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THE STATUS OF THE IMPLEMENTATION OF MEDSTAT ACTIVITIES IN THE GFCM AREA (METHODOLOGY, APPROACHES AND SOFTWARE DEVELOPMENT)

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* Available only in English

DRAFT VERSION

Preparation of this document

This document has been commissioned by the Executive Secretary of the General Fisheries Commission for the Mediterranean (GFCM), Dr Alain Bonzon, and has been prepared in consultation with the GFCM Bio-Statistician, Dr Matthew Camilleri.

For many years, the GFCM has been trying to build up a regional data collection and information dissemination activity. The absence of its own budget and the limited human resources available at the Secretariat level prompted (in 2002) the launching of FAO/TCP/INT/2904 and the MedFisis Projects to safeguard the heavy statistical work undertaken through the Mediterranean Projects (Adriamed, Copemed and MedSuMed) and to foster and widen its implementation. Nowadays, with the establishment and the consolidation of the "new" GFCM with its own budget and organization, the issue has been revitalized, several initiatives are under way with several national and inter-institutional applications having been developed and agreements reached on many topics.

In general, as MedStat is being implemented through the FAO Mediterranean Projects and the GFCM, it will help countries develop their national fishery statistics systems in a coordinated and regionally compatible manner, also enabling them to better manage the sustainable development of their fisheries. In parallel, the implementation of MedStat will create a compatible regional system at the GFCM, which will serve as a vital tool for international bodies to monitor the state of fisheries resources and the well-being of the whole ecosystem in the Mediterranean with the additional help of other resource management tools.

Strengthening the capability of the fisheries institutions of the Mediterranean countries in marine fishery statistics and information systems, with a view to meeting the relevant national needs and requirements for participation in, and complementing in its entirety, the Mediterranean Fishery Statistics and Information System, is a priority issue of the GFCM and is, at the same time, the objective of MedStat. It is clearly worth mentioning here that MedStat is not just a database system performing data management and statistical computations.

MedStat focuses on the whole national statistical organization and concerns of a set of databases (information component) developed following tailored statistical data collection and implementation methodologies and procedures (statistical component) primarily covering the Fishing Vessel Census, the Catch and Effort Survey, and other surveys targeting monitoring and management issues. It has a modular implementation by national staff, with the technical support of FAO-MedStat experts, to enable each country to progress according to its priorities and resources (national capacity building component) and, at the same time, ensure that each step is achieved and consolidated before a new step is initiated, thus avoiding to jeopardise the work already achieved.

This document, prepared at the request of the Executive Secretary of the Commission, for the SAC Sub-Committee on Statistics and Information System to be held in Kavala (17-20 September 2007) has two objectives: (i) to report the status of the implementation of MedStat in the Mediterranean countries and (ii) propose a detailed and practical implementation strategy to enable the GFCM to achieve its above-mentioned "priority issue". It is worth highlighting that the implementation of MedStat is a sequence of activities and tasks designed to be carried out within a given programme of work and implemented to function at two management levels - the national (countries) and the regional (GFCM). This document is divided into four parts: the background, the implementation status, the possible strategy and the programme of work with expected resources needed.

C O N T E N T S

1. Background

1.1 MedStat Components overview[1]

The "information component" of MedStat is designed and implemented using the most advanced technology in user interfacing and database implementation. As a general rule, the user interface is designed to be as close as possible to real life operations and reproduce, to the maximum, the input documents (survey questionnaires/data sheets). Generally speaking, the system provides the user with the following facilities:

- Easy and assisted data entry and modification options.
- Guided safety storing and chronological history and data exchange between all MedStat components.
- Fast search and filtering facilities for data elaboration, which simplify data management.
- Generation of several special reports and graphical presentations of processed statistics.
- Synchronization and coherence of the data items between the national system, the monitoring system, catch and effort data and the MedStat Public (regional interface).
- Documentation, forms and questionnaires, reference manuals, etc., all available on line.

MedStat is always proposed and applied according to sustainability and resource allocation by the countries. The difference lies in the functionalities of the system, the range of applications possible, available financial and skilled human resources to be dedicated to the system, and the overall research programme in the country. In other words, each country may or may not implement the whole MedStat System, but use only one database (i.e., the vessel register database) as a stand-alone application.

MedStat is built around seven main components whose basic structure and main functions were set at design level.

Hereafter are the seven main modules composing MedStat.

- The National Management and Monitoring System
- The Regional/National/Local Reference and Codification System
- The Register of Fishing Vessels
- The Catch and Effort Survey of Industrial Fishery based on the logbook approach
- The Catch and Effort Survey of Artisanal Fishery based on the sample approach
- The Regional (GFCM) Database and Monitoring System
- The MedStat Database supporting the Web Portal as part of the GFCM Information System

All modules are strongly interrelated, are governed by the management and monitoring system, and checking and validation routines are performed whenever data are transferred from one system to another. The above MedStat structure reflects the situation at that moment (when MedStat was first designed). It is however a must and normal that long-term programmes, while keeping the mission and objectives intact, should review the activity plans and tasks as the situation evolves. Nowadays, taking also into consideration the overall data/information plan presented by the GFCM (see appendix 1), MedStat can and should revisit and re-propose focussing better the two components that are in it: the national and the regional contexts.

[1] Coppola, S.R. MedStat - An Adaptive Approach for the Improvement of Fishery Statistical Systems in Mediterranean Countries -*Studies and Reviews. General Fisheries Commission for the Mediterranean.* No. 79. Rome, FAO. 2005. 57p

1.1.1 MedStat national context

Direct support to member countries is, as already stated, the primary objective of the implementation of MedStat. It is normally performed though a series of well-established and tested activities. The strategy applied is to systematically choose a series of activities (from a consolidated list) to be implemented according to the needs found in a given country or situation (scenario). According to the scenario, the MedStat task force will be involved in :

- ✓ ascertaining the accuracy, completeness, up-to-dateness and usefulness of the existing national registers for fishery, as well as their suitability for the purpose of designing national catch assessment surveys;
- ✓ designing and implementing a coverage frame survey for accurate *de-visu* assessment and recording of the current size, structure and localisation of the fishing fleet, as well as the major land-based fishery infrastructures;
- ✓ undertaking the system design and development, or revision, of a computerised register of fishing vessels; this must be undertaken urgently and be completed before any of the other field work is started;
- ✓ undertaking the system design and development of a computerised yearbook of the fishing industry;
- ✓ constructing the sampling frame of fishing vessels by taking into account regional, statistical, biological and organisational criteria to be used for catch and effort assessment surveys;
- ✓ introducing a Catch and Effort Survey that meets national and regional standards;
- ✓ undertaking a critical analysis of the results;
- ✓ participating in the 'on-line workgroup' to respond to ad hoc queries that will certainly arise during the field work.

