELAM

The GFCM Aquaculture Committee Technical Secretary should also participate, as requested in the constitutional documents of the three networks, in the annual management/coordination meeting of the other three networks, TECAM, SELAM, and

EAM for discussion of the progress achieved and for finalisation of the annual work programme. These are meeting with a duration not exceeding three days. This participation would imply an annual estimated cost of US\$ 3000.

SIPAM Management Meetings

The SIPAM Management Meeting, would normally involve the participation of the SIPAM Regional Coordinator from the Tunis office, two staff members from FAO Headquarters, and two experts from the region participating in the national SIPAM work and attending on a rotational basis. This meeting would have a workshop characteristic to work on the new data bases structure and in the finalisation of the programme of work, and would imply a cost to the organisation estimated at US\$ 4000 per year. Similar to the coordination/management meetings of the other three networks the SIPAM management meeting will discuss the progress achieved and adopt a programme of work for the following year. The duration of this meeting should also not exceed three days.

SIPAM Scientific Activities

In addition to the SIPAM Management Meeting it is considered convenient to organise, at least for the first years, one scientific activity per year for SIPAM. This activity would take the form of a seminar of 2–3 days duration in which the work of the network will also be presented to new potential users. The FAO could cover the attendance of up to 8 participants from the countries already linked or to be connected to the network, but the attendance would be open to more participants which will have to cover their own attendance cost from various sources. These seminars should also provide elements for the design of the future work programme of the SIPAM network. The estimated cost of this activity to FAO would be about US\$ 8000 per year, and it is expected that the institutions hosting these seminars will contribute partly to the cost.

SIPAM Expansion

In the initial biennium it will also be necessary to consider the expansion of the network from the present 8 countries to include the maximum number of countries belonging to the GFCM. The travel required to brief the new countries joining the SIPAM will have an estimated cost of US\$ 3000 per year, but will be limited to the initial biennium after which it is expected to have the definitive structure of the network in place.

Summary of Expenditures

The total cost of the activities indicated above, excluding optional activities (see below) to the GFCM Secretariat would thus be comprised between US\$ 21500 and US\$ 23000 distributed in the following way:

Aquaculture Committee	US\$3500–5000
Networks Management Meetings	US\$3000
SIPAM Management Meetings	US\$4000
SIPAM Scientific Activities	US\$8000
SIPAM Expansion (first two years)	US\$3000
TOTAL	US\$ 21500–23000

If the SIPAM Management Meeting could be held in conjunction with the meeting of the GFCM Aquaculture Committee there would be savings estimated at about US\$

3000, bringing down the estimated funding requirements to US\$ 18500–20000 which would decrease to US\$ 15500–17000 after the first biennium. In principle, and resources permitting, the above mentioned costs could be met by the FAO Secretariat, through FAO Regular Programme funding. It is however expected that in the future it should be possible to finance at least the scientific activities of the network from voluntary contributions of the member countries or from revenues generated by the network activities through the sale of information generated by the SIPAM network.

Administrative Support

The Aquaculture Committee and the SIPAM network would be administratively supported by the GFCM Secretariat, and assisted by a Technical Secretary and by the technical staff in charge of fisheries information systems development from the FAO Fisheries Resources and Environment Division. The reports prepared for the various meetings of the Aquaculture Committee and the SIPAM Network Management Meetings would be edited and published by the FAO in the GFCM series. The operation of the SIPAM Regional Centre will be financially supported by the Tunisian Government, for what are the standard costs as indicated in the exchanged letters of agreement between the Tunisian Government and the FAO.

Possible other activities to be considered in the future

- Training of national SIPAM new operators. (one workshop/year).
- Specific training for a better use of computerised networks in cooperation with FAO office. (one workshop/year).
- Editory of specific maps and synthesis book about aquaculture in the Mediterranean.
- Experts missions to study opportunities for the improvement of the system.
- Development of relations with other regional information networks (SIPAL, INFOFISH, INFOSAMAK, GLOBEFISH...).
- Development of specialised aquaculture databases (TECAM, SELAM, EAM).
- Development of paying services for external clients and study on the demand in this sector.

It is clear that the extended budget is not yet funded and that contributions from other sources will be necessary. The preparation of the budget will be one of the responsibilities of the GFCM through the committee of aquaculture. This is all the more justified as there is a good opportunity to present a support proposed to the European Union in the next months. This proposal can be done either through an international organisation (GFCM) or through a multi-lateral project associating northern and southern countries. MM. Arnal and Dadic were asked to get in touch with CIHEAM and PAP/RAC respectively in order to **prepare a common request to the European Union**. Indeed, M. Coppola reminded that CIHEAM has asked SIPAM to be the official link between the four network. This implies the involvement of SIPAM in the preparation of the proposal to the European Union. Mr. Akrouit suggested that Ifremer could support the request to the European Union by a part-time person who could coordinate the preparation of programs to be financed. Mrs. Kentouri stressed the urgency of this action for deadlines are soon.

V.4 Potential actions

a-Newsletter

The usefulness of a newsletter has been recognised since the first version of the project document for an information system (1991); it has been confirmed in the final SIPAM project document (1993) and during the last steering committee meeting of Beymelek (1994).

Recently, CIHEAM and PAP/RAC representatives confirmed that a usual link between the specialised networks as a newsletter was compulsory in order to avoid the exclusiveness of computerised data and to facilitate the interface with non-computerised systems.

However, M. Coppola presented three remarks:

- since a FAO aquaculture newsletter already exists, no more resources can be provided by FAO Headquarters;
- it is untimely to launch this bulletin as no financial resources are secured at the moment and the worst position would be to stop edition after 2 to 3 issues;
- the priority is clearly on software improvement and data entry, not on spreading the products of SIPAM on a large scale. SIPAM has to demonstrate first its efficiency and usefulness. Later, time will come for the diffusion of SIPAM system by other ways, like a newsletter. Consequently, it was decided to postpone the realisation of this newsletter until favourable conditions were combined.

b-Map

The project of a yearly map of aquaculture production in the Mediterranean was first presented at the Nantes working group and later approved by the last steering committee meeting of MAEDRAP. As it represents an excellent symbol of a common interest cooperation among mediterranean countries, this project was approved without restriction. M. Arnal suggested to prepare in the same time a small booklet detailing the data and their sources, which could be distributed with the map.

VI. Conclusions and recommendations

The first conclusion of this working group is that **SIPAM software prototype may now be considered as adopted** by all the member countries. This was obtained through two convergent ways:

- this project could be useful to all countries as it had been discussed and tested by the countries themselves, although it still need further improvement before final spreading;
- the agreement, of all participants to the content and the parameter definitions of all the databases is now clearly established as a stabilised basis for standardised data exchange and process.

The second conclusion is related to the basic element of this network: data. Its accuracy and reliability depend first on the people who are in charge of search, collection, and checking before final recording in the right database. **Methodology efficiency depends on the combination of two key-elements : quantity and quality of data.**

Concerning the legal aspects, the status of SIPAM must be clarified, especially what is concerning the protection of software, databases content and copyright. Letters of agreement have to be signed by the different parts involved in this project (GFCM, Tunisian Government, FAO). Those commitments have to consider also the future commercial aspects of SIPAM activity.

The last conclusion concerns the perennity of this system. As SIPAM member countries and FAO may be considered as “genitors” of this “newly born baby”, they have the responsibility to give it the maximum chance of survival. Hence, the development of this network has to be oriented to the demand of final user who could also provide funds. The cost of the development of SIPAM has to be secured on the long term which implies to **designate a small team for the preparation of a precise finance request to the European Community** which submittance could be done either through GFCM or through a group of mediterranean countrreis. At the moment, an ad hoc group of four representaives (Croatia, France, Greece, Spain) has to prepare a request to the European Union with the support of Ifremer.

Recommendations are consequences of those observations. **Exhaustive data entry is now urgent**-Procedures for collection or estimation of missing data have to be started. The organisation of a permanent part or full-time national team is necessary in order to secure the steadiness and the professionnality of the participation of each country tot he regional network.

Similarly, the permanent regional centre team has to be secured by the bosting enuntry (Tunisia), with a clear commitment in the charge of the operating cost of SIPAM as defined in FAO proposal (letter of agreement dated January, 1995).

The change from the experimental phase to the growth phase is crucial. It is now under the responsibility of each participant to make this change a successful metamorphosis, not a crisis.

**Third Working Group on SIPAM
System Design Development**
Iraklio - Greece, 4th – 7th April, 1995

List of Participants

• **Mr Magd El Bawab**

Director General of Department of Information Centre
General Authority for Fish Resources Development
4, Tayaran Str. Nasr City
Cairo - **EGYPT**

Phone : 20-22-620 118/119
Fax : 20-22-620 117

• **Mr. Vlado Dadic**

Coordinator of Info System
Institute of Oceanography and Fisheries
Setaliste Ivana Mestrovicveo 63. P.O Box 500.
58000 Split-**CROATIA**

Phone : 385-21-355 688
Fax : 385-21-358 650
E-mail : DADIC JADRAN. IZOR. HR

• Mrs. Daphne stephanou

Head aquaculture Division - Biologist
Ministry of Agriculture and Natural Resources
Department of Fisheries
13, Aeolou Str. Nicosia - **CYPRUS**

Phone : 357-2-30 35 26
Fax : 357-2-36- 59 55

• **Mr Zouhaier Saghrouni**

Aquaculture Engineer
Ministère de l'Agriculture, Direction Générale de la Pêche et de l'Aquaculture
30, Rue Alain Savary 1002 Tunis. **TUNISIA**

Phone : 216-1-891 993
Fax : 216-1-891 993

• **Miss. Oya Ersan**

TUBITAK (the Scientific and Technical Research Council of Turkey). Atatürk Bulvanı No
221

06100 Kavaklıdere - Ankara - **TURKEY**
Phone : 90-312-468 53 00/11 83
Fax : 90-312-427 05 36

• **Mrs. M. Kentouri**

Institut of Marine Biology of Crete. PO Box 2214 Iraklion
Crete - **GREECE**

Phone : 30-81-242 022
Fax : 30-81-241 543
E-mail : IMBC @ imbc..gr

• **Mr. S.R. Coppola**

FAO - NF 511 - Viale delle Terme di Caracalla, 00100
Rome - **ITALY**

Phone : :39-6-522 53034
Fax : 39-6-522 53020
E-mail : RINO. COPPOLA @FAO. ORG

• **Mr. Bruno Menu**

IFREMER, Chemin de Maguelone 34520 Palavas-les-Flots
FRANCE

Phone : 33-67-68 07 64/67 68 08 33
Fax : 33-67-68 28 85
E-mail : CPOMELIE@ifremer. FR

Lecturers

• **Ms. Liz Heffernan**

FAO - Legal Office - Viale delle Terme di Caracalla, 00100
Rome - **ITALY**

Phone : 39-6-522 56166
Fax : 39-6-522 54408

• **John Bostock**

Institute of Aquaculture, University of Stirling
Stirling FK9 4LS, Scotland - **U.K.**

Phone : 44-789-473171
Fax : 44-786-472133
E-mail : JCB @ STIR. AC. UK

MEDRAP/SIPAM Team

- **Mr. Hassen Akrou**
- **Mr. Othmen Baji**
- **Mr. Zitoun Mahjoub**
- **Mr. Denis Lacroix**

MEDRAP II. Ministère de l'Agriculture, c/o Direction Générale de la Pêche et de l'Aquaculture

30, Rue Alain Savary 1002 Tunis. **TUNISIA**

Phone : 216-1-784 979/790 119

Fax : 216-1-793 962

**Third Working Group on SIPAM
System Design Development**
Irakilo - Greece, 4th – 7th April, 1995

Agenda

Tuesday, 4th of April

- 9:00 – 13:00 Welcome address
by A. Eleftheriou (IMBC)
Designation of officials
Adoption of the agenda
- State of SIPAM project activities (starting from Nantes meeting, work done, tasks achieved)
by D. Lacroix
 - Report on SIPAM software use (national representatives)
 - State of development of SIPAM
by R. Coppola
- 14:00 – 18:30
- Uploading procedures from National to Regional Databases
by R. Coppola
 - Collation, compilation and Data Securing procedures and protocols to build up regional databases and their distribution
by R. Coppola

Wednesday, 5th of April

- 9:00 – 12:30
- Preview of SIPAM application
 - Position of SIPAM in GFCM frame and potential development of SIPAM in Windows environment
R. Coppola
 - Observations and comments on SIPAM development (discussion moderated by H. Akrouf)
 - Observations and recommendations about use and copyright of SIPAM software and Data (FAO Legal Office)
- 15:00 – 19:00
- FAO legislation Database structure and functionalities
FAO legal office
 - Stirling University experience on Database management
by J. Bostock
 - Discussion about data collection methodology.

