MedStat 2011 – Fishing Vessel Census

CENSUS DESIGN AND IMPLEMENTATION

By

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Preparation of this document

This document is one of a series produced by *MedFisis* in its final operational year and refers to the design and implementation of a *Census of Fishing Vessels* as well as the establishment of the national *Fishing Vessel* Register. The other, sister documents are: “Operational manuals”, “Software manuals”, “Source of information, data structure, definitions and codification” , “Case studies” and “Training manuals” (See References).

This document was prepared for three main reasons:

- to explain what *MedFisis* is and how it implemented its programme of work and developed the *MedStat* System,
- to assist national officials in the conduct of a *Fishing Vessel Census,* from its design and organisation to its implementation, and
- perhaps more importantly, to propose a working strategy to help national officials when an external consultant, whether national or international, is recruited to implement a similar assignment. It therefore provides the basis for countries to develop and implement a sustainable made-to-measure statistical system rather than use an off-the-shelf product.

It should be noted that this document is not a statistical manual. The theoretical methodology and the strategy on which *MedStat* is based are extensively reported in the manuals included in the *List of references* at the end of this document.

Moreover, *MedStat* is not just a data processing tool; it focuses on the whole national statistical organisation. It comprises a set of databases (information component) which are developed following tailored statistical data collection and implementation methodologies and procedures (statistical component) covering, primarily, the *Fishing Vessel Census*, the *Catch and Effort Survey*, and other surveys targeting monitoring and management issues.

To complete the documentation package, a selection of reports prepared in connection with technical support delivered to some member countries has also been added for reference (Case Studies).

Abstract

The *MedFisis* (Mediterranean Fishery Statistics and Information System) regional project was set up in response to an increasing need to monitor fishing activities and provide fishery management systems in several GFCM (General Fishery Commission for the Mediterranean) countries. Specifically, there was an urgent need for a comprehensive fisheries statistics collection and analysis system. From the outset of the project it was recognised that to be effective such a system must be designed to meet the needs of all stakeholders in the fishery involved, and that all resulting statistics must be reliable, timely and backed by relevant research. The project would involve a study of existing statistical and information systems in order to identify and upgrade areas requiring attention and/or optimisation. Moreover, all the work should be done by the national staff, limiting external aid to filling any gaps, and the system adopted should be as close as possible to existing working practices and conditions for the staff involved.

The solution produced by FAO staff was the modular *MedStat* system. *MedStat* consists of a set of databases and associated statistical data collection and implementation methodologies, techniques, and procedures, including training modules and technical support covering a *Fleet Census, a Catch and Effort Survey* and other surveys. There are also tools to facilitate monitoring and other management issues. Structurally, *MedStat* comprises a core system which includes the regional/national/local reference and codification system, and the national fishery control and monitoring system.

Considerable attention is paid to the structure and conduct of the census, and throughout *MedFisis* it is emphasised that accurate, reliable and exhaustive data collection is crucial to the output of the survey. All aspects of census procedure are dealt with in detail including the preparation, quality control and the all-important questionnaire. A comprehensive *MedFisis* questionnaire is presented and explained, as is the association between the questionnaire and the data field descriptions and reference system.

There are a number of useful appendices which include a flow chart of a typical census survey and a list of references.

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They also extend their thanks to the *MedFisis* project coordinator, for his support and advice as well as to other FAO colleagues and national counterparts who contributed with their comments and involvement and without whom this project idea would not have been possible.

In addition, special recognition goes to the many anonymous fishery field officers and statistical recorders whose daily work provides the basis on which important decisions are often taken.

Contents

Introduction

The establishment of fishery statistics and information systems in several countries of the General Fishery Commission for the Mediterranean (*GFCM*) continues to be considered a high priority issue. There is an increasing need to monitor fishing activities and provide fishery management at all levels with accurate, reliable and timely data which can interact with stock assessment and economic and socio-economic studies for decision making.

In accordance with the *FAO* and *GFCM* mandates the *MedFisis* project's immediate objective is to strengthen the capacity of the relevant institutions in Mediterranean countries and to build up marine capture fishery statistical and information systems using an adaptive approach. The proposed systems should comply with both the national and regional statistical requirements, with emphasis on the vessel register and catch assessment surveys as fundamental to fishery management information systems.

MedFisis is a regional project, co-financed by the *EC* and *FAO*, formulated and implemented to assist the countries in establishing, improving or consolidating a self-sustaining statistical and information system. This is achieved through a series of interventions focusing on the design, implementation and processing of the most important fishery surveys starting with the *Census of Infrastructures*, the *Census of Fishing Vessels* and, finally, of the *Catch and Effort Survey*.

The working system implemented in several countries is *MedStat* (Coppola, 2007). In order to fulfil its mission, *MedStat* has been designed and developed following a regional vision based upon proven methodology and modern data management and processing standards. It is constantly updated in the light of new developments, and it has been built and implemented around a series of considerations and practices based upon more than simply scientific requirements. Attention has been paid to national working practices and the organisational structure and capacity building of each Fishery Department concerned.

The problem

As with any human undertaking, marine fisheries must be governed if it is to be successful and responsive to a durable and proper exploitation of natural resources, with due regard for the environment. Governance is, therefore, the lighthouse towards which efforts must be directed. It is generally believed that one of the foundations for correct governance is 'knowledge of the system'. It follows, therefore, that the establishment of sound and functional information systems targeting governing issues should be given due priority.

For a fishery statistics and information system to be viable and effective (to governance), and not simply an accumulator of data, it must meet the needs of the stakeholders, notably the administrators, the fishermen, the fishing-vessel builders, operators and repairers, the fish processors and marketers, fishery inspectors, investors, and even consumers. Particularly it must meet the needs of those who have to take decisions as well as those who provide the basic data and information and submit them to the relevant national and international entities. Moreover, to be effective, the contribution of fishery statistics and information to fishery development and management must be reliable, timely and backed by relevant research in the fields of biology, socio-economics and the environmental sciences.

The *GFCM*, in various fora, has stressed the urgent need to complement and optimise a number of fishery management provisions in order to properly conduct fishery management in the region. A statistical and information system could serve as the vital basic tool for international bodies to monitor the state of the fisheries and the well-being of the whole ecosystem in the Mediterranean. Once established and operational, the system would be made available to the *GFCM* Secretariat for use by their Mediterranean fishery statistics and information systems.

The solution

The urgent need to reorient the national statistics systems of the countries involved in order to satisfy both national and regional requirements in such a way that they can meet internationally set standards, has been accepted as the basic mandate of *MedFisis*. In this respect, FAO assistance through the *MedFisis* project was deemed to be the most appropriate solution since the methodology involved is the same as that already introduced in many Mediterranean countries by FAO *Adriamed, Copemed* and the newly-established *EastMed* projects. The project would involve a study of existing statistical and information systems in order to identify and upgrade areas requiring action to optimise national requirements and to obtain data compatible with regional and international standards. Nationally generated information would then be of a quality suitable for input into the proposed GFCM regional network.

The strategic plan

During the first coordination meeting of the *MedFisis* project attended by appropriate national representatives, it was decided to draw up a strategic plan to guide and monitor project activities so as to meet countries' expectations as close as possible. Following those guidelines, the project management applied a step-by-step implementation following an agreed plan. All the work undertaken had limited but well considered principles in mind, such as:

- The work should be done by and with the national staff of the fishery department or other national entities responsible for fishery statistics, limiting external aid to filling the gaps, if any, (mainly in methodological, organisational and data processing domains). The system adopted should be as close as possible to existing working practices and conditions for the staff involved, and be compatible with the existing technological and operational environment.
- Depending upon the needs, the same specialist or group of specialists should be assigned to the same country/Fishery Department for the entire duration of the project.
- Before formulating the programme of work a series of studies should be undertaken to ascertain the accuracy, completeness and usefulness of the existing national fishery registers, and whether they are up-to-date, and suitable for the purpose of designing national catch assessment surveys.
- If necessary, a *Coverage Frame Survey* should be designed and carried out for an accurate assessment and record of the current size, structure, and localisation of the fishing fleet, as well as the major land-based fishery infrastructures.
- The design and development of a computerised register of fishing vessels, or revision of an existing one, should be based upon the chosen statistical methodology and implementation process, and must be completed before any other field work is undertaken.
- For the sake of the sustainability of the results, any new methodology should be developed so that fishery licences and authorisation certificates related to the fishing unit are controlled by a computerised system which requires that the applicant up-dates the vessel's characteristics information.
- The system must be able to construct the frame or the sampling frame of fishing vessels taking into account regional, statistical, biological and organisational criteria to be used for future catch assessment surveys.
- Training and direct support must be provided to the national staff to achieve the tasks' aims. A series of training sessions should be organised to target all involved national managers, supervisors, field recorders and data processing staff.

Background

The General Fisheries Commission for the Mediterranean (GFCM) through the work of its Scientific Advisory Committees (SACs) in various technical domains, and its sub committees, plays an acknowledged leading role in the management of fisheries. It has also contributed to, and benefited from, the work of FAO in the fields of fishery statistics and fish stock assessment. This long experience brought into focus the inadequacy of fishery statistics and information systems to ensure the long-term compatibility and comparability of the data made available by the Mediterranean countries. This is also due to the continued evolution of fish stocks, fishing vessels and fishing methods, which makes it difficult to apply the results of fishery statistics and information systems to fishery management and development. As responsible fisheries management and development are fully dependent upon the availability of data and information about the various fisheries and fish stocks, collection of data is of primary concern to all countries in the region. Reliable statistics and information at national, regional, and sub-regional levels are essential to the effective management of fisheries in the Mediterranean and to any related research.

In 2001 the Commission endorsed the project proposal to develop a Mediterranean Fishery Statistics and Information System (*MedFisis*) as presented by the SAC Sub-Committee on Statistics and Information, and emphasized the importance and urgency of setting-up an integrated statistical system necessary to monitor the state of the Mediterranean fisheries. It was emphasised that the required system, to be of effective regional use, should interface all countries around the Mediterranean having national systems that collect, process, store and disseminate an agreed common set of data; i.e. with the same data standards and definitions (units of measurement, frequency, classification, terminology, etc.). Once established and in operation, the system would be made available to the GFCM secretariat for continued activation and use by their Mediterranean Fishery Statistics and Information System. The three year project *MedFisis* was jointly financed by FAO and the European Commission.

The project attempted to ensure a sustainable long term implementation of the data/information component within the countries by the upgrading of technical staff and national fisheries statistics institutes in the fields of methodology, processing power, analytical strength, reporting, and by interfacing national with regional and global references. The activities included within the project complemented ongoing fishery information systems and programmes in the Mediterranean. The EU Mediterranean member countries had already established a relationship with the EU for the harmonization of their fisheries statistical and information systems. The sub-regional FAO-*Copemed* project consolidated the existing work in Algeria, Libya, Malta, Morocco, and Tunisia. Some countries such Albania, Croatia, and Slovenia were already benefiting from assistance by the FAO *Adriamed* sub-regional project.

Special assistance was necessary to apply the same method to the countries that were not in a position to benefit from technical assistance. Results achieved from the application of the methodologies of *Copemed* and *Adriamed* were available to this project. This bridging assistance was granted by FAO through the formulation of a Technical Cooperation Programme (TCP). The TCP project Enabling participation in the fishery statistics and information system in the Mediterranean prepared countries in the eastern part of the Mediterranean to improve and coordinate their fishery statistics systems and fully participate in *MedFisis* regional activities. The TCP component became operational in November 2003, and the first coordination meeting was held in Beirut, Lebanon, 19-24 January 2004. The interest of the Governments of participating countries in the project was such that they responded by sending high level representatives to the meeting following FAO's request that it be attended by two officers with specific profiles and functions in their own countries. Specifically, these were a senior official responsible for the statistical and data collection system in the country at as high a level as possible on the decision-making scale (normative mandate) and a second officer in charge of the development and implementation of the statistical system and data collection system in the country (functional mandate) who would also be the counterpart assigned to the implementation of the TCP activities on a continuing basis.

Implementation of the *MedFisis* project was from September 2004 to August 2005 (Year 1), and from March 2006 to February 2007 (Year 2). However, since the main donor (EC) requested an audit of the second year and there was a need to align *FAO*/EC administration, the funding for the third year was not

released until December 2009. Given the considerable scope and geographical coverage of the *MedFisis* project it was not possible in 2007/2008 to implement the third year activities without full funding. It was therefore decided to await the release of the remaining funds before implementing the full third year programme. Pending the release of these funds *FAO* explored appropriate ways to keep the project operational and so avoid the loss of the momentum that it had already generated, while devoting significant effort to the audit. During the period from December 2007 to December 2008, the *MedFisis* project undertook a limited number of activities and initiatives at the regional (*GFCM*) and national (*GFCM* member countries) levels.

The future perspective

Originally, *MedFisis* was to be implemented as an initial three year programme to help countries to develop their national fishery statistics systems. It was also supposed that it would introduce a regionally compatible system that could monitor the state of fisheries resources and the well-being of the Mediterranean ecosystem. In the third and final year of the initial programme the project would continue to follow the adaptive approach; it would also finalise the development and implementation of catch and effort assessment surveys and related database software. It was expected that the concerted synergy and integration of *MedFisis, Adriamed, MedSudMed, Copemed II* and the newly established *EastMed* project, would be developed further. This coordinated action would provide technical assistance to the GFCM Secretariat and to the member countries to develop and consolidate internationally compatible Fishing Vessel Registers where needed, and promote the establishment of catch and effort monitoring systems. The core *MedStat* software suite of the *MedFisis* fishery statistics and information system was completed with the release of the marine fisheries catch and effort software application. Integrated with the Fishing Vessel Register, it constituted a basic component of the GFCM fisheries information and management system, and would be tested in a pilot study in one of the countries that was already using the system.

It should be noted that *MedFisis* and *MedStat* were a central component of several of the regional projects currently being run in the GFCM area, as well as of new projects being considered for the Black Sea. The limited resources available for a project with such a wide scope and geographical coverage placed significant constraint on what could be achieved. Adequate resources would be needed if *MedFisis* were to evolve to effectively complete its complex tasks at both national and international levels.

During the last year of *MedFisis* a proposal for a second phase of the project to be executed under the GFCM Secretariat would be prepared.

The *MedStat* system

For many years, the General Fishery Commission for the Mediterranean (GFCM) tried to build a regional data collection and information dissemination system. Since it lacked its own budget and human resources were limited at the secretariat level, a new project - *MedFisis* - was launched in 2002. The aim of *MedFisis* was to safeguard the heavy statistical work undertaken by FAO and FAO projects in the Mediterranean and to foster and widen its implementation. Nowadays, with the establishment and consolidation of the GFCM with its own budget and organisation, the issue has been revitalized, and several initiatives are under way with a number of national and inter-institutional projects.

As *MedStat* is being implemented through FAO Mediterranean projects and the GFCM, it will help countries develop their national fishery statistical systems in a coordinated and regionally compatible way, and at the same time enable them to better manage the sustainable development of their fisheries. In parallel with this, the implementation of *MedStat* will create a compatible regional system at the GFCM level which will serve as an important tool for international bodies to monitor the state of their fisheries resources and the well-being of the whole ecosystem in the Mediterranean.

The system design

MedStat consists of a set of databases and associated statistical data collection and implementation methodologies, techniques, and procedures, including training and technical support covering the *Fleet Census,* the *Catch and Effort Survey* and other surveys and tools targeting monitoring and management issues. It has modular and made-to-measure components to enable each country to progress according to its priorities and available resources and, at the same time, to ensure that each step is achieved and established before a new step is initiated so as not to jeopardy work already done.

MedStat focuses on the whole national statistical organisation and concerns a set of databases which follow a tailored statistical design, and procedures to cover the main fishery surveys.

Functional components

The DataBase application 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 to best reproduce 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,
- synchronisation and coherence of the data items between the national system, the monitoring system, catch and effort data and the *MedStat* public (regional interface), and
- documentation forms and questionnaires, reference manuals, *etc*., all available on line.

MedStat is always proposed and applied according to the sustainability and resource allocation by the countries involved. Each country may or may not implement the whole *MedStat* System. It may, for example, use only one database such as the vessel register database as a stand-alone application.

Operational component

The implementation of *MedStat* comprises a sequence of activities and tasks designed to be carried out within a programme of work at two management levels: national (countries) and regional (*GFCM*). *MedStat* is built around several main components whose basic structure and main functions were set at design level. The backbone of the system is made up of the following domains:

- a national management and monitoring system,
- a regional/ national/local reference and codification system,
- a register of fishing vessels,
- a catch and effort survey of industrial fishery based on the logbook approach,
- a catch and effort survey of small scale fishery based on the sampling approach,
- advanced tools to support applications and performances, and
- training tools to facilitate training

All modules are designed to be implemented on a client/server platform or as a family of stand-alone databases. Preference is given to the family of stand-alone databases which ensures a modular implementation to enable each country to progress according to its own priorities and resources. In this case, the applications are strongly interrelated with a robust data definition and codification system, governed by the management and monitoring system or built-in protocols. Double checking and validation routines (in-out) are performed whenever data are transferred from one system to another.

This *MedStat* structure reflects the situation when *MedStat* was first designed. However, it is normal that in long-term programmes, while keeping the mission and objectives intact, that activity plans and tasks are modified as the situation evolves.

Materials and Methods

The Statistical design (theory and methods) on which the whole *MedStat* implementation is based is derived from the implementation of the *Pestat :"A qualitative assessment of the Italian Fisheries Statistical System"* programme. Pestat was designed and executed by the *Istituto di Ricerca sulla Pesca Marittima*, Ancona, with the technical assistance provided by two *FAO* experts in Fishery Statistics (G. Bazigos and S. Coppola). The programme of work consisted of two type of investigations:

- the *Quality Check Survey* on fleet statistics aiming at assessing the quality of the existing registers of fishing vessels and also providing accurate estimates of the quantitative and qualitative description of the fleet, and
- the *Quality Check Catch and Effort Surveys* on production statistics with regard to the methodology used and the results obtained.

Software Technical specifications

The system prototypes were entirely developed in MS Windows 97/2000 Operating System, in a Visual Basic environment with MS Access 97/2000 engine. The bulk of the software was developed (in 2004-2005) in MS Windows 2000/XP. Its development environments were: 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.

MedStat 'second generation' is the development choice of the *MedStat* final product. It has been developed in 2010 within the activities of *MedFisis*' third year implementation and consists of a MS SQL Server Express 2005 database, including both codification and vessel data and a Windows application which has been developed on the .NET Framework 3.5 within the Visual Studio 2008 .NET IDE, using the C# .NET programming language and DevExpress WinForms controls.

The latest release of *MedStat* software has been developed in full collaboration and compliance with the *GFCM*, thus ensuring its future maintenance and further implementation. User guides, manuals and survey questionnaires are all built into the systems and may be consulted and retrieved in PDF format.

The most important tangible tasks achieved during the implementation of *MedStat* in association with the other Sub-Regional FAO projects (FAO/TCP/INT/2904-*MedFisis*, *Copemed* and *Adriamed*) in the Mediterranean were presented and discussed during the meeting held in Nicosia, Cyprus, during October 2007 (see References).

The *MedStat* database

At the heart of any large statistical programme such as the National Fishing Census there will be a database. A database consists of an organized collection of data for one or more uses, typically in digital form. In the case of this *MedFisis* project the database is *MedStat*, designed and developed following a regional view based on the concept of MedFish (Coppola, 1997). In the design and implementation of *MedStat* considerable attention was paid to national organisational structures, hardware and software availability, and the data processing skills generally available in the country or fishery departments concerned. It is constantly updated in the light of new experience and developments.

The first step in designing a database is to evaluate the working environment in which the application is going to be developed. This appraisal is one of the most important steps and should not be limited to the computer processing part but should be extended to the entire working environment and will be the tool to prepare the conceptual design.

The key issue is to decide, among other criteria, whether a database is going to be an isolated application, a shared application, a corporate application or part of a family of databases (database system), and the level of authorisation and control that the committing entity (the fishery institution) has over the whole environment. By 'the whole environment' is meant the whole data processing flow, from the data collection, operation transactions, personnel mobility, language, forms, interpretation, input and output rules and criteria up to the financial aspects, and so on. Other criteria will include the amount and type of data to be managed, the response rate, the transaction rate, the access requirements and the internal/external relationship etc. By 'authorization and control that the committing entity has over the whole environment' is meant the likelihood, or better the freedom, that this entity has over the whole environment and whether it can make management decisions as it pleases. This will definitely help the designer to decide on the approach to be applied.

Top-down and bottom-up approaches

In the literature, two classical approaches to database construction are generally described:

- the top-down approach, and
- the bottom-up approach.

Top-down and bottom-up are strategies of information processing and knowledge ordering. Briefly the top-down approach is a situation in which the developer conceives the whole system from the very beginning to the end. Essentially, it is the breaking down of a system to gain insight into its compositional sub-systems. In theory, this approach should give a better outcome since everything is planned according to given project criteria and implemented without any external interference, constraints or obstacles. Moreover, being centrally planned and implemented, it will certainly have reduced costs, quicker implementation and be fully functional. Reduced costs and better performance may also be expected in the management, maintenance and further improvement of the system. This approach is possible only when the administration has full control and ownership of the whole environment and can manage and decide on it as it wishes. This scenario is rare in the fishery assessment and monitoring domains.

On the other hand, the bottom-up approach is the piecing together of systems to give rise to more comprehensive systems. This appears to be more practical and requires less authority, though a certain level of authority will be needed. Developing the system one step at a time, with the consensus of the partners and users, and learning as one progresses, is generally less risky and more appropriate and acceptable. Moreover, since the application is developed in participation, many errors and bad decisions may be avoided, thus reducing cost and ensuring subsequent appreciation and support. However, if the development phase becomes too slow because of the participation of all parties and constant revisions and reviews, then it may jeopardise the whole project. In that case it may become necessary to re-design the database or, more seriously, to change the personnel involved.

Another major problem arises in the case of applications which are interrelated to others, that are already developed or conceived. The problem, sometime fatal, may occur at any time of the development process, especially when interfacing a new database with an existing one in the same family that has been modified - for a good reason - away from the original common design. Fishery data systems are certainly complex and comprise many activities; data management and information production are interrelated and react accordingly. A bottom-up approach would therefore be too slow and too risky to accommodate all of the elements that would need to be incorporated step by step.

The database system for the Mediterranean

A mixed approach was decided upon for *MedStat*. The design of the whole frame followed top-down logic but the implementation was bottom-up. With this approach it was possible to develop applications in pieces, as much as possible close to their natural environment, with guidance from national staff (the end-users). The development, although adapted to the individual cases, was always made within a fixed, robust framework. Moreover, in *MedStat* an initial country was always chosen (followed by another

country with different situations) to be used as a test case to develop prototypes. The strategy was to use real life situations as pilot surveys in order to complete at the same time and therefore with the same resources, the development of the working prototypes and the final product.

The *MedStat* system is built around a series of system functionalities that are required to support central fisheries administrations in the Mediterranean countries in their normative (national and international) as well as scientific functions. The preparation of *MedStat* was based on a detailed conceptual design and the experience gained in this field over many years; it was constructed by applying a mix of top-down and bottom-up approaches. Its possible implementation on different platforms (client/server or standalone) obliged the designer to introduce certain landmarks. The basic instrument introduced in *MedStat* is the separation between:

- the core system, and
- the database family.