The outputs envisaged from the direct support to a country could be one, or all, of the following systems:

- The National Management and Monitoring System
- The Register of Fishing Vessels
- The Catch and Effort Survey of Industrial Fishery based on the logbook approach
- The Catch and Effort Survey of Artisanal Fishery based on the sample approach
- The National/Local Reference and Codification System aligned to the Regional system

1.1.2 MedStat regional context

The ultimate objective of MedStat is to create a Regional Information System based on national contributions not necessarily integrated into one system. It should, rather, be understood as the repository of all useful data (according to agreed protocols) which are considered strategic for the normative and scientific responsibilities of the GFCM.

The Regional information database centre should be constituted by the following systems:

- The integrated Regional/National/Local Reference and Codification System
- The GFCM Register of Fishing Vessels
- The GFCM Catch and Effort reporting system for Industrial Fishery

- The Catch and Effort Survey of Artisanal Fishery
- The Regional (GFCM) Database and Monitoring System
- The MedStat Database supporting the Web Portal as part of the GFCM Information System

1.2 The Casablanca opportunity

The GFCM Secretariat, in organising the "TRANSVERSAL WORKSHOP ON THE COMPILATION OF GFCM TASK 1 DATA" (Casablanca, Morocco 19-22 June 2007), took the opportunity to launch an assessment of the status of MedStat as a basis to draw up a detailed plan of action to tackle the data collection and statistical issue in general, as appropriate and at the earliest time. Hereafter, the status of MedStat implementation in the region is reported country by country. It is worth noting that some developments and support have been punctual and constant overtime whereas others have been occasional and *ad hoc*. There are several reasons for this; in certain cases, major events happened between the start of an application and its conclusion, such as accession to the European Union (EU) or the obtaining of "EU pre- accession country"status which directed respective Governments towards a general national review of the whole Information System (i.e., e-Government standards) with more resources and different EDP solutions (read: Croatia, Cyprus, Slovenia, Turkey). In other situations the stalling of activities is mainly due to the discontinuity of Copemed, the reduction of resources in Adriamed, and the stagnation of the EastMed Project, in which many expectations were placed for the continuation and further expansion of statistical activities started under the FAO/TCP/INT/2904-MedFisis projects.

2. MedStat implementation by country

2.1 Historical background

The implementation status of MedStat in the participating countries is presented below. Table 1 gives a summary of the narrative descriptions.

In the text, the attribute "first generation" to a software version normally defines a prototype release developed entirely in the Operating System MS Windows 97/2000, in Visual Basic environment with MS Access 97/2000 engine, which is a real Relational Data Base Management System (RDBMS). Specifically, all prototypes were developed in Visual Basic – Access 97/2000 as a stand-alone configuration.

MedStat "second generation" is the development choice of the MedStat final product. The software is developed in Operating System MS Windows 2000/XP. Its development environments are: Visual Studio 2003.net (Framework 1.1 - Programming Language: C# 2003 and MS Visual Basic .NET) plus Add-ons to Visual Studio: DataDynamics Active Reports and Dundas Charts. Microsoft SQL Server - SQL programming language or Access 2002 as database engine.

Malta

Malta was one of the two pilot countries (with Albania) which started the implementation of the MedStat application with the support of the Copemed Project. The work for MaltaStat progressed well but, since it was the pilot country, all software used in Malta is classified as first generation. Concerning development of the software, the original MedStat system has gradually been updated according to requirements, both administrative and scientific. The Maltese system is actually made up of all the MedStat components designed - National Control and Monitoring System, Census DataBase, Fishing Licence Monitoring and Management, Catch end Effort Sample Survey for Artisanal Fishery, Catch and Effort Logbook Survey for Industrial Fishery.

The census of artisanal and industrial fishing vessels was conducted and completed. The work also consisted of the development, installation, training and full use of the national fishing vessel register database with all the data management functionalities and updating procedures. Moreover, the whole fishing licence process, from the management of all the data to the physical issuance of licences, is also included in the system. The Catch and Effort Survey (CAS; sample approach – for small-scale fishery), started as a pilot phase, was completed in 2002 and, since then, is an ongoing application the results of which are regularly submitted to the General Directorate of Fisheries. In parallel, the whole system has been revised to fully match the EC requirements. The CAS for industrial fishery has also been implemented and is regularly used by the Administration. We were informed that shortly the MedStat Maltese system would be further exploited and considered for a network application.

Tunisia

MedStat is collaborating with the INSTM as well as with the DG Pêche within the framework of the World Bank (WB) Project (component 5) project implementation for the reorganization of the Fishery Statistical Sector in Tunisia. The WB project Census has been conducted

covering in the region of 23 fishery domains. The Census of Fishing Vessels and, subsequently, the Catch and Effort survey are the two domains where a strong synergy was identified between the WB project and MedStat supported by the Copemed Project, which also provided resources for two scientists involved in the statistical programme. At the moment, the Industrial and Artisanal fleet data have been transferred to the MedStat database (software re-elaborated in French with their support). The intensive scrutiny of the collected data suggested an in-depth review of the contents of the database. The staff of the Ministry have reviewed all data concerning the industrial fleet and part (northern of Tunisia) of the artisanal fleet. Unfortunately, this important task was interrupted because of the departure of the statistician in charge. The immediate follow up, recently decided, is to recruit three more scientific staff to deal with the statistical issue, complete the quality assessment of the artisanal database and launch a catch and effort survey on a national scale. For this latter task, the WB agreed to having GFCM support. The software developed and adapted for Tunisia is second generation, although not the latest.