Thursday, 6th of April

- 9:00 – 12:30
- National and regional databases structures (R. Coppola)
 - Report on the newsletter proposals (D. Lacroix)
 - SIPAM workplan for 95/96 (R. Coppola)
 - Budget estimation for 95/96
 - Presentation of IMBC facilities
- 14:00 – 16:00
- Final adoption and check up of immediate tasks to be undertaken (R. Coppola)
 - Conclusion and recommendations
- 18:00
- Airport registration for Iraklion - Athens

Friday, 7th of April

Visit to the industrial farm of SELONDA (sea bass and sea bream):
hatchery, grow-out cages, processing plant, etc...

Saturday, 8th of April

Back travel.

Annex 3

Report on the visit to Selonda fish farm

Friday 7th of April, 1995

by Bruno Menu

General presentation

Selonda produced 30 T of sea bass and sea bream in 1987, 70 T in 1988 and 120 T in 1990. Since 1990, Selonda group developed new hatcheries and expanded to 8 new grow-out sites. In 1994, fry production reached 20 million fingerlings and production totalised 1.100 T of commercial size fishes.

This farm is located in a narrow valley ending in a well sheltered bay on the left side of the road between Corinth and Epidaurus. The hatchery is producing 5 millions fry per year for all grow-out sites of the group. The local capacity of the site is 500 T of production per year.

Hatchery

Its capacity is 5 millions fry/year (1–2 g). Two marine water supply sources are available: one from a drill (16–21°C), re-oxygenated and one from the sea (600–700 m³/km), filtered at 50 microns and UV sterilised.

Breeders allow egg supply from november to June for sea bass and all the year round for sea bream larval rearing in managed in one single hall (40 tanks of 1,5 m³ and 10 tanks of 10 m³) Artemia (8 tanks of 2,2 m³) Rotifers (14 tanks of 1 m³) and algal inoculums are produced in 3 small rooms close to the hall. Algal mass production is done in an external hot-house which can be cooled by bottom circulating water (10 cm depth).

Pregrowth phase

Fingerlings are weaned in larval rearing tanks and start pre-growth phase in 22 big circular tanks located under open side halls until they reached the average weight of 1,5 g.

Grow-out cages

A large aluminium shuttle equipped with a crane allows to transport personnel, feed and equipment to the cages. 3 separate cages lines are producing with one small transfer set of cages. Cage structure is in galvanised metal with plastic floats (15 × 15 × 6m). Water depth is about 12 m. Feed is distributed automatically by air flow through pipes connected to one general silo, ashore. Additional manual distribution allow to control stock quality and behaviour.

Operations are limited to initial sorting, net change and final harvest. The site is not exposed to waves or to algal blooms. The only risk is net sealing by excess of fouling which can ends in anoxia.

Processing hall

After 16 to 18 months, fishes are processed in a specialised hall which seems to be rudimentary when considered the total of production to be processed per year.

Personnel: 35 persons are working on this site (hatchery + 500 T). Selonda group totalises 200 people.

Problems and future development

The main biological problem is infections pathology on sea bass (95% of the problems according to the pathologist). Selonda foresees to start soon a big capacity process unit (4,000 T/year - 3 millions USD). New species (Pagrus, Sole) are or will be tested in order to diversify production and above all, to avoid potential problems linked with a single client as it is with Italy nowadays.

AQUABANK
Data Bank of Aquaculture Farms of Marine Species in Greece
by Nikos Papandroulakis

The project AQUABANK is operational since March 1994. It was financed by STRIDE programme. The available information is concerning the state of development of the Greek Aquaculture. The information system is developed in two parts. The main data base located in Iraklion which is available on-line, and a microcomputer based system containing summary information.

The main information system is developed on a relational data base (UNIX, ORACLE), is multi-user and the access to the information is through a local Ethernet network, packet switched data network HellasPAC or public telephone system. Through the network the information is available to anyone interested. It is also possible retrieval of secondary information like the growth rate of the reared fish according to the location and the season of the rearing as well as the time for reaching the marketable size according to the location of the farm. The users, divided in three categories, have different access privileges.

The microcomputer information system is developed based on the data of the main system. It is developed on a user-friendly environment (Windows) and does not require special knowledge. The system provides gathered information and gives an overall picture of the present situation of the Greek aquaculture. The system is available to everybody and will be renewed every year with new data arising from the main system.

The data collection was done with questionnaires sent to farmers after informing them for the purpose of the project, and also with personal interviews from specialised personnel. 75 farms covering almost 60% of the total national production and all different types (vertical integrated, on-growing, big or small), were presented on the first data collection. Also, the geographical distribution of the farms was representative of the total. The check of the data was done in two ways:

- a. through the questionnaire itself with cross check evaluation of the data.
- b. by the local check at the farms.

Another part of the information existing in the database was retrieved at the institute from raw data that the producer provided.

The further data collection will take place on regular base (4–5 months) from 10 farms selected from the accuracy of the data they have provided the structure, from the size and also from the geographical location.

Final objective of the project is the integrated recording of the situation of the Greek aquaculture, the consultancy services and the long distance training to the farmers, with the use of new technologies, something that it is essential for the further development of the aquaculture branch.

Institute of Marine Biology of Crete
P.O. Box 2214, 71003 Iraklio, Cret, GREECE
Ph. + 30 81 242022. Fax. 241882
E-mail: imbe@poseidon.inbe.gr.

Stirling University Experience by J. Bostock

Introduction

Stirling Aquaculture are the consultancy and project management group within the Institute of Aquaculture at the University of Stirling. We have one foot in the Mediterranean as one of our key projects at present is Malta Mariculture, a 500 tonne per annum sea bream farm which we were instrumental in setting up and for which we now provide technical management. We are hoping to set up a marine fish hatchery in Malta over the next year.

We are also involved in many other projects in Europe, Africa, Asia, North and South America, some of which have required data collection and the use of databases.

The main problems linked with data management are the following :

- we are processors of information - constantly receiving new information which may be assessed, developed and used to advise clients;
- large quantities of information are received, but is mostly unstructured and only valuable if it is accurate and readily accessible;
- key information is often unavailable or is out of date.

databases do not solve all these problems, but they can help overcome the problem of not being able to locate data, and they provide a tool to help summarise and analyse information. Database development and maintenance is expensive however, as most data is time dependent or time sensitive. Any attempt to capture it into a database requires the database to be maintained, otherwise the value of the database may rapidly decline.

A. The role of databases at Stirling.

Most of the work at the institute of Aquaculture is contract base, with relatively short time horizons. This, and perhaps the fact that we have no specific computing section has discouraged the establishment of large databases. Databases are seen as a tool to use when there is a very specific job to be done. Most are very small by the standards of SIPAM Typical examples are as follows:

As an index to paper-based information

This of course is partly covered by databases such as ASFA, AGRIS and the University library catalogue. However, these do not cover the many reports, newsletters, magazines and industry brochures that we receive. Key information about each publication or article (e.g. keywords and reference) are entered into a database to help with subsequent retrieval. Another database keeps track of the many CVs (Resumés) we keep. Again, rather than enter full details about each person, we record only name and keywords on subject and geographical area. A search on say "shrimp" and "India" will give the names of people with expertise in shrimp and experience in India - we can then go the paper CV for more information.

For simple information storage and retrieval

For some types of information (such as names and addresses) databases are the easiest and most flexible form of storage. Most of these use a single data table and are

focused - e.g. UK fish farms or Institute Newsletter mailing list, or equipment suppliers. Most are single table databases, although the equipment suppliers database uses three tables to link products and suppliers in many-to many relationship.

For data analysis

Databases are sometimes used to help analyse information gathered during a one-off survey. Examples include water quality surveys, evaluation of training courses, or surveys to gain information on fish farm practices databases have the advantage here of providing a better interface than spreadsheets for data entry and checking, and allowing greater volumes of data to be input. Modern packages can also carry out much of the required analysis. Otherwise it is simple to export the data to a spreadsheet or statistics package for additional analysis.

For project management

In a simple way, databases are sometimes used to track project progress, for instance carrying out a questionnaire survey. Each record contains the contact detail for the person to be contacted. Logical fields track the progress. Memo fields allow specific comments to be included, such as notes to phone back at a specific time. The progress of the project can quickly be summarised, and delays addressed.

The most complex database developed within Stirling Aquaculture also falls within this category, although it is also for data storage and analysis. This is a database setup to help manage a fish farming extension program in Malawi.

All of these databases are PC based, although we potentially have access to Networked application, including a Unix based Oracle server. Currently we are using Microsoft Access under Windows, with earlier databases developed in dBase III + or IV.

B- Problem with databases.

Databases are often not used because of problems such as:

- most are not suitable for unstructured information;
- unless they are very well planned, difficulties quickly arise as users wish to enter data where there is no appropriate field, or where a numeric value is required, but only qualitative information is available;
- definitions are misunderstood so data is mis-entered;
- relational databases can be difficult for end-users to understand and set up;
- the likely end result is considered to be not worth the investment in time and effort required to design and construct the database.

C- Experience of data collection in Scotland and in Malawi

Wherever possible, Stirling Aquaculture relies on secondary data from all types of publication. Where primary data collection is required this is minimised by asking what do we really need to know in order to answer the questions that have been asked? A strategy for answering those is then worked out. Sometimes this involved questionnaires. Most of the time a small sample of people are approached, and the questionnaire is completed via a telephone interview (conversation) or even a personal visit.

Using this personal approach it is possible to achieve an 80–90% response rate. Obviously, obtaining commercially sensitive information in this way can be very difficult, although much depends on the attitude of individual companies, or even individuals

within those companies. Developing out of hours social contacts with people in the industry can often be the only way of hearing what is really going on.

For surveys of this kind, budget and practical considerations often outweigh statistical ones. Since up to 70% of the Scottish salmon industry is owned by a small handful of companies, targeting these plus a few smaller operators can be sufficient to give a good coverage.

Government agencies potentially have an advantage in data collection, in that companies can be put under a legal obligation to provide appropriate information to the department concerned. For instance, in Scotland there is statutory requirement for the industry to provide information on production and disease to the ministry concerned.

Data collection on the extension project in Malawi is more formalised than in Scotland. Again a series of forms provide the basic framework for the data collection. These concern things like the registration of new farmers, registration of new ponds, stocking and harvesting activities, visits of the extension agent and pond management practices. Each of these forms follow the database data entry screens to assist with inputting the data to the computer. The forms are completed by the Extension Agents when they visit farmer. They have regular training sessions to ensure they understand how to collect the data and why it is needed.