The core system

Having defined *MedStat* as being adaptive, it was crucial to construct a structure in which the fundamentals common to all future application developments (database family) would find a place. It was equally fundamental to know and fix, right from the start, all the uploading and downloading procedures and the level of control that the elementary data elements needed. It was also crucial to incorporate the whole national/regional/international codification and data definition system into a core system that supervises all the functions of a virtual Data manager, responsible at Departmental level This system also concerns all the protocols, standards and authorizations needed to disseminate official statistics, upload higher systems, modify codification and references (within the network), and monitor the work and results being produced in the national data collection system.

The other major component of the core system is the Master database (for Census, CAS and LogBook application) constructed specifically for all mandatory fields and the common regional fields (as the basic data threshold) . This Master database performs all the functions of any national Fishing fleet Register but limits them to the fields treated. It also contains the settings to be able to work as a database for EU countries as well as those in the pipeline or, simply, countries that want to use the EU regulations and standards in terms of statistical data management. It can also accommodate countries that do not need or want to be compliant with the EU. All applications, whether for EU countries or other, are bound to the GFCM/FAO international standards and procedures..

The core system is, therefore, most important for the coherence and consistency of the system as a whole. It is the repository for all the codification applied by *FAO, GFCM, EC* and other regional and international entities, as well as the data dictionary. It also contains the reference between national languages and standard English in all the terms used in the system. The Master database and the Regional/national reference system were the two building blocks on which the core system was built. In a client/server environment the functionalities of the core system have different set up since most of the functionalities are naturally performed by the net. The core system, in this case, is generally seen as the hub of the network.

The database family

The rationale of a centralised data management system and the associated functions and standards had to be established before developing the family of elementary databases. Each component of the database family is derived from its Master database (a- the Fishing Fleet Register, b) the Catch and effort Survey based on the LogBook approach and, c) the Catch and Effort Surveys on a Sample basis). They are, therefore, developed following predetermined data model, principles, standards and functionalities defined at the configuration level (System Set-up) when installing the system.

In developing new applications, or further customising previous releases, there is the certainty that the overall framework, the components, the relationships between any new applications and their basic data models, and the functional specifications (as in the Master database) has already been established. The structural positions of each database in the overall design and their input/output parameters, computer

languages and options as well as constraints were also set at the beginning. Computing system requirements (working station, platforms, *etc*.) were also defined.

The implementation process that introduces national and specific requirements, the level of detail, the amount of data processed and the level of interaction with national counterparts as well national specifications were developed stepwise. National and regional requirements were included in the system development without upsetting the overall plan. Also, development priorities were adjusted according to cases, but always respecting the specifications set in the general framework. This approach was, in a way, dictated by the situation. Some countries and some offices had different priorities and different preparation and resources to follow the same development plan.

In *MedStat*, functional integration has been the most important consideration at design level. Each software package incorporates the communication features required to ensure integration within the family. Consider, for example, the relationship between the *Fishing Vessel Registry* and the sampling frame of a *CAS* or with the fishing licensing, *etc*.

MedStat components

The core system and the databases family are the two building blocks on which *MedStat* was built. A third component includes several tools and training material. The structures are:

Core system

- the regional/national/local reference and codification system, and
- the Master database

Family of databases

- the census register of fishing vessels, no matter the size or the type,
- the catch and effort survey of industrial fisheries based on the logbook approach, and
- the catch and effort survey of artisanal fisheries based on the sample approach.

Tools and training material

- sampling frame for CAS building,
- interactive electronic training tools,
- advanced debugging systems for correlated data, and
- the *MedFisis* home page.

Some final considerations

When planning a database it is important to know the context in which the application will be used. How information is organised within the database influences the efficiency of the different functions. Planning applications around a robust core system with corporate functions to impose standards, manage the results and provide the means of interacting with other systems in the family will simulate a data warehouse environment. This corporative function also serves as a control support system with built-in facilities to generate regular reports, *ad hoc* reports, aids to forecasting, and aids for monitoring and connecting systems. In the regional and international context, the agreed regional codification system will, in addition to saving time in development and maintenance, assure the maximum level of harmonization, quality and consistency.

It is also important that standard tables are made public and available for use in other end-user computing systems dealing with applications to be developed within the Mediterranean region.

The census

Accurate, reliable and exhaustive data collection associated with sound database management and advanced processing capability, can provide administrations and stakeholders with a good picture of the situation under investigation, and a better understanding of the environment and its mechanisms. Presentation of the processed results enables the study of different scenarios and the facility to make decisions that will influence the outcome in the desired direction (increased production according to a given management plan, safeguarding the environment, improving working conditions of the fishermen, *etc*.). This can be achieved only if a proper data collection programme is designed and implemented according to the plan. The census is the first step; it is the procedure of scrutinising a complete population to acquire information about its members/units. This information could be numbers of units, its characteristics, and other items of information that administrations and stakeholders consider fundamental to their mandate.

Census statistics

From a statistical point of view, a census is an official count of the population which is undertaken regularly (every year, every ten years, etc.) or whenever needed (*e.g*. when it is recognised that the previous census results no longer reflect the real situation or when no official records exist). In order to maintain or increase the interval between censuses, other appropriate and less costly mechanisms have been tested and put into place to regularly update census records *e.g*. when paying the yearly fishing licence, using catch and effort surveys, changing ownership or home port or, in general, whenever any change is registered. The census approach is the best way of obtaining valuable statistical information about a population. It is, therefore, the basis for all fisheries statistics and is used, among other things, for planning sample surveys - that is the scrutiny of a representative subset of a given population.

The census figures are usually presented as aggregated data (descriptive statistics), that is, total number of individuals in the population, average characteristics of these individuals, *etc.* They provide all the necessary data to obtain a truthful view of the system (*e.g.* the fisheries sector) allowing the extraction of comprehensive information and its structure. In practical terms, a census procedure is based on four main operations:

- design of the census,
- field implementation,
- database management, and
- data processing.

This paper deals with the design, implementation and quality issues of the *Fishing Vessel Census*; the database management and data processing tools are dealt with in other papers.

The fishing fleet census describes the number of vessels, their size and typology, their distribution by port and landing place and other associated information or characteristics useful for administrative, technical and operational statistics. A *Fishing Vessel Register* (in *MedStat*, this term is always used for the digital copy of the census in a database format) is derived from the census and referenced to a fixed date and time. The *Fishing Vessel Register* is the first working output of the census from which all the other associated actions can be performed.

Census uses

Because of the cost and effort needed to carry out a census it needs to be as exhaustive as possible and able to cope with all the administration’s requirements. From the national point of view, the census provides particulars of essential managerial measures deemed necessary for the sustainable management of the stocks through fisheries regulation.

In order to establish a programme for the welfare of a fishery and the conservation of the stocks by regulating fishing activities, it is crucial to know the size of the fishing fleet, its capacity and the effort that

it exerts on the resources. A census is the basis of a *Fishing Fleet Register* that serves the administration to assess the size of its fishing fleet and its composition, to know the location/distribution of the fleet (base ports), the area, target species, fishing seasons periods and landing places, *etc*. It provides information about the fleet that facilitates the introduction of managerial strategies to regulate fishing activities (control of fishing effort and capacity) with due regard for species or area restrictions with the ultimate purpose of maintaining a sustainable exploitation of the stocks.

Census data and information can also be used as a tool to provide valuable information for other interested sectors. Some other possible uses of a census are:

From the national point of view:

- ***Labour force trends and analyses***. Information on crew numbers and income is of great interest to the National Statistics Office that produces country statistics. Employment rates, gender analysis, part time and full time employment in the sector can be analysed from this data.
- ***Industry*.** Information on the current equipment carried on fishing vessels and their consumption rates, *etc*., enabling research on innovative and more efficient equipment for fishing vessels, or even the construction of new ones with improved characteristics that would make them more competitive.
- ***Insurance.*** Knowledge of the costs involved in running fishing vessels and the risks taken in the sector, which can lead to a better understanding of how to insure these assets.

and, from regional and international perspectives:

- The Fleet register is the heart of a national information system. Moreover, the information obtained through the census survey also caters for requests from regional and international bodies. Data on vessel numbers and their main characteristics (length, vessel type, *etc*) are requested by GFCM both for Task-1 data submission and the Authorised Vessel List (AVL), and for ICCAT (ICCAT record of vessels). Further data on the fleet is also requested to comply with Task-1.1 and part of Task-1.2 and 1.3 (*i.e.* vessel characteristics, main gears used).
- The data collected through the census is also the basis for other parallel systems such as the Vessel Monitoring System (VMS), the Fishing Licensing System and the Catch and Effort Assessment Surveys (Logbook and Sampling Approaches). It can also provide valuable information for socio-economic surveys.

The census data can also provide structured information on port/landing places (*e.g.* situation, infrastructures, number of vessels and crew, *etc*), vessel distribution by vessel and gear type, segments of the fleet, fishing zones and targeted stocks.

Preparation of the census

The implementation of a census is a sensitive issue at national level, not only for the involvement of the many parties involved, resources implications and heavy costs, but also because of its institutional implications. Very often, approval from the top management or even a parliamentary decree is needed. Consequently, it has to be dealt with skilfully and a certain protocol must always be followed. Therefore it is advisable not to propose a new survey unless it is absolutely necessary.

Assessment of the current situation

First of all, it must be ascertained whether a truly valid census has been conducted in the past (recent or remote) or whether this is the first time that such an activity has been introduced in a country. The decision can then be made whether to:

- launch a census for the first time,
- analyse the existing census and decide whether to launch a new one, or
- review an ongoing survey by introducing innovations or improvements, *etc.*

This preliminary understanding is very important since the protocol to be followed in each of these scenarios is completely different

Pre-assessment or reconnaissance survey

In some cases, where no current information is available and/or a proper census has never been carried out, then before any census design is initiated, a reconnaissance survey or pre-assessment survey must be carried out. It is normally conducted through the collection of any documentation/information, direct or indirect, that refers to the population/domain under consideration. Typically, these could be:

- port descriptions,
- legal acts,
- normative documents,
- fishing vessel related material,
- any information about fishermen,
- any previous reports on the subject,
- previous surveys,
- documentation such as fishing licences,
- sailing permits,
- maps,
- list of gear, and
- list of species, *etc*.

Any of these documents could be of great help in providing a qualitative view of the situation in order to better prepare for the census and so avoid unpleasant surprises. It is therefore strongly advisable to obtain information from all available sources and never to disregard any of them. For example, a census of an artisanal fishery throughout a country or over a vast area definitely requires a qualitative/reconnaissance survey to be carried out. It will provide the basic knowledge for planning the census survey, that is the boundaries and logistic organisation of the survey, (Coppola, 2006).

In *Appendix 9* the basic information required for an inventory of artisanal fishery communities in the Western and Central Mediterranean is presented for reference.

Types of reconnaissance surveys include:

- aerial surveys,
- remote sensing from satellite,
- inventory of fishing communities, and
- historical reports, newspapers, *etc*.

Once all the necessary ancillary data is available, an assessment of the current situation in the sector can take place and the design stage can begin.

Dealing with the assessment

During the assessment several issues must be dealt with and assessed according to certain criteria. The main components of a census are:

- the statistical design on which the system is based (the methodology, approaches, *etc*.),
- the data processing exercise,
- the human resources assigned, and
- the necessary infrastructure

All of these components must be scrutinised and evaluated individually and in depth so that a score (indicator) can be assigned to each of them. For instance, the indicators could be:

- up-to-standard,
- incomplete,
- insufficient, and
- not available.

The assessment table below (*Table 1*) could be used to assign scores:

Table 1. Assessment table

	EVALUATION			
ISSUES	**Up to standards**	**Incomplete**	**Insufficient**	**Not Available**
Statistical				
Data Processing				
Human Resources				
Infrastructure				

After completing this work, a global assessment can be made and a way forward can be anticipated. The table should help to better identify the areas where more emphasis should be given and support strengthened.

As an example of a systematic approach to assessment, the procedure detailed below has been suggested for use within the *MedFisis* project. The assessment is completed by checking on a number of key issues, as now explained in detail.

Statistical design

In the area of statistics the following tasks must be evaluated and a score (indicator) attributed accordingly:

- the survey design (coverage, stratification, typology, frequency, *etc*.),
- the references (coding system, field definitions, data dictionary), and
- information reporting (types of reports, different end-users, *etc*.).

An assessment of the qualitative level required for the survey is also important. Key issues are:

- supervision foreseen,
- manual and automatic error finding (definitions, coverage, contents, *etc*), and
- quality-control.

All of these have to be checked and an indicator allocated. The indicator could be defined as:

Up-to-standard. This score could be assigned to a situation where:

- the design is acceptable,
- the coverage on space and vessel typology is good,
- the stratification is appropriate,
- all compulsory fields are complete,
- the codification is in line with national and international standards,

- the definitions are clear and are not open to misinterpretation,
- all necessary reports for national and international bodies are produced, and
- quality check and error finding routines are in place, *etc*.

Incomplete *w*here:

- the design could be improved for better coverage and more accurate stratification,
- some vessel types were not considered,
- some data fields are missing,
- some reports are not produced or are incomplete,
- not all international codification standards are followed, and
- the system is not updated.

Insufficient where:

- the design is wrong since it does not follow proper stratification and/or does not cover all typologies of vessels, gears, *etc*.,
- the design has deteriorated over time,
- there is no reference system,
- reporting facilities are very basic,
- no quality control tools are available, or
- there is no implementation, *etc.*

Not available where there is no statistical system in place.

Data processing

In the area of data processing the following items must be evaluated and a score assigned:

- the software package (complete, fast enough, flexible, produces reports, queries available, *etc*.),
- the error trapping routines (quantities and ranges check), and
- quality-control for consistency (logical) and contents (compulsory data), *etc*.

Indicator scoring could be:

Up-to-standard where

- the software used is adequate for the task in all respects,
- there is an error check routine supported by a check table with ranges of values and possible answers,
- all compulsory data is properly recorded,
- the system is flexible enough to allow updates and changes, and
- several types of queries are feasible and all necessary reports can be produced automatically, *etc.*

Incomplete where

- the software is fast but some tools are missing,
- not many types of queries can be done,
- the error check routine is very basic,
- some compulsory data are not properly managed and hence not all necessary reports are complete, or

- national reports are available but not international ones, *etc.*

Insufficient where:

- the software is rudimentary,
- only simple listing reports are produced with no basic statistical information,
- there is no interactive querying system in place, or
- there is no quality control or error trapping routines, *etc.*

Not available where there is no system in place. The data is collected but not put into a system.

Human resources

In the area of the human resources the following tasks must be evaluated:

- the number and skill level of staff available for the tasks,
- whether available staff are fully dedicated to the system or just part-time,
- levels of training,
- extent of experience and know-how in the field, and
- potential for recruiting external/temporary staff, *etc*.
- Indicator scoring could be:

Up-to-standard where:

- there is a dedicated team with differentiated tasks assigned to each member,
- there is a hierarchy in place and people in charge of making the system function,
- all members involved are fully trained for the tasks they have to carry out,
- in-field training has taken place and data collection and processing procedures have been finely tuned, and
- there is a dedicated budget and excess for unforeseen expenses like external recorders or temporary staff, *etc.*

Incomplete where:

- there is a team focussing on fisheries statistics but without proper training and therefore likely to collect inconsistent data, and use different criteria to select answers from the questionnaire list,
- the hierarchy/leadership is not well defined leading to uncertainty on actions to be taken after different directives, *etc*.

Insufficient where:

- there is no dedicated team for fisheries statistics but, say, just few people from the agriculture department who are collecting some fisheries data but also dedicated to several other tasks,
- there is no budget for recruiting temporary staff, or
- there is no expertise in fisheries or statistics, etc.

Not available where there are no staff allocated to the fisheries sector.

Infrastructure

In the area of infrastructure the following tasks must be evaluated:

- facilities allocated to the survey (offices, furniture, *etc*.),

- hardware (PCs, stationary, *etc*),
- network (local net, internet connection, *etc*.),
- logistics (vehicles, extra-hours, *etc*.), and
- administration structure (fisheries department, fisheries research centres, *etc*),

Indicator scoring could be:

Up-to-standard where:

- there is a fisheries department in charge of the national research centres with a good structure,
- there are offices available and enough PCs and other hardware assigned to fisheries,
- internet connection and a local network are in place,
- vehicles are available for recorders to get to harbours, and
- extra hours and night shifts are implemented, *etc*.

Incomplete where:

- the department structure, although in place, is weak and stress is put on the higher grades
- the number of recorders is scarce,
- extra hours or night shift are not allowed, or
- there is only one computer with internet connection, *etc*.

Insufficient where:

- there are no vehicles available for the fisheries department, or
- there are not enough PCs or they are not modern enough to carry out the necessary tasks, *etc*.

Not available where there are no PCs available.

The overall assessment can then be made on the prepared table (see *Table 1*). At this stage, an assessment report must be issued with the resulting situation, stressing the points to be amended or reorganised. Specific concrete solutions should be put forward for each of the weak points in the system.

Some example case studies of overall assessment are presented in *Appendix 1*.

The evaluator

The assessment must be made by a senior expert who has a broad understanding of the fisheries sector and its administration at national and international levels. Moreover, the evaluator must show diplomacy and discretion in dealing with delicate issues and be able to involve the local staff in the whole process, from planning to implementation. This is essential for the system to work on a long-term basis. However, whilst involving the local personnel, the evaluator must be firm in enforcing decisions. Of course, he/she must be trusted in the area so that the local people are confident enough to provide the essential data. The evaluator must issue a report on the assessment and propose improvements to the existing system as well as provide a timetable for implementation, including costs and expected qualitative and quantitative results.

In the evaluator's report concrete proposals for each issue must be made, *e.g.,* if the statistical system used by a country is incomplete or insufficient, then how it can be improved; if the software used by a country is weak or difficult to upgrade, then that new software be installed; or that if the infrastructure is scored as 'not available' or 'does not exist' then that funds should be allocated from the administration, the project, or other sources. It is very important that the whole programme of work be harmonised and

well prepared to avoid difficulties that may jeopardise results. When the evaluator's report is finalised, it has to be certified by someone in the administration (Head of Fisheries, Minister, *etc*.).

Terms of reference for the evaluator and international consultants are presented in *Appendices 11* and *12.*

The quality check survey

In applied fisheries statistics the best approach to the quality evaluation of the existing systems, and therefore to the improvement in the statistics produced, is to carry out a *Quality Check Survey* (*QCS*) based on sampling techniques. *Ad hoc* methodologies can be developed for any type of survey (*Censuses, Catch and Effort Surveys, Fish Market Surveys, etc*.).

The Coverage Quality Check Survey (CCS)

The *CCS* aims at appraising the precise state of the national *Fishing Fleet Register* (drawn up from a census) *vis-à-vis* the existing situation. Normally, data contained in the *Vessel Register* originates from information supplied through a census with updates introduced over time. The aim is to ascertain whether the *Fishing Fleet Register*, after a certain time and after all the modifications have been made, still reflects the actual situation within the fleet and is therefore statistically representative. The *CCS* is designed and implemented in layers depending upon the availability of resources and time. It can be limited to checking the number and location of the fishing vessels and their generic data, or conduct a more in-depth screening to include the vessels' main characteristics (GRT/GT, Length, and HP/kW). If necessary it can also include gear composition and operational practices, *etc*.

One of the first issues to be considered is whether fishing vessel records based on paper material (dossiers, folders, catalogues, updating forms, *etc*.) are computerised or not. If the system is fully computerised, we can immediately pass to the verification (matching process) between the recorded data (memorised into a DB) and the vessels in the ports (the reality). The computerisation of fishery censuses using suitable data management tools is still not universal in the Mediterranean. In many cases existing systems are not wholly appropriate. The situation is by no means consistent in the region; there are, broadly speaking, three practices of managing fishing vessel records:

- ***a fully mechanised vessel register*** stored into a database structure where all corrections and updating are made directly in the database,
- ***a semi mechanised vessel register*** stored into a database structure in which revisions are first received on paper, or by other means, and then input to the database; no historical records of the variations are kept, or
- ***a manual register*** where the vessels' records are kept in books, cards, dossiers, *etc.,* and the revisions are made manually, or where unsuitable, computer tools are used instead of a proper database structure, (such as *Excel*, tables, unrelated data banks*, etc*).

Different vessel record management practices require made-to-measure interventions. In the case of a fully mechanised register, starting a *Coverage Check Survey* is straightforward whereas in the case of a semi mechanised system, a two-step approach must be applied. In this latter case, we must first check the consistency between the paper documentation and the database, validate its contents and then launch the *CCS*. When dealing with manual systems it is evident that we need first to develop a database system for the vessel register, establish all the relationships, codification, *etc*., and then input the data (or migrate it from some other digital system such as a spreadsheet). We may then check the consistency and the coverage of the database and, if validated, launch the *CCS*.

Once the contents of the fishing vessel database have been validated from the operational point of view, the *Coverage Check Survey* consists of the following steps to be undertaken in sequence:

1. Office work

1.1 Select a few ports and/or landing places where the survey must be conducted; the 'Survey Unit'. These ports/landing places are the primary sampling units (*PSUs*) of the quality check survey. The *PSUs* should not necessarily be selected statistically, but should preferably be chosen according to some practical judgments, *e.g*. ports where big changes in the fleet have been reported, ports where major changes in the infrastructures occurred, or where new land developments affecting landing places had taken place, *etc*. It is important that the sample is representative of changes in the vessel records. In any case the selection process is normally dictated by the objective of the survey.

1.2 Produce a list, from the above Vessel Registry of all the vessels belonging to the selected ports or landing places; the 'Target population' (office data).

1.3 Prepare a series of spreadsheets (development of a database for this application is not necessary), one per port/landing place having more or less the format as in *Table 2,* below. In the example, one possible solution is shown, where the surveyors want to test the following:

- distribution pattern of fishing vessels at the date of the QCC compared to that in the Registry.
- consistency of generic vessel data (vessel name, type, homeport, *etc*.) between the vessel data in the registry with the observed data ,
- consistency of the level of the contents of the data base (the Registry) (New Vessel/Cancel Vessels/Same Type/New Type)
- consistency of some technical characteristics of the vessels such as length, GRT, HP
- evaluation of the overall status of the 'up-to-dateness' and reliability of the Fishing Vessel Registry.

1.4 Automatically fill in such tables from the Fishing Vessel Registry database.

1.5 Conduct an intensive and detailed training course for selected recorders. It is emphasised that recorders recruited for the *QCS* must be efficient and properly prepared.

2. Field work

Launch the *QCS* in all selected ports/landing places, sending the recorders to collect data for all the vessels observed and record their status by filling in the form illustrated in *Table 2*, on the following page.

When conducting a Quality Coverage Survey, it is important that there are no missing values in the report, which should never have any missing data or hanging questions. Any missing values must be reported and justified - and eventually estimated by the recorder.

Once the field work is completed and the collected data validated, the matching process can start. The quality check of the census can be done at various levels which will now be considered in detail.