Algeria

The situation in Algeria, during the Copemed Project, was that the Frame Survey (listing approach) was conducted and probably covered all the vessels, but an in-depth assessment of the saved data has revealed a consistent omission of data in the database contents (structural characteristics, fishing habits, season, etc.) which appeared to be poor. It was estimated that out of about 2500 vessels covered by the census, only 500 had good data coverage. All data were saved in MedStat (French version). To overcome the mobility problem of enumerators and supervisors in remote areas (for security reasons), a network system was designed to be set up between the CNDPA and the 14 Willayas (districts) in the country through a satellite Internet connection and with the support of Copemed. The networked databank and the data exchange procedures between the centre and the peripheral offices (data collectors) were to be carried out via intranet FTP being developed by MedStat. With the closure of Copemed this implementation was not completed. It is worth mentioning that, though it is not the latest release, Algeria MedStat Census database is of a second generation and in French.

Libya

In **Libya**, the census of artisanal and industrial fishing vessels was conducted and completed in 2001. The work also consisted of the development, installation, training and full operation of the database of the national register of fishing vessels with all the data management functionalities and updating procedures. The database was placed at the Tajura Marine Biology Research Centre. Since then more than one attempt has been made to maximise the results by putting in motion an automatic up-dating system and, mainly, to implement a Catch and Effort Survey. Several revisions were added to the original system but were all scattered and ad hoc. Staff from the institute were also invited to Rome to work on the improvement of the census data and start planning a pilot study on Catch and Effort in Libya. During the final part of the Copemed project, agreement was reached on some support from MedStat to Libya but it could not be materialised because of lack of time and resources. The Libyan authorities have reiterated on various occasions (GFCM, SAC and MedSudMed meetings) their willingness to rehabilitate the system and proceed with the CAS. Also in Libya, MedStat is a second generation application.

Morocco

In **Morocco**, the Institut Nationale de La Recherche Halieutique (INRH) is responsible for the assessment, monitoring, and advising on management options of the fishery and fishing activities in the country. It is within this framework that, in 2003, the INRH (Nador Station) started a strong statistical programme for acquiring knowledge and experience in the design and implementation of a statistical data collection system for assessment and monitoring purposes.

The census of artisanal and industrial fishing vessels, limited to the segment of Moroccan fishery statistics (Mediterranean coast items of information needed only for catch and effort data collection) was conducted and completed. After such application, a pilot scheme on how to set up a sample survey for scientific purposes in the present catch and effort survey in the country was envisaged (MedStat QCSS). The main objective of this new programme was to find the best possible, or at least the most appropriate, approach, by applying different techniques and models, targeting the improvement of data collection in Morocco. Following the closure of the Copemed Project, the support ended and, though Moroccan scientists continued the field work, it was not possible to complete the analyses.

Albania

The Albanian Statistical system (AlbaniaStat) was developed as a prototype to further extend the coverage of MedStat to other countries in ADRIAMED as was done with countries in COPEMED. Moreover, these two initiatives fully contributed to the harmonization of the fishery data collection process at the regional level.

From its part, the Government of Albania, although in a difficult situation because of important engagements and restrictions due to national priorities, invested a great deal of resources in this project. Some items/actions considered prerequisites for the implementation of *MedStat* were treated as urgent and priority issues.

Apart from the establishment of a Statistical Unit in the Fishery Department and the upgrading of the skills of the national staff, the computerised fishery census, based on national methodology, and national and international standards and requirements has definitely been the most conspicuous result. The census, with built-in enhancements and functionalities, introduced at the request of the Albanian Administration, as well as the upgrading introduced, is, *de facto*, the national fishing register.

A catch and effort assessment survey for Commercial Fishery based on a made-to-measure methodology that conforms to national criteria, with a high degree of harmony with the regional context and, at the same time, taking into account the difficult restrictions the Albanian Administration were facing, was put in place. An *ad hoc* statistical design was purposively developed to enable the Albania Fishery Department to start, with limited resources, a remarkable and difficult task.

As far as the small-scale fishery is concerned, the “MedStat Albanian small-scale fishing census” has been designed and the database developed. The work, undertaken in 2007 by a joint Adriamed/MedFisis project effort, is being implemented (field work, data entry and quality control) by the staff of the Fishery Directorate, Ministry of Environment, Fishery, Forestry and Water Management.

Slovenia

The census of the Slovenian fishing fleet was conducted and the database was completed and certified. The database structure was developed taking into account GFCM and EC requirements. Reports are generated in Slovenian, and English on request. International reports are only in English. The census results and the database are located in the office of the "Capitaneria Marittima" in Koper (Istria) and are under the control of the "Director General of Fisheries - Ministry of Agriculture Forestry and Fishery" Lubjana.

As far as the Catch Assessment survey is concerned, the data collection forms and the appropriate documentation were prepared and the Pilot Survey planned. Forms and reports were sent for ministerial approval. Because of other national priorities, no immediate follow-up was given to this initiative.

In 2003 we were informed that, with the accession of Slovenia into the EU, further resources had been provided by the European Commission to the Ministry of Agriculture Fishery and Forestry to upgrade the system developed with Adriamed assistance into an EC “compatible“ System.

Croatia

The Adriamed Project has supported the review of the Croatian Fishery Statistical system since the beginning. The country was under pressure to prepare all national infrastructures to fulfil EU requirements. The fishery statistical system was one of the chapters to be revised. The MedStat team undertook a severe review of the statistical system in Croatia (2002) and functional cooperation and collaboration was developed between MedStat and the Statistical office of the Fishery Directorate. In 2004, we were informed that Croatia was receiving direct support from the EU within its accession programme and that the national statistical programme would be included in that plan of action. The planned training course on Fishery Statistics was also postponed until the completion of the new activity. As far as the Catch and Effort Survey is concerned, MedStat undertook a quality assessment and informed the Fishery Directorate accordingly.

Syria

One of the first activities of the FAO/TCP/INT/2904-MedFisis project was the design and implementation of the Census of the fishing fleet in Syria. The whole MedStat Census Programme has been undertaken from the design, training, field work, database development, data management and, finally, consolidation.

From the national side, considerable support and attention was given to this task. The assigned nine field officers were afterwards supported by another eight. Supplementary field and computer training (two days) was organized for the whole group. Groups of two to four officers were assigned to carry out the field census in specific fishing harbours. Samples of questionnaires were checked, and notes were made to the officers for further consideration.

On completion of the Census and implementation of the MedStat Fishing Vessel register, the Syrian administration continued to interact with the MedFisis Project to build up a catch assessment monitoring system. In Syria, a second generation system is running and is one of the most advanced.