In order to gather information on pond inputs, Extension Agents often use a sampling technique asking farmers to recall what they have put into the pond over the past few days. Asking farmers to give a good idea of general patterns has rarely been found to give accurate data. Another method which is successful with some farmers is to provide them with a notebook and show them a diagrammatic method of recording pond inputs.

The incentives for farmers to provide data are centred around the advice and occasional assistance with stocking and harvesting that they receive from the Extension Agent. In Malawi Fish Farming Extension Agents are not involved with enforcing fisheries regulations or collecting taxes, so reasonable cooperation can be established.

D- Data verification

This can be one of the most difficult and expensive aspects of database construction and maintenance. Data is only useful if it is accurate. Problems include :

- missing data;
- errors due to inaccurate data entry,
- inaccuracies in the original;
- inaccuracies due to changes since the data was entered.

There are various methods used at Stirling to try to limit these problems. Missing data must usually be tackled by looking for other sources of the data. This often involves identifying the person who may know the answer and specifically asking them that question. Otherwise it may require personal observation or measurement if very important. Errors during data entry can be checked by a second person comparing entered database records with the original paper forms. Overcoming inaccuracies in the original data can be the hardest task. In this case, the most satisfactory approach is often for a subject area specialist to review the data to spot data which does not fit in with expectations. This may be automated to some extent by applying a simple statistical analysis to the data. If this reveals values which are well above or below the norm these can be checked with the source, or with alternative sources. Occasionally there are other published sources of information against which the data may be compared. More

sophisticated analysis along these lines may use correlation, or regression or grouping of data appropriate to identify data that does not fall into normal ranges. It may not be necessary to update all information in the same time interval. Market prices for instance need to be almost constantly updated, whereas data on fish farming companies may only need to be checked once per year.

Eliminating all errors from a database is probably almost impossible, and becomes more increasingly expensive (Probably exponentially) as the goal of nil errors is approached. In every case there will be a trade-off between acceptable cost and acceptable error rate.

E Directions for the future

I intimated at the start that databases are not something with most users at the Institute feel comfortable with, or use to their full potential. However, there is considerable interest now in the Internet World Wide Web. For those not familiar with this technology it is a way of linking documents and databases located on many computers around the world but providing a seamless interface where it is not necessary always to know where any specific piece of information is stored. Free text information or more structured databases are maintained locally, but accessed globally. People at the Institute are suddenly interested in making data available, and using this system - something which has never really happened with previous database systems.

The advantage of this approach is that data is maintained locally where there is the best chance that it will be accurate and up to date. The disadvantage is that there is much less structure and search mechanisms are still fairly crude. This may change over the next few years with the introduction of more sophisticated search programmes which will trawl the Internet for answers to more specific information.

There are also serious questions about data security which need to be addressed when dealing with commercially (or politically sensitive) data. However, rapid progress is also being made on this front with secure data transfer mechanisms already with us, and the possibilities of credit and transactions to be carried out just around the corner.

The World Wide Web is not offered as an alternative to the types of databases discussed above, or the SIPAM, but as a new means of sharing information in a way that is robust and can be readily searched and the data integrity sustained. Careful interpretation of information on the World Wide Web will always be required, and verification may still be needed. Like journal articles and newsletters, it will never provide access to everything. However, it is a welcome step towards helping us with more general information needs.

Examples of information that may be available through the World Wide Web from Stirling University Institute of Aquaculture includes:

- staff directory and resumés;
- institute facilities;
- institute services;
- current research programmes;
- course prospectus;
- institute newsletter articles;
- short scientific papers on current research;
- library of images for use in aquaculture extension;
- short articles to provide information on commonly asked questions about aquaculture development.

Observations on the Legal Aspects of SIPAM

by Liz Heffernan, FAO Legal Office

A- General Legal Framework

1. It was noted that the institutional structure of is currently in a state of transition. With the termination of the MEDRAP II project during the current year, responsibility for the coordination of SIPAM will pass to the GFCM. It is envisaged that SIPAM will come under the operation of the proposed GFCM Committee for Aquaculture Development. Three and related matters will be discussed at the next meeting of the GFCM in May 1995.

2. The legal framework is anticipated to comprise a number of elements. In the first place, agreement among GFCM members will be required regarding the foundation and operation of SIPAM. This will reflect consensus on the objectives and characteristics of SIPAM, and will involve defining such matters as its institutional frameworks and the rights and obligations of the various participants. In trun, it will serve to clarify certain other legal issues, such as the question of copyright ownership.

3. As regards the contribution of the working group, the importance of making a clear presentation to the GFCM of the objective,s characteristics and operation of SIPAM was emphasised. It was also noted that while SIPAM is currently operating solely in the government/public interest sphere, extension to the private/commercial sphere would involve additional legal considerations. The general question of securing financial support for the continued operation of SIPAM was raise, although recognised as matter outside the mandate of the working group.

4. Finally, some comments were made concerning the status of GECEM as a body established by an agreement under Article XIV of the FAO constitution. In particular, it was observed that the GFCM does not possess sufficient autonomy to enter into agreements with countries that are not GECEM members and that any such arrangements must be concluded by the FAO Director General. This issue may arise in the context of the participation in SIPAM of states which are not GFCM members, such as the current participants, Croatia and Portugal, which are members of MEDRAP but not of the GECEM.

5. The legal framework will also comprise an arrangement between the FAO Director General and the tunisian government, which has formally offered to act as host country to SIPAM. This offer is currently the subject of discussions between the Director General and that Government. The agreement ultimately concluded is likely to cover such practical considerations as the physical housing of SIPAM, maintenance, staffing and basic expenditure.

6. Thirdly, it will be necessary to seek legal advice as to the implications of the operation of SIPAM under Tunisian law, e.g., to ascertain wether there are registration or other formalities and to assess the application of Tunisian intellectual property laws.

B- Copyright

7. A brief outline of the law of copyright was presented. Copyright remains a matter which is primarily regulated by national law so that the nature and extent of protection afforded varies from country to country. There have been considerable efforts at harmonisation of copyright laws at an international level principally through WIPO and UNESCO. Bilateral arrangemenjts and, more particularly, multilateral agreements such

as the Berne Convention and the Universal Copyright Convention (UCC) provide for reciprocal protection and impose minimum requirements, thereby reducing the impact of disparities in national laws. It was noted that most of the SIPAM countries are parties to one or other of these two conventions.

8. The diversity of national copyright laws is particularly apparent in respect of new technologies such as computers and databases. Although the application of copyright principles to computer software and databases was slow to emerge, it is steadily gaining acceptance. It is the subject of a provision in the Agreement on Trade Related Aspects of Intellectual Property concluded in the Uruguay Round of the GATT and of an EC Draft Directive which seeks to harmonise the national laws of the EC member states on the protection of databases. At a national level, most copyright laws either specifically or implicitly regulate databases.

9. In general terms, copyright law gives the owner of work the exclusive right to copy and distribute the work as well as the right to develop and produce derivative works, for a specific period of time. Thus, once a work is protected by copyright, the permission of the copyright owners is required in order to engage in any of these activities.

10. Multilateral arrangements such as the Berne Convention and the UCC set out certain minimum requirements or general principles on copyright. These requirements relate to matters such as defining the type of work which warrants protection, determining the country of origin of a particular work and establishing the duration of copyright protection.

Copyright in databases derives from the general protection afforded to "literary" works. Although under the Berne Convention, copyright is created automatically and without the need to complete any formalities, the UCC practice is generally favoured, whereby copyright is established by the use of the copyright symbol, the name of the copyright owner and the year of first publication, e.g. "© copyright FAO 1995. All rights reserved".

11. The need to define the relevance of copyright considerations to SIPAM was identified. It was recognised that a number of factors may limit or exclude the application of copyright principles. For example, the public interest/non-profit character of SIPAM, the non-confidential nature of the data, and the limited circulation of SIPAM data to the public, reduce the need for copyright protection. A further consideration is whether the data (and if so how much of that data) is actually susceptible to copyright. Generally, data must be sufficiently "original", having regard to its content and skill or labour involved, to warrant protection. Thus, statistical, bibliographical and similar data generally fall outside the protection of copyright.

12. A distinction was drawn between three copyright issues which may arise in respect of SIPAM. First consideration must be given to the database itself i.e., the access of software. In the case of SIPAM, this software was devised by FAO and is protected by FAO copyright.

13. A second concern relates to the data supplied to SIPAM. This data may be supplied at a national level to the national centres or, alternatively, may be supplied by national, regional or international sources to the Regional Centre. For most part, it is unlikely that this data will be protected by copyright. However, if it is so protected, then it should not be input or stored in the SIPAM system without the prior authorisation of the copyright owner. Such permission may involve the payment of a fee and the inclusion of a copyright acknowledgement with the data. Thus, any requests for permission to use

a third party copyright should be coordinated through the Regional Centre. This is necessary given the possibility of pre-existing arrangements between FAO and third parties regarding the use of copyrighted data which may be supplied to SIPAM.

14. The third copyright issue relates to the data which is actually compiled on the database, i.e., SIPAM data. There is considerable support for the view that the acts of selecting, compiling and storing data on a database result in a work which may attract copyright protection, independent of any rights in the original data. Clearly, this issue is more complicated than the other two, not least because the data is actually compiled at national and regional levels. In this regard, it is suggested that regional rather than national selection and compilation should be deemed to give rise to SIPAM data. It is this SIPAM data which should be the subject of distinct copyright protection. The identity of the copyright owner must await the conclusion of the general legal framework for SIPAM, as discussed above. However, given the co-ordinating function of GFCM, SIPAM data is likely to come under FAO copyright.

15. The need for copyright protection depends in part upon the number and profiles of potential users of the SIPAM database. In this regard, the importance of the role of the national centres in identifying and co-ordinating the use of SIPAM data was emphasised. However, it was also recalled that the principal objective of FAO copyright protection is not economic per se, but rather is to secure the widest possible dissemination of the data.

16. Some consideration was given to potential future applications of SIPAM data. Commercial uses would involve a change of emphasis in the practical and legal arrangements for SIPAM and, for example, might ultimately require the introduction of standardised licensing arrangements. However, there was agreement that any such uses are not contemplated at the current time. It was also noted that copyright protection might also extend to any derivative products produced or developed from SIPAM data.

17. In light of the above, it was recognised that a precise and comprehensive account of the implications of copyright protection for SIPAM would require analysis of the copyright laws of each of the participating countries. Similarly, since certain data supplied to SIPAM originates at a national level, restraints on its use for SIPAM purposes will be a matter of the respective national laws of the SIPAM countries. In addition, any such review would require consideration of other relevant areas of national law, such as contract and criminal law, as well as identification of any special provisions or waivers operating in favour of international organisations or non-profit activities. As more immediate and practical first step, it was suggested that advice be sought regarding the copyright laws of Tunisia, the location of the Regional Centre, which for copyright purposes, will be deemed to be the "country of origin" of SIPAM data.

C. Legislative Database

18. A brief overview was presented of the operation of the Fisheries Law Database at the FAO Legal Office. It is still in a transitional phase and is estimated to be fully operational by early 1996.

19. The database is exclusively legislative in character and covers wide-ranging forms of legislation in substantive areas of fisheries law. Aside from the general benefits stemming from the operation of the database, the Legal Office is using the system to develop a system of classification of laws. It offers a far more comprehensive and precise classification of the data than the traditional methods. At the current time, the data is drawn exclusively from within the FAO archives and FAO sources.