Table2. Assessment table

Coverage Check Survey														
Stratum : _____ Port Name; _____ Date: _____ Recorder: _____														
Vessel Registry Data							**Content validation**		**Observed Data**					**Comments**
Vessel Identification			***Control Characteristics***				***Presence in Port***			***Control Characteristics***				
Registration Code	Vessel Name	Vessel Type Code	Main Gear Code	Length (m)	GRT/ GT	HP/ CV	Found (Y) Not Found (N)	(N) give Reasons	Vessel Type Code	Main Gear Code	Length (m)	GRT/ GT	HP/ CV	
Vessels not in Registry					**Content validation**		**Observed Data**						**Comments**	
Vessel Identification					***Presence in Port***		***Vessel Characteristics***							
Registration Code	Vessel Name	Vessel Type - Code	Origin of the Vessel		Give reasons		Main Gear Code	Second Main Gear	Length (m)	GRT/ GT	HP/ CV			

Checking the number of vessels and their distribution (coverage)

This first part of the analysis is made through arithmetical counting and ratio estimates (percentages of presence/absence). In order to check the number of vessels and their locality it is useful to start with the following classification based on the vessels' ID:

A. vessels on the list (office data) and found in the port (physically).

B. vessels on the list (office data), but not found in the port.

C. vessels not on the list (office data) but found in the port.

D. vessels that are neither in the office data, nor in the port.

Information on the D-type vessel is usually obtained by asking people at the port. In some cases, it is necessary to stay in the port (or revisit it) for further day(s) in order to determine which vessels were not present on the day of the *Coverage Check Survey*. It could be that there is a new vessel that has not been reported to the authorities which was away fishing, although this case is not very common.

Numbers for vessel types A, B, C and D are then entered on a grid as illustrated in Table 3.

Table 3. Checking the number of vessels and their distribution

		Vessels in Office Data	
		Yes	No
Vessels Observed at Port	Yes	**A**	**C**
	No	**B**	**D**

The number of vessels present in the surveyed ports is therefore given by: (A – B) + (C – D)

Checking the vessels' characteristics (quality)

As far as testing the consistency of the vessel technical characteristics (of same vessels), numerical data, *regression analysis* is definitely the most simple and quick to do.

Based on the prepared lists, data on horse power (*HP*), gross tonnage (*GT*) and length (*Ln*) from the national register can be compared with observed data collected from the selected trial ports. A linear regression can be run with the register data for a port and the data collected/observed for that port in order to see if changes have occurred, and to calculate the levels of match of the two samples. This should be done port by port for each of the vessels' characteristics *HP, GT* and *Ln*. Coefficients of regression together with an assessment of its consistency must be reported for each port.

In the example that follows we simulate a test for matching data on *Length* stored in the registry (variable X) against the *Length* measured during the QCS (variable Y) in ports Port A, Port B and Port C. We then follow the same procedure with *GT* and *HP* data. The results could show that in one port the two series (registry data and observed data) are the same, in another port they may be slightly different, an in another they may be quite different. In this latter case, the problem would then be to ascertain whether it was a matter of bad recording, errors in the data entry or real changes that have occurred over time *etc.*

In *Table 4* the analysis is done by characteristics per port, whereas in *Table 5* below the analysis is done by port for the three characteristics.

Table 4: Testing vessel characteristics per port

Coverage Check Survey																									
Stratum : _____ Vessel Characteristics within the same Port Date: _____ Supervisor _____																									
TESTING PROCESS																									
Port A							Port B							Port C										**Comments**	
Vessel Identification	***Length l***		***GT/GRT g***		***HP/CV h***		***Vessel Identification***	***Length l***		***GT/GRT g***		***HP/CV h***		***Vessel Identification***	***Length l***		***GT/GRT g***		***HP/CV h***			
Registration Code	$_{i}X1$	$_{I}Y1$	$_{g}X1$	$_{g}Y1$	$_{h}X1$	$_{h}Y1$	Registration Code	$_{i}X1$	$_{I}Y1$	$_{g}X1$	$_{g}Y1$	$_{h}X1$	$_{h}Y1$	Registration Code	$_{i}X1$	$_{I}Y1$	$_{g}X1$	$_{g}Y1$	$_{h}X1$	$_{h}Y1$		
	$_{i}X2$	$_{I}Y2$	$_{g}X2$	$_{g}Y2$	$_{h}X2$	$_{h}Y2$		$_{i}X2$	$_{I}Y2$	$_{g}X2$	$_{g}Y2$	$_{h}X2$	$_{h}Y2$		$_{i}X2$	$_{I}Y2$	$_{g}X2$	$_{g}Y2$	$_{h}X2$	$_{h}Y2$		
	$_{i}X3$	$_{I}Y3$	$_{g}X3$	$_{g}Y3$	$_{h}X3$	$_{h}Y3$		$_{i}X3$	$_{I}Y3$	$_{g}X3$	$_{g}Y3$	$_{h}X3$	$_{h}Y3$		$_{i}X3$	$_{I}Y3$	$_{g}X3$	$_{g}Y3$	$_{h}X3$	$_{h}Y3$		
	$_{i}X4$	$_{I}Y4$	$_{g}X4$	$_{g}Y4$	$_{h}X4$	$_{h}Y4$		$_{i}X4$	$_{I}Y4$	$_{g}X4$	$_{g}Y4$	$_{h}X4$	$_{h}Y4$		$_{i}X4$	$_{I}Y4$	$_{g}X4$	$_{g}Y4$	$_{h}X4$	$_{h}Y4$		
	$_{i}X5$	$_{I}Y5$	$_{g}X5$	$_{g}Y5$	$_{h}X5$	$_{h}Y5$		$_{i}X5$	$_{I}Y5$	$_{g}X5$	$_{g}Y5$	$_{h}X5$	$_{h}Y5$		$_{i}X5$	$_{I}Y5$	$_{g}X5$	$_{g}Y5$	$_{h}X5$	$_{h}Y5$		
	$_{i}X6$	$_{I}Y6$	$_{g}X6$	$_{g}Y6$	$_{h}X6$	$_{h}Y6$		$_{i}X6$	$_{I}Y6$	$_{g}X6$	$_{g}Y6$	$_{h}X6$	$_{h}Y6$		$_{i}X6$	$_{I}Y6$	$_{g}X6$	$_{g}Y6$	$_{h}X6$	$_{h}Y6$		
	$_{i}X7$	$_{I}Y7$	$_{g}X7$	$_{g}Y7$	$_{h}X7$	$_{h}Y7$		$_{i}X7$	$_{I}Y7$	$_{g}X7$	$_{g}Y7$	$_{h}X7$	$_{h}Y7$		$_{i}X7$	$_{I}Y7$	$_{g}X7$	$_{g}Y7$	$_{h}X7$	$_{h}Y7$		
	$_{i}X8$	$_{I}Y8$	$_{g}X8$	$_{g}Y8$	$_{h}X8$	$_{h}Y8$		$_{i}X8$	$_{I}Y8$	$_{g}X8$	$_{g}Y8$	$_{h}X8$	$_{h}Y8$		$_{i}X8$	$_{I}Y8$	$_{g}X8$	$_{g}Y8$	$_{h}X8$	$_{h}Y8$		
	..	..	..	..	..	..		$_{i}X9$	$_{I}Y9$	$_{g}X9$	$_{G}Y9$	$_{h}X9$	$_{H}Y9$		$_{i}X9$	$_{I}Y9$	$_{g}X9$	$_{G}Y9$	$_{h}X9$	$_{H}Y9$		
	$_{i}Xn$	$_{I}Yn$	$_{g}Xn$	$_{g}Yn$	$_{h}Xn$	$_{h}Yn$		$_{i}X10$	$_{I}Y10$	$_{g}X10$	$_{g}Y10$	$_{h}X10$	$_{h}Y10$		..	..	..	..	..	..		
								$_{i}X11$	$_{I}Y11$	$_{g}X11$	$_{g}Y11$	$_{h}X11$	$_{h}Y11$		$_{i}Xn$	$_{I}Yn$	$_{g}Xn$	$_{g}Yn$	$_{h}Xn$	$_{h}Yn$		
								..	..	..	..	..	..									
								$_{i}Xn$	$_{I}Yn$	$_{g}Xn$	$_{g}Yn$	$_{h}Xn$	$_{h}Yn$									
Regression	$A_{I}R^2$ =		$A_{g}R^2$=		$A_{h}R^2$=		Regression	$B_{I}R^2$ =		$B_{g}R^2$=		$B_{h}R^2$=		Regression	$C_{I}R^2$ =		$C_{g}R^2$=		$C_{h}R^2$=			
$_{i}X1$-gX1- hX1	Measurements of Length, GT and HP as reported in the Fishing Vessel Registry for vessel N: 1 to 'n' in Ports A, B and C													$_{I}R^2$=	Coefficient of Determination between Length measurements							
														$_{g}R^2$=	Coefficient of Determination between GT/GRT measurements							
$_{I}$Y1-gY1-hY1	Measurements of Length, GRT and HP observed for the Vessel No 1 to 'n' seen in the same A, B and C Ports during the QCS													$_{h}R^2$=	Coefficient of Determination between HP/CV measurents							

Table 5: Testing each port for the 3 main vessel characteristics

Coverage Check Survey

Stratum : _____ **Test by Technical characteristics between ports.** Date: _____ Supervisor _____

TESTING PROCESS

Length measurements (l)							**GT/GRT (g)**							**HP/CV (h)**							**Comments**
Vessel Identification	***Port A***		***Port B***		***Port C***		***Vessel Identification***	***Port A***		***Port B***		***Port C***		***Vessel Identification***	***Port A***		***Port B***		***Port C***		
Registration Code	A_lX1	A_lY1	B_lX1	B_lY1	C_lX1	C_lY1	Registration Code	A_gX1	A_gY1	B_gX1	B_gY1	C_gX1	C_gY1	Registration Code	A_hX1	A_hY1	B_hX1	B_hY1	C_hX1	C_hY1	
	A_lX2	A_lY2	B_lX2	B_lY2	C_lX2	C_lY2		A_gX2	A_gY2	B_gX2	B_gY2	C_gX2	C_gY2		A_hX2	A_hY2	B_hX2	B_hY2	C_hX2	C_hY2	
	A_lX3	A_lY3	B_lX3	B_lY3	C_lX3	C_lY3		A_gX3	A_gY3	B_gX3	B_gY3	C_gX3	C_gY3		A_hX3	A_hY3	B_hX3	B_hY3	C_hX3	C_hY3	
	A_lX4	A_lY4	B_lX4	B_lY4	C_lX4	C_lY4		A_gX4	A_gY4	B_gX4	B_gY4	C_gX4	C_gY4		A_hX4	A_hY4	B_hX4	B_hY4	C_hX4	C_hY4	
	A_lX5	A_lY5	B_lX5	B_lY5	C_lX5	C_lY5		A_gX5	A_gY5	B_gX5	B_gY5	C_gX5	C_gY5		A_hX5	A_hY5	B_hX5	B_hY5	C_hX5	C_hY5	
	A_lX6	A_lY6	B_lX6	B_lY6	C_lX6	C_lY6		A_gX6	A_gY6	B_gX6	B_gY6	C_gX6	C_gY6		A_hX6	A_hY6	B_hX6	B_hY6	C_hX6	C_hY6	
	A_lX7	A_lY7	B_lX7	B_lY7	C_lX7	C_lY7		A_gX7	A_gY7	B_gX7	B_gY7	C_gX7	C_gY7		A_hX7	A_hY7	B_hX7	B_hY7	C_hX7	C_hY7	
	A_lX8	A_lY8	B_lX8	B_lY8	C_lX8	C_lY8		A_gX8	A_gY8	B_gX8	B_gY8	C_gX8	C_gY8		A_hX8	A_hY8	B_hX8	B_hY8	C_hX8	C_hY8	
	..	..	..	..	..	..		A_gX9	A_gY9	B_gX9	B_gY9	C_gX9	C_gY9		A_hX9	A_hY9	B_hX9	B_hY9	C_hX9	C_hY9	
	A_lXn	A_lYn	B_lXn	B_lYn	C_lXn	C_lYn		A_gX10	A_gY10	B_gX10	B_gY10	C_gX10	C_gY10		A_hX10	A_hY10	B_hX10	B_hY10	C_hX10	C_hY10	
								A_gX11	A_gY11	B_gX11	B_gY11	C_gX11	C_gY11								
								..	..	..	..	..	..		A_hXn	A_hYn	B_hXn	B_hYn	C_hXn	C_hYn	
	..	..	..	..	..	..		A_gXn	A_gYn	B_gXn	B_gYn	C_gXn	C_gYn								
	..	..	..	..	..	..															
Regression	A_lR^2 =		B_lR^2=		C_lR^2=		Regression	A_gR^2 =		B_gR^2=		C_gR^2=		Regression	A_hR^2 =		B_hR^2=		C_hR^2=		

$_lX1$	Length mesurements as reported in the Fishing Vessel Registry for vessel No 1 in a given Port	$_lR^2$ =	Coefficient of Determination between Length measurents in the 3 sample Ports
$_lY1$	Length measured for the Vessel visited in the same port during the QCS		
A_gXn	GRT value as reported in the Fishing Vessel Registry for vessel No 'n' in a given Port	$_gR^2$=	Coefficient of determination between GT measurents in the 3 sample Ports
A_gYn	GRT values measured for the Vessel No 'n' visited in the same port during the QCS		
A_hXn	HP / CV values as reported in the Fishing Vessel Registry for vessel No 'z' in a given Port	$_hR^2$=	Coefficient of Determination between HP measurents in the 3 sample Ports
A_hYn	HP / CV values measured for the Vessel No 'z' visited in the same port during the QCS		

Remarks:

Note that all of these checks (correlations) can be done at lower levels (more detailed or in sub-sets); for example, correlation of *GT* for trawlers only, *etc.*

These coefficients will indicate whether the national register (office data) has good coverage in terms of the number of fishing vessels and their distribution by ports/landing places, and if it was correctly updated for the variables considered. A high regression coefficient (coefficient of determination) *e.g.* R^2 = 0.78 or higher, indicates a ood correlation between the data in the national register and the observed data in the ports. By doing this for a few trial ports, we can get an idea of how accurate the national register is. We will also be able to describe the status of the records in each port (*e.g. " ….. three ports are well updated but one further away has not had the vessel list updated for a while and there are inconsistencies …..* "). Needless to say, if some minor differences are found then this is a good opportunity to update the office data without the launching of a census.

Checking the gear type

In order to carry out a deeper screening, the gear type used can also be checked following the procedure described above. The typology of the vessels observed at the ports has to be checked with the national register data and any inconsistencies examined. Secondly, the gears used by those vessels (observed at port), have to be compared with those recorded for those vessels in the national register. Once these two have been checked for inconsistencies and their regressions calculated, a third test can be done by comparing the vessel type with its corresponding gear (*e.g*. there cannot be a trawler with surrounding nets).

Output of the quality check survey

A complete report with all these results must be produced and a detailed description of any changes observed from port to port in any of the three levels checked, that is:

- number of vessels and their distribution,
- vessels characteristics, and
- vessel type and gears used.

This report is confidential and is the sole property of the country involved.

The *QCS* will thus help determine whether a country's existing census data is good enough, whether there are some issues to address or whether the census is unrecoverable and has to be carried out again from scratch.

With all the *QCS* results in hand, an overall assessment of the situation can be undertaken.

For example, there could be a situation in which there are poor results at the first level (number of vessels and their distribution) but good results at the second (vessel characteristics) and third levels (vessel types and gears). This could mean that the census previously carried out was good, but that there was subsequent movement of vessels from port to port without notification to the authorities. This assessment therefore alerts the administration to introduce changes so that future movements are recorded in the vessels' national register.

Another example could be that levels 1 and 3 are good, but level 2 (vessel characteristics) is poor, since, say, a change in *HP* was noted. The administration could now, depending upon existing legislation, issue warnings to vessels exceeding the maximum authorised power, or at least ascertain in which area it is happening and tackle the problem.

Another case could be that of levels 1 and 2 receiving a good evaluation, but level 3 being poor, because the main gears used had changed or that gear data were not collected or were neglected during any updating. This could indicate that the fishing licences were not updated or changes were not notified. It could also indicate a trend in changing gears that could be due, say, to a decrease in targeted stock.

The above are examples based on the *MedFisis* approach to *QCSs*; there is no *standard* method.. A *QCS* must always be adapted to the particular situation in a country.

A *Coverage Check Survey* case study is presented *in Appendix 2*.

Preparation of the census survey

There are a number of protocols which are applied in *MedStat* countries, in consultation with national authorities, in order to conduct a census survey. It is essential that ministerial agreement is obtained before starting any census activity.

The whole process of implementing a new census survey for the fishing fleet or updating an existing one is usually carried out through the guidance of a regional programme such as *MedFisis* in consultation with national authorities. This is because the best approach for building sustainable fisheries statistical systems compatible across the region is to build the capacity of the national fisheries institutions, using common concepts and tools to facilitate the exchange of experience and knowledge among the countries involved. If all countries use similar concepts and tools, it will be easier to compare experiences among the different institutions and offer mutual support. This will allow a pool of regional experts to be built to provide support and advice to the different institutions, thereby avoiding dependence on external experts and consultants. This will promote true national ownership of the fisheries statistical systems arising from this work, indeed, the best package for the planning of the census survey may be said to comprise:

- true national ownership together with sufficient commitment from the country to provide adequate staff and infrastructure for the statistical system, which is indispensable for the long-term success of the project, plus
- a good assessment report (statistics, data processing, human resources and infrastructure), which also incorporates comments and suggestions from the expert.

Planning the census survey

A census is an institutional exercise, *i.e.* it cannot be launched without official approval because it participates in the national statistical system. In some countries, the fishing fleet census is carried out by the national statistical institute with the purpose of providing information for calculating the gross domestic product (*GDP*); it is therefore a delicate issue and great care must be taken in the design and planning phases. Ideally, taking into account how national fisheries are structured in the Mediterranean Region, the census should be carried out with the collaboration of three national institutions:

The National Statistical Institute/Office (NSO) that is assigned to produce and distribute home statistics. The *NSO* must always be contacted when designing or planning a census, even if it does not participate in it, since it is the responsible institution for national statistics and will agree the statistics behind the census. It is the authority that gives the final approval and can provide valuable information for carrying out the census. The *NSO* is responsible for:

- the national statistical framework, carrying out population surveys and providing industry with macro indicators; as a consequence it may request additional items of information to be collected during the fishery census in order to feed the national statistics,
- the national codification system and associated nomenclature, and
- the statistical evaluation of the results and for distributing the resulting fisheries statistics officially.

The Fisheries Department/Service*,* which is usually the institution leading the census since it has the specific knowledge of and responsibility for the sector. The Fisheries Department is responsible for:

- running the census,
- all items of information related to fishing and its planning, and
- implementation of fisheries legislation.

The Fisheries Research Institutes, which contribute mainly by their valuable involvement and their knowledge of the fisheries. Their contributions may include

- technological/biological know-how (gears, species *etc*).
- the validation of statistical data, *etc.*
- the provision of some of the data collected during the fishing fleet census, such as the *Catch Assessment Survey*.

It is very important to contact all three institutions beforehand and invite them to become involved in the census exercise or at least, if they cannot participate, make them aware of it so that they can provide any input they consider useful. They should also be invited to propose some additional tasks for the census organisation that could be of importance to the country. This is a very collaborative way of working which does not imply much extra effort during the census and provides other institutions with valuable information. An example of this could be that of a country which does not have a system to record or update the records of the fishery infrastructures such as ports and landing places, or has an incomplete understanding of the status of the artisanal fishery communities in the country. In this case an extra data sheet could be added in the census where information about these structures could be collected and subsequently processed. The list of Items (record track) of the database on fishery infrastructure (port database) derived from *Itafish* is presented in *Appendix* 10 as a model.

Designing the vessel census

It is extremely important that the census survey is planned and designed in collaboration with the national staff. The codification system (*Appendix 5*) and the data dictionary (*Appendix 4*), *i.e.* the field definitions both at national and regional levels, must also be agreed with them. Every step of the procedure must be prepared in collaboration with the national staff, so that the final product is suited to the country's needs and to the people who will be involved in maintaining the system which they have helped to plan and build. It is essential that local staff consider the final product to be their own so that it will be maintained throughout time. Whilst fulfilling the international harmonisation requirements, there may be routines that are part of the national working system that have to be respected, thereby needing the direct assistance of the local staff. A national supervisor must be nominated for each survey. He or she will be the contact point for any activity and will communicate with the appropriate authority at the Ministry, *e.g*. the National Focal Point.

When carrying out a census the first issue to be considered is the *First Level Stratification*, which is the grouping or association of units. This is called geo-political stratification which is rarely based on statistical argument. This step must be carried out in collaboration with the National Statistical Office since it is their responsibility to provide home statistics within a given structure (by region, province, *etc*.). The fisheries census must therefore follow the stratification of the National Statistics Office, which is usually:

- country (major strata),
- region (strata),
- province (sub-strata), and
- towns/ports (elementary units/level)

In some cases, sub or super divisions have to be adopted for logical reasons (such as major strata within a country with both Atlantic and Mediterranean coasts), or for a country with overseas territories, *etc*. These divisions can be significant in statistical terms since the units aggregated within a particular stratum can be statistically different from other units considered.

Because the fleet segmentation can be different at national, GFCM and FAO levels the boundaries of the strata may not match. Therefore it is highly recommended to match as much as possible the chosen national segmentation boundaries with international ones.

Special care has to be taken with segmentation when collecting the data (vessel type, gears, *etc*.) so that they can be aggregated afterwards into different classifications to comply with the different levels requested (national, *FAO, GFCM*). For this purpose it is crucial to put every effort into developing a suitable data set.

Data structure

Applications of the *Census of Fishing Vessels* must be able to handle three sets of data:

- compulsory data elements
- common data elements, and
- complementary data elements.

When a new country becomes 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; 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 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. *MedStat* manages 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 definitely available in all *MedStat* applications.