Egypt

Egypt, like Syria and Lebanon, was also among the first countries assisted by the TCP/INT/2904-MedFisis in the rehabilitation of the national statistical system. An assessment was made in 2004 in collaboration with GAFR and several activities were planned and undertaken aiming at implementing a census and the related fishing fleet register. The work mainly consisted of assembling all vessel data stored in various electronic support, revising them and rearranging them into a structured database system (MedStat Fishing Register). The unforeseen problem of the lack of qualified personnel for the management of the data/software was identified during the planning phase which the team tried to overcome by committing translation of the data entry/management interfaces into Arabic. Two staff from GAFR were also invited in 2004 to FAO HQ to programme and build up this work. Unfortunately, as the translation did not result in a concrete product, this idea was given up and no new opportunities materialized to have MedStat Database fully functioning in Egypt.

For information, the Egyptians were initially given the beta version of the second generation software. The logic behind this was that, had the translation and further implementation of the data entry/management component in Arabic undertaken with the support of the Egyptian colleagues worked, the same could have been used for other cases in the region.

Turkey

During the first Coordination Committee of TCP/INT/2904-MedFisis (Jan 2004), contacts with the Turkish authorities were initiated to evaluate issues where the FAO project and the Turkish Government could collaborate. From the FAO perspective, the prospect of following a joint agreed programme which could lead to boosting the national system was guaranteed, and the work already undertaken by the Project in conjunction with the other two major sub-regional projects Copemed and Adriamed through the "MedStat Statistical System" was taken as the starting point. The successful implementation of MedStat in other countries in the Mediterranean which had the same prospects as Turkey (i.e., possible accession to the EU) was given appropriate consideration.

In 2005, the TCP/INT/2904/MedFisis Project was asked to draw up a plan for the implementation of the Turkish Fishery Information System with particular emphasis on the development of the "**Fishing Vessel Register and Information System**" for the Turkish General Directorate and the EU Twinning Project management.

The recommendations, based on the MedStat Fishing Vessel Register (since its structure is open and closest to the EC requirements) were basically accepted. Specific requirements from the Government of Turkey and the EC were to be accommodated in the data model according to the approaches indicated in the MedStat programme. It was also emphasised that, once the Consortium responsible for implementing the Turkish information system had identified the team of experts, an *ad hoc* meeting for an exchange of views would be sought as soon as possible. Unfortunately there was no follow up to this initiative.

Lebanon

MedStat work in Lebanon mainly concentrated on the Lebanese Fishing Register and was carried out in 2004-2005 with the support of the TCP/INT/2904 - MedFisis Projects. Some suggestions on the functionality of the software (e.g., Arabic references, interface and reports) could not be implemented at this stage. The ability of the register to produce annual fishing licenses is also to be considered in the future. Through this initiative Lebanon has, for the first time in its history, a census of its fishing fleet. This census resulted in a computerized Fishing

Vessel Register. This register conforms to the standards set by FAO/GFCM, is developed in the second generation version and is, like that of Syria, one of the most advanced.

Montenegro

In Montenegro the Fishing Vessel Register was implemented in 2004 ??? as soon as Montenegro joined the Adriamed Project. The system is complete and fully operational. It was provided a second generation application derived from AlbaniaStat with all the functionalities to manage the fleet statistics and eventually be able to design a catch and effort survey. Also in Montenegro, as in some other countries, this is the first time they have a comprehensive Fishing Vessel Register .

2.2 Discussion and reports from participants during the Casablanca workshop (by country)

The participant from **Albania** reported that they were in the process of completing the fishing vessel census for artisanal fishery and, at the same time, were testing the feasibility for a CAS for artisanal fishery. Albania, for various reasons, has the most updated MedStat Census database and, at the same time, the CAS for industrial fishery is still the first (revised) version. It would be of great help to have the new and most advanced release as soon as possible.

The **Libyan** researcher attending the meeting reported to be aware of the census databases in Tajura, but could not figure out its position since he was just a user of the data and not directly involved in the statistical data collection system. Further discussions were held on the subject, soon after the Casablanca meeting, with the DG of the Tajura institute and the officer in charge for fish assessment studies at a MedSudMed project meeting in Rome, when it was decided that, at the moment, the system would need an overall review followed by a quick design and implementation of the Catch and Effort Survey. The major constraints of the past were over and the Institute seems to have a stable and self-financed plan of action on which they can build a long-term system. We must envisage a consultant staying for some time in the country (as Mr. Lamboeuf did for the Census and Artisanal fishery issues). They need more targeted and immediate assistance for this exercise.

The participant from **Algeria** reported that the Ministry had conducted in 2004 a new Census of Fishing units in the Country. The census was completed and they were now planning to develop a database to host census results. The Algerian representative was not aware of the census undertaken by the CNDPA and the availability of a database made to measure for Algeria. Fortunately, from an assessment made of the most recent census (2004) it is evident that the data structure is quite similar to that developed for Algeria/MedStat and, therefore, it will be possible, if appropriately coordinated, to apply the MedStat database (appropriately modified) also to the new exercise.

The **Tunisian** representative in the discussion on statistical issues reiterated the importance of Copemed in the previous phase in his country and that such support was critical for advancing in that respect. The Tunisian Administration wants to undertake a complete study and set up a national statistical system making full use, through adequate coordination, of the various sources of support: FAO-Copemed, National Project, World Bank Project, etc. With the successful completion of the National Census, undertaken within the World Bank project, and some Copemed participation, it has been decided to follow up the implementation of the Catch and effort survey in Tunisia. This exercise will start soon and initially cover three

"Gouvernatorat" and a sample of the industrial fishery. An official request from the Tunisian DG Pêche is expected to be sent to the GFCM shortly.

Representatives from **Malta** reported that their system was fully working though they would greatly appreciate having the most advanced version since they were planning to put the whole system in a network.

The report from **Montenegro** was that their system was completed and they were eventually ready to start a CAS with the support of Adriamed.

With the **Moroccan** team, important initiatives were discussed to initiate as soon as possible (and resources identified) a Catch Assessment Survey aiming at complementing with scientific data the present survey system conducted by national authorities. This survey should be based on the lesson learned during the previous experience. The work will be facilitated by the fact that the team, initially located only in Nador, is now split between Nador and Tangier and they are all part of the initial group fully trained during the Copemed time.

The participant from **Egypt,** who is also the focal point of TCP/INT2904 - MedFisis and the SAC, reported that they had started the rehabilitation of the statistical system in the country in 2004, but after an initial prospect, they had not received a more advanced version of the MedStat database. He was advised to officially write to the MedFisis project seeking technical assistance for this specific issue.