The keywords for the fisheries database have been selected and are accompanied by guidelines which provide the user with definitions of keywords.

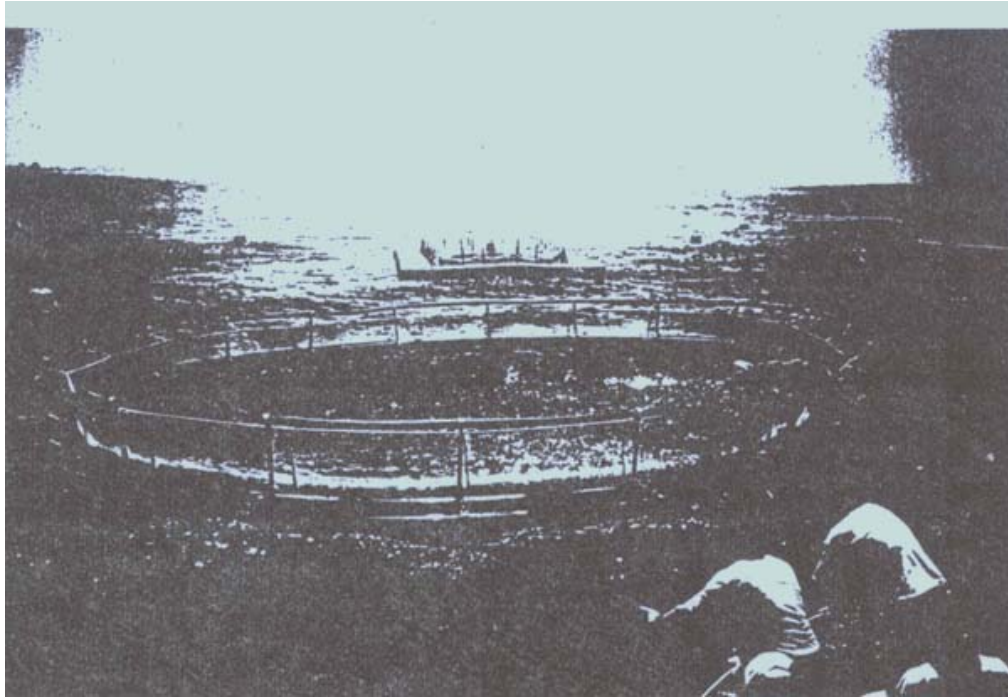
20. As regards each individual record, the data is provided in English, French or Spanish. Information is presented regarding the type of text or legislation and its legislative history. A brief outline is provided in the form of a summary. For selected pieces of legislation, a more extensive abstract, prepared by legal experts, is available. Although not yet operational, linkage is anticipated, so that the entire legislative history of a piece of legislation will be available on a single page.

21. Concerns were expressed regarding the role of the national centre in dealing with legal data and, in particular, in drafting summaries of national legislation. It was suggested that this latter function will require the use of legal expertise. In response to question it was confirmed that the FAO fisheries law database also covers EC legislation.

Fourth Working Group on SIPAM System Design Development

Nicosia-CYPRUS 14th – 17th June, 1995

Denis LACROIX



FAO/MEDRAP/SIPAM
MEDiterranean Regional Aquaculture Project
System of Information for the **Promotion of Aquaculture in the Mediterranean**

Abstract

This fourth working group of SIPAM had as main objectives: to finalize the output formats of all databases, to prepare the organisation of the hosting structure of SIPAM at the end of MEDRAP (31st. of July, 1995) and to establish links with TECAM. The five countries attending the meeting (Cyprus, Greece, Spain, Tunisia and Turkey) highlighted the fact that the network already plays an important role among their various systems of information. Consequently, it becomes urgent to transform it into a operational and reliable tool.

The first task is to secure the efficient functioning of the programme after adding all output commands which are necessary for the full use of the databank. This will be done in two steps: first, programmation and test with real data in Tunis and second, bench-testing with Greece, Tunisia and possibly Cyprus) before software spreading to all SIPAM countries.

The network has also to prepare the future when considering organisation and budget. The department of fisheries and aquaculture of the Tunisian Ministry of Agriculture will relay MEDRAP at the end of August. A new team is about to be selected. It quality is a key-element of the efficiency of the network.

A financial support to the network would also be valuable during the difficult first phase of start-up out of MEDRAP frame. A request had been already sent to Spain. It would be completed by other demands, notably to institutions as European Union, in order to strenghen the working budget.

The importance of GFCM was stressed as it collects now several urgent responsibilities: choice of national experts to be par of the management board, clearing of all legal aspects of SIPAM, procedure to define concerning new countries adherence, search for additional funding, etc. Its tasks will be made easier if GFCM can rely on a dynamic and operational network. It is also the first priority of SIPAM.

Key-words: Mediterranean, aquaculture, network, information.

Acronyms :
MEDRAP : MEDiterranean Regional Aquaculture Porject.
SIPAM : System of Information for the Promotion of Aquaculture in the
Mediterranean.
GFCM : General Fisheries Commission for the Mediterranean.

Résumé

Ce quatrième groupe de travail du projet SIPAM avait trois objectifs: arrêter le choix des formes de sortie pour toutes les bases de données, préparer l'organisation du nouveau cadre de travail du SIPAM à la fin du projet MEDRAP (31 Juillet 1995) et étudier les collaborations possibles avec le réau TECAM. Les cinq pays présents (Chypre, Espagne, Grèce, Tunisie et Turquie) ont montré que le réseau faisait désormais partie intégrante de leurs systèmes d'informaton et qu'il était donc essentiel de le faire évoluer définitivement en un outil fiable et opérationnel.

La première urgence est d'assurer le fonctionnement efficace du programme après l'ajout de toutes les commandes de sortie indispensables à l'utilisation pratique de la banque de données. Ceci sera fait en deux temps: programmation et test avec des données réelles à Tunis puis test approfondi avec trois pays volontaires (Chypre, Grèce et Tunisie) avant la diffusion du logiciel à tous les membres du SIPAM.

Le SIPAM doit également préparer l'avenir au plan organisationnel comme au plan financier. Le département des pêches et de l'aquaculture du Ministère de l'Agriculture tunisien prendra le relais de MEDRAP fin Août 1995. Une nouvelle équipe est en cours de sélection. Sa qualité apparait déterminante pour la pérennité du réseau.

Un appui financier au réseau serait très utile dans la difficile phase du démarrage. Une requête est déjà en cours auprès de l'Espagne. D'autres demandes pourraient suivre, notamment auprès d'institutions comme l'Union Européenne, afin de renforcer le budget de fonctionnement.

L'importance du CGPM a été répétée: il a désormais plusieurs responsabilités urgentes: nommer les deux premiers experts nationaux prévus pour le comité de coordination, clarifier les aspects juridiques du SIPAM, instruire les demandes d'adhésion de nouveaux pays, rechercher des financements complémentaires, etc... Sa tâche sera facilitée s'il peut s'appuyer sur un réseau dynamique et opérationnel; c'est aussi l'objectif immédiat du SIPAM.

Mots-clefs: Méditerranée, aquaculture, réseau, information.

Acronymes :

- SIPAM : Système d'Information pour la Promotion de l'Aquaculture en Méditerranée.
- MEDRAP : Projet Regional de Développement de l'Aquaculture en Méditerranée.
- CGPM : Commission Générale des Pêches pour la Méditerranée.

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Front page picture : offshore cages of Sagro deep sea farm in front of Paphos (Cyprus)

I. Introduction

The fourth working group meeting on SIPAM system Design Design Development organised by MEDRAP II Project in collaboration with FAO (FIRI) was held from the 14th to the 17th of June, 1995 in Nicosia, Cyprus. Some sessions of this meeting were common with the TECAM workshop in order to facilitate mutual information and common lectures and discussins. This meeting was attended by representatives of five countries: Cyprus, Greece, Spain, Tunisia and Turkey. Preparing the future adherence of Morocca to SIPAM, a representative of this country took part to the meeting.

Were also present:

- from FAO Rome : M.Pedini (senior Adviser, aquaculture develop.)
S.R. Coppola (System Designer)
- from MEDRAP Centre : H. Akrouit, D. Lacroix, O. beji and M. Zitoun

Annex I gives the list of participants and updated address and E-mail.

The meeting was opened by **Mr. C. Petrides**, Minister of Agriculture of Cyprus. He welcomed all participants and underlined the role played by Cypurs in the activity of MEDRAP Project, the importance of aquaculture for the island (20% in value of Cyprus Fisheries), the will of Cyprus Government to develop this sector without prejudice to tourism industry and the anticipated participating of Cyprus to the networks on topics presenting locall interest.

As UNDP resident representative, **Mr. C. Perry** thanked FAO for its efficient cooperation with UNDP in this programme and pointed out the special. importance of the aquaculture sector for Cypurs, as this country is developpig rapidly.

Mr. Pedini thanked the authorities for hosting this joined meeting and recalled four key-elements for the development of the networks:

- good linkage between the specialised networks;
- development of databases adapted to end-users needs;
- permanent and exacting updating;
- consolidation of the system through permanent relations with reliable sources of data like EAS or GLOBEFISH.

He thanked also M. Akrouit for the good work achieved through MEDRAP activity and notalby the care to the cooperation between North and South in the Mediterranean.

As MEDRAP Coordinator, **Mr. H. Akrouit** noticed that it was necessary to speak not only about quantities of fish produced by Cyprus but also about the quality of its representatives to MEDRAP. He expressed the hope to see soon the statt-up of common projects in research and in technology thanks to the cooperation toof the netwokrs can be. He emphasised the need to support this cooperation through internatinal institutions and also through the countries themselves.

The Director of CIHEAM Regional Centre of Zaragoza, **Mr. M. Valls** reminded to participants that three years ago, in Cyprus, started the first cooperation with MEDRAP. He streessed the importance of the developement of permanent relations between institutions and networks in order to save time and efficiency.

Mr. R. Coppola presented then the objectives and evolution of the SIPAM to TECAM and SIPAM grups. He underlined five main points:

- SIPAM Network is a three level system: national, regional and FAO level, which allows different specific functions at each level and consequently a better consistency;
- SIPAM Network is the information system for the specialised network which implies a close cooperation for the definition of the databases, their improvement and updating;
- transfer of good quality information is crucial for the efficiency of the system. This will be developed through general INTERNET connection between all member institutions and also through a better training of all counterparts acting as SIPAM country head office;
- one may say that SIPAM software is now ready for use with a DOS version. A more friendly user version will be developed soon under WINDOWS;
- when data entry will be completed by all member countries, SIPAM will be able to enter in WAICENT system, a FAO corporate database conceived to provide clients, including governments, research institutions, universities and private users, with fast access to FAO's library of information on agriculture, forestry, fisheries, aquaculture, etc...

Mr. M. Pedini reminded to the participants the interest of a joined meeting:

- necessity of multi-disciplinarity (example of the technical success of *Pagrus major* and its commercial failure);
- meeting and workshop are useful but they require time and money. An efficient information network can save both and, above all, can stimulate the work in cooperation.

He concluded saying that TECAM has to select what its members want to develop with SIPAM and SIPAM has to explain to TECAM group which services are already available for the optimal use of its functions.

The officials of the SIPAM meeting were designated as follows;

- Chairperson : Mrs. Daphne Stephanou.
- Rapporteur : Mr. D. Lacroix.

The preliminary agenda was adopted as presented. (see annex 2.p.23).

II. SIPAM System Development

II.1 Data entry progress at regional level.