It is necessary that any data related to the fishing vessel register needed by national and international authorities is included in the census dataset, which must therefore comply with the requirements at all levels of:

- the NSO,
- the Fisheries Department,
- the Research Institutes (Biological / Technical),
- GFCM,
- FAO,
- EC
- World Bank
- International Monetary Fund, and
- any other international body the country is a member of

Statistics accessible through the census data set, *e.g.* manpower, may be of value to authorities outside of the fisheries sector. Compulsory *MedStat* fleet register data elements are listed in *Table 6*. The list of common data elements (fields) are to be found in the questionnaire in *Appendix 3.*

Table 6 MedStat- list of compulsory data elements in the fishing vessel database

Ref.No	Items	Description
1	Recording date	Indicates the date when the data was collected in the field (date of questionnaire).
2	Recording event	Indicates the type of event taking place when collecting the data (census, modification, *etc*).
3	Import/Export Country	Only for EU countries. Depends on the Type of Event as per Annex I of Commission Regulation (EC) No 26/2004.
4	Type of Export	Only for EU countries. Depends on the Type of Event as per Annex I of Commission Regulation (EC) No 26/2004.
5	Public Aid Code	Only for EU countries. Depends on the Type of Event as per Annex I of Commission Regulation (EC) No 26/2004.
6	Administrative Decision Date	Only for EU countries. Depends on the Type of Event as per Annex I of Commission Regulation (EC) No 26/2004.
7	Unique Registration number	The unique registration number assigned to the fishing vessel.
8	Registration Number	Indicates the registration number assigned to the vessel by the port authorities.
9	Flag	Registration country of the vessel
10	Registration Office	Office where the vessel has been registered
11	Registration date	Registration date (dd/mm/yyyy).
12	Vessel type	Type of the vessel
13	Vessel name	Vessel name.
14	Operational status	Operational status of the vessel
15	Non operational reason	If the Operational Status is "Inactive", then it is compulsory to indicate the reason for this status.
16	Home port	Name of the docking port of the vessel.
17	Length overall (m.)	Longitudinal dimension of the hull of the vessel. The length of the fishing vessel measured from the bow to the stern.
18	Decked	Indicates if the vessel is decked or not (Y/N); i.e. if it has a closed volume.
19	GT	The Gross Tonnage of the vessel as registered.
20	Authorisation type	Type of fishing authorisation
21	Authorisation Document ID	The id number of the fishing authorisation document.
22	Issuing office	The office issuing the authorisation document.
23	Fishery Department Registration number	Indicates the registration number assigned by the fisheries department.
24	Gear Rank	Indicates if the gear is a main gear (rank 1) or other. It is compulsory to indicate at least one gear.
25	Gear Type	Indicates the specific type of gear that is used. It is compulsory to indicate at least one gear.
26	Target Group of Species	Indicates which main group of species (pelagic, demersal, *etc*) are targeted by that gear.
27	Engine rank	Indicates the engine rank. Rank 1 is the main engine. This field is compulsory only for powered vessels.
28	Engine location	Indicates the engine position (Inboard/Outboard). At least one engine is compulsory for powered vessels.
29	Power (kW/HP)	The engine's power either in HP or kW. Compulsory only for powered vessels.
30	Equipment type	If equipment information has been inserted, then it is compulsory to indicate the type.
31	Gear Activation Type	The method used to activate the fishing gear.
32	Winch type	If winch information has been inserted, then it is compulsory to indicate the type.
33	Winch Operated by	If winch information has been inserted, then it is compulsory to indicate the operation type (manual, *etc*).
34	Company name	Indicates the company name. It is compulsory to include at least one owner.
35	Company operated by	Indicates who operates the company (owner, operator, *etc*).
36	Operator name	Indicates the name of the operator. Compulsory only if the company is operated by an operator (not the owner).
37	Operator address	Indicates the address of the operator.
38	Port	Operational port name. At least one operational port is compulsory if it is not the 1st time the vessel operates in the country.
39	Port begin month	Indicates the starting date of fishing operations based on that particular operational port.
40	Port end month	Indicates the end date of fishing operations based on that particular operational port.
41	Operation gear type	The main gear which was used during the fishing operation
42	Operation begin month	The month in which the described fishing operation started.
43	Operation end month	The month in which the described fishing operation finished.
44	Fishing Zone	Indicates the zone where the fishing operations take place.
45	Targeted group of species	Indicates the group of species that is targeted during that fishing operation.

The questionnaire

The questionnaire is a list of questions or data fields organised into logical groups (fishing vessel ID, structural characteristics, fishing authorisation, ownership, crew, *etc*.) and relate to the lists of possible answers in the reference tables (*see Appendix 5*). Some fields are compulsory and others are optional, but all of them have a number linking it to the corresponding data field description (definition and sometimes type of answer such as Yes/No, date, measuring units, *etc*.) The identification code also refers to a table with the references or codification system where all possible answers are listed together with their corresponding codes, English name and correspondence to other international codification systems. Because *GFCM, EC* and *MedFisis* codifications and permitted answers have been upgraded in recent years, the reference tables were fully revised during the third year of the project (see *Appendix 6*).

The numbers given to each field in the questionnaire are consistent with those in the data field descriptions.

The paper questionnaire constitutes the basis of the data collection procedure. It is also the best proof of work for evaluating a recorder since the recorder's name, date and place of interviewing are registered. It is highly recommended that paper questionnaires be used and completed in pencil. This will provide a hard copy of the data and avoid electronic devices getting wet in the enumeration process. Paper records are also easily checked for information, and allow collection of data from two vessels concurrently when time is short at landing places. The paper questionnaire also has the advantage of being accessible and easy for fishermen to read. This makes it possible for them to check what information is being collected about their vessel and their activity and thereby building trust with the recorder. A laptop is less accessible to fishermen and they could become uncooperative or suspicious if they cannot see what information is being written about them. Fishermen must be respected if reliable answers are to be obtained.

Attention should also be paid to other important parts of the questionnaire such as the heading where tracking data should always be noted on each page (the questionnaire could comprise several pages) in order correctly identify the recorder, the survey, the questionnaire page and total number of pages (*e.g*. page 3 of 5), and perhaps some internal reference. This information would allow the ordering of the paper sheets should they became mixed up by mistake or identifying the recorder should the need arise. Another useful part of the questionnaire is the observation or note that should be added at the bottom of each section. These notes could be very useful for the supervisor in fine tuning the data collected in the questionnaire. The data collection and data entry are not always performed by the same person, and therefore useful comments at the end of each section can be very helpful.

Other useful items for recorders to carry are a measuring tape, a battery powered torch and a cleaning cloth. A disposable camera could also prove helpful. A situation may arise in which the lack of simple things could prevent the collection of data (*e.g*., not being able to read the registration number of a vessel or knowing its *LOA*). It is also crucial for recorders to possess and display an ID card identifying them as recorders for ease of recognition by fishermen and port officials.

The questionnaire has to be validated by a supervisor who checks whether it is consistent or not. It is strongly advised to codify the answers of the questionnaire as much as possible. Providing a long list of possible answers is highly advisable and advantageous since plain text answers are more difficult to process and statistics may not be obtainable from them.

When the data set list has been drawn up and the questionnaire has been defined, it is necessary to update or develop the codification and *Reference System* into which all codifications and standards should be integrated. In selecting identification codes consideration should be given to existing codification systems used by different bodies related to the fisheries, or requesting data from the fisheries sector. The various codification systems have to be related to each other, so that equivalences are possible and easy to retrieve.

The Questionnaire and Data Field Descriptions together with a summary of the Codification system are presented in *Appendices 3, 4* and *5.* A table summarising the most recent updates to the *MedFisis* codification system is to be found in *Appendix 6*. Full versions of these samples are given in the *Source of information, data structure, definitions and Codification.*

The *MedFisis* project has developed a questionnaire, data field descriptions and references (codification system) that are fully compliant with international standards and are available for the countries to use them. Moreover, a full revision of the Reference System was undertaken and any updates can be seen in *Appendix 6.* This is of interest mainly to countries that are already using a *MedStat* Fleet Register application.

Training

Training is crucial at all levels. In the case of the recorders it is especially important since they provide the data that will constitute the basis for the whole system. Misleading questions or answers can lead to errors in the results at the statistical analysis stage. It is also crucial to make sure that all fields are fully understood and that adequate answers can be provided and accepted.

The project will build on national expertise by contracting national consultants and local institutes to assist with planned project activities. National expertise will also be used for the preliminary gathering of information at country level. This will enable a study of existing statistical and information systems in participating countries for the identification and upgrading of areas requiring action, for data collection, computerized inputs, and analysis of data and information. National counterparts (scientists, fisheries statisticians and other relevant fishery staff) will collaborate in each phase of the consultants' interventions.

Training courses will target major topics related to fisheries statistics and information systems, such as:

- statistics theory,
- data collection procedures,
- statistical packages for processing and analysing fishery data, and
- the use of data base management.

Theory training

Theory training usually takes place at local premises and is given by experts in the field. All aspects of the data collection must be covered from the data fields' definitions and codes, data collection procedures, interviewing techniques, recording data, measuring units, supervision, *etc.* The training must be comprehensive and tailored for participants according to their duties and responsibilities, that is:

- for Recorders (data collection),
- for Supervisors (data collection and processing, coordination of recorders, logistics and first data screening), and
- for the National Coordination Team or Steering Committee (census implementation and management)

Recorders. It is important that the recorders are provided with a manual for data collection, plus the *Statistical Recorders Book* and that clear terms of reference are drawn up for each professional profile and are discussed and understood during the training sessions. The *Statistical Recorders Book* comprises the *Census Questionnaire* which they have to complete, the *Data Field Descriptions* and the *References (Codification System)* which need to be consulted regularly. It is strongly recommended that these three sections are always accessible when collecting the data since it is often necessary to consult the codes or definitions for particular data fields. For this reason, it is useful to provide a summarised table of the most common and useful codes and definitions for easy and quick reference. Considerable effort is put into the proper training of people who will carry out the census exercise, so

trained recorders should be retained since they are the basis of the whole system. Well trained recorders can determine whether the questions and their selection of answers are adequate or not, thus helping to upgrade the questionnaire (this is normally done during the pilot survey in-field training) as well as detecting possible errors in the dataset. Trained recorders should be considered as a valuable asset both for parallel systems such as catch assessment surveys, and for further exercises in the field.

Supervisors. Developing trust with the recorders is a key element for a supervisor, since it is preferable from the point of view of good statistics to know if some data are lacking rather than entering contrived answers into the records. Supervisors should follow the whole training programme, including the parts concerning recorders and the project counterpart. This is because the supervisor has to carry out, among other things, three main tasks during the census implementation:

- supervision of the recorders on a daily or weekly basis to understand the work progress, the discovery of possible errors and incoherence in the data collected, and the evaluation of the source and nature of the errors (systematic error, misunderstanding, forged or false data recorded, *etc*) and intervene accordingly.
- replacement of recorders when they cannot work (sick leave, holidays, *etc*.), and,
- interaction with the National Coordination Team and eventually be able to take charge of the project for a while should that become necessary; under no circumstances can implementation of the census be unsupervised at any levels.

The supervisor must also to be aware of sensitive issues such as the social group of the recorder so that, when organising the logistics, recorders can be sent to areas where they are known or where they come from.

National Coordination Team. The responsible team or project counterparts must also receive some training, since some actions cannot be undertaken by other people. They are responsible for announcing the census exercise to all participants and making sure that other parties involved (NSO, Research Institutes, *etc*.) have expressed their interest in collecting extra data during the census that could be of use to them.

On-the-job training

The next step in the training process is to provide on-the-job training, which will give both the trainers and the trainees the opportunity of confronting real situations, discussing any doubts that could arise as well as modifying the planning of the real survey to be carried out at a later stage. This can be done as part of the *Pilot Survey,* (see later).

The training programme

A detailed training programme should always be organised according to the technical skills of the participants. Too much advanced training will lead to initial misunderstanding and may end in a lack of interest from the participants. On the other hand, an oversimplified or tedious course could lead to the same problem. The training expert should develop a training programme that can be understood and of interest to all the participants. Should this not be possible then it may be necessary to deal with trainees in groups and then bring them together at the end. The following outline programme covers the whole range of training components.

Module 1 – Introduction

General

Purpose of the Survey

Statistics to be collected

Integrated survey system

National / international relationships (GFCM, EU,*etc*.)
Use of the results - Lifecycle of a System
System maintenance and review

Module 2 - The organisation of the statistical unit

National structure and logistics.
Responsibilities and supervision
Basic field duties
Additional duties
Field check of recorder's work

Module 3 - The fishery statistics general theory overview

This module needs to be carefully designed because there will be participants with different levels of statistical knowledge and different tasks and responsibilities. The trainer, where necessary, will have to structure this module and tune the teaching to the skill and ability of the group of participants to understand and follow and to their knowledge and functions in the survey.

Module 4 – The Fishing Vessels Frame Survey (or Coverage Check Survey)

Planning a frame survey
The target population
The area stratification
The data structure
Coverage and non-coverage errors
The questionnaires
Codification system
How to enumerate
The missing values problem

Module 5 - Processing the results of the Frame Survey (or Coverage Check Survey)

The Database
The *MedStat* Database management System and its functionality
Automatic data debugging
Tabulation and reporting system

Module 6 - Quality of the collected data

Standards of performance
Critical analysis of the results.

Module 6 - Catch and effort survey

It must be synchronised with the dedicated document on the Catch and Effort Survey

Module 7 - Data processing tools

Training sessions on database use is envisaged in this context. This activity is intended firstly for national computer programmers and, as a continuation of that programme, may be

extended to other staff involved (depending on the number of participants) where the *MedStat*-DB system will be used as an example. This second level will focus mainly on data management including statistical survey data, data exchange with the statistical packages, GIS packages, analytical tools, *etc*.

Module 8 - A statistical package

In all the interested fishery institutions, organising a one-week training course on the use of a Statistical Package for processing and analysing fishery data should be taken into account. This activity is needed to better prepare national scientists to synthesise analyses and reports dealing with fishery statistics (census, catch and effort estimates, *etc*.) which seems to be generally lacking in the area. The course should focus on the theoretical and practical use of the statistical package, using national data, mainly on the analyses and critical analyses of the results, on debiasing procedures to improve the estimates, on optimising sample size, data quality control, *etc*.

Module 9 - Pilot survey

In Appendix 7 an example of the execution of a pilot survey is attached.

Module 10 - Design and implementation of a National Fishery Information System

Specific training

Special training sessions should also be developed and conducted specifically for the staff who will implement the survey in the field (Recorders, Supervisors, *etc*.). For this purpose *MedFisis* has produced a training manual that comprises a teaching scheme covering in detail the most important issues and actions in undertaking a census survey (fleet register). The modules in this programme are:

1.1 The census survey

Review of local situation
A fishery census
The *MedStat* Fishing Vessel Census approach

1.2 Fisheries statistics

The scope of statistics
Some statistics
The presentation of statistics

2.1 The fishing vessel

Vessel types
Structural characteristics
Engines
Methods of activating fishing gear
Winches

2.2 Fishing vessel equipment

Electronics

Navigation
Communications
Fish finders
Safety
Preservation
Processing

2.3 Fishing operations

Fishing gears
Fishing zones
Geographical sub areas (GSA)
Target group species
Pollution prevention

2.4 Fishing vessel documentation

Ownership
Crew
Port operation
Fishing authorisation

3.1 The field recorder

The census survey
Interviewing and data acquisition techniques
The questionnaire
Knowledge of the local fishery
GPS and map use
Preparation for the survey
Port / landing place questionnaire

3.2 The supervisor

Roles of supervisors
Technical preparations
Survey logistics
Recruitment and training of Field Recorders
Field Recorders' workload
Data collection by Field Recorders
Supervising the Field Recorders' work

3.3 The national coordination team or steering committee

The fishing fleet census
The *MedStat* publication: *Census design and implementation*
Recommendations made during the first coordination meeting of the *MedFisis* project
Further responsibilities

4. The MedStat questionnaire

Heading
Fishing vessel characteristics
Structural characteristics
Fishing authorisation
Gears
Engine
Electronics
Equipment
Deck machinery
Ownership
Crew
Ports of operation (previous year)
Fishing operation (previous year)
Pollution prevention
General remarks

5. The practical exercise

Organisation of practical exercise

6. Data processing

Organisation of practical exercise

The training manual includes an Appendix which deals with a number of basic concepts and methods in the field of statistics.

The pilot survey

The pilot survey is the ultimate test before carrying out the real survey. It is a small, simulated version of the census, thus providing a good opportunity for on-the-job training as well as getting useful feedback on what could happen during the real survey. It also allows amendments to be made and problems to be foreseen and tackled in time. It also presents the opportunity to check whether questions are understood by fishermen; misleading or confusing questions or answers can be corrected. A pilot survey usually has the following aims (Bazigos *et al,* 1984):

- to evaluate the time and predicted cost for deploying the full survey,
- to point out the logistic difficulties and verify the efficiency of the field operations,
- to verify the efficiency and suitability of the prepared questionnaires, and
- to verify the reliability of the recorders operating in the field.

The questionnaire can be reviewed from the pilot survey experience and even the data processing can be updated according to its results. The pilot survey is also a good occasion to build up the frequently asked questions (*FAQs*) file. This document, built on a national basis, will harmonise field descriptions, answers and coding. Occasional errors occur when the recorders are not confident about an issue and record an answer according to their best knowledge without consulting their supervisor who would have instructed them to always use standard answers. At the end of the pilot survey a revision of the design and the planning of the census survey must be carried out prior to starting the survey. Moreover, a pilot survey should also be carried out on the database in order to check for errors, discrepancies or redundancies, *etc*. Only when the following tasks have been satisfactorily completed may the actual survey begin:

- the dataset defined,
- the questionnaire defined,
- the data processing checked and updated,
- all codification systems *etc* cleared,
- the pilot survey completed and the questionnaire reviewed, and
- the training of recorders and supervisor(s) completed.

The field work

A good presentation of the work planned for the census, before carrying it out, can avoid extra work for the recorders, and increase efficiency. It is therefore very important to keep all parties informed of the activities that are going to take place so that everyone becomes familiar with them. Very often this familiarity will encourage collaboration from the fisheries professionals in providing the data needed for the census. It is also useful at this stage to distribute information booklets and provide all recorders with an identification card, so that they can be easily identified by fishermen and port authorities.

Prior to the survey, the supervisor should go to the ports or regions and organise a *Census Demonstration Seminar* inviting personnel from port authorities, fishermen's associations, shipyards, Coast Guards, the National Statistics Office, the research institutes, *etc.* During these seminars, a number of points have to be clarified so that all participants know why the census is being carried out, which data is going to be collected, what the expected outputs are, *etc.* Any possible friction can be dealt with during the seminar rather than later on in the field with the recorder. All doubts can be clarified and problems or concerns addressed during the seminar while keeping all participants informed so that they are more willing to collaborate.

The supervisor organises the work of the recorders, deciding where each will be operating and how many ports are under their responsibility. He/she also organises the logistics and always informs the port authorities and associations of the activities planned before the work starts. The supervisor has always to be on-call and he/she collects all the data weekly and does the first screening to make sure

that they are consistent and complete, after which they can be certified. This check has to be done immediately after collecting the data; if too much time passes after the collection it will be difficult to correct mistakes or estimate missing data. The final data check will be carried out during the first processing.

In addition to data collection, due attention should also be given to interviewing techniques. It is important to follow certain steps prior to the interview that will facilitate the task; these include informing the port authority, the fishing cooperatives and the fishermen themselves before the actual interview takes place. This practice, whilst showing respect for their activity, will also smooth the first contact, predisposing them to be more accessible when the interview takes place. Other important pieces of advice to consider are not to carry out the interview when the fishermen are tired, since they will not be keen to reply, and never use force to get the information. Although fishermen are obliged by law to provide information on their activities, threatening them with the police or port authorities will not help getting better data, and will hinder future data collection exercises. In this case, effort must be put into getting the data from other sources (ask the fishing cooperative, local people, *etc*.).

When facing major problems it is strongly advised to use a positive approach and not to involve authorities unless strictly necessary, in which case it is generally advisable to involve the Coast Guards, as they are the only authority in close contact with the fisheries sector and therefore more familiar to the fishermen. The supervisor and recorders have to use their common sense for most situations.

So, general advice is to use common sense, be polite and, in case of a problem, immediately call the supervisor. The recorders must get involved with fishermen and, at the same time, be a sort of link to the administration by collecting not only the census data but also fishermen's questions and expectations, problems and administrative needs, *etc.* There are many times when fishermen need support or information on several issues such as pension funds, schools for children, training, credits, national health, ID documentation for immigrants, *etc*., and the recorders can be of great help by being cooperative with them.

At the end of the census operations it is also advisable to organise a second seminar in order to provide all parties and institutions who participated or collaborated in this work with some first-hand basic statistics, description of the activities, consistency of the data collected, number of questionnaires completed, reactions from the fishermen, cost of the census, what was achieved, *etc.* This will have the format of a courtesy progress report and must be done before the official results are published. This will greatly help future cooperation and interest in our work.

Expected outputs

All the needs and requirements of official institutions (national and international) have to be catered for in the output of the system. For this purpose a list should be drawn up of all the requirements of each body; it is important to have this list at the outset, otherwise it will be more difficult to modify the system.

The are two types of outputs:

- ***unprocessed data output (data):*** this is usually a copy of the databank or a part of the databank which can be presented in different formats (xls, csv, xml, etc) in readable or coded versions, and
- ***processed data output (statistics):*** these could be tables, data files, graphs, *etc.,* issued at national, regional, international, or biological/technical levels. These tables or graphs can have summarised data or basic statistics according to the requested criteria.

Another important classification of the outputs of a fleet register system is the following:

- ***Official/international outputs:*** like those required by international bodies (EU snapshot, FAO FishStat FF-1 and FF-2, and GFCM Task-1, AVL list or the Fleet Register are some examples)
- ***National outputs:*** those that can be customised according to different needs of the national organisms requiring the data (Fisheries Ministry, National Statistical Office, etc)

As an example, the reporting/exporting functionalities developed by *MedFisis* provide the following types of reports/exports:

Official reports/exports (tipically involving the whole register database):

FAO FishStat reports:

Fishstat FF-1 (decked vessels)

Fishstat FF-2 (undecked vessels)

GFCM exports:

Full Fleet Register

Fleet Register Updates

Authorised Vessels List

Task-1

European Union export:

EU Snapshot (fleet register updates)

Full fleet register

National reports/exports (involving part or the whole register):

Fleet Reports (*e.g. MedStat* report) consisting of a table with information on the vessel records:

Small Fleet Report (see an example in figure 2 below)

Standard Fleet Report

Full Fleet Report

Custom Fleet Report

Statistical Reports which provide either a chart or a table with summary statistics. They can be run in the whole fleet or selected parts of it through queries:

Vessel Distribution by Port (see an example in figure 3 below)

Vessel Distribution by Minor Stratum

Vessel Distribution by Vessel Type

Vessel Distribution by Main Gear Class

Vessel Distribution by Vessel Type and Length

Vessel Distribution by Manufacturing Country and Length

Distribution by Port and Vessel Type

Distribution by Vessel Type and Port (see an example in figure 4 below)

Crew Distribution by Vessel Type

Equipment Distribution

Basic Numerical Statistics

National Statistics Summary

Fleet exports (xls, xml, coded or readable):

Full Fleet export

Catch and Effort Assessment export

Exporting on queries (see an example on figure 5)

Ideally a census/fleet register system should allow addition/development of further customised reports according to specific national needs.

Figure 1: Screenshot of the reporting window of t he fleet register software developed by MedFisis.