The participant from **Syria** reported that after completion of the Census and implementation of the MedStat Census Database (TCP/INT2904 – MedFisis), they had received continuous support from MedFisis in setting up their Catch Assessment Survey monitoring system and that they were satisfied with the support being provided.

Table 1 - Localization and status of MedStat applications in the Mediterranean

Country	Application	Release	Present Status latest update
Albania	Commercial Vessel Register	Second Generation	Completed/Ongoing
	Commercial CAS Logbook	First Generation	Completed/Ongoing
	Small-Scale Vessel Register	Second Generation	Ongoing 2007
	M&M Control Centre	Second Generation	Prototype 2005
Algeria	Fishing Vessel Register	Second Generation	Interrupted/ No activity
Croatia	Industrial Vessel Register	First Generation Prototype	Interrupted/ No activity
	Industrial CAS	Assessment	Interrupted/ No activity
Egypt	Fishing Vessel Database	Second Generation (??)	Beta Version/ No activity
Lebanon	Fishing Vessel Register	Second Generation	Completed 2005
Libya	Fishing Vessel Register	Second Generation	Completed No activity
Malta	Fishing Vessel Register	First Generation	Completed/Ongoing 2006
	CAS Logbook	First Generation	Completed/Ongoing 2006
	CAS Artisanal Fishery	First Generation	Completed/Ongoing 2006
	M&M Control Centre	Second Generation	Prototype 2007

Montenegro	Fishing Vessel Register	Second Generation	Completed/Ongoing 2005
Morocco	Fishing Vessel Database	First Generation	Completed/Limited area coverage
	CAS - QCSS	First Generation	One occasion task. Completed
Syria	Fishing Vessel Register	Second Generation	Completed/Ongoing 2006
Slovenia	Fishing Vessel Register	First Generation	Completed/Interrupted
	CAS	First Generation	Beta Version/ Interrupted
Tunisia	Fishing Vessel Database	Second Generation	Interrupted
	CAS -Logbook	Second Generation	Planned
Turkey	Fishing Vessel Database	MedStat-QCS	One occasion task. Completed
GFCM-HQ	Operational Unit-Task 1	Second Generation	Add-on tool Ongoing 2007
FAO-HQ	Regional-National Reference System	First Generation	On going development 2007

3. Analysis of the situation and possible scenarios to evaluate

3.1 Overview of the MedStat System

The MedStat System has been progressively developed according to availability of resources, requests from countries, pilot studies, etc. All the elements of the MedStat package have been developed and are available, though to a different level of completeness, functionalities and use, to the countries. It is worth underlining that, from the experience gained during the implementation of MedStat, it was noted that when a country manages to have a system working and uses it for real reasons and helps fulfilling important obligations, the implemented system is regarded as a real achievement and is *de facto* a self-sustainable system. It is therefore important that, since quite a few regional initiatives are, finally, in the pipeline from the GFCM to boost the data collection, dissemination and processing of common data, a special effort should be made to complete at least all pending situations that were initiated and, for various reasons, were abandoned. Here is the MedStat state-of-the-art from the development/implementation point of view (information component):

Fishing Vessel Register: Complete and fully operational in several countries
(one first-generation version is still working in Malta (fully operational)
This version -started as the pilot - is the most completed from the functionalities point of view; apart from the Fishing Vessel Register Management, it is also linked with the Fishing Licenses management and delivery, Report to EC according to EC protocols, etc.

Catch and Effort Survey – LogBook approach
First-generation version complete and operational. Its further development is discontinued, only maintenance is considered.
Second generation (Prime/Basic) is ready and could be implemented at anytime.

Catch and Effort Survey – Sampling approach.
First-generation version is complete and operational. Its further development is discontinued, only maintenance is considered.
Second-generation version (Prime/Basic) is not ready in all its parts, but it could be implemented at any time if necessary.

Regional/National Codification System

First-generation version is fully operational and constantly updated.
The second-generation version is not envisaged until extra development resources (programmer) are made available or the system is reconfigured in a networking environment (Regional under the GFCM management).

National Management and Monitoring System
Second-generation version only. Under development for the two pilot countries (Albania and Malta). They are constantly kept updated and tested. Could be released only if a country has the infrastructure to manage it or their MedStat System be re-configured on a network environment. The development of this MedStat element is particularly important at regional level. In fact the National Management and Monitoring System is seen by the designer as the prototype for the Regional Management and Monitoring system, where all the functionalities now planned at national level will be replicated with regional coverage.

Operational Unit Data Management - Task 1 Data structure

Based on the instructions issued by the GFCM Statistical Unit within the Secretariat, an Add-On Tool (see Appendix 3) has been developed to allow Census Data automatically classified and structured to be uploaded and incorporated into the Operational Unit DataBase. This application, now in prototype version, will be finalized when the whole manual process is accepted.

3.2 Envisaged programme of work

With the full functioning of the statistical and data processing competences inside the GFCM, two main lines strictly concerned with statistical and data processing components are to be considered:

a- Direct assistance to member countries and,
b- Setting up the regional statistical and information system.

3.2.1 Direct assistance to Member countries

This is, in a way, the original plan of TCP/INT2904 - MedFisis which was that the project should assist member countries in meeting national and regional requirements in statistical data collection and information management. As shown in Table 1, there are countries where the Census of Fishing vessels was conducted and (regardless of whatever version was installed) a Fishing Vessel Register developed. In order to boost or complete the implementation and updating of this application in those countries an *ad hoc* task force must be set up by the GFCM to accommodate all the work to be conducted in certain countries according to the suggested following approach.

The approach that could be envisaged (after all it is what was applied in the projects supporting MedStat) is the following “package”.

3.2.1.1 The implementation of the Fishing Vessel Census/Register

A qualified fishery statistics / data processing specialist should first conduct a quality check for consistency and coverage of the items of information recorded on previous occasions (latest available data concerning the Fishing Vessel Register). If the results are “positive” - a certain percentage of data collected and maintained in the fishing vessel files are actual and complete (the experience of the evaluator will decide on this issue), then targeted assistance should be provided firstly to customize the MedStat Fishing Vessel Register according to the national needs “at that time” and then to assist in carrying out the data entry or downloading existing data files, or datasets, from old versions or other sources. In this second phase, a junior scientist and the programmer should be involved. It is expected that, on average, one month should be allocated for this operation per country.