As SIPAM data manager, D. Lacroix presented first the state of achievement of the workplan decided at the previous meeting for April–June, 1995.

	SIPAM Team	Coppola	Countries
1 <u>Database copy procedure</u>			
- List of files to be recorded for each DB before sending copy from the countries to the regional centre (fax to countries).	*	-----done 12/4-----	>
2 <u>Software modification</u>			
- Modifications in tables and definitions	*		in user guide
- Aquastat definitions	<	-----*	
- Copy by fax to countries	*	-----	>
- Automatic installation procedure	<	-----*	operational/
- Uploading/downloading	<	-----*	filtering to be developed
3 <u>Data entry/collection</u>			
- Country report	<	--- -3 countries	-----*
- Data recording (reg. & nat.)	*	(95% for MEDRAP: table 2)	*
- Data collection	<	-----	*
4 <u>User guide improvement</u>			
- User guide copy	*	-----	> April
- Proof reading	<	-----*	May
- Conceptual design (diskette)	<	-----*	June
- Updating of user guide and distribution	*	-----	>

Table 1: State of achievement of the April–June workplan.

All countries met problems in the use of the SIPAM 2 software mainly because of some functions inefficiency. Few countries reported by fax or phone the problems they were facing. A new indexation procedure was sent in order to solve some of the misfunctions but it was not found successful. Consequently, seven countries mailed partially completed databases from 26th April to 22nd of May, 1995.

Table 2 present the scale of achievement of data entry in SIPAM software 2. The great differences between the level of fulfilment of the databases according to countries, and the delay in receiving the diskettes (three of them were delivered at Tunis SIPAM Office on the 29th of May explain why it was not possible to test properly the regional module.

(To be completed as soon as possible and faxed back ; if "A" status, send diskette)

	CROATIA	CYTRUS	EGYPT	PRANCE	GREECE	PORTUGAL	SPAIN	TUNISIA	TURKEY
PRODUCTION	diskettes	A		C	A	B	C	A	B
IMPORT	mailed on	A	no import	not available	C	not available		no import	
EXPORT	12th of May	A			C	not available		A	
EXPERTS	through Austria	B	B	C	C		B	A	B
SUPPLIERS	-	A	C	C option for A				A	C
INSTITUTIONS	never	A	C	C			B	A	B
PRODUCERS	received	A		C option for A		B		A	C
PROGRAMMES		B							

A: fully completed B: main part achieved (more than 50%) Date: 1.6.1995
 C: few records no letter: no record

Table 2: Scale of achievement of data entry in SIPAM Software 2 in the participating countries.

Concerning MEDRAP II activity reports, a special workplan had been scheduled for these 40 documents to be summarised and recorded in the regional module.

A detailed follow-up system had been decided in order to control the progress of data entry as shown on figure 1. This system is based on the items to be processed and the level of processing (written, available on diskette, recorded in DB).

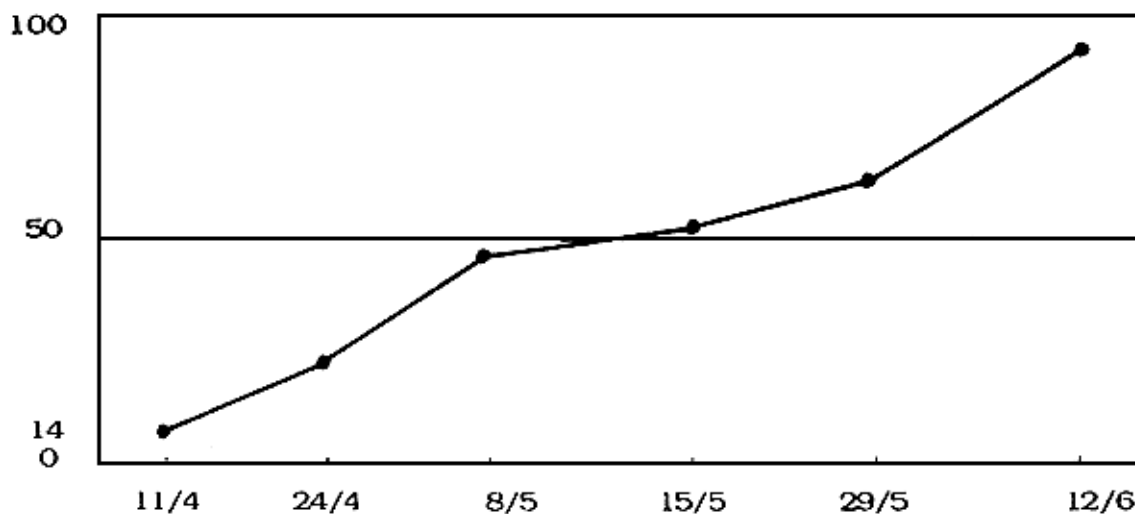


Figure 1. Follow up of Data entry percentage in MEDRAP activity reports database

A similar system could be applied for countries national database to help counterparts to evaluate the progress in data entry. An interview of M. Carle, Aqualon Manager, in France revealed that it was much more efficient and time-saving for a country like France to contract with a private company for the collection and the regular updating of data about producers and suppliers as it would represent an expensive and long work for the national SIPAM counterpart.

In the following discussion were expressed three main points of view:

- countries representatives observed that it was impossible to fill properly the databases as required because several misfunctions in the software use, and that the imported version of the programme that was finally used by Tunisia has to be circulated to all countries to save time and effort.

- FAO head office noticed that the software had not been correctly tested before its mailing to countries and consequently there was a lack of control of the operationality of this new version;

- the MEDRAP Coordinator reminded that SIPAM team should have benefitted of the support of the local computer specialist but MEDRAP never succeed to activate this commitment. The recent experience of SIPAM 2 software diffusion demonstrates the urgent need of a computer specialist besides the programmer and the biologist with the permanent backstopping of FAO system designer. This support should be all the more easy to obtain that it had been promised since the very beginning of the project, through IRESA institute, part of the tunisian Ministry of Agriculture.

II.2 Data entry progress at national level

• Tunisia

Zouhaier Saghrouni confirmed that it took time to solve progressively the various problems that merged when mass data entry started. The vicinity of SIPAM centre allowed to solve all the problems which explains the good level of achievement of the tunisian database.

• Cyprus

1. All SIPAM 2 diskettes were infected by virus 3D (GENB), They were cleared by antivirus programme of Dr. Solomon. We notified the SIPAM centre accordingly.

2. The transfer of data from SIPAM 1 to SIPAM 2 presented problems. So we partly succeeded to do it for some files (like national suppliers) of some data banks. In these, we completed the missing fields. Although we followed the instructions given by the SIPAM Centre, we did not succeed in transferring them all. The problem was located to indexing since we were using different programme language.

3. Problems were faced when trying to use numbers instead of acronyms. Several options were tried with no result. Then, the indexation procedure named INST was sent to us by SIPAM but it did not solve the problem either.

4. The weak points and defects of the programme, which were located during the data entry, were indicated to SIPAM Centre. Suggestions for the programme improvement were also sent to SIPAM Centre.

5. We sent to Tunis our diskette with all the data that we were able to enter by "data post", on the 5th May, together with a long list of our final remarks and suggestions on programme improvement.

6. The scale of achievement of data entry SIPAM 2 was the following:

production	A
Import	A
Export	A
Expert	B

Suppliers	A
Institutions	A
Producers	A
Programmes	B

She concluded that it does not make sense to try to fill a database set when its software is not fully operational. She observed that quite all problems had been solved in two days after MM. Coppola and Zitoun arrival in Cyprus but first, this is not a realistic way of new software installation and second, few problems are still pending.

• Spain

Ignacio Arnal reported that a significant part of the information requested for SIPAM were already available on a dbase IV bank: production statistics, experts and institutions.

As it was possible to transform this format in SIPAM one, he mailed directly the three databases to SIPAM after their copy from dbase IV bank. This format cannot be changed because the databank belongs to another institution than IEO. Consequently, R. Coppola indicated that a routine will have to be developed to allow the transfer of data from this databank to national SIPAM office in IEO centre before data transfer to regional centre.

• Turkey

Oya Ersan met some problems in the use of the software but her main constraint remains the lack of data. The inquiry that she started at the end of 1994 (questionnaires to producers, experts, institutions and suppliers) is not successful. The only solution is a personal contact by phone allowing to explain clearly the aim of data collection and the interest for the private partners to supply precise and right data. This work will be done systematically after July when her thesis will be achieved. Anyhow, Oya Ersan succeeded to complete production, experts and institutions at B level and suppliers and producers at C level. The use of latin alphabet will be soon generalised even for turkish names.

D. Lacroix raised at this time the problem of data quality control as he had been surprised by the record of 12.000 T sea-bream in turkish production database for 1994.

R. Coppola explained then that three levels of control will be prepared in the downloading procedure:

1. Record control. If uncomplete, record to be revised.
2. Codification control. If wrong, record to be revised.
3. Data control. If Prod. > 100.000 T (example), record to be checked.

At the regional level, a similar type of checking has to be set in order to secure the best consistency among the numerous data coming from very different countries.

The validation range for each parameter cannot be decided definitely. It is a progressive tuning in order to balance accuracy and functionality.

• Greece

Nikos Papandroulakis pointed out first the lack of time and personnel for entering data which explains the late data of mailing the diskette (22nd of May). He met some problems in data recording notably after more than 7 or 8 files. A message then appears: "error base 1003. Variable does not exist".

R. Coppola and M. Zitoun explained this message was related to the fact that a CLIPPER made programme cannot process more than 15 open files simultaneously. This problem had been solved yet by sharing the task in two parts which allows to process easily 30 files in the same time.

Anyhow, data entry progressed considerably during the last 3 weeks before the meeting: A level for production and producers; B level for experts and suppliers; C level for import/export institutions and programmes.

II. 3 Conclusion on data entry improvement

As emphasised during Iraklion meeting, real data entry is the only way to check completely the software. This has been done by countries which allowed to identify numerous misfunctions.

In two days, R. Coppola and M. Zitoun had been able to solve most of them. This experience of testing showed also the difficulty to solve several software problems without a reliable and cheap link. This will be available soon through Internet which installation by FAO associated expert is planned for mid-July in Tunis.

To save time and efficiency, it was proposed to test first the SIPAM 3 version only with three countries: Tunisia, Greece and Cyprus (if possible). Then, it will be sent to all SIPAM countries with automatic installation and uploading/downloading procedures.

II.4 Output formats revision

This part summarises briefly the main improvements and modifications adopted by the working group for each database output.

Aquaculture Production statistics.

- Output title becomes "Aquaculture Production statistics"
- In "time series" table, an option filter is proposed: system, structure, disposal, sector, environment can be selected.
- In "time series" table, increase "quantity" space and reduce "environment" and others.
- Production Statistics Abstract: Output title: "Aquaculture Production Statistics Summary Table". Add: Country and quantity (MT).
- "Country", "type of product" and "year" must be on one line.
- In the output table, increase "structure of culture" space (+4) and reduce "disposal" space (-4).
- In the selection table, give the capacity to select several parameters: year, type of product, sector (all, by sector...> sector table), etc...
- No french name in output.
- When "other" is selected in "product", indicate in "help" that it is necessary to precise the main species gathered in "other" class.
- "Aquaculture production evolution" becomes "aquaculture production time series".