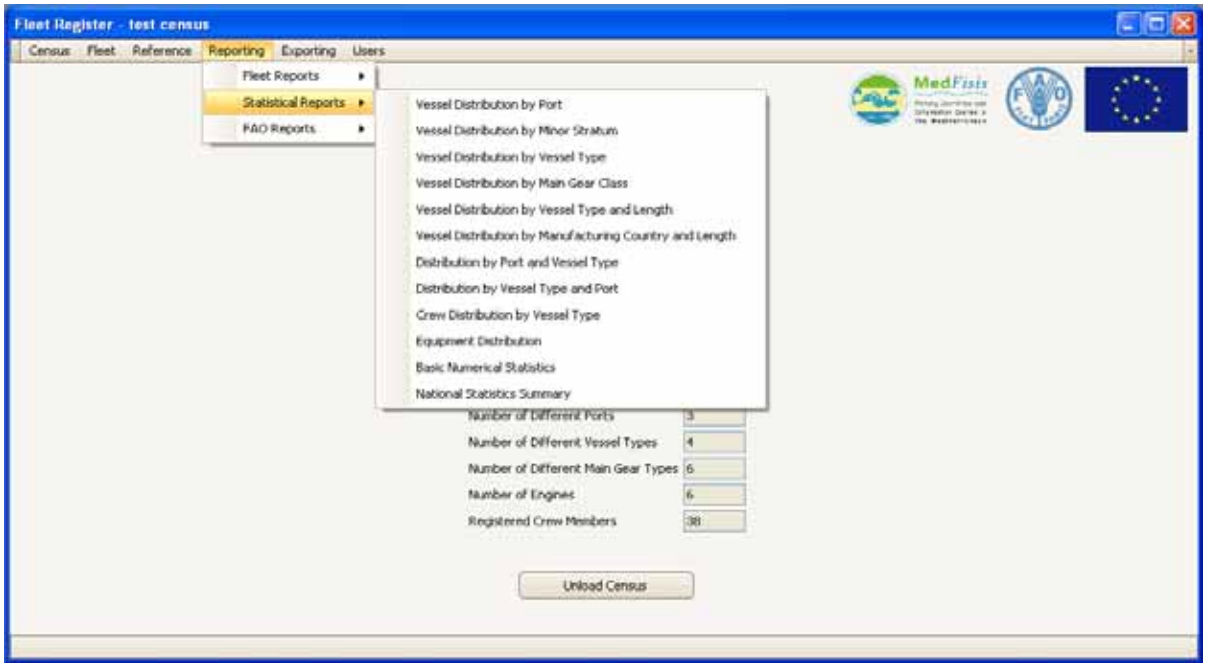


Figure 2. Example of a small fleet report

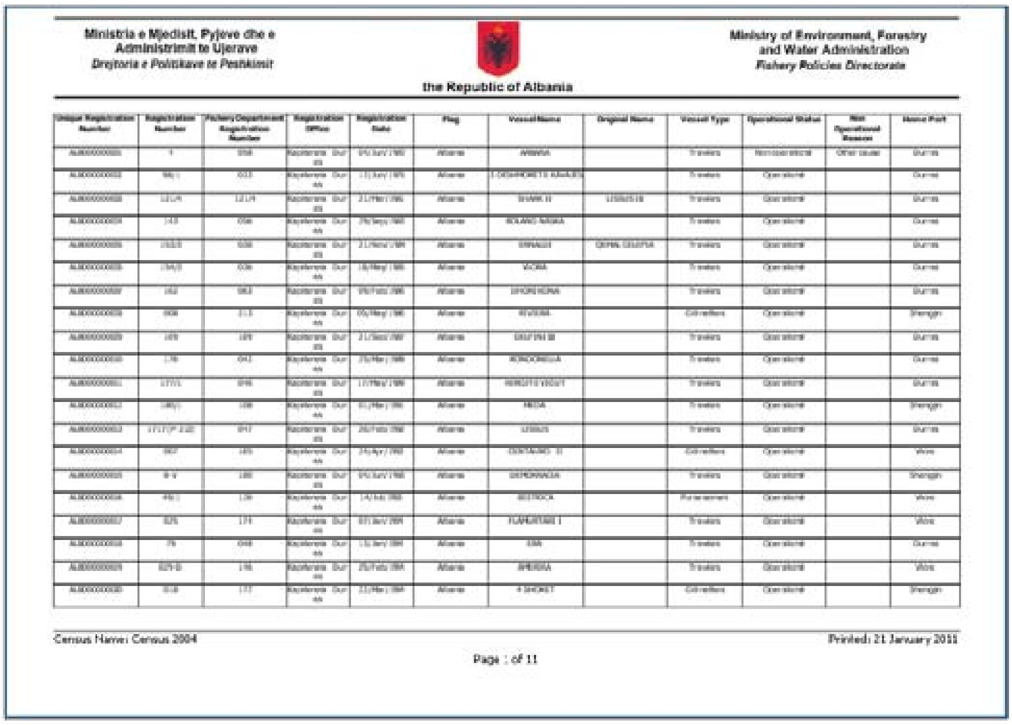
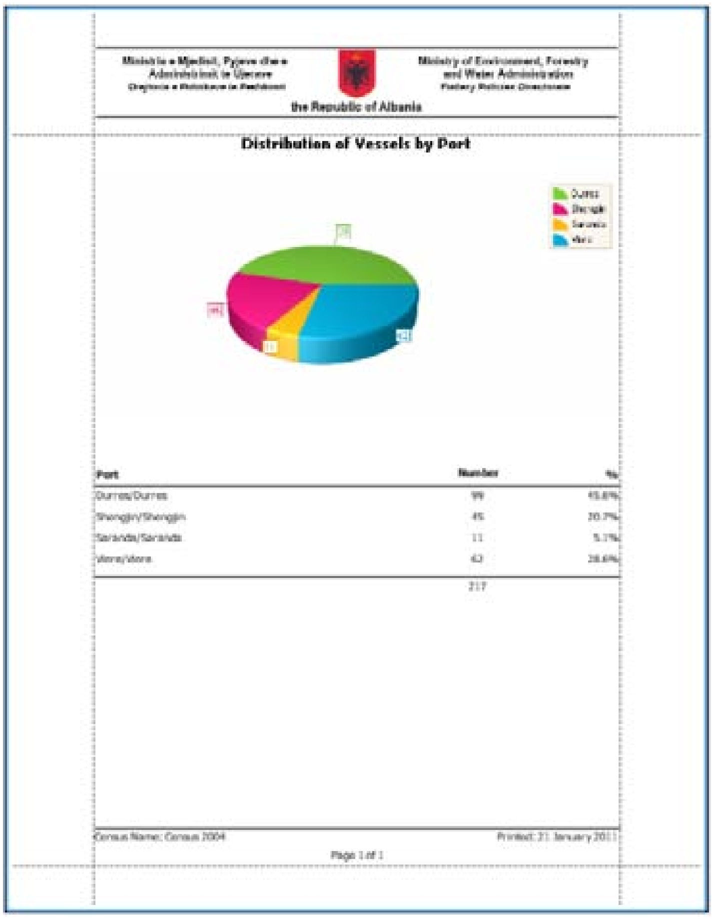
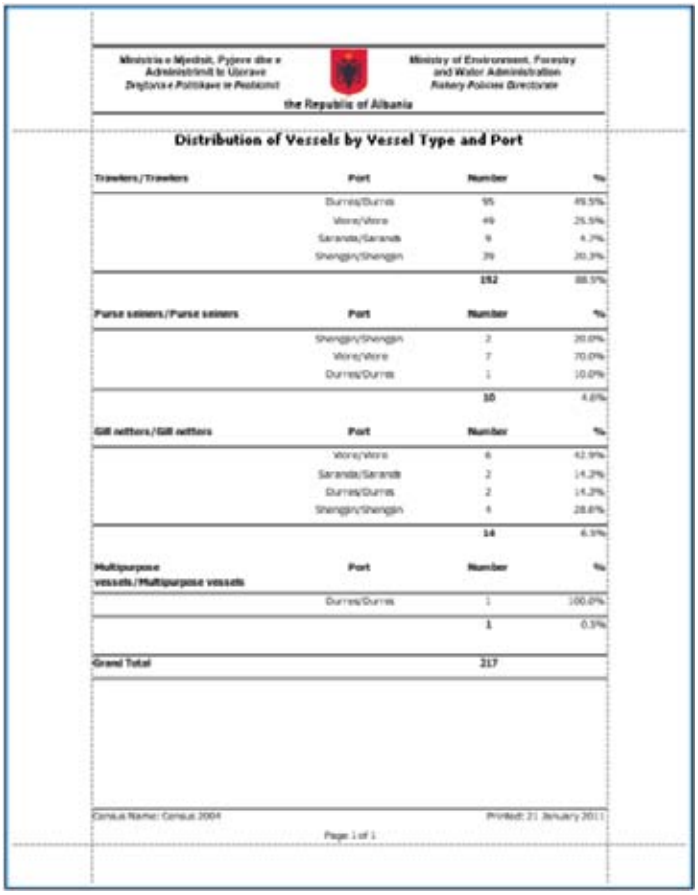


Figure 3. Example of a statistical report (distribution of vessels by port)



Port	Number	%
Durres/Durres	99	45.6%
Shengjin/Shengjin	45	20.7%
Saranda/Saranda	11	5.1%
Vlore/Vlore	62	28.6%
	217	

Figure 4. Example of a statistical report (distribution by vessel type and port)



Ministria e Mjedisit, Pyjeve dhe e Administrimit te Ujerave
Drejtoria e Politikave te Peshkimit

Ministry of Environment, Forestry and Water Administration
Fishery Policies Directorate

the Republic of Albania

Distribution of Vessels by Vessel Type and Port

Trawlers/Trawlers	Port	Number	%
	Durres/Durres	95	49.5%
	Vlore/Vlore	49	25.5%
	Saranda/Saranda	9	4.7%
	Shengjin/Shengjin	39	20.3%
		192	88.5%

Purse seiners/Purse seiners	Port	Number	%
	Shengjin/Shengjin	2	20.0%
	Vlore/Vlore	7	70.0%
	Durres/Durres	1	10.0%
		10	4.6%

Gill netters/Gill netters	Port	Number	%
	Vlore/Vlore	6	42.9%
	Saranda/Saranda	2	14.2%
	Durres/Durres	2	14.2%
	Shengjin/Shengjin	4	28.6%
		14	6.5%

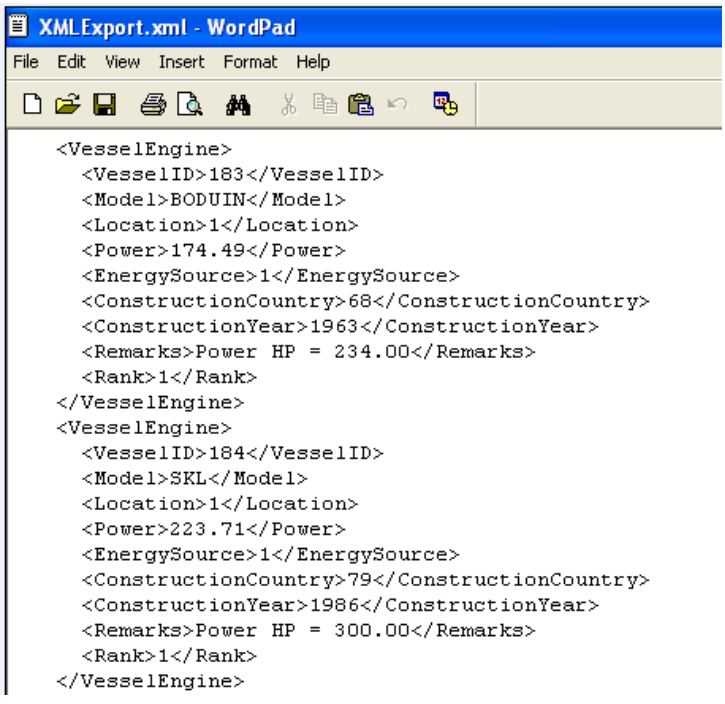
Multipurpose vessels/Multipurpose vessels	Port	Number	%
	Durres/Durres	1	100.0%
		1	0.5%

Grand Total		217	

Census Name: Census 2004 — Printed: 21 January 2011

Page 1 of 1

Figure 5. Example of a fleet export (XML)



XMLExport.xml - WordPad

File Edit View Insert Format Help

```
<VesselEngine>
  <VesselID>183</VesselID>
  <Model>BODUIN</Model>
  <Location>1</Location>
  <Power>174.49</Power>
  <EnergySource>1</EnergySource>
  <ConstructionCountry>68</ConstructionCountry>
  <ConstructionYear>1963</ConstructionYear>
  <Remarks>Power HP = 234.00</Remarks>
  <Rank>1</Rank>
</VesselEngine>
<VesselEngine>
  <VesselID>184</VesselID>
  <Model>SKL</Model>
  <Location>1</Location>
  <Power>223.71</Power>
  <EnergySource>1</EnergySource>
  <ConstructionCountry>79</ConstructionCountry>
  <ConstructionYear>1986</ConstructionYear>
  <Remarks>Power HP = 300.00</Remarks>
  <Rank>1</Rank>
</VesselEngine>
```

Conclusions

An important issue which should be carefully considered when launching a census and its fishing vessel register is its maintenance and updating. This topic is firmly related to the queries that are frequently posed to developers and experts. How long can the census results be considered acceptable and reliable? How often should a census be conducted? - and so on. In other words, after having conducted a census in the best possible way, how can the investment be protected and how to judge when it is time to prepare for a new one?.

The census life cycle is estimated to be of around five years. This is just an approximation because its life mostly depends on the variability and dynamics that change the fishing industry in a country. In the case of agriculture and forestry ten years is the common lifespan of a census. Taking into account that agriculture and forestry structures, except in rare cases, are more stable than those of a fishery, the five year cycle is acceptable. However, since its importance is significant and the investment is high, it is vital to keep the quality of the census as close as possible to the reality until a new survey can be undertaken. There are several activities that can be envisaged and sometimes also recommended to achieve this. Some are useful but also expensive to carry out, others are less efficient but approachable from the cost viewpoint, and others are unrealistic, no matter whether cheap or expensive. Some of the possible and approachable actions are considered below:

(a) The use of certain indicators. This is one of the best approaches provided that the indicators (their components and how they are collected and constructed) have already been tested and found useful to assess the quality of the census data. Of course, this approach only answers part of the question: when are the current census data are no longer reliable?

(b) Undertake *ad hoc* micro surveys to measure some control characteristics that have direct relationship with the contents and the completeness of the census data. The *ad hoc* micro survey *par excellence* is the Quality Check Survey already introduced in the text. It can be used for assessing the status of the survey and, if acceptable, the collected data can be used to update the census

(c) Set up an electronic system whereby the vessel owners are authorised to modify, update and validate the vessel characteristics. This is theoretically valid only if it is implemented in a strictly controlled environment which also includes the verification and validation from the administration. This is rarely applicable unless the entire national information system is computerised and adequate resources (human, material and means, infrastructures, *etc*.) are available and shared between all governmental institutions. This issue will be dealt with in depth in the document concerning the Catch and Effort Assessment Survey under the LogBook section.

(d) The establishment of a computerised Fishing Licensing System linked to the Fishing Vessel Register and of a clear procedure whereby, in the case of applications from the fishermen for a fishing licence, for renewal of or modification to a fishing license, or other requests relating to the license, the applicant is at the outset required to update the related vessel register record before submitting the application.

(e) Use of the Catch and Effort Survey as the sensor of changes in the fleet composition. The administration should introduce a direct link between the catch assessment data collection and the updating of the vessel records. If the country has a CAS by logbook on a census basis, all that fishing category (both industrial and commercial vessels) can benefit by introducing such a link. Needless to say, the two systems must be prepared *a priori* to be able to work in symbiosis. The data base must accept variations originating from the CAS and, at the same time, the CAS questionnaires must be equipped to report changes in the vessel characteristics. Each time such a variation is reported, the CAS operator automatically updates the vessel records.

As far as the CAS by sampling approach is concerned, this facility is obviously only possible for some vessel characteristics in certain Primary Sampling Units (ports/landing places) and is limited to the sampled vessels. However, while this approach has a good impact on the updating of the fishing vessel characteristics and the mechanism certainly works very well, it is not advisable for it to become automatic. In *MedStat* we have successfully installed such procedures, but the physical modification of the vessel records are done by the Vessel Register operator. Technically, the existing procedure is that the CAS operator reports changes according to a given protocol to the Register operator who then flags the changes as “CAS origin”. Of course, in a fully working and reliable client/server environment, this process could be fully automatic and strongly recommended.

Practice and experience would suggest that a census life span, in the absence of major events (war, tsunami, massive migration, serious social conflicts, *etc*.) can go from five to ten years if it is properly monitored. As far as the above cited evaluating and updating measures are concerned, their function must only be to lengthen the life cycle of the census while monitoring its status, but the moment discrepancies appear then a new census must be considered. As far as *MedStat* is concerned, the last two options are the principle choices that *MedFisis* has developed and put into practice. Also, a small tool was developed in the latest version of the Census Register which, without any presumption to determine the status of the art of a census, supports monitoring the variations that occurred in vessel characteristics over a certain period of time. (*i.e.* a sort of tracking system)

Appendix 1: Assessment case studies

A few practical cases are presented below as examples of the variability that can be met in the field, and the type of reactions that have to be taken. In all cases priorities must be set so that crucial issues are dealt with first.

Case 1. A country where the statistical design, data codification system, reporting and quality control are good but data processing is poor since the software is slow and cannot track errors; some data fields are missing, *etc*. Human resources are trained and available and facilities (offices, computers, network, *etc*) are up to standard. This situation will appear as follows in the evaluator's report:

	EVALUATION			
ISSUES	**Up to standards**	**Incomplete**	**Insufficient**	**Not Available**
Statistical	X			
Data Processing			X	
Human Resources	X			
Infrastructure	X			

As a result of the assessment, solutions must be proposed for the data processing part. An upgrade of the software is needed by adapting the existing system to the regional standards and making it more efficient. An error track routine has to be developed within the software and all fields must be completed. The data reporting facilities will be upgraded to produce reports at all levels from national to regional. A small team of people must be trained on how to use the software for data analysis and the production of reports.

Case 2. A country which has a good statistical design, reference and coding systems, an updated data processing software which can produce the necessary reports for the different end-users, but does not have trained recorders so that the data collected is unreliable. There are several working stations with the processing software but they are not enough to keep all data entry on time.

	EVALUATION			
ISSUES	**Up to standards**	**Incomplete**	**Insufficient**	**Not Available**
Statistical	X			
Data Processing	X			
Human Resources			X	
Infrastructure		X		

The main focus of any action must be training, a clear priority issue in this case. Suggest that a theory training course be conducted followed by on-the-job training for recorders and supervisors. This is recommended since an expert will guide the recorders, step by step, through the whole process fixing any weak areas. Also, support must be given to provide more PCs.

Case 3. A country with sufficient trained personnel comprising a supervisor and recorders that are experienced in fisheries data collection but do not have all the necessary hardware or software so that their data processing skills are outdated. Moreover, there is no statistical system in place since there is no understanding of how to design a census survey for the fisheries sector.

ISSUES	EVALUATION			
	Up to standards	**Incomplete**	**Insufficient**	**Not Available**
Statistical			X	
Data Processing		X		
Human Resources	X			
Infrastructure		X		

In this case, the priority must be to establish a new statistical system. Some information will be necessary to plan the statistical design according to the coverage, the vessel typology, *etc*. The reference and codification systems will then have to be checked out or, if they are not already in place, be developed together with the local staff by following the international standards related to the country (*EU, GFCM, FAO*). Once the statistical system is in place, the software used for processing the data and producing the reports must be upgraded. Finally, PCs must be made available so that the tasks can be carried out properly.

Case 4. A country where there is no infrastructure since there is no Fisheries Department with assigned premises and hardware. Moreover, statistics and data processing are the responsibility of another department that is not focussed on fisheries only. Insufficient attention is paid to fisheries statistics with the consequence that there is inadequate provision for the production of proper reports. On the positive side there is sufficient staff available within other departments who are trained in data collection procedures and could be allocated to the task.

ISSUES	EVALUATION			
	Up to standards	**Incomplete**	**Insufficient**	**Not Available**
Statistical		X		
Data Processing		X		
Human Resources	X			
Infrastructure				X

First of all a revision of the Ministry structure must be made. Advice has to be passed onto the Ministry (agriculture, forestry, environment or whatever) so as to highlight the importance of the fisheries sector and therefore the need to create a specific department or service that would deal with it. This means that offices and hardware need to be made available within the Ministry and allocated to the new fisheries department. There will also be a need to allocate personnel including a supervisor for the recorders, a head of department who would coordinate all activities involved and interact with the Ministry and international bodies, *etc*. In the case where there are no funds for computers, it may be worth exploring the possibility of making them available through a *Regional Project*. Secondly, a full revision of the previous statistical system and data processing procedures must be undertaken involving the local staff. By taking this approach it may not be necessary to organise training courses, knowing that the staff is already experienced and needs only to adapt to the upgraded system.

Appendix 2: *QCS* case study

As a practical exercise, an imaginary case study is presented here to give a clear idea of the general procedure to be followed in conducting a quality check survey on the fishing vessel register.

A country with a *Fishing Vessel Registry* produced by updating an earlier one of is considered as a starting point. This country is interested on boosting its national statistical and information system by improving it to a level to be useful for fishery management in the country, and to interact with other major applications in the country. Also, the country wishes to participate in *FAO/GFCM* regional activities and be compliant with the EU in issues concerning data collection methodologies, database structures and data processing models. It would also like to be able to communicate with the EU corporate regional databases.

The immediate targets of the *QCS* are the checking of the status of the census (and therefore the register) of fishing vessels. The *QCS* on the *Fishing Vessel Registry* must be completed before the *QCS* on the catch and effort data collection system can be undertaken. Starting from the register of fishing vessel units, its validity in terms of coverage, consistency and coherence and has to be tested by analysing in detail the whole data collection and memorisation process from the origin of the data to the final database management and reporting system. The quality of the data and its usefulness to the Administration in terms of management of the fleet, and compliance with international (*EU, FAO, GFCM*) regulations, must also be checked. Quality control (that is assessing the quantity, adequacy and utility of the statistics produced, and de-biasing existing fisheries time series) and validation routines have to be in place and tested.

The original census may have been well conceived and properly conducted at the time but it could be that it no longer covers the present needs, or changes have occurred that make it ineffective for its current purpose. Therefore, a *Coverage Check Survey* aimed at validating the existing data and collecting supplementary information to cover the entire commercial fleet in all its characteristics must be considered. By conducting a *Coverage Check Survey* we are targeting inventory errors (or reporting and misclassification errors) as well as content errors or inconsistencies, (Bazigos *et al,* 1984). In greater detail these errors are

Inventory errors. In a fishery census the enumeration process results in a series of lists of fishing ports and landing places, and of the fishing units within ports or landing places. Once it has been ensured that all ports and landing places are correctly reported and updated, the most usual listing errors can be attributed to omissions, duplications or erroneous inclusions of fishing units in the proper port or landing places. Vessel and vessel category misclassifications are also part of this error category.

Content errors. These errors arise from the incorrect listing of any components constituting a fishing unit (vessel, gear, crew). The most common content errors are usually incompleteness, wrong classification and, mainly, lists not being up-to-date. It is well known that fishermen often change vessel structure, gear, equipment, etc., without informing the authorities.

The immediate objective is to assess the status of the present *Register of Fishing Units* and eventually propose, if possible, ways and means to de-bias the system, or minimize errors and/or inconsistencies without running a new census of the fishing fleet which is a costly and time-consuming exercise. The aim of this task is to provide the country, in a relatively short time and with limited financial resources, with a *Fishing Vessel Register* that will:

- serve the Administration in assessing the size and composition of its fishing fleet, knowing the location/distribution of the fleet (base ports), the area, target species and periods of fishing operations, and landing places, *etc.,*
- provide information about the fleet that will facilitate the introduction of managerial strategies to regulate fishing activities (control the fishing effort and capacity) according to species or

area restrictions with the ultimate purpose of maintaining a sustainable exploitation of the stocks,

- construct a sound sampling frame to be used for a *Catch and Effort Survey*,
- provide built-in procedures to generate appropriate national and international reports,
- establish data communication procedures within the national system and with *FAO/GFCM* and EU,
- be *FAO, GFCM*, EU compliant,
- classify or re-classify all items according to a dual classification (national and international) to meet national and regional/community requirements, and
- constitute the basis for the licensing system, *VMS, AVL*.

In order to assess the existing *Fishing Vessel Register*, a sample survey can be carried out to investigate whether vessels' characteristics sampled during the survey are different from those recorded in the registry. The differences, if small, could be due to random factors; if they are large they could be related to systematic errors, and therefore a new census of the fleet would be necessary.