The month could be broadly divided into the following expertise:

- Qualified fishery statistics/data processing specialist: 1 full week.
- Junior Expert or supporting GFCM staff: 2 full weeks
- Programmer: 2-3 full weeks

From the national side, one month of an officer should be taken into account. (except in the case of a new full data entry). Needless to say that associating a national programmer to these initiatives could definitely improve the success and the future prospects.

From the travel point of view, the following should be envisaged:

- One trip (one week) for the qualified fishery statistics/data processing specialist to visit the country.
- Five days in the country for the GFCM supporting staff.
- Four/ five days for the national staff to be in Rome, alternatively the programmer should travel for the same time to the country to validate the software once it has been developed.

It is envisaged that up to four countries could be followed simultaneously if a team is set up and coordinated as appropriate.

Should the implementation of a new survey be recommended, then the time to be allocated for the specialist and supporting staff should be, on average, doubled, and at least one more trip of the national counterpart to Rome HQ must be added.

Furthermore, should the above plan be implemented, in a few months time (three, four months?) all countries, where it is technically possible, could be provided with the Fishing Vessel Register.

Special attention and possibly a priority status should be given to Romania who requested at the SAC level to become part of the MedStat system. It is recommended that contacts should be initiated with the Romanian authorities as soon as possible (hopefully during the SAC sub-committee meetings) to verify whether the intentions were maintained.

3.2.1.2 The implementation of the CAS

When launching a Catch and Effort Assessment activity due attention, especially in the following three subjects, must be given:

- Unless it is a special case, the census of the fishing population (artisanal and/or industrial fleet) must have been completed and certified.
- The design of the CAS must be undertaken by a senior specialist and not by a novice on his own.
- The countries must have enough resources and determination regarding implementation of the CAS which, it must be repeated, is not a one-time occasion but rather a full-time, ongoing, application and involvement.

For each country and according to the situation objectively assessed, national resources at disposal and the detailed requirements of the administrations, a special task programme should be carefully developed. Priority should be given to those countries where the CAS according to the MedStat model is already running and they need to upgrade, expand or finalize their systems. In other words, as in the cases of Albania, Malta and Morocco where the survey efficiency is known, it should be a commitment that could be started and completed within a few months in total. As far as Syria is concerned, an assessment should be a priority to estimate the effort to be envisaged.

For a "new" country, it mostly depends on the level of skill of the national staff in the field of Fishery Statistics, resources put at disposal of the survey, the survey complexity (area/characteristics) and, the expected results from the administration. The survey approach chosen, sampling or logbook, also determines differences in involvement and effort. To implement, "from scratch", a national catch and effort survey requires that the task force be in place right from the beginning. In general, and according to experience gained, the following timetable could be considered for a "typical country":

- One month for the assessment, design, initial training and pilot survey.
- One month for software customization and preparation of field manuals and questionnaires
- One week's training of national statisticians/ recorders
- Three month's guided (possibly on remote) implementation.
- One week for analyses of the first field period test and tuning the application
- Six months of monitored (possibly on remote) implementation.
- Two weeks for an overall analysis of the survey system (questionnaires, software, statistical responses, quality control, etc.)
- Some expected software monitoring and tuning should also be considered.
- Six months of implementation, possibly with very limited support.

Should everything go according to schedule, after about one year's implementation the survey can be considered finalized and advice to the national administration should be provided on the follow-up procedure.

Some of the above actions are consecutive, others can be performed contemporaneously and it is needless to say that the training component is always present in all of the above steps and delivered according to the needs and the disciplines.

3.2.2 Setting up the regional statistical and information system

The first priority of the GFCM to build up its regional statistical and information system is the re-design of the Regional/National codification/thesaurus system.

In other words, the already-developed database in Access should be redeveloped in SQL-Server with open access to the external world (networked).

The second priority should be assigned to the completion of the "Management and Monitoring System" that incorporates summary results from national MedStat applications and selective data administration.

The Operational Unit database management system should immediately follow the above two.

With these three applications the Regional Office can lay the basis for a regional fishing vessel register, automatic reporting of catch and effort from countries, *ad hoc* updating of the operational unit/task1 data set, building the backbone for a sound, white list, **certified** fishing vessel monitoring system.

It is suggested that, for the regional database system, a data warehousing approach is chosen in a client/server environment that uses the available MedStat stand-alone running systems as prototypes.

3.3 Database structures

3.3.1 Census of Fishing Vessels structure

All MedStat applications of the Census of Fishing Vessels handles three sets of data:

- Compulsory data elements
- Common data elements
- Complementary data elements.

When a new country is associated with MedStat, the system assumes as default a MedStat common dataset. Each country, at this point, can add any other data element that it considers important, strategic or simply complementary for its own use. Some data elements within the common data set are compulsory. In other words, the system does not accept records with missing compulsory data elements. From a practical point of view, the common data elements (fields) are those most commonly and easily found and needed in the Mediterranean and those which enable a good descriptive analysis of the fishing fleet and its operation.

The compulsory data set, instead, is made up of those data elements which constitute the minimum requirements at regional level and the minimum set of variables necessary for the Catch and Assessment Survey and for the determination of the Operational Units issue. For the record, MedStat is managing a set of about 180 unique data elements over all the applications, out of which 110 are common to all countries (which does not necessarily mean that they are all collected and available) and 24 are compulsory and therefore available for certain in all MedStat applications. In Table 2 the list of compulsory data elements is presented. In Appendix 2 the list of common fields (data elements) generally found in most or all MedStat Fishing Vessel Registers is presented for a better evaluation of the contents of the database.

Table 2 MedStat- List of Compulsary Data Elements in the Fishing Vessel Database

Ref.No	Items	Description
1	Registration number	The registration number assigned to the fishing vessel.
2	Registration Office	Office where the vessel has been registered
3	Flag	Registration country of the vessel
4	Registration date	Registration date (dd/mm/yyyy).
5	Vessel name	Vessel name.
6	Vessel type	Type of the vessel
7	Operational status	Operation status of the vessel
8	Home port	Name of the docking port
9	Fishing authorisation type	Type of the fishing authorisation
10	Authorization Document	The id number of the fishing authorisation document.
11	Issuing office	The office issuing the document
12	Protocol number	Registration number in the fisheries department
13	Main gear	Main gear used by the boat as registered
14	Length overall (m.)	Longitudinal dimension of the hull of the vessel. The length of the fishing vessel measured from the bow to the stern.
15	GT or GRT	The Gross Tonnage of the vessel as registered.