Aquaculture Import/Export statistics

- "Country of origin" to be put in the title.
- Add "country of destination".
- "No" instead of "Nb".
- Exit "final" from "final total".
- Introduce "sub-total" for the different group of species.
- Output first keys:
 - by country of desitination;
 - by year;
 - by 5 years in quantity;
 - by 5 years in value.
- Output second key:
 - whatever preservation/presentation;
 - by preservation;
 - by presentation

Experts

- Instead of "naem / Surname / Nationality /". "Personal Particulars" will be written.
- Output title becomes "Directory of Aquaculture experts".
- List by surname (Family name first and then by name (given). Notice is necessary in help.
- "Post" code instead of "Zip" code.
- Propose a profile in expert sarch and output.
- Country to be classed by alphabetical order.
- List all keys for expert selection:
 - expert by
 - all;
 - permanent address;
 - species;
 - laboratory subject;
 - language;
 - etc...

The selection can be obtained from one or all criteria.

- "Second language" becomes 'language' as it is a key.
- Put "permanent address" after "working address".
- Add 'institution' before address.
- Prepare option for list with address only.
- When there is no expert after selection, set message "no expert meets the request".

Production centres

- Add country.
- Acronym is compulsory. It is called “acronym/abbreviation” and when lacking, it is automatically composed with the beginning of the name of the centre with the four last spaces filled with country code in English (“/CyP” for Cyprus for example).
- A profile has to be prepared.
- Selection routine to be prepared as for expert.
- Output title becomes “Directory of aquaculture production centres”.
- “Indicative” production replaces “production range”.
- Prepare option for list with address only.

Suppliers

- Output title becomes “Directory of Aquaculture Suppliers”.
- Acronym: see above.
- Delete code for speciality.
- Add “country”.
- Prepare abstract profile.
- When same acronym, search by whole name, then town and telephone number.
- “General field/speciality” replaces “legal status” in output.
- When there is no supplier after selection, set message: “no supplier meets the request”.

Institutions

- Output title becomes “Directory of Institutions”.
- Delete code in “second language”.
- “Second language” becomes “language” as it is a key.
- Add “country”.
- Prepare abstract profile.
- Set similar system for output selection:
 - selection by:
 - all;
 - affiliation;
 - etc...
- Add labelling option for quick mailing.
- Prepare option for list with address only.
- When there is no institution after selection, set message “no institution meets the request”.

Programmes

- Add "subject" to laboratory.
 - When a document has to be transferred to this database:
 - select option/entry/import;
 - give the name of the fish in ASCII - enter.
- indicate in help that the file must be under DOS and cannot exceed 60 kilobytes. (30 pages).
- When there is no programme after selection set message "no programme meets the request".
 - Prepare a key-words table to facilitate the selection of parameters to identify specialised programmes.
 - Set "main target" instead of "field of activity" in the title of the table and the datafile.
 - After "funding sources", prepare space for funding institutions and address abstract.
 - Put "documentation" instead of "bibliography". A link, if any, with SIPAM bibliography database must appear in the file.
 - Prepare abstract profile for search and output functions.
 - "Search" function must propose a table of parameters as described above.

List of MEDRAP activity reports

R. Coppola appreciated that this database is quite completely filled with relevant and controlled data. Few remarks were made:

- Add "list of reports" in search and output.
- Put "network" instead of "framework".
- "Reference" to be enlarged.
- "Venue" to be reduced.
- In the selection process, add:
 - all activities;
 - activity by network;
 - activity by year;
 - selected items:
 - all
 - summary
 - participants
 - lecturers
 - recommendations
 - agenda.

II. 5 Aquadab presentation

In order to show the complementary aspect of SIPAM within the FAO fisheries department software library, R. Coppola presented Aquadab software.

Aquadab is intended to be of interest to researchers and farmers, who want to store and retrieve, in a standard and concise format, basic information on research and trials on cultivated species. It allows the user to store information on animal species with aquaculture techniques. Aquadab has also been developed to encourage aquaculture researchers to record basic aquaculture information in a format which can easily be accessible to other scientists. The Aquadab manual provides the basic information required to install, run and use Aquadab. It also describes the general structure of the database, the information contained in its records and all software menu commands and function keys. The Aquadab software runs on IBM PC compatible computers and has no special memory or hard disk requirements. The software is distributed in a single 1.44 MB diskette.

Aquadab is organised in two modules (AQUADAB.GENERAL and BIBLIO) and four submodules under AQUADAB.GENERAL (AQUADAB-ENVIRONMENT, AQUADAB-REPRODUCTION, AQUADAB-FEEDING and AQUADAB-DISEASES) which contain different types of information. In Aquadab terminology, a record is the basic unit in which information is stored. A record has several fields (each field has one piece of information, e.g. the name of a species or the value of the conversion ratio) and may be linked to one or several datasets. A record corresponds to information in one of the two Aquadab modules and a dataset to information in one of the four Aquadab submodules. Each dataset is tied up to AQUADAB-GENERAL record and will contain several fields. The number of datasets tied to individual records is not limited in Aquadab. Each AQUADAB-GENERAL record and all its linked datasets are linked to a single BIBLIO record. However, a given BIBLIO record may be linked to several AQUADAB-GENERAL records.

The BIBLIO screen allows basic information about the data source, including key-words, to be entered. If the data entered in the linked AQUADAB-GENERAL are not from a published source, BIBLIO fields can be filled with information on ongoing research. AQUADAB-GENERAL is organised to store basic information about the cultivated species and contains also four fields of 250 characters for management notes and comments. In the AQUADAB-ENVIRONMENT there are 13 fields dealing with culture systems and water parameters. AQUADAB-REPRODUCTION contains fields to store information and data about reproduction and larval rearing. In AQUADAB-FEEDING the information about food characteristics and growth parameters is divided into 12 fields. Major diseases have been classified and codified in a three alpha code to be entered in AQUADAB-DISEASES together with information on drug treatments.

II.6 APS module presentation

Mario Pedini presented the Aquaculture Planning Simulator software to the first TECAM-SIPAM joined session. This module developed under Dbase IV is an analytical tool which aims at the technical and financial analysis of aquaculture projects through the comparison with parameters extracted from already operating similar projects. It will be part of SIPAL and SIPAM software in order to allow private investors, banks and development officers to check the consistency and the relevancy of new projects that they want to promote or that will be proposed to them.

This module will be soon validated with real cases protected by confidentiality in order to enrich the model with numerous and concrete data.

A more detailed presentation is given in annex 3.

III. Development Programme

III. 1 Windows version

R. Coppola presented the planning for Windows version:

- November 95 : working prototype
- March 96 : complete Windows version
- June 96 : final version

He underlined the basic requirements for each SIPAM operational workstation:

- powerful computer machine: 486 CPV or Pentium; 16 MB of RAM; 50 Mh frequency;
- laser printer;
- E-mail connection including modem (14.400 min.);
- CD-ROM reader;
- standard Windows software.

The new version will be multi-language (english, french, italian, spanish), with possibility of arabic, skills and funds permitting.

The screen structure is organised as shown below:

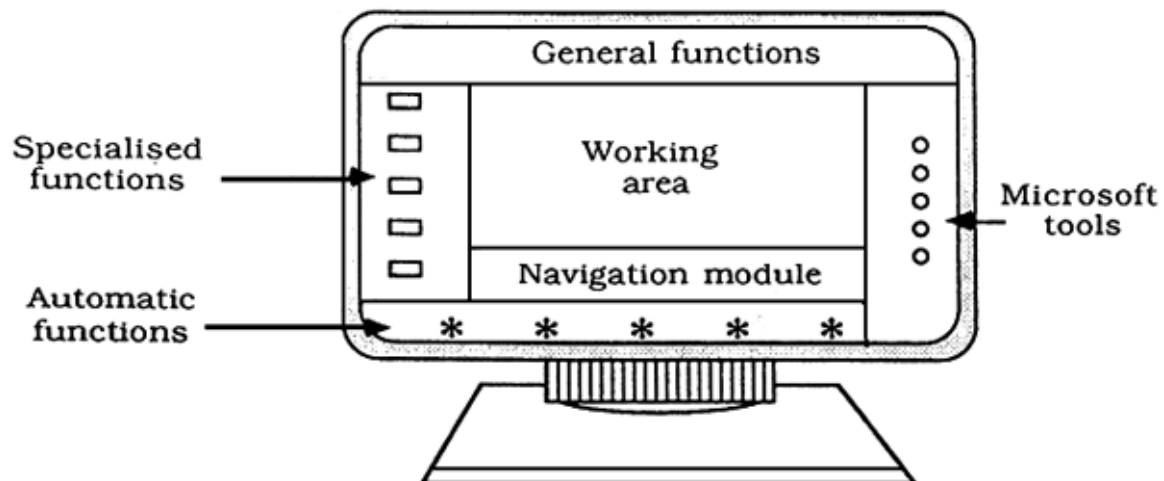


Figure 2: SIPAM Windows version previsual screen

In relation with a specialised greek office, FAO/AFC (computer division) is developing the software with special care to:

- iconisation (pictograms);
- special search form from one or several keys;
- automatic system of modification, except in some parts;
- selection of macro-regions such as Maghred or Europe, time permitting.

III. 2 Opening SIPAM to new members

The procedure for the opening of SIPAM to new members is under the responsibility of the Aquaculture committee of GFCM which first meeting is expected to be held at the end of 1995 but, for budget, reasons, will be probably postponed to January or February 1996. Actually, the answer to several questions depends directly on the decision of GFCM aquaculture committee. Anyhow, some points have been cleared after discussion:

- Focal point

There must be an institutional head office in each country in order to secure the reliability of the national data and APS operator function as this expertise work cannot be given to anybody. The focal point will act as a "dealer" in relation with secondary end-users in the country.

- New members

New member candidates will be screened first by FAO technical division and regional centre in order to check if the proposed national offer meets the requirements (cf. III. 1).

- Member request/paying procedure

It is clear that any secondary user has to ask first the focal point of his country for any SIPAM service. In the case the country is not member of SIPAM, this user may ask directly the regional centre.

The aquaculture committee has to decide the paying procedure as the system must become financially autonomous on the long-term.

- Management board

It is composed of FAO/GFCM representative plus SIPAM Coordinator and two experts from SIPAM countries. For the first meeting, the two experts have to be designated for a provisional mandate.

III. 3 New hosting structure for SIPAM

MEDRAP II Project will normally end on the 31st of July. The department of fisheries and aquaculture of the Ministry of agriculture of Tunisia is planned to host SIPAM. A contract is about to be finalised between FAO and the Tunisian Government.

The Tunisian Government plans to supply the following team:

- SIPAM Coordinator : Hédi Gazbar, Directorate of aquaculture at the DGPA.
- Senior aquaculturist : Not known at the moment. Selection has started.
- Programmer : Mahjoub Zitoun.
- Computer/software/assistance : IRESA team. Calculation centre of the Ministry of Agriculture.
- Secretary : To be selected.

The support of the actual data manager is secured until mid-October and will be probably extended to mid-August, 1995.

SIPAM will benefit of the existing MEDRAP facilities, office and equipment, which will be transferred to SIPAM.

FAO representatives underlined the fact that the relevancy and the efficiency of the SIPAM team was under the responsibility of Tunisia and no specific financial incentives can be planned for personnel purpose. On the other hand, a support may be envisaged from various sources as it had been done recently with the Ministry of Foreign Affairs of Spain. In addition, it is worth to recall that SIPAM should generate income in a near future if member countries and regional office show to be efficient and useful.

III. 4 SIPAM Budget

It has been described precisely in the Crete report. It is now under the responsibility of GFCM which aquaculture committee is competent for this question. Obviously, additional external resources would be extremely useful for the two first years of SIPAM. A European support programme for data collection up dating in Mediterranean countries may be solicited. This request has to be prepared by countries, not by FAO, although its assistance and support is needed. In addition, participation in E.U. programmes referring to information systems will be sought.