The area distribution of the samples have to be decided upon according to different criteria such as being representative of the general fleet, being homogeneously distributed, *etc*. In fact, the whole design of the *QCS* has to be designed in cooperation with national officers who have the knowledge to decide on the best distribution. Three ports could then be selected within these criteria to run the *QCS.*

Data structure of the Fishing Vessel Registry

The fields from the fishing vessel registry that have to be used for validation during the *QCS* are:

- license number
- name of the vessel
- owners name
- address
- engine power
- gross registered tonnage
- length over all (LOA)
- registered length

The hypothesis to be tested is that the existing register reflects the structural characteristics and number of the fleet. In fact, what is being checked is whether the process used in the country to update the vessels' register during the renewal of fishing licenses, properly records real changes in the fleet

Survey design

Sample surveys can be considered to be selected subsets of the target population which provide estimates of the parameters being studies, with certain assumptions being made about the distribution of the specific population parameters. A sample survey involves uncertainties typically related to the fact that the study is only partial. However, well designed sampling can often produce accurate and reliable estimates at a much lower cost than the complete numeration (census). The *QCS* comprises two stage sampling with non-probability selection of primary units (ports) and census of the secondary units (vessels).

Survey implementation

By definition, a *QCS* must be carried out by qualified personnel only. A list of recorders together with their responsible officer must be drawn up. It is often convenient to carry out a *QCS* implementation course. The goal of this course is: *'To finalize the design of the Quality Check Survey of the Fishing*

Vessel Registry and to prepare interviewers, group leaders, and staff dealing with the fishing vessel register for the survey in the selected ports'. During the course a number of subjects must be covered: rational for the survey,

- the set-up of the Fishing Vessel Register,
- definitions of terms,
- the fishing vessel register in relation to catch and effort assessment and,
- conducting interviews with fishermen.

An important part of the course is practical training in a harbour, where the course participants can conduct a trial survey or *Pilot Survey*, with the cooperation of local fishermen. During the course the last adjustments can be made to the survey design. It must be taken into account that the survey design (for the register) has to be adaptive since different situations may arise; for example, part of a fleet may move to another port during a closed season.

Methodological processing

Three issues should be investigated:

- the presence/absence of vessels in ports and in the registry,
- the presence/absence of fishing vessel characteristics/parameters in the registry, and
- the degree of correspondence between vessel reality (*HP, GRT, LOA*) and registry.

The analysis must include:

- investigation of anomalous data independently in the vessel registry dataset and in the survey dataset,
- investigation of missing values independently in the vessel registry dataset and in the survey dataset,
- comparison between vessel registry data and the survey data (the *QCS*),
- correlations, scatter plots,
- regression analysis between registry and sample vessels' characteristics to investigate the degree of relationship

Investigation of anomalous data and missing values, both in the vessel registry and in the survey data, is necessary to understand the degree of accuracy of the datasets. This must be done before any other analysis.

A simple linear regression analysis has to be performed relating to each structure parameter (*HP, GRT, LOA*), that is *HP* registry values have to be plotted against *HP* survey values and so on for all of the parameters. In a good fit, values should be plotted on the line bisecting the first and third quadrant of Cartesian axes. The value of the regression coefficient (angular coefficient of the line) should not be significantly different from 1, and the intercept value should not be significantly different from 0. These are therefore the two hypothesis to be tested (Ho: β_1=1 and Ho: β_2=0). In the case of hypothesis rejecting, the survey data set will be considered significantly different from the vessel register data set, on the base of the parameters under analysis (*HP, GRT, LOA*). As a consequence, if the regression coefficient is significantly different from 1 and the intercept is significantly different from 0, the registry data and the survey data do not match, and a new full survey would have to be carried out.

Register data check

The data to be checked for missing values in the Register are:

- region,
- city,
- gear,

- number,
- vessel name,
- total power,
- *GRT*,
- *LOA,* and
- registered length.

There are deemed to be *missing values* if one or more of the above characteristics are missing from the record of the secondary sampling unit (fishing vessel, gear and crew). The same parameters must then be checked in the register for *anomalous values.* Anomalous values usually arise in the data input process, and consist mainly in blank spaces written before the answer, or values higher or smaller than is to be expected for one or more of the above characteristics. *Incoherence* arises when values for vessel characteristics that usually go hand by hand (length, *GRT* and *HP*), are very different in magnitude (*e.g.* LOA <18m and HP > 1000, GRT<10 tons and HP>1000, GRT>300 tons and LOA<20m, *etc*).

The project will build on national expertise by contracting national consultants and local institutes to assist with planned project activities. National expertise will also be used during the preliminary gathering of information at country level as the basis for a study of existing statistical and information systems for the identification and upgrading of areas requiring action. These areas will be: data collection, computerized inputs, and analysis of data and information. National counterparts (scientists, fisheries statisticians and other relevant fishery staff) will be closely associated with and trained in each phase of the consultants' interventions.

The project will support the participation of one trainee fisheries statistician from each country in the group training courses organized by the EU-funded *FAO Regional MedFisis Project* to enable capacity building in identified key knowledge gaps in any given country. Training courses will target major topics related to fisheries statistics and information systems, such as the use of a statistical package for processing and analysing fishery data, use of data base management systems for computer programmers, *etc.*

In order to increase awareness in the application of information results for fisheries management, the project will - within the limits of budgetary availability - facilitate the participation of one representative from each country in the yearly steering committee meetings of the EU-funded *FAO Regional MedFisis.*

Survey data check

The survey data is usually analysed by port. However, since this is a *QCS* on a small sample of three ports, all of the data collected can be analysed as a whole. The following rules are to be followed:

- missing data will not be admitted,
- all records containing mistakes should be rectified,
- in case of correction, make a note of each record and field modified,
- where correction is not possible, the record must be deleted,
- in case of many errors the entire port must be rejected.
- if necessary, data must be returned to the country staff.

Comparison of survey with registry data (QCS)

As mentioned in the earlier section *The quality check survey,* in order to check the number of vessels, it is useful to start with the classification:

- vessels on the list (office data) and found in the port (physically),
- vessels on the list (office data), but not found in the port,
- vessels not on the list (office data) but found in the port,

- vessels that are neither in the office data, nor in the port.

The *number of differences* between the values recorded in the survey and those recorded in the registry must be counted and it must be explained whether they refer to input errors in the registry, or can be attributed to real differences. A *cleaning process* is then carried out by correcting the records containing anomalous values related to input errors in the registry. Records with missing values must be deleted since they are of little use for making comparisons.

Appendix 3: The census questionnaire

THE CENSUS QUESTIONNAIRE

(1.1) Recorder name: (RefRecorders)_____ **Code:** _____

(1.2) Date: __ __ **/** __ __ **/** __ __ __ __ **(dd/mm/yyyy)**

Recording Serial: _____

Recording place: _____

(1.3) Recording event: (RefEvents**)**_____

(1.4) Import country: (RefCountries**)**_____

(1.5) Public Aid Code: (RefPublicAidsEU**)**_____

(1.6) Administrative Decision Date: __ __ **/** __ __ **/** __ __ __ __
(dd/mm/yyyy)

IMPORTANT NOTICES

- All underlined bold fields are required (compulsory): this information must be inserted in the *MedFisis* System.
- For Engine, Winch and Fishing Operation underlined fields are required for each existing engine, winch or operation.
- The column “Table” refers to the Codification System paper (*MedStat References Census*).
- Numbering on the left follows numbering of fields in the software; therefore it should not be changed.

2. Fishing vessel characteristics

			TABLE
2.1	**Unique Registration Number**		---
2.2	**Registration Number**		---
2.3	External Marking		---
2.4	**Flag**	□ (*Country*) □ Other: _____	RefCountries
2.5	**Registration Office**		RefMinorStrata
2.6	**Registration Date**	__ __ / __ __ / __ __ __ __ (dd/MM/yyyy)	---
2.7	**Vessel type**		RefVesselTypes
2.8	**Vessel name**		---
2.9	Former name		---
2.10	Former registration number		---
2.11	Former deletion details (register)		---
2.12	Former flag		RefCountries
2.13	**Operational status** (one only)		RefOperationalStatuses
2.14	**Non operational reason** (compulsory only if non operational status)		RefInactivityReasons
2.15	**Home port**		RefPorts
2.17	Remarks		---

3. Structural characteristics

			TABLE
3.1	**Overall length (m)**		---
3.2	Width (m)		---
3.3	Depth (m)		---
3.4	Shipyard / Builder name		---
3.5	Construction country of the vessel	□ (*Country*) □ Other: _____	RefCountries
3.6	Construction year of the vessel		---
3.7	Hull material		RefHullMaterials
3.8	**Decked**	□ Yes □ No	---
3.9	GRT (Gross Registered Tonnage)		---
3.10	**GT (Gross Tonnage)**		---
3.11	GTs		---
3.12	Remarks		

4. Fishing authorisation

			TABLE
4.1	**Authorisation type (License)**		RefAuthorisationTypes
4.2	**Document ID (License number)**		---
4.3	**Issuing office (Registration office)**		RefIssuingOffices
4.4	Issue Date	__ __ / __ __ / __ __ __ __ (dd/MM/yyyy)	---
4.5	Expiry Date	__ __ / __ __ / __ __ __ __ (dd/MM/yyyy)	---
4.6	Fishery Entry Date	__ __ / __ __ / __ __ __ __ (dd/MM/yyyy)	---
4.7	**Fishery Department Registration No.**		---
4.8	License Indicator	□ Yes □ No	---
4.9	Remarks		
Gears			
4.10	Fishing Gear class (1)		RefGearClasses
4.11	**Fishing gear type (1)**		RefGears
4.12	**Target group of species (1)**		RefGroupOfSpecies
4.13	Remarks		
4.10	Fishing Gear class (2)		RefGearClasses
4.11	Fishing gear type (2)		RefGears
4.12	Target group of species (2)		RefGroupOfSpecies
4.13	Remarks		
4.10	Fishing Gear class		RefGearClasses
4.11	Fishing gear type (3)		RefGears
4.12	Target group of species (3)		RefGroupOfSpecies
4.13	Remarks		

5. Engine

	Engine (1)		
			TABLE
5.2	Model		---
5.3	**Engine location**	□ Inboard □ Outboard	RefEngineLocations
5.4	**Power**	_____ □ **kW** □ HP (if kW not available)	---
5.5	Energy source		RefEnergySources
5.6	Construction country of the engine	□ (*Country*) □ Other: _____	RefCountries
5.7	Construction year of the engine		---
5.8	Remarks		

	Engine (2)		
			TABLE
5.2	Model		---
5.3	**Engine location**	□ Inboard □ Outboard	RefEngineLocations
5.4	**Power**	_____ □ **kW** □ HP (if kW not available)	---
5.5	Energy source		RefEnergySources
5.6	Construction country of the engine	□ (*Country*) _____ □ Other:	RefCountries
5.7	Construction year of the engine		---
5.8	Remarks		

6. Electronics

			TABLE
6.1	IRCS Indicator		---
6.2	IRCS Callsign (if there is a IRCS indicator)		---
6.3	VMS Indicator		---
6.4	Remarks		---

7. Equipment

7.1	**Navigation equipment**		
			TABLE
7.2	Navigation equipment (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Navigation equipment (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Navigation equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Capacity		

7.6	Capacity units		RefCapacityUnits
7.7	Remarks		

7.1	**Communication equipment**		
			TABLE
7.2	Communication apparatus (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Communication apparatus (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Communication apparatus (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Value		
7.6	Measurement units		RefCapacityUnits
7.7	Remarks		

7.1	**Fish finder equipment**		
			TABLE
7.2	Fish finder equipment (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Fish finder equipment (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Fish finder equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		

7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Value		
7.6	Measurement units		RefCapacityUnits
7.7	Remarks		

7.1	**Safety equipment**		
			TABLE
7.2	Safety equipment (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Safety equipment (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Safety equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Value		
7.6	Measurement units		RefCapacityUnits
7.7	Remarks		

7.1	**Preservation equipment**		
			TABLE
7.2	Preservation equipment (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Preservation equipment (2)		RefEquipment
7.3	Purchase year (2)		---

7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Preservation equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Value		
7.6	Measurement units		RefCapacityUnits
7.7	Remarks		

7.1	**Processing equipment**		
			TABLE
7.2	Processing equipment (1)		RefEquipment
7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Processing equipment (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Processing equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.2	Other equipment		RefEquipment
7.3	Purchase year		---
7.4	Quantity		
7.5	Value		
7.6	Measurement units		RefCapacityUnits
7.7	Remarks		

7.1	**Other equipment**		
			TABLE
7.2	Other equipment (1)		RefEquipment

7.3	Purchase year (1)		---
7.4	Quantity (1)		
7.5	Value (1)		
7.6	Measurement units (1)		RefCapacityUnits
7.2	Other equipment (2)		RefEquipment
7.3	Purchase year (2)		---
7.4	Quantity (2)		
7.5	Value (2)		
7.6	Measurement units (2)		RefCapacityUnits
7.2	Other equipment (3)		RefEquipment
7.3	Purchase year (3)		---
7.4	Quantity (3)		
7.5	Value (3)		
7.6	Measurement units (3)		RefCapacityUnits
7.7	Remarks		

8. Deck machinery

			TABLE
8.1	**Method of activating the fishing gear**		RefGearActivationMethods
8.2	Remarks		
8.3	**Winch Type (1)**		RefWinchTypes
8.4	Winch Quantity (1)		---
8.5	**Winch operated by (1)**		RefWinchOperationTypes
8.3	**Winch Type (2)**		RefWinchTypes
8.4	Winch Quantity (2)		---
8.5	**Winch operated by (2)**		RefWinchOperationTypes
8.3	**Winch Type (3)**		RefWinchTypes
8.4	Winch Quantity (3)		---
8.5	**Winch operated by (3)**		RefWinchOperationTypes
8.3	**Winch Type (4)**		RefWinchTypes
8.4	Winch Quantity (4)		---
8.5	**Winch operated by (4)**		RefWinchOperationTypes
8.6	Remarks		

9. Ownership

	Owner (1)		**TABLE**
9.1	Company type		RefCompanyTypes
9.2	**Company name / Owner name**		---
9.3	Company establishment year / birth date		---
9.4	Company address		---
9.5	Company postal code		---
9.6	Company town		---
9.7	Company region		---
9.8	Company country	□ (*Country*) □ Other: _____	RefCountries
9.9	Company registration office		RefMinorStrata
9.10	**Operated by (skipper)**		RefOperators
9.11	Operator name		---
9.12	Operator address		---
9.13	Operator postal code		---
9.14	Operator town		---
9.15	Operator region		---
9.16	Operator country	□ (*Country*) □ Other: _____	RefCountries
9.17	Remarks		

	Owner (2)		**TABLE**
9.1	Company type		RefCompanyTypes
9.2	**Company name / Owner name**		---
9.3	Company establishment year / birth date		---
9.4	Company address		---
9.5	Company postal code		---
9.6	Company town		---
9.7	Company region		---
9.8	Company country	□ (*Country*) □ Other: _____	RefCountries
9.9	Company registration office		RefMinorStrata
9.10	**Operated by (skipper)**		RefOperators
9.11	Operator name		---
9.12	Operator address		---
9.13	Operator postal code		---
9.14	Operator town		---
9.15	Operator region		---
9.16	Operator country	□ (*Country*) □ Other: _____	RefCountries
9.17	Remarks		

10. Crew

			TABLE
10.1	Minimum number		---
10.2	Maximum number		---
10.3	Full time number		---
10.4	Remarks		

11. Ports of operation (previous year)

			TABLE
11.1	Port name (period 1)		RefPorts
11.2 11.3	Period 1 (beginning / end)	__ __ / __ __ (mm/mm)	RefMonths
11.1	Port name (period 2)		RefPorts
11.2 11.3	Period 2 (beginning / end)	__ __ / __ __ (mm/mm)	RefMonths
11.1	Port name (period 3)		RefPorts
11.2 11.3	Period 3 (beginning / end)	__ __ / __ __ (mm/mm)	RefMonths
11.1	Port name (period 4)		RefPorts
11.2 11.3	Period 4 (beginning / end)	__ __ / __ __ (mm/mm)	RefMonths
11.4	REMARKS		

12. Fishing operation (previous year)

	Fishing operation (1)		
			TABLE
12.1	**Fishing gear type**		RefGear
12.2	**Fishing starting month**		RefMonths
12.3	**Fishing ending month**		RefMonths
12.4	Approximate number of trips per month		---
12.5	**Fishing zone**		RefFishingZones
12.6	GSA		RefGeoSubAreas
12.7	**Targeted group of species**		RefGroupOfSpecies
12.8	Remarks		

	Fishing operation (2)		
			TABLE
12.1	**Fishing gear type**		RefGear
12.2	**Fishing starting month**		RefMonths
12.3	**Fishing ending month**		RefMonths
12.4	Approximate number of trips per month		---
12.5	**Fishing zone**		RefFishingZones
12.6	GSA		RefGeoSubAreas

12.7	**Targeted group of species**		RefGroupOfSpecies
12.8	Remarks		

	Fishing operation (3)		
			TABLE
12.1	**Fishing gear type**		RefGear
12.2	**Fishing starting month**		RefMonths
12.3	**Fishing ending month**		RefMonths
12.4	Approximate number of trips per month		---
12.5	**Fishing zone**		RefFishingZones
12.6	GSA		RefGeoSubAreas
12.7	**Targeted group of species**		RefGroupOfSpecies
12.8	Remarks		

13. Pollution Prevention

			TABLE
13.1	Disposal of oil residue		RefDisposalTypes
13.2	Disposal of other residue		RefDisposalTypes
13.3	Remarks		

14. General remarks

Appendix 4: Data field descriptions

DATA FIELD DESCRIPTIONS

IMPORTANT NOTICES

- All the 14 boxes refer to the Census Questionnaire paper (*MedStat Form*).
- The column are:
- "Items" refers to fields' name (of the Questionnaire);
- "Comments" contains a useful description of the information requested in each field.
- "Item ref." refers to the numbering in the Questionnaire and the Software fields.

Item ref.	Items	Comments
1.	**Recorders**	
1.1	Recorder name	The name of the recorder carrying out the interview.
	Recorder code	The internal/national code of the recorder carrying out the interview.
1.2	Date	The date when the interview takes place (DD/MM/YYYY)
	Recording Serial	The sequential number of questionnaire done by that recorder on that date (e.g.: questionnaire 1, 2, 3...).
	Recording place	Name of the place where the interview was carried out.
1.3	Recording event	The reason for which the vessel details are being recorded (See References document).
1.4	Import country	(EU field only) The country from which the vessel was imported.
1.5	Public Aid Code	(EU field only) The type of public aid received, if any (see Ref. doc).
1.6	Administrative Decision Date	(EU field only) The date when the vessel received approval for the event.
1.7	Remarks	Notes on the above mentioned characteristics
2.	**Fishing vessel characteristics**	
2.1	Unique registration number	The 12-character unique code assigned to the vessel (GFCM unique identifier).
2.2	Registration Number	The registration number assigned to the fishing vessel by the national authorities.
2.3	External Marking	Indicate the way the vessel is marked. Most of the time the registration number is put onto the hull of the vessel.
2.4	Flag	The country where the vessel is registered.
2.5	Registration Office	The office in which the vessel is registered.
2.6	Registration date	The registration date (dd/mm/yyyy).
2.7	Vessel type	Indicate the type of the vessel (see *RefVesselTypes*)
2.8	Vessel name	The full vessel name.

2.9	Original name	The original name of the vessel, if different to current name.
2.10	Original registration number	The original registration number of the vessel, if different to the current registration number. Indicate if vessel was deleted from register in the original country.
2.11	Original deletion details	The official document indicating why the vessel has moved from the previous country to the current one.
2.12	Original flag	The original country in which the vessel was registered, if different to the current flag.
2.13	Operational status	The operational status of the vessel (only one option to be chosen).
2.14	Non operational reason	The reason of inactivity of the vessel (see *RefInactivityReasons*).
2.15	Home port	The name of the port where the vessel is normally docked.
2.17	Remarks	Notes on the above mentioned characteristics

3.	**Structural characteristics**	
3.1	Overall length (m.)	The principal longitudinal dimension of the hull of the vessel. In other words: the length of the fishing vessel (m) as indicated on the property notebook and the Marine Fishing Licence. If in doubt, or the length is not indicated, the length needs to be measured from the bow to the stern.
3.2	Width (m.)	The width (beam) of the fishing vessel (m) is as indicated on the property notebook and the Marine Fishing Licence. If in doubt, or if the width is not indicated, the width needs to be measured at the widest point of the vessel (starboard to port [from right to left]).
3.3	Depth (m)	The depth of the fishing vessel (m) is as indicated on the property notebook and the Marine Fishing Licence. It is the vertical distance from the lowest point of the hull or keel, to the side of any deck that may be choose as a reference point. Therefore, it has to be stated in specific terms such as depth to upper deck amidships. It is impractical to measure depth in any other way, since it usually varies from one point to another. For example, the depth is greater at the stern than amidships.
3.4	Shipyard	The name of the shipyard where the vessel was built.
3.5	Construction country of the vessel	The country where the vessel was built.
3.6	Construction year of the vessel	The year of construction of the vessel.
3.7	Hull material	The hull material used (see *RefHullMaterials*).
3.8	Decked	If the vessel is decked or not (Y/N). Simply, indicate whether the boat has a deck or whether it is an ‘open’ boat without a deck.
3.9	GRT (Gross Registered Tonnage)	Indicate the Gross Registered Tonnage according to the Oslo Convention (1947) (in use until11995). (GRT represented the total measured cubic content of the permanently enclosed spaces of a vessel, with some allowances or deductions for exempt spaces such as living quarters [1 gross register ton = 100 cubic feet = 2.83 cubic meters]).
3.10	GT (Gross Tonnage)	The Gross Tonnage of the vessel as registered, according to the International Convention on Tonnage Measurement of Ships, London, 1969 (in use since 1996).
3.11	GTs	(EU field only) Indicates the supplementary increase in capacity that is allowed for safety reasons. This information will be found in the boat’s documentation.
3.12	Remarks	Notes on the above mentioned characteristics

4.	**Fishing authorisation**	
4.1	Authorisation type	The type of fishing authorization given to the vessel.
4.2	Document ID	The number of the fishing authorisation (or licence).
4.3	Issuing Office	The office which issued the fishing licence.
4.4	Issue Date	The date of issue for the Fishing Licence (dd/mm/YYYY).
4.5	Expiry Date	The date of expiry for the Fishing Licence (dd/mm/YYYY).
4.6	Fishery Entry Date	The date of entry in fishery of the vessel (dd/mm/YYYY).
4.7	Fishery Department Registration Number	The registration number given by the Fishery Department.
4.8	License Indicator	Indication of whether the vessel has a valid fishing license (Y/N).
4.9	Remarks	Notes on the above mentioned characteristics
Gears (Record first the main fishing gear class as registered for the vessel [see *RefGearClasses*], and then other gears used in order of importance - 2nd, 3rd etc).		
4.10	Fishing gear class	Indicates the category group of each fishing gear authorised to be used (see *RefGearClasses*).
4.11	Fishing Gear type	Indicates the precise/specific gear type of each gear authorised to be used (within a category). (see *RefGearClasses*).
4.12	Target Group of Species	Indicates the group of species, as defined by the GFCM, targeted during a particular fishing operation with a specific type of gear. (see *RefGroupOfSpeciesGFCM*).
4.13	Remarks	Notes on the above mentioned characteristics for any gear.