16	Decked	Indicates if the vessel is decked or not (Y/N).
17	Inboard/Outboard	The engine position (Inboard/Outboard).
18	Power (kW/HP)	The engine's power either in HP or kW.
19	Method of activating the fishing gear	The method used to activate the fishing gear
20	Gear for Fishing Operation	The main gear which was used during the fishing operation
21	Fishing Month Start	The month in which the described fishing operation started.
22	Fishing Month End	The fishing month end of the fishery form the list.
23	Fishing Zone	Fishing zone
24	Targeted stock / species	The target stock

3.3.2 Catch and Effort Survey structure

The Catch and effort Survey system handles two sets of data referring to the logbook approach and to the sample approach respectively. Hereafter the two data models are presented. It is worth mentioning that the data model below concerns the input variable (collected data) and does not include the produced statistics and estimates and that it should only be considered as a reference, because it really depends on the level of details that the countries need.

Catch and Effort Data Collection Model

Logbook Approach

Log book data
Recorder
Operational Port
Reference month
Reference year
Recording date
Vessel name
Matriculation
Vessel type
Vessel type code
Registered main gear

Activity
Activity code [Active/Non Active]
Reasons for non Activity [Temporary/Permanent]
Number of trips in the month (Log Sheets)
Supervisor Check

Log Sheet data
Number of Fishing Trip (Sequential)
Departure date
Departure time
Return port
Return date
Return time
Landing port
Fishing zone
Stock Resource
Gear used
Gear size/dimension
Species caught (Code and Kg/Boxes)
Estimated total discards
Number of fishing operation
Time spent in fishing (hrs)

Ancillary data
Master name
Master Address
Agent name
Agent Address

Number of professional Fishermen
Number of Part time Fishermen
Gasoline Consumption (litre)

Sampling Approach

Basic data
Recorder
Stratum
Interview site name (PSU)
Type of PSU
Reference month
Year

Frame data (once a month)
Total fishing units from the previous month
Number of Vessels permanent modified
Number of Vessels temporary modified
New entries (temporary immigrate from other port)
New entries(permanent immigrates or new entries in fishery)
Number of active vessels in the reference month (Calculated)
Number of fishing days in the month

Sample day by day data
Boat sampled No.
Interview day and time
Vessel name and code
Vessel type
Number of full-time fishermen
Number of part-time fishermen
Number of trips in the day
Fishing area (description and code)
Time spent in fishing (hrs)
Species caught
Number of boxes
Box weight (kg)
Number of animals
Average weight of animals (kg)
Total weight (kg)
Fishing gear used
Number of units
Size, Length (m) or Number

Number of boats landed in the day
Number of boats sampled in the day

4. Implementing the programme of work

4.1 Introducing the programme

Regarding itemized package programmes and the associated budgets, the GFCM should, during the sub-committee meeting in Kavala, present all various options to the country representatives (their own cases and not general issues), seek agreement in principle and, where possible, obtain firm undertakings. Thereafter a preliminary programme of work and associated budget should be established for each case. This idea could be presented and discussed in Kavala with national technical officers, the recommendations be finalized and, afterwards national institutions and FAO projects and other sources of support be contacted to draw up a detailed plan of action. Special attention and therefore priority (if it is still the case) should be given to Romania. In order to make this initiative successful, it in important that before the meeting the GFCM secretariat informs the national authorities involved with their data collection system on this issue.

4.2 Expected resources

To set up a tentative list of resources envisaged, the GFCM Secretariat should first assess and finalise the results of the above exercise, then develop all associated needs together with the other statistical and EDP activities in the GFCM (SIPAM, Website, White list, Task1 etc) and draw up a master plan. This is mainly because there are several interconnected tasks carried out by more then one staff simultaneously. Supporting staff and consultants are also partners in several applications according to their time, qualifications and willingness.

It can, however, be anticipated that, for the workplan to be successful and for a full implementation of the whole GFCM Statistical and Information system, at least two programmers should be envisaged for the database development/assistance to the countries together with the Web developer. As far as supporting staff are concerned, a senior specialist in statistical development/data processing, and no less that two more scientists covering statistical, economical and biological aspects, are definitely needed. Coordination and administrative functions are not included in the above and should also be provided.

4.3 Concluding remarks

In summary, during the recent years MedStat was implemented or started in 13 countries. In five countries MedStat became the national statistical system (or part of it) (see tables 3a and 3b). In a further five countries MedStat could, with limited effort, become their running system (plus Romania) (see table 4a and 4b), and three countries have taken alternative solutions.

Table 3 -GFCM Countries where MedStat applications are the working Systems

Table 3a - Fishing Vessel Register

Albania	**Commercial Fishing Vessel Register**
>>	**Small Scale Fishing Vessel Register**
Lebanon	**Fishing Vessel Register**
Malta	**Fishing Vessel Register**
Montenegro	**Fishing Vessel Register**
Syria	**Fishing Vessel Register**

Table 3b - Catch and Effort Data Collection System

Albania	**Commercial Fishery Logbook**
Malta	**Industrial Fishery Logbook**
>>	**Artisanal Fishery CAS Sample**
Morocco	**QCSS Industrial Fishery* One occasion – Completed**

Table 4 - GFCM Countries where the MedStat applications could become the working System with a minimum of effort

Table 4a - GFCM Countries where MedStat Fishing Vessel Register could become the working System