A similar programme is available in Spain. It totalises 400,000 US\$ for all the networks. A request had been already sent by FAO to the Ministry of Foreign Affairs of Spain. An analytical complementary request was prepared during this meeting in order to stress the initial request for allocating funds to SIPAM (Annex 4).

On a long term basis, the GFCM aquaculture committee has to prepare the rules for the use tariff of SIPAM as numerous and very different end users are expected: international institutions, banks, private investors, etc...

III. 5 Workplan

An indicative workplan was established:

- July–August 95 :
 - Modification of software to integrate all improvements decided in Cyprus and all those which were indicated by the countries before the meeting and were pending - - - > SIPAM 3 software.
 - Backstopping of FAO-FIRI in case of any problem.
 - Installation of Internet connection.
- Sept.–Oct. 95
 - Test of SIPAM 3 by three countries: Tunisia, Greece and Cyprus, if possible.
 - Start of training of Tunisian SIPAM team.
- November 95 :
 - Final tuning of SIPAM 3. Main to all SIPAM countries.
- Dec.95–Jan.96 :
 - Mass data entry.
 - Preparation of aquaculture committee meeting probably back to back with SIPAM group meeting.

M. Pedini underlined the fact that the three first priorities of SIPAM remain:

1. data entry from countries;
2. validation through national counterparts and regional office;
3. spreading the information.

The representative of Morocco asked for a support mission of SIPAM in Morocco in order to secure a reliable installation of the software and the immediate uploading of existing databases about aquaculture. This could be achieved through an on-going TCP programme concerning fisheries activities.

III. 6 Potential cooperation with TECAM

The potential cooperation with TECAM remains dependent on the selection by TECAM representative of priority databases to be developed in cooperation. After the two joined sessions, it appears clearly that time has not come to start a technical cooperation as most of TECAM participants on diversification discovered during this meeting the softwares which were presented to them: Aquadab, APS, Agris-caris, Waiscent and SIPAM. Two suggestions for immediate action were made:

- preparation of draft database on on-going research on species diversification including publications, in order to save time and money in new research programmes;
- check list (Matrix) of "who is doing what and where?"

CIHEAM, in cooperation with a TECAM relevant working group, has to take the responsibility of the collection.

VI. Conclusions and Recommendations

This meeting demonstrated the similarity of the main misfunctions met by countries when testing SIPAM 2 software. In the same time, it revealed the lack of efficiency in software testing when nine countries are concerned simultaneously for a short term evaluation. Finally, it showed the great variations in the level of fulfilment of the databases by country focal points and the constraint of lack of reliability and speed in the communication among the countries.

All those problems can be solved soon: modifications in software programme, testing with mass real data with small test, group before spreading the modified version, installation of Internet connection allowing quick information, data exchange and programme installation control through E-mail and FTP tools.

A special care has to be given to the transfer of responsibilities from MEDRAP hosting institution to the Department of Fisheries and Aquaculture of the Ministry of Agriculture as a new team will start to manage the system.

The SIPAM group recommended:

- **to speed up the legal aspects of SIPAM:** copyrights, obligations of countries, relations with national focal points and secondary end-users, membership adherence procedure, etc...;
- **to secure high quality of personnel in the regional centre** to ascertain the continuation of SIPAM and notably to check that they have a good command in english, which is a prerequisite;
- the GFCM secretariat **to finalise the demand of Morocco and Malta** to become members of SIPAM;
- **to go ahead with the development of the design of the new Windows advanced version** to be financed by the reserved funds as budgeted under the French Trust Fund.

The SIPAM group recommended that additional external support be found and FAO officially contact the bilateral and multilateral donors. The relevant request to Spanish Authorities was endorsed and the group recommended to the Spanish representative, I. Arnal and FAO to pursue the request as much as possible to the relevant Spanish Authorities.

The SIPAM group agreed with the fact that it will be under the responsibility of the management board to select the two country representatives of the first management board.

The SIPAM group acknowledged:

- **Mr. Hassen Akrouf**, for his valuable contribution to the preparation and start-up of SIPAM. This newly born network may already be considered as one of the most useful issues of MEDRAP II activity:
- **the countries** which participated actively to data collection and software testing as this work had been crucial for the improvement of the system for the benefit of all members. On the first rank, Cyprus, Greece and Tunisia have to be thanked with special mention;
- **Cyprus** which organised this meeting with a remarkable efficiency and a constant care of joining fruitful work and warm hospitality.

**SIPAM Working Group Meeting
14th – 17th of June, 1995
Nicosin, Cyprus**

List of participants

Mrs. Daphne Stephanou

Head Aquaculture Division

Mr. Savvas Kanios

Senior Fisheries Assistant

Department of Fisheries

Ministry of Agriculture, Natural Resources and Environment

13, Aeolou str, Nicosia - **CYPRUS**

Phone : 357-2-30 35 26

357-2-30 32 77

Fax : 357-2-36 59 55

Mr. George Neophyton

Veterinary Officer A'

Department of Veterinary Services

Ministry of Agriculture, Natural Resources and Environment

Athalassa - **CYPRUS**

Phone : 357-2-30 52 02

Fax : 357-2-33 28 03

Mr. Hedi Gazbar

S/ Directeur de l'Aquaculture

Mr. Zouhaier Saghrouni

Aquaculture Engineer

Ministère de l'Aquaculture, Direction Générale de la Pêche et de l'Aquaculture

30, rue Alain Savary 1002 Tunis, **TUNISIA**

Phone : 216-1-891 993

Fax : 216-1-891 993

Miss. Oya Ersan

Environmental Engineer

TUBITAK (The Scientific and Technical research Council of Turkey).

Ataturk Bulvari № 221

06100 kavaklidere - Ankara - **TURKEY**

Phone : 90-312-468 53 00/11 83

Fax : 90-312-427 05 36

E-mail : oersan @ 193.140.80.8

oersan @ tubitak.gov.tr

Mr. Nicos Papandroulakis

Researcher

Institute of Marine Biology of Crete. P.O. Box 2214

71003 Iraklion

Crete - **GREECE**

Phone : 30-81-241 892

Fax : 30-81-241 543

E-mail: NPAP @ POSEIDON . IMBC . GR
IMBC @ POSEIDON . IMBC . GR

Mr. S.R. Coppola

FAO - NF 511- Viale delle Terme di Caracalla, 00100
Rome - **ITALY**
Phone : 39-6-522 53034
Fax : 39-6-522 53020
E-mail: RINO.COPPOLA @ FAO.ORG

Mr. Mrio Pedini

Senior Adviser (Aquaculture)
FAO FISHERIES DEPARTMENT FAO FIRI NF 515
Vio Terme di Caracalla, 00100
Rome - **ITALY**
Phone : 39-6-522 56279
Fax : 39-6-522 53020

Mr. Ignacio Arnal

Instituto Espanol de Oceanografia
Av. Brasil, 31
28020 MADRID - **SPAIN**
Phone : 34-1-597 44 43
Fax : 34-1-597 47 70
E-mail: ignacio-arnal @ md.ieo.es

Mr. El Ahdal Mohamed

Chef de Service des Statistiques
Institute Scientifique de Pêches Maritimes (ISPM)
2, rue de Tiznit BP 21 Casablanca
MOROCCO
Tél : 212 222 2090
Fax : 212 226 6967

MEDRAP / SIPAM Team

- **Mr. Hassen Akrouit**
- **Mr. Othmen Béji**
- **Mr. Mahjoub Zitoun**
- **Mr. Denis Lacroix**

MEDRAP II. Ministère de l'Agriculture, c/o Direction Générale de la Pêche et de l'Aquaculture.

32, Rue Alain Savary 1002 Tunis, **TUNISIA**
Phone : 216-1-784 979/790 119
Fax : 216-1-793 962
E-mail: MC5594@MCLINK.IT

**SIPAM Working Group Meeting
14th – 17th of June, 1995
Nicosin, Cyprus**

Agenda

Wednesday 14th

9:00 – 10:00

- Item 1** : Opening session (joined with TECAM)
Welcome speeches
- Minister of Agriculture of Cyprus.
 - UNDP Resident Representative.
 - FAO Representative.
 - MEDRAP II Coordinator
Designation of Officials Adoption of the agenda.

10:00 – 10:30

- Item 2** : To TECAM and SIPAM groups: Introduction to SIPAM, objectives and evolution of the SIPAM, by Mr.S.R. Coppola / M. Pedini

10:45 – 13:00

- Data entry progress at regional level, by Dinis Lacroix, Othmen Béji.
- Data entry progress at national level, by National representatives.

14:30 – 18:00

- Item 2** : Data entry progress (continued)
Item 3 : Technical session on problems encountered during software use

Thursday 15th

9:00 – 13:00

- Item 4** : SIPAM software final version: output formats
- Revision of all outputs.
 - Adoption of definitive forms.
Moderator: S.R. Coppola

14:30 – 16:25

Output formats (continued)

16:45 – 19:30

- Item 5** : SIPAM demonstration to TECAM and SIPAM groups by R. Coppolla

18:45 – 19:30

working group on request to spanish Government.

Friday 16th

9:00 – 13:00

Item 6 : Oping of SIPAM to new members:

- New countries,
- Private members,
- Non GECM countries
- International institutions

Item 7 : Development of SIPAM (Windows version)

- state of development, (R. Coppola).
- support proposal to European Union, (M. Pedini).
next working group: objectives and tasks
- workplan for 1996 by S.R. Coppola
- Proposals for management board organisation by H.Akrout

15:15 – 16:30

Conclusions nad recommendations for SIPAM by Coppola and D. Stephanou

16:45 – 17:30

Item 8 : SOFA denibstration by Rino Coppola

Item 9 : Common meeting with TECAM group: Potential cooperation between SIPAM and TECAM

17:45 – 19:30

Item 10 : SIPAM analytical tool: APS Demonstration, future actions by M. Pedini

Item 11 : Open discussion with TECAM group about network use and future development.

- Closure of joint meeting

Saturday 17th

Technical visit : Sagro Deep Sea Ltd farm in Paphos Meneou
Marine Aquaculture
Research station in Larnaca.

THE AQUACULTURE PROJECT SIMULATOR (APS)

(Background information)

by Mario Pedini (FAO-FIRI)

When FAO and the regional projects were in the process of preparing the information systems for aquaculture promotion SIPAM and SIPAL, which have a modular structure, it was felt that there was need for an analytical module which would enable the examination of new project proposals in terms of their technical design and operational and financial parameters by comparing them with the data collected from similar projects already in operation.

With this objective in mind, the design of the APS was initially started through the AQUILA II regional project. Given the parallel development of MEDRAP II and AQUILA aquaculture promotion systems, the possibility of providing MEDRAP II with the opportunity of participating in the development of this software was considered. The idea was discussed and accepted at the meeting on the development of the SIPAM prototype held in Rome in May, 1994.

The new APS module was conceived with three potential users in mind: (i) **the private sector**, interested in obtaining information to improve the desing of new projects or in comparing the performance of their projects with that of other projects in the area; (ii) **banks**, which could make use of a databank including the main parameters of existing projects in order to judge the validity of proposals which could be submitted for financing, and (iii) **aquaculture planning officers** in the government, who might be interested in a comparative analysis of the various production systems which could be established in a given area.