5.	**Engine**	
5.1	Rank	Indicates the order of importance by numbering them starting from 1.
5.2	Model	The name of the engine model.
5.3	Engine location	The engine position (Inboard/Outboard).
5.4	Power	The engine's power in kW. If not available in kW then record in HP and make note in *5.8 Remarks*
5.5	Energy source	The energy source for propulsion (see *RefEnergySources*).
5.6	Construction country of the engine	The country where the engine was manufactured.
5.7	Construction year of the engine	The year when the engine was manufactured.
5.8	Remarks	Notes on the above mentioned characteristics

6.	**Electronics**	
6.1	IRCS Indicator	Indicates if the vessel has an International Radio Call Sign on board (yes/no).
6.2	IRCS Callsign (if there is an IRCS)	Indicates the International Radio Call Sign of that vessel.
6.3	VMS Indicator	Indicates if there is a Vessel Monitoring System on board (yes/no).
6.4	Remarks	Notes on the above mentioned characteristics

7.	**Equipment**	
7.1	**Navigation equipment**	**The equipment category for navigation apparatuses.**
7.2	Navigation equipment type	The type of each navigation apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each navigation apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic 'measure' (e.g.

		frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other navigation equipment	Indicate any other type of navigation equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Communication equipment**	**The equipment category for communication apparatuses.**
7.2	Communication apparatus	The type of each communication apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each communication apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other communication equipment	Indicate any other type of communication equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Fish finder**	**The equipment category for fish finding apparatuses.**
7.2	Fish finder equipment	The type of each fish finder apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each fish finder apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other fish finder equipment	Indicate any other type of fish finder equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Safety equipment**	**The equipment category for safety items.**
7.2	Safety equipment	The type of each safety apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each safety apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other safety equipment	Indicate any other type of safety equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Preservation equipment**	**The equipment category for fish preservation apparatuses.**
7.2	Preservation equipment	The type of each preservation apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each preservation apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other preservation equipment	Indicate any other type of preservation equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Processing equipment**	**The equipment category for fish processing apparatuses.**

7.2	Processing equipment	The type of each processing apparatus on board (see *RefEquipment*)
7.3	Purchase year	The year of purchase of each processing apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.2	Other processing equipment	Indicates any other type of processing equipment that is not included in the References (Equipment table).
7.7	Remarks	Notes on the above mentioned characteristics
7.1	**Other equipment**	**Any equipment category that is not included in the References.**
7.2	Other equipment	The type of each apparatus on board.
7.3	Purchase year	The year of purchase of each apparatus.
7.4	Quantity	The amount of apparatus of this type or model.
7.5	Value	The value or measurement of a characteristic ‘measure’ (e.g. frequency) of each apparatus.
7.6	Measurement units	The units in which the measurement is done (units of 7.5 *e.g.* kHz)
7.7	Remarks	Notes on the above mentioned characteristics

8.	**Deck machinery**	
8.1	Method of activating the fishing gear	The method used to activate the main fishing gear (manual, automatic...).
8.2	Remarks	Notes on the above mentioned characteristics
8.3	Winch type	Indicates the type of each winch on board (see *RefWinchTypes*)
8.4	Winch Quantity	The number of winches of each type.
8.5	Winch operated by	The method used to operate each winch (see *RefWinchOperationTypes*: mechanical, electric, *etc*.).
8.6	Remarks	Notes on the above mentioned characteristics

9.	**Ownership**	
9.1	Company type	The type of Ownership (see *RefCompanyTypes*).
9.2	Company name	The name of the company owning the vessel.
9.3	Company establishment year	The year when the company was established.
9.4	Company address	The company address.
9.5	Company postal code	The company postal code.
9.6	Company town	The company town.
9.7	Company region	The company region.
9.8	Company country	The company country.
9.9	Company registration office	The office where the company is registered.
9.10	Operated by	Indicates the type of operator: owner, operator... (see Ref. Operators)
9.11	Operator name	The name of the operator, if different from the owner.
9.12	Operator address	The address of the operator, if different from the owner.
9.13	Operator postal code	The postal code of the operator, if different from the owner.
9.14	Operator town	The town of the operator, if different from the owner.
9.15	Operator region	The region of the operator, if different from the owner.
9.16	Operator country	The country of the operator, if different from the owner.
9.17	Remarks	Notes on the above mentioned characteristics

10.	**Crew**	
10.1	Minimum number	The minimum number of the crew on board the vessel during the year.
10.2	Maximum number	The maximum number of the crew on board the vessel during the year.
10.3	Full time number	The number of crew registered with the authorities working on the vessel on a full-time (75-100% revenue) basis during a particular year.
10.4	Remarks	Notes on the above mentioned characteristics

11.	**Port of operation**	**Fishing operations carried out the <u>previous year</u>**
11.1	Port name	The name of each port of operation for each fishing period (see *RefPorts*).
11.2	Period beginning	Beginning month of operations for each Period.
11.3	Period end	End month of operations for each Period.
11.4	Remarks	Notes on the above mentioned characteristics

12.	**Fishing operation**	**Fishing operations carried out the <u>previous year</u>**
12.1	Fishing gear type	The specific type of fishing gear used in each fishing operation (see *RefGearClasses*).
12.2	Fishing starting month	The start of each period where this specific gear type was used.
12.3	Fishing ending month	The end of each period where this specific gear type was used.
12.4	Approximate number of trips	Approximate number of trips per month within this period.
12.5	Fishing Zone	Indicate the main fishing zone where each fishing operation takes place (see References Fishing Zones).
12.6	GSA	The Geographical Sub Area where each fishing operation takes place (see References Geographical Sub Areas).
12.7	Target group of species	Indicates the group of species that are targeted with the particular type of fishing gear (see *RefGroupOfSpeciesGFCM*).
12.8	Remarks	Notes on the above mentioned characteristics

13.	**Pollution Prevention**	
13.1	Disposal of oil residue	The way of disposing/managing oil discards (see Ref Disposal Types).
13.2	Disposal of other residue	The way of disposing/managing other types of residues/discards.
13.3	Remarks	Notes on the above mentioned characteristics

14.	**General remarks**
	This section is available for indicating general remarks regarding the questionnaire as a whole, or those related to a particular section that may require attention.

Appendix 5: Summary of the reference system

Table A5.1 Reference tables used by the fleet register

REFERENCE TABLES USED BY THE REGISTER

Table Name	To be Populated* / Integrated**
Authorisation Types	Populated
Capacity Units	Integrated
Company Types	Integrated
Countries	Integrated
Disposal Types	Integrated
Energy Sources	Integrated
Engine Locations	Integrated
Equipment	Integrated
Equipment Categories	Integrated
Events	Integrated
Event Classes EU	Integrated
Events EU	Integrated
Export Types EU	Integrated
Fishing Zones	Populated
Fleet Segmentation	Integrated
Fleet Segment Identification	Integrated
Gear Activation Methods	Integrated
Gear Classes	Integrated
Gear Group Of Species	Integrated
Gears	Integrated
Gears EU	Integrated
Geo SubAreas	Integrated
Group Of Species	Integrated
Group Of Species GFCM	Integrated
Hull Materials	Integrated
Hull Materials EU	Integrated
Ice Formats	Integrated
Inactivity Reasons	Integrated
Issuing Offices	Populated
LOA Classes	Integrated
Minor Strata	Populated
Months	Integrated
Operational Status	Integrated
Operators	Integrated
Ports	Populated
Public Aids EU	Integrated
Recorders	Populated
T Distribution	Integrated
Vessel Gear Types	Integrated
Vessel Types	Integrated
Vessel Types FAO	Integrated
Vessel Types FFFAO	Integrated
Winch Operation Types	Integrated
Winch Types	Integrated

Total 44 tables

(*) Populated fields have to be customised for each country at the application set up.
(**) Integrated fields are available in the system.

Appendix 6: Revision of the Reference System

Reference Tables revision

MedStat System (September 2010)

Introduction

The *MedFisis* project, Mediterranean Fishery Statistics and Information System, works towards the setting-up of an integrated and standardised statistical system in the Mediterranean region based on the *MedStat* approach and is especially focused on its codification structure.

The codification structure of the *MedStat* fishery statistical system is based on international standards (consolidating all the data requirements of FAO, GFCM and EC) but it also caters for regional and national requirements. The international references are used to standardise, group and aggregate national references and to prepare reports for internal and external functions, whereas the local references are used for national needs and will not appear in international communications.

The GFCM and *MedFisis* codifications have been through some changes in the last 6 years. As a consequence, a general revision of all codes used in the Reference tables of the *MedFisis* application was long needed.

Definition of Reference Tables

The Reference tables contain the list of predefined values for certain data fields whose potential values are already known. These are usually fields related to international requirements. Therefore, the values in the tables form a list of options to choose from when giving a value to a determined field.

The reference tables are part of the system and provide standard answers to many fields that are part of the questionnaire. Therefore, they serve the system on two occasions: one when carrying out the questionnaire in the field (by allowing the choice of an answer to certain fields) and secondly when inputting the data into the system (where it provides the list of possible answers to certain fields).

One could say that the overall system comprises:

- the application, that provides the data fields, the linkage between them, the tests, the reporting and exporting facilities, *etc.,*
- the reference tables, which are the source of standard values for certain fields, and
- the data, which is input and stored into the system by creating one record per fishing vessel.

General Overview of the MedFisis reference tables

The *MedStat*/*MedFisis* system uses a total of 58 reference tables which provide the full list of all potential answers to certain (many) fields. Out of these, 53 tables are listed in the Reference document; one of them is the ‘species’ list which is not reproduced here due to its length (ASFIS list of around 10.000 species) and four other tables are internal linking/calculation tables:

- FleetSegmentIdentification (Internal table)
- GearGroupOfSpecies (linking table)
- TDistribution (internal calculations)
- VesselGearType (linking table)

From this set of 58 tables, 50 are more or less static and eight are customisable. These eight tables are meant to be filled up with national specific information at the set up of the application.

The fleet register (census) application uses 42 out of these tables, six of which are of the customisable type. The rest may be used by the CAS surveys.

The Reference tables deal with aspects like types of gears and types of vessels, fleet segmentation,

areas, ports, group of species, *etc.* for which a predefined list of values is necessary (in order to keep international standardisation). Some of these tables correspond to fields related to the GFCM, FAO (FF forms) or EC requirements and therefore follow their codification. There are a total of 111 fields in the Census / Fleet Register application (and in the questionnaire). Of these, 39 are related to reference tables. Only 42 fields are compulsory (38 for non-EU countries) and not necessarily related to reference tables. The Reference tables are built up of a number of columns which are, at least, the ID (code) of each value (predefined answer), the description, the name in the national language and the name in English. The user can choose which language to show when deploying the drop-down list at the data input (this has to be established at the set up of the application). Some tables also contain extra columns which establish the link to other tables (*e.g.* RefGears) or value ranges for each potential answer (*e.g.* RefLOAClasses) or extra information regarding these answers (*e.g.* RefPorts).

Types of tables

There are 3 types of reference tables in the Census / Fleet Register system: the integrated (25), populated (6) and mixed/extendable (11) ones.

- The **integrated tables** are those providing an exhaustive list of all possible values for that field. These tables are the most common ones (25 out of 42 reference tables). They are usually standard at regional or international level, which means that they have been agreed at international level and that the national values have been appropriately related to these. Examples of integrated tables are: the gears, events, the fleet segmentation, geographic sub-areas, group of species, *etc.* The values in these tables are usually linked to other values in other tables by means of their codes. This linkage is used for validation (quality control) of some fields based on the values of related ones (see a couple of examples of integrated tables below). For this type of table, the addition of new answers or values is not allowed.

Table A6.1: Fleet Segmentation[1] according to the GFCM. The fleet segments have been agreed by the GFCM members and they relate to vessel types and length classes

FIPD008\SQLE...tSegmentation

	ID	Description	Name	NameENG	AlphaCode
▶	99		Not Classified	Not Classified	X
	A		Polyvalent vessels without engine (<12 metres)	Polyvalent vessels without engine (<12 metres)	A
	B		Polyvalent vessels with engine (<6 metres)	Polyvalent vessels with engine (<6 metres)	B
	C		Polyvalent vessels with engine (6-12 metres)	Polyvalent vessels with engine (6-12 metres)	C
	D		Trawlers (<12 metres)	Trawlers (<12 metres)	D
	E		Trawlers (12-24 metres)	Trawlers (12-24 metres)	E
	F		Trawlers (>24 metres)	Trawlers (>24 metres)	F
	G		Purse Seiners (6-12 metres)	Purse Seiners (6-12 metres)	G
	H		Purse Seiners (>12 metres)	Purse Seiners (>12 metres)	H
	I		Long liners (>6 metres)	Long liners (>6 metres)	I
	J		Pelagic Trawlers (>6 metres)	Pelagic Trawlers (>6 metres)	J
	K		Tuna Seiners (>12 metres)	Tuna Seiners (>12 metres)	K
	L		Dredgers (>6 metres)	Dredgers (>6 metres)	L
	M		Polyvalent vessels (>12 metres)	Polyvalent vessels (>12 metres)	M
*	NULL	NULL	NULL	NULL	NULL

Table A6.1: Fleet Segmentation[2] according to th

[1] **GFCM/33/2009/3** (Annex 1). Implementation of the GFCM Task 1 Statistical Matrix repealing Resolution GFCM/31/2007/1.

Table A6.2: Gear classes according to the ISSCFG. The values for the "Gear Class" field are limited and listed in the following table. No new gear classes can be added to it

FIPD008\SQLE...efGearClasses

	ID	Description	Name	NameENG
▶	01		Surrounding Nets	Surrounding Nets
	02		Seine Nets	Seine Nets
	03		Trawls	Trawls
	04		Dredges	Dredges
	05		Lift Nets	Lift Nets
	06		Falling Gear	Falling Gear
	07		Gillnets and Entangling Nets	Gillnets and Entangling Nets
	08		Traps	Traps
	09		Hooks and Lines	Hooks and Lines
	10		Grappling and Wounding	Grappling and Wounding
	11		Harvesting Machines	Harvesting Machines
	20		Miscellaneous Gear	Miscellaneous Gear
	25		Recreational Fishing Gear	Recreational Fishing Gear
	99		Gear Not Known or Not Specified	Gear Not Known or Not Specified
*	*NULL*	*NULL*	*NULL*	*NULL*

- The **populated tables** are those that are directly related to the country and therefore their values cannot be provided directly by the standard reference tables. Instead, the tables provide a numbered list to be replaced with national values/answers. There are six populated tables within the census / fleet register system, which need to be decided beforehand by the national authorities and must be populated during the set-up of the application. These tables are: port names, recorders, authorisation types, minor strata, issuing offices and fishing zones. The values of these tables can relate to values in other tables but the connections will have to be built during the set up (for example, linking the Ports to the Minor Strata). However, some of these tables are not linked to other tables (such as the recorders). The populated tables allow for customization of the application to each country's needs (together with the selection of national language) by specifying the values/answers for these fields.

Table A6.3: Ports: example of a populated table before being filled up with country information (real ports names and location)

FIPD008\SQLEX...- dbo.RefPorts

	ID	Description	Name	NameENG	PortCode	MinorStratum	Latitude	Longitude	GeoSubArea	PortType	PortCodeEU
▶	1		Port 1	Port 1	AAA	204	19°32'00"	41°28'00"	17	1	
	2		Port 2	Port 2		202			19	1	
	3		Port 3	Port 3		203			17	1	
	4		Port 4	Port 4		201			17	1	
	5		Port 5	Port 5		201			18.1	1	
*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*

Table A6.4: Recorders: example of a populated table before being filled up with country information (real recorders names)

FIPD008\SQLEX...o.RefRecorders

	ID	Description	Name	NameENG
▶	201		Recorder 1	Recorder 1
	202		Recorder 2	Recorder 2
	203		Recorder 3	Recorder 3
	204		Recorder 4	Recorder 4
	998		Other	Other
	999		Unknown	Unknown
*	NULL	NULL	NULL	NULL

- The **mixed/extendable** tables are those that are initially integrated tables, but that can accept additions to the list of values. These additions could relate to other fields by building the links at the set up. However, these will not be essential to international reports. Examples of mixed/extendable tables are: the equipment, equipment categories, energy sources, disposal types, hull materials, etc.

Table A6.5: Equipment categories

FIPD008\SQLE...entCategories

	ID	Description	Name	NameENG
▶	1		Navigation equipment	Navigation equipment
	2		Communication apparatus	Communication apparatus
	3		Fish finder	Fish finder
	4		Safety equipment	Safety equipment
	5		Preservation equipment	Preservation equipment
	6		Processing equipment	Processing equipment
	7		Other equipment	Other equipment
*	NULL	NULL	NULL	NULL

Modifications done

The *MedFisis* system had developed and used, until 2010, its own codification (internal) which derived mainly from the GFCM and FAO (FF forms) codifications and was linked to the EU codification. This system though needed to be normalised by adopting an internationally agreed codification that can be applicable everywhere in the Mediterranean.

As a consequence, during 2010, a thorough revision of the tables, fields, values and codes was undertaken to make sure that the updated codification would be compatible and coherent with international, regional and national requirements. The full set of tables was revised and the necessary modifications were carried out (see *figure A6.6* for specifications).

In general, all tables were checked one by one and:

- checks were made for correctness (codification, classification, contents, *etc*),
- gear codes and vessel codes were updated according to the ISSCFG[3] and ISSCFV[4] respectively (agreed by the Coordinating Working Party of Fisheries Statistics). This international classification was used as the basis for the upgraded-revised *MedFisis* gear classification and, therefore, also their links to other related tables had to be updated. The tables *gears FAO, gear classes FAO* and *vessel types FAO* became redundant and were deleted,

[3] International Standard Statistical Classification of Fishing Gears.
[4] International Standard Statistical Classification of Fishing Vessels.

- Some table names were corrected and therefore related columns in other linked tables (the previously called *SubBasin* and *Basin* tables, are really *FAO Statistical Division* and *FAO SubArea*, according to FAO classification),
- Unnecessary tables (not in use nowadays) were removed from the system (*e.g. MAGP segments EU* refers to an outdated multi-annual programme and *gears FFFAO* was incorrect and therefore removed),
- the *Other* option (value) was removed from some tables where it made no sense (gears, *etc*).

At the same time, two tables were added: *Events* and *Group of species GFCM*. The first one is a table acting as a link for the *events EU* but incorporating two more types of events to include the corrections of human errors and an indication that the event information comes from the CAS survey. The second table also acts as a link for the *Group of species* table set by GFCM but allowing incorporation of two subgroups: *tuna* and *excluding tuna* that are of interest to the *MedFisis* system.

One of the most important modifications has been the reconstruction of links among related tables that were corrupted. These links are of major importance since they are used for validations and checks of the data entered into the system.

Other modifications carried out in the reference tables are:

- the extension of the list of possible values (for example the capacity units and company types),
- the correction of wrong values (mistakes introduced throughout time),
- the updating of the codes, updating (inclusion of new) EU values for certain tables, and
- the setting up of the populated tables into sequential numbers so that they can be replaced with data for each country.

The importance of updating

Updating the references is a crucial task since outdated codes, values, or links in these tables could lead to major mistakes in the analysis and interpretation of the reported data. Wrong interpretation based upon it could lead to ineffective or even harmful management measures.

The dynamic process of updating the References

The codification standards are being constantly revised and agreed upon by the countries and international bodies. This process does not take place very often. However, there are occasions when it can happen, such as whenever the management systems undergo changes, like for example, the “control” of the fishing capacity of the fleet or the application of the Operational Units concept to fisheries for the management of the effort instead of the catches. In cases like these, there may be reorganisation of concepts that require a revision of the classification and codification systems.

The Coordinating Working Party (CWP) through its ISSCFG meeting groups is one of the fora for updates or revisions of codification and classification, but not the only one. The GFCM has used a partial classification of fishing vessel types based on the ISSCFV according to the needs of the Mediterranean region. This classification has to be revised some time soon to maintain compliance with the established international standards. When these changes take place, the system should be updated to make sure it complies with all requirements and it is still effective for its purpose.