Algeria	**....**
Egypt	**....**
Libya	**....**
Tunisia	**.....**
Romania	**???**

Table 4b - GFCM Countries where MedStat CAS could become the working System

Tunisia	**....**
Morocco	**....**
Libya	**....**
Syria	**....**
Romania	**???**

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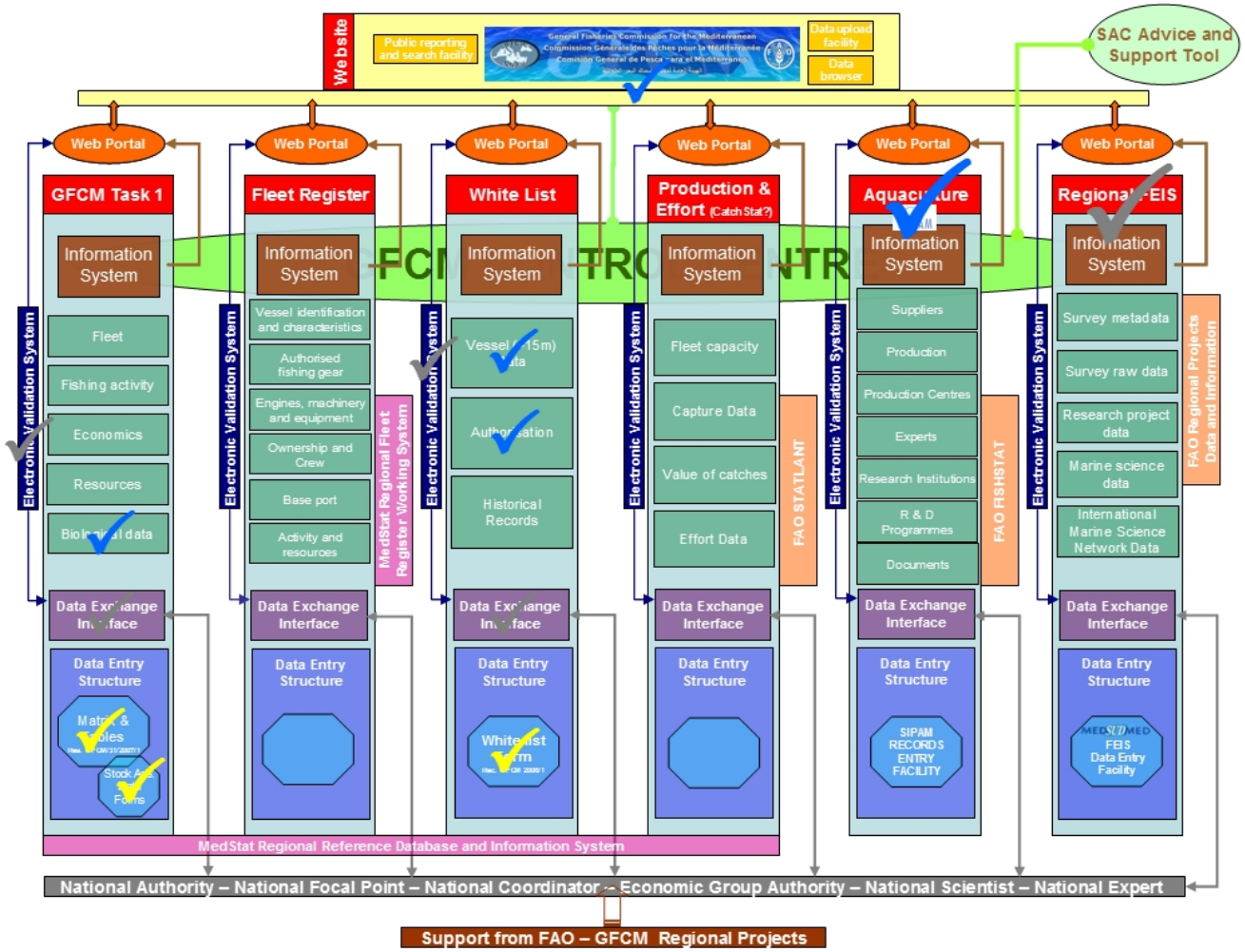
Appendix 1 : The GFCM Database and Information System Structure



Appendix 2 : MedStat Vessel Register Common Fields

Vessel Register

DataSets	DATABASE COMMON FIELDS
Fishing vessel identification characteristics	EU Registration no
	Registration no
	Registration Office
	Flag
	Registration date
	Vessel name
	Vessel type
	Operational status
	Non-activity reason
	Base port
	Fleet segmentation
Fishing authorisation	Fishing authorisation type
	Issuing office
	Main gear
	Fishing gear (2, 3 or 4)
	Other gears
Structural characteristics	Overall length (m.)
	Width (m.)
	Height (m)
	Shipyard
	Country of construction
	Year of construction
	Hull material
	Year of entry in fishery
	GRT
	NRT
	GT
	Decked
Engine	Model or manufacturer
	Inboard/Outboard
	Power (KW)
	Type of propulsion
	Country
	Year
Electronic equipment	Navigation eq. (1, 2, 3 or 4: Type / Year)
	Other equipment (Type / Year)
	Communication app. (1, 2 or 3: Type / Year)
	Other apparatus (Type / Year)
	Finder app. (1, 2 or 3: Type / Year)
	Other finder (Type / Year)
Deck machinery	Method of activating the fishing gear
	Line winch (Number / Type)
	Net winch (Number / Type)
	Trammel winch (Number / Type)

	Power block (Number / Type)
	Other (1 or 2: Name / Number / Type)
Ownership	Type of company
	Name of company
	Year company was established
	Company address
	Company postal code
	Company town
	Company country
	Name of owner
	N. of co-owners
	Operated by
	Name of skipper
	Year of owner born
	Address of owner
	Postal code
	Owner residence town
	Owner country
Crew	Maximum number
	Minimum number
	Number of registered full-time fishermen
Activity	Port (1, 2, 3 or 4)
	Period
Fishing operation	Vessel gear category
	Fishing Month Start
	Fishing Month End
	N. of outgoings
	Fishing Zone
	Main Stock
Equipment for preserving and transforming fish	Hold for fresh fish
	Capacity (cbm)
	Hold with refrigerating plant
	Capacity (cbm)
	Refrigeration temp. (C)
	Plant for refrigerated sea
	Hold for live fish
	Capacity (cbm)
	Ice plant
	Capacity (kg/h)
	Format ice
	Other equipment:
	Capacity other
	Freeze
	Capacity (cbm)
	Fish meal
	Capacity (cbm)
	Oil
	Capacity (cbm)
	Filleter
	N. machines

	Other
Other equipment	Lift equipment
	Fish pumps
	Lights for fishing
	Number of lights
	Power of each light (candle)
Safety equipment	Number of belts
	Number of lifeboats
	Number of flares
	Number of fire equipment
	Other safety equipment
	Disposal of residues (oil)
	Disposal of residues (other)
Recording Info	Recorder
	Recording date
	Recording place
	Recording serial

Appendix 3 : Task 1 – MedStat Relationship (MedStat add-on tool)