Initially, the APS was developed to extract the information required for comparisons from the SIPAL/SIPAM modules, but it soon became obvious that, at least in the initial stage, a specific data entry would be needed to speed up the adoption of this module, which, for the time being, was the only analytical tool of the SIPAL/SIPAL systems. This data entry would be made through interviews of existing aquaculture farms using a specific questionnaire and strictly maintaining the data base (Borland, dBase IV Tm.), would group the projects into categories by species and production techniques, as well as by geographic location, thus allowing a comparison of the new project proposals with similar projects selected from the data entry. A special effort would be required at the national level to fill the data entry with existing projects as additional projects are introduced to enhance the accuracy of the comparison.

when a new project is to be compared, the relevant data have to be logged into four different sections:

- general identification, including geographic parameters;
- infrastructure;
- production technology envisaged, and
- main economic parameters.

Once this information is entered, either complete or incomplete, the comparison (simulation) with the records contained in the data entry can start. A selection of similar projects will be carried out by the programme by grouping farms with similar species and

type and scope of production. Options also exist to build specific filters to extract other types of cases from the data entry for comparison. The programme then automatically presents tables with categories of comparison displaying the data of the proposed project as well as those of the data entry projects grouped by area, country and region. For every parameter the programme displays maximum and minimum values, the average value and standard deviation of the distribution of data of the given parameters as contained in the data entry. This allows the user to verify the position of his project with respect to existing projects for given parameters and eventually leads him to another utility of the programme.

An extra possibility offered by the APS is a financial analysis of the proposed project. It utilises the data entered in the economic section of the project. This first phase of financial analysis ends with a series of summaries on product sales, financial data, company structure (which helps in defining the part of capital to be provided by the shareholder) and loan conditions. At a second stage, the APS produces an automatic analysis of the financial parameters of the project as a series of tables. These include investment and amortisation tables, revenue tables, variable cost analysis, fixed cost working capital requirements, profit and loss account, estimated overdraft, etc. It must be said that this is the first release of the programme and that in future releases a more complex financial analysis of the project could be included.

This first analysis, which has been prepared with the assistance of a Senior Economist of the FAO Investment Centre, is considered complete in the sense that it allows the investor and the banks to visualise the financial viability and degree of risk of the project.

The first release comes with examples of Italian farms in the data entry, which dispels the view that it is difficult to obtain real production and economic data from the farms. This is probably because the programme guarantees the confidentiality of the data and hence the managers of the farms may only have an interest in controlling their level of performance. Since the programme also allows for a tuning of the simulation, through the facility offered by the software, managers could tune the more critical parameters for the improvement of the financial performance of their farms.

Visit to Meneou Research Station

Meneou station is the research and development unit for marine species of the Department of Fisheries of Cyprus since 1989. Presently the main programmes of this centre are to test new species for culture. The team is composed of one night biologist, two technicians and one night watchman. In addition, the station has the support of the fisheries dept. headquarters concerning both physical and human resources.

Facilities:

Meneou station has one hatchery and an outdoor tank unit. The hatchery is equipped with:

- 7 circular tanks of 9 m³ each;
- 13 cylindro-conical tanks of 5 m³ each;
- artemia hatching set;
- 10 cylindres for algae culture of 1 m³ each;
- 1 wet lab, 1 dry lab;
- 1 breeder conditioning room with a 9 m³ circular tank.

Also warm and ambient temperature water supply exists, while cold water supply is under installation

The outdoor unit is equipped with:

- 4 circular tanks for breeders of 50 m³ each;
- 8 circular tanks of 9 m³ each.

The water is pumped from the sea, 250 m offshore. The water of the hatchery is filtered on gravel. Air is delivered by three RIETSCHLE airblowers (1,5 – 2,2 kw).

An emergency power plant of 30 kVA is installed under shelter.

Species studied:

All the breeders were collected from the wild with the exception of *P. major*. Sometimes, they are reared by farmers and sold to the hatchery when needed. Eight species are studied:

- | | |
|--------------------------|-------------------------------|
| - <i>Pagrus pagrus</i> | - <i>Puntazzo puntazzo</i> |
| - <i>Pagellus acarne</i> | - <i>Siganus rivulatus</i> |
| - <i>Dentex dentex</i> | - <i>Sparus aurata</i> |
| - <i>Pagrus major</i> | - <i>Dicentrarchus labrax</i> |

Research is done in close relation with private producers. It is clear that a closer cooperation with other research institutes working on the same species would be valuable for Cyprus at different levels:

- better efficiency of research;
- saving in time and budget;
- opportunities to raise external funds;
- better support to private producers:
 - for duplication of the experiments
 - for applying different methods at the same season
 - for direct application of the results by the private sector.

Visit to Sagro (Deep) Sea Fish Ltd farm, offshore Paphos

Production

Sagro (Deep) Sea Fish Ltd farm is one of the biggest aquaculture companies in Cyprus. One of its 2 partners owns a hatchery (Sagro Aquaculture Ltd) which produced 4 millions fry in 1994, and which 50% are reserved for the three grow-out units (2 in Cyprus and 1 in Greece) and the rest is exported mainly to Greece and Israel. They use several types of cages as Farmoclean, Flex Float, Aqualine, Dunlop, etc, which allows the optimisation of grow-out according to the size of the fish and the harvest constraints. The exposure to open sea waves and especially winter storms has some consequences in the grow-out management of the farm.

Market

Their expected production for 1995 is about 100 T and should double next year. The main species reared is sea bream (60 %), followed by sea-bass (20 %) *Puntazzo puntazzo* (10 %) and *Pagrus major* (10 %) limited to Cyprus market (6 Cyprus pounds/kg). The local market is developing quite quickly with a price ranging from 3 to 4,5 C.P/kg. Sales started at 1T/week in 94 and it is increasing although the tourism market has not been fully explored yet.

Main problems

The three main problems are:

1. Tourism industry lobbying against the site of the offshore cages. Reaction exists also from fishermen.
2. Hazards in grow-out cages, because of open sea conditions.
3. Lack of information on international markets and national regulations.

Productivity gains are possible in:

1. Mechanisation especially for feeding and harvesting.
2. Control of feeding as the food conversion ratio is close to 2,5 which is high.

They are very interested in SIPAM system and want to know as soon as possible which are the conditions for direct adherence to SIPAM or affiliation to national office.

Recommendation.

The SIPAM Working Group, at its meeting in Nicosia, Cyprus, held from 14 to 17 June 1995, examined the status of the Information System for promotion of Aquaculture in the Meditetranean, (SIPAM), at the moment in which the UNDAF/FAO project which has generated the network (MEDRAP II) is coming to an end.

In order to be able to fully utilize the potential offered by the SIPAM system at regional level, the Working Group recommended that additional external support be found. This recommendation is therefore addressed to the FAO to officially contact the bilateral and multilateral donors, in particular the Spanish Government to which a project idea to support and amplify the activities of the four networks generated by the MEDRAP II project, has already been forwarded on occasion of the last COFI session. In this connection the Working Party also requests the Spanish delegate to approach his administration presenting the situation of the SIPAM system along the lines indicated below and to keep the Working Group informed, through the PAO, of the outcome of his discussions.

The present status of SIPAM development.

The salient points related to the present development of the SIPAM system are:

- the architecture of the system has been defined, the prototype has been finalized in DOS environment and the debugging process is ongoing. The nine participating countries have started the collection of data for inclusion in the national SIPAM modules and successive transfer to the regional system which processes and redistributes the information to all the participants. The first beta version of the Aquaculture Planning Simulator has been completed and is being distributed for comments and corrections,
- the level of participation of the institutions in the various countries has been of different, reaching cases in which SIPAM has been adopted by some of them as the official system for storage and processing of aquaculture data. There is also full participation of national professional in its development,
- the regional center which should oversee permanently to the collation and redistribution of national data to all participants has been created in Tunisia, under the terms which had been endorsed by the last MEDRAP II Steering Committee,
- in the context of the newly created Aquaculture Committee of the CPCMC, SIPAM is adopted as the aquaculture information system for the Mediterranean.

When examining the status, problems and constraints have also been identified.

- there are delays in the collation, linkage and downloading of the national data bases because the local cost to implement these tasks rapidly cannot be fully met,
- it is not possible to reach a total regional coverage by the time MEDRAP II finishes in July 1995,
- the telecommunication linkages between the regional center and the national ones still rudimentary,
- although the SIPAM system has potential to be an analytical system assisting in the decision making process this potential has not yet been fully exploited, as at present the system is essentially a data base. This requires additional efforts to convert it first into a full information system and, in a second stage, into an analytical

system at regional level. An indication of the potentiality indicated above is given by the APS module for technical and economic evaluation of aquaculture proposals, already developed.

- although the GFCM has accepted to supervise directly the work of SIPAM, as proposed by the FAO, the resources which the organization could allocate would not allow the full development of the potentialities of the system.

Assistance requested.

Assistance is required to consolidate and further develop the system of which Spain is also part since April 1995.

At the request of the Spanish Government, through its official representation at FAO, the Organization sent through the official channels an initial project idea for support of the four regional networks of the Mediterranean (in which SIPAM is included), on occasion of the last session of the COFI. The proposal is still under evaluation.

If after the evaluation which in the SIPAM countries are hoping will take place with minimum delays due to urgency of continue the work carried out so far-a positive decision is reached, The SIPAM Working Group proposes to go ahead with the preparation of a full project document for the strengthening of the networks, with the following purposes as far as SIPAM activities are concerned:

- acceleration of the collation and downloading of the national data into the regional data base. This would require support for:

- provision of temporary assistance to the national and regional SIPAM centers especially these which have shortage of personnel for the task to be achieved.(*)

- assistance for programming, to automatize the downloading of the national databases into SIPAM national data bank, also implying design of the necessary interfaces,

(*) or lack of necessary skills

- travel of the national SIPAM coordinators and staff assisting them for discussion with institutions which possess data of interest to the system,

- local contracts for collection of data and to cover communications costs,

- some hardware when needed-for remote connection of the national data center,

- fund for acquisition of existing data bases of interest.

- Expansion of the system to other countries in the Mediterranean region (nine countries participate at present), to ensure the maximum possible benefits from the regionalization.

- Evolution of the system from the present advanced data base status to a first phase of information system and a second phase which would be analytical system.

- Implementation of the necessary institutional strengthening in the participating countries to ensure the permanence of the system after the termination of the project, by promoting the establishment of national groups which will be involved initially in the downloading of the bulk of information available related to aquaculture, and then in the maintenance of the system, elaboration of additional national data bases and data entry in the various modules.

- Establishment of the national teams which will be in charge of the analytical system -like the APS-which would imply:
 - training of national staff in the collection of the information on existing operations and implementation of the surveys,
 - data entry process and analysis of projects,
 - divulging knowledge about the system amongst potential users (planning offices, banking institutions and private sector)
 - creating the capability to respond to enquiries on analysis of project proposals and on analysis of performance of existing farms.

The SIPAM Working Group considers that the above could be reasonably fulfilled in the time framework envisaged by the FAO (four years) and with the financial resources which have been indicated, although obviously a full project document should be elaborated by FAO at a later stage.

The reasons justifying their confidence are: that the system is already operational and its architecture is already in place, that the national institutions in charge of the system are already deeply involved, that a regional center which should collect and redistribute information is already in place with its permanence assured by the Tunisian Government, that the permanent assistance of the FAO technical divisions is ensured as the system is adopted by the GFCM as information system for

aquaculture promotion, and finally that new modalities for incorporation of national experts and of national institutions, recently adopted by the FAO should allow a reduction of the effective cost of personnel and contractual services.

The donor country, being part of the system and confronted with the problems of aquaculturally developed countries with a large quantity of data to be collected and downloaded in the national SIPAM center, would also directly benefit from the activities of the project.