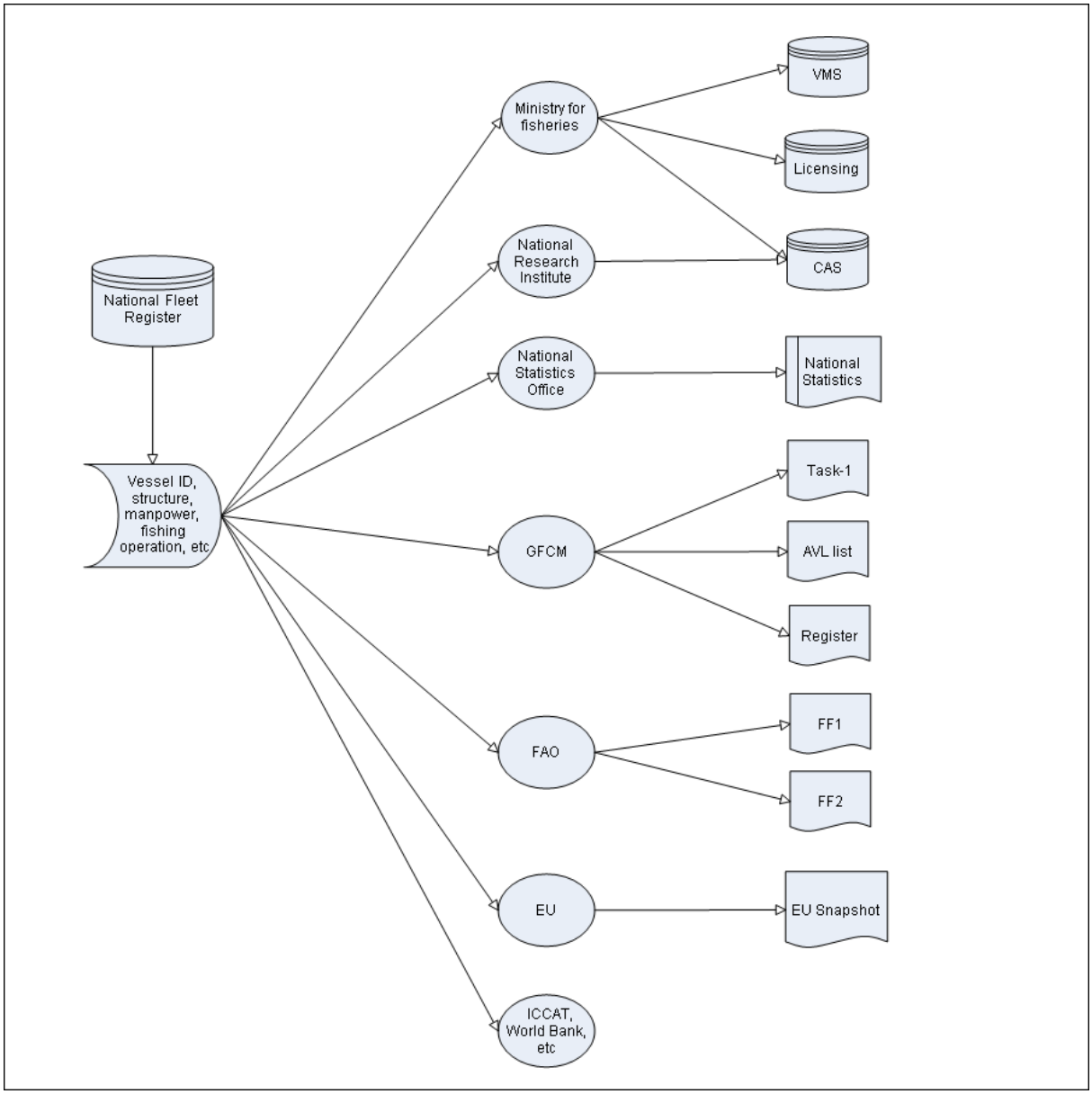
Table A6.6 Ful list of reference tables used by the system (register and catch assessment), including type of table and main changes undertaken

Table Name	Previous Table Name	Integrated / Populated*	Used by FR	Main Changes
Authorisation Types	Authorisation Types	**Populated**	Yes	Re-organised
Capacity Units	Capacity Units	Integrated	Yes	List extended
Company Types	Company Types	Integrated	Yes	List extended
Countries	Countries	Integrated	Yes	Added NameFRN & NameESP + *MedFisis* countries
Disposal Types	Disposal Types	Integrated	Yes	
Energy Sources	Energy Sources	Integrated	Yes	
Engine Locations	Engine Locations	Integrated	Yes	
Equipment	Equipment	Integrated	Yes	List extended
Equipment Categories	Equipment Categories	Integrated	Yes	
Events	***None***	Integrated	Yes	New Table: Connecting with "Events EU"
Event Classes EU	Event Classes EU	Integrated	Yes	
Events EU	Events EU	Integrated	Yes	
Export Types EU	Export Types EU	Integrated	Yes	Spelling
FAO Statistical Division	**SubBasins**	Integrated	**NO**	Table & column names updated. Values corrected.
FAO SubArea	**Basins**	Integrated	**NO**	Table name updated. SubArea 37.4 added
Fishery Sectors	Fishery Sectors	Integrated	**NO**	
Fishing Techniques EU	Fishing Techniques EU	Integrated	**NO**	(no description, no info)
Fishing Zones	Fishing Zones	**Populated**	Yes	
Fish Presentation Types	Fish Presentation Types	Integrated	**NO**	Corrected
Fish Tags	Fish Tags	Integrated	**NO**	
Fleet Segmentation	Fleet Segmentation	Integrated	Yes	Values revised and updated
Fleet Segment Identification	Fleet Segment Identification	Integrated	Yes	Revised and completed.
Gear Activation Methods	Gear Activation Methods	Integrated	Yes	
Gear Classes	Gear Classes	Integrated	Yes	"Other gear" option removed.
None	Gear Classes FAO	~~Integrated~~	~~**NO**~~	(Redundant)
Gear Group Of Species	Gear Group Of Species	Integrated	Yes	Corrected codes + reconstructed links + completed
Gears	Gears	Integrated	Yes	Corrected codes + revised + "Other gear" removed
Gears EU	Gears EU	Integrated	Yes	Revised
None	Gears FAO	~~Integrated~~	~~**NO**~~	"Other gear" & "FFFAO" removed. Revised abbreviations
None	**Gears FFFAO**	~~Integrated~~	~~**NO**~~	Deleted
Gear Units	Gear Units	Integrated	**NO**	Replaced by Gear Units GFCM

Geo SubAreas	Geo SubAreas	Integrated	Yes	Spelling + revision & correction, new SubAreas updated
Group Of Species	Group Of Species	Integrated	Yes	Spelling + "Other" & "Unknown" removed. ISCAAP
Group Of Species GFCM	***None***	Integrated	Yes	New Table: Matching with GFCM
Hull Materials	Hull Materials	Integrated	Yes	
Hull Materials EU	Hull Materials EU	Integrated	Yes	
Ice Formats	Ice Formats	Integrated	**NO**	
Inactivity Reasons	Inactivity Reasons	Integrated	Yes	
Issuing Offices	Issuing Offices	**Populated**	Yes	
LOA Classes	LOA Classes	Integrated	Yes	
Logbook NA Reasons	Logbook NA Reasons	Integrated	**NO**	
None	**MAGP Segments EU**	~~**Populated**~~	~~**NO**~~	Deleted
Marine Fishery Subsectors	Marine Fishery Subsectors	Integrated	**NO**	
Minor Strata	Minor Strata	**Populated**	Yes	Changed values to Minor Strata 1, 2, 3, etc.
Months	Months	Integrated	Yes	
Operational Status	Operational Status	Integrated	Yes	Removed "Other" option
Operators	Operators	Integrated	Yes	
Permanent Modifications	Permanent Modifications	Integrated	**NO**	
Ports	Ports	**Populated**	Yes	Changed values to Port 1, 2, 3, etc. + Geo SubArea
Port Types	Port Types	Integrated	**NO**	
Public Aids EU	Public Aids EU	Integrated	Yes	Added with 2 new options from EU website
Recorders	Recorders	**Populated**	Yes	Changed values to Recorder 1, 2, 3, etc.
Species	Species	Integrated	**NO**	Replaced with ASFIS list (10.900 species)
Stocks	Stocks	Integrated	**NO**	(is this correct?)
Strata	Strata	**Populated**	**NO**	Changed values to Strata 1, 2, 3, etc.
Substrata	Substrata	**Populated**	**NO**	Changed values to Substrata 1, 2, 3, etc.
T Distribution	T Distribution	Integrated	Yes	
Vessel Gear Types	Vessel Gear Types	Integrated	Yes	Re-done from scratch.
Vessel Types	Vessel Types	Integrated	Yes	Revised ISSCFV codes & classes + STD abbrev column
None	Vessel Types FAO	~~Integrated~~	~~**NO**~~	Revised ISSCFV codes & classes. Link to FFFAO codes
Vessel Types FFFAO	Vessel Types FFFAO	Integrated	Yes	
Winch Operation Types	Winch Operation Types	Integrated	Yes	
Winch Types	Winch Types	Integrated	Yes	
Total 58 tables	Total 62 tables	8 populated	42 for census	

Appendix 7: Flow chart of pre-census assessment

Figure A7.1 Census data uses



Shape Legend:

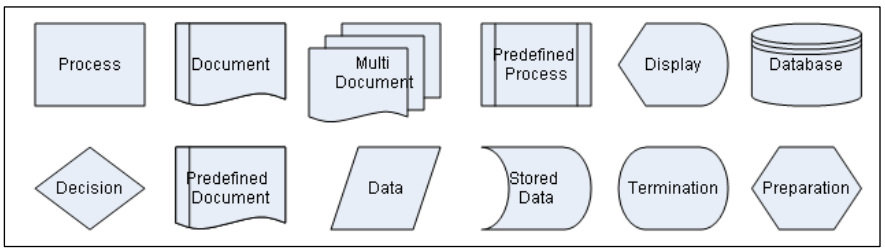
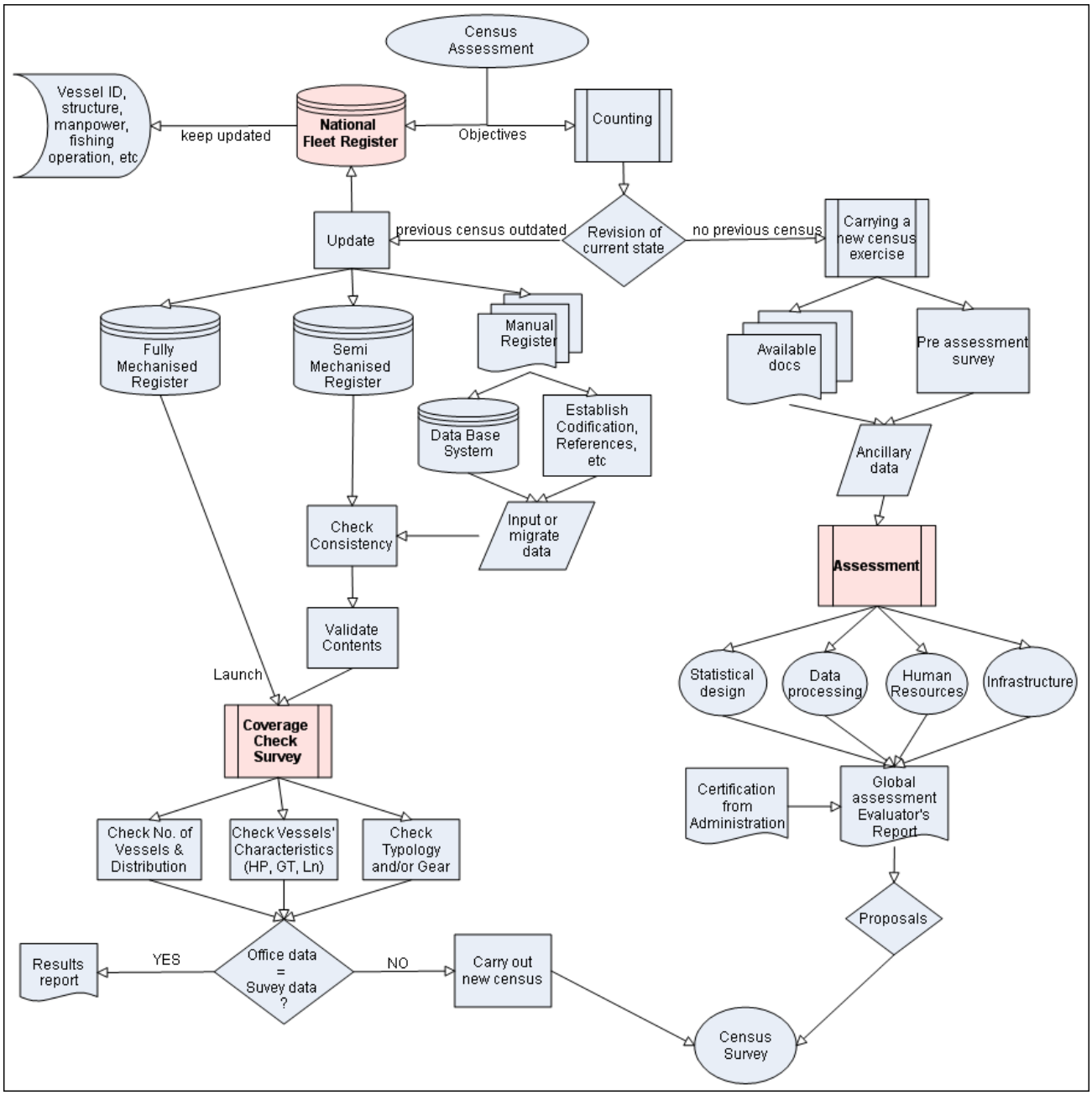
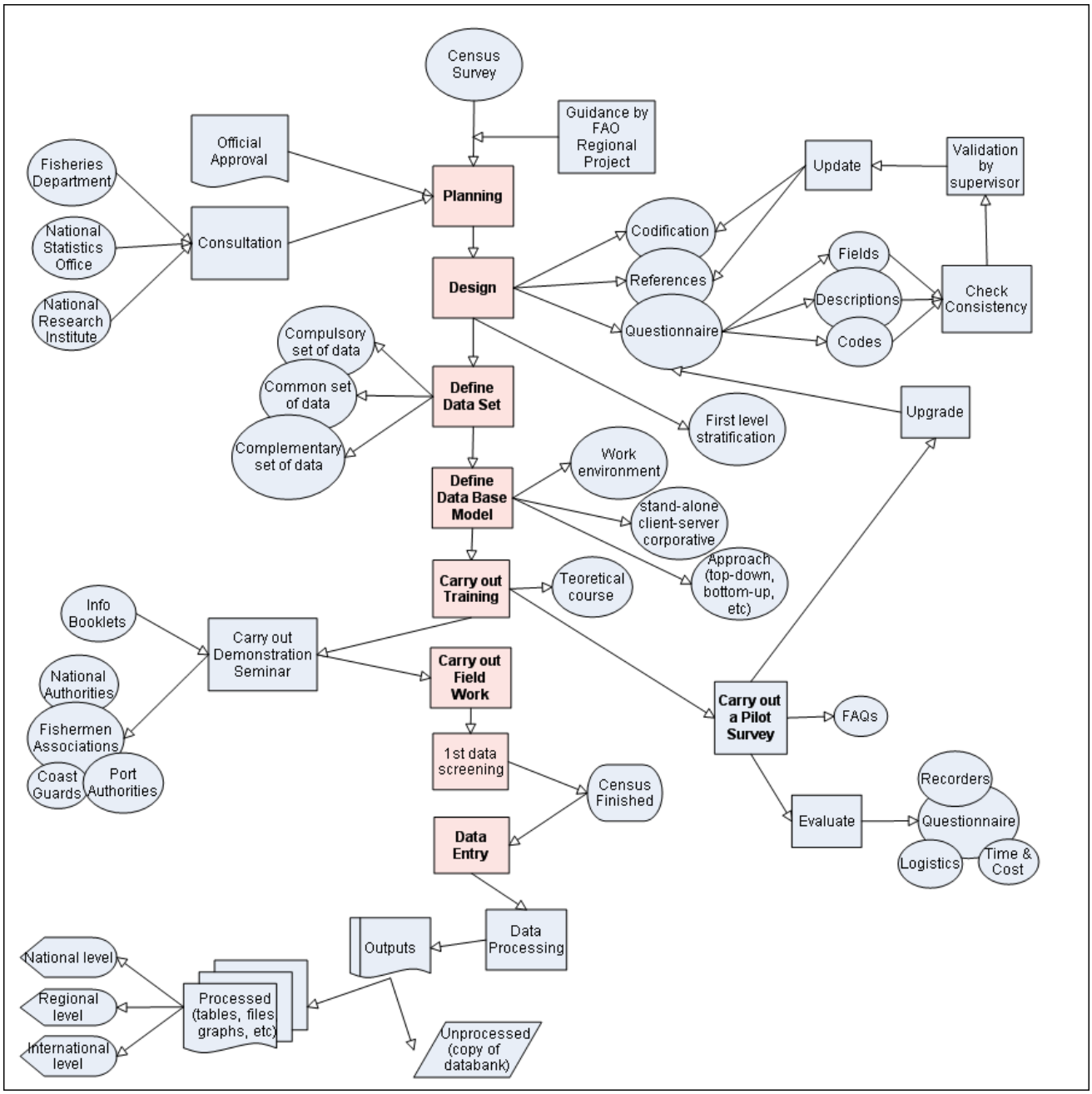


Figure A7.2 Pre-census assessment



Appendix 8: Flow chart of census survey

Figure A8.1 Census survey



Appendix 9: Inventory of Artisanal Fisheries Communities in the Western and Central Mediterranean

Ports, landing places or any other localities where an activity defined as «Artisanal Fishery» was present.

- ❑ Name of the Port/Locality
- ❑ Region or province (administrative) where located
- ❑ Geographical localisation of the Port in Latitude, Longitude units.
- ❑ Very brief description identifying the port or locality (few words to explain whether it was a port or a landing place, a seasonal landing place or other).
- ❑ Expected number of artisanal fishing units present in the port (known or subjective estimates)
- ❑ Expected number of artisanal fishermen present in the port (known or subjective estimates).
- ❑ Note. Any ancillary information useful to the work

- ❖ Description of the ports (about half page) describing the port, its position, the activity, the importance, the coexistence of other activities related to artisanal fishery, etc. Also the presence in the area or in the vicinity of tourist areas, marine or national parks, etc. (In a separate file)

- ♦ A photograph of the port or locality, emphasising the artisanal component.

For each port or locality the following items were collected

- ❑ Gear used (FAO name in English, French or Spanish)
- ❑ National/Local Name of the gear
- ❑ Target Species (Scientific Name, or FAO name in English, French or Spanish)
- ❑ National/Local Name of the Target Species
- ❑ Associated Species (Scientific Names, or FAO Names in English, French or Spanish).
- ❑ Fishing Zone by name or a range from the port, or any other indication as appropriate
- ❑ Average depth (known parameter or estimates)
- ❑ Months of activity in the year.
- ❑ Expected number of artisanal fishing units using that gear in that period (known or estimates)
- ❑ Expected number of artisanal fishermen using that gear in that period (known or subjective estimates).
- ❑ Fish transport performed by the same fishermen
- ❑ Complementary activity carried out by the above (boat/fishermen)
- ❑ Associated in Co-operative

- ❖ For each of the above items, whenever applicable, a description or comments were required. (Description or comments were to be given in a separate file, mainly reporting on details about Gear used, Species and associated, Fishing zones, Months of activity, Number of units and Number of Fisherman)

- ♦ A photograph of the gear and the species was requested.

Appendix10: Port / Landing Place (Infrastructures) Questionnaire

Recorder name: _____ Code: _____

Date: DD MM / YYYY

Recording Serial: _____

Name of port / landing place: _____

Geographical location

GPS Coordinates: Latitude_____ Longitude_____
Province: _____
Region: _____
Postal reference: _____

Physical description

Type of coast: _____ (beach, cliffs, rocky, etc)
Natural or artificial protections: _____ (islands, pier, etc)
Access ways: _____ (road, path, transport, etc)
Other: _____

Administrative details

Marine department: _____
Harbour office: _____
Legal authority: _____

Telecommunications

Telephone: _____
Fax: _____
Electronic mail: _____
Website: _____

Operating limits

Access limits: _____
Draft: _____
Length: _____
Tonnage: _____
Maximum admissible size of fishing boats: _____

Fishing fleet

Estimated number of vessels: _____
Estimated number of fishermen: _____
Estimated number of fishermen per boat: _____
Main types of fishing vessel: _____
Main types of fishing gear: _____
Estimated average length of vessels: _____

Servicing Infrastructures

Number of refrigerating plants: _____
Characteristics: _____
Number of freezing plants: _____
Characteristics: _____
Number of oil/petrol pumps: _____

Electricity: (yes/no) _____
Water: (yes/no) _____
Ice: (yes/no) _____
Boatyard: (yes/no) _____
Medical emergency services: (yes/no) _____
Laying-up services: (yes/no) _____
Gear repairs: (yes/no) _____

Commercial Infrastructures

Sale of electronic items and engines: (yes/no) _____
Fish Market: (yes/no) _____
Type of fish market: (big, small, international...) _____
Associations: (yes/no) _____
Marine agent: (yes/no) _____

Comments

Appendix 11: Terms of reference for advisory services (evaluator)

TERMS OF REFERENCE
for
Advisory Services (Evaluator)

Under the general and technical supervision of the **[**Committing Ministry/Division] and of the direct supervision of the [Committing Service/Office], will lead team activities for the project implementation. He will liaise closely with national counterparts the Fishery Departments and with other officials appointed by the Governments.

During the first mission (one week in each country, split in two/three missions) the expert will assess the national working environment and identify functions required to implement the system to be developed. He will liaise with the administrations responsible for its management to define technical requirements (norms and standards, types of reports, periodicity, "clients", etc.), taking in due account historical developments, existing capacity and tools, and identify the major problems and gaps (data quality, timeliness, information technology). More specifically, the expert will:

- Ascertain the accuracy, completeness, up-to-date status, and usefulness of the existing national registers for fishery, as well as their suitability for the purpose of designing national catch assessment surveys;
- Undertake a methodological and procedural assessment of the catch and effort survey system and evaluate the coverage, the quality and its position and correlation in the frame of a regional context;
- Design, in consultation with national authorities, a methodological implementation programme, including estimate of resources required and the viability of the proposal in terms of priorities and cost-benefits;
- Define a remote monitoring programme to support national activities in the short-medium terms;
- Prepare details of the local contractual arrangements for field census/survey and in-country group training organization.

During the second mission (one week in each country, split in two/three missions) the expert will make a presentation of the system to be implemented and plan for training requirements of national counterparts. Specific tasks in the countries will vary according to the scenario identified as feasible and viable in each one country. However, activities will aim at proposing solutions for the review or improvement of the following:

- design and implement a coverage frame survey for accurate assessment and recording of the current size, structure and localisation of the fishing fleet, as well as the major land-based fishery infrastructures;
- undertake the system design and development, or revision, of a computerised fishing register of fishing vessels;
- construct 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;
- introduce the catch and effort survey that meets national and regional standards;
- set up an 'on-line workgroup' to respond to ad hoc queries that will certainly arise during the field work to be undertaken by national teams.

Each activity to be undertaken during both missions will be carried out calling upon the close participation of national staff, with a view to give top priority to national capacity building and ownership.

A technical report will be prepared at conclusion of each mission in each one country to present results and action-oriented recommendations for the system implementation.

Appendix 12: Terms of reference for international consultants

TERMS OF REFERENCE
for
International Consultants

Experts in census surveys

Under the general supervision of the [Committing Ministry/Division] and of the direct supervision of the [Committing Service/Office], the incumbent will participate in the data collection system of fishery infrastructures and fishing fleet data. Specifically, the incumbent will:

- participate in the design of the statistical surveys to be conducted in the country;
- supervise the data collector group assigned to this activity;
- collect fishery infrastructure and fleet data according to a given schedule and with total discretion and reservation;
- compile fishery forms an d questionnaires according to instructions and in all their parts using appropriate codification, as applicable;
- be present at the data collection site/s whenever required/requested;
- check the completed questionnaires for consistency and completeness;
- perform data quality control of the final statistics before submission;
- submit the completed questionnaires to the Centre, according with instructions received;
- promptly report any circumstances that may be interfering with the work progress and the quality of the data collected;
- Interact with the team based in [Ministry / Division/Service / Office] for all technical issues concerning the above activities;
- perform any other duties within his/her sphere of competence, according to needs and circumstances, as requested by the supervisor;
- prepare and submit a report on completion of each mission describing activities performed and work progress.

Duration: three months in 3 missions (each in a group of countries)

Experts in catch and effort surveys

Under the general supervision of the [Committing Ministry/Division] and of the direct supervision of the [Committing Service/Office], the incumbent will participate in the data collection system of fishery infrastructures and fishing fleet data. Specifically, the incumbent will:

- participate in the design of the statistical surveys to be conducted in the country;

- be familiar with species identification, vessel category and gear types;
- supervise the data collector group assigned to this activity;
- organize and supervise the data collating of LogBooks;
- organize, supervise and follow-up the sample selection of landing places (Primary Sampling Units) and of fishing units (Secondary Sampling Units) according to a given schedule;
- compile fishery forms and questionnaires according to instructions and in all their parts using appropriate codification, as applicable, and with total discretion and reservation;
- be present at the data collection site/s whenever required/requested and be available on different places on selected days during the landing time;
- check the completed questionnaires for consistency and completeness;
- perform data quality control of the final statistics before submission;
- submit the completed questionnaires to the Centre, according with instructions received;
- promptly report to the [Committing Ministry/Division/Service/Office], responsible officer any circumstances that may be interfering with the work progress and the quality of the data collected;
- Interact with the team based in [Committing Service/Office], for all technical issues concerning the above activities;
- perform any other duties within his/her sphere of competence, according to needs and circumstances, as requested by the supervisor;
- prepare and submit a report on completion of each mission describing activities performed and work progress.

Duration: nine months in five missions (each in a group of countries)

Appendix 13: Census check list

(to be compiled by an external consultant)

Section	Item	Tick
Preparation of Census 1	Previous census exercise available.	
Preparation of Census 2	Checked available documentation (pre-assessment)	
Preparation of Census 3	Assessment Statistics	
	Assessment Data Processing	
	Assessment HH.RR.	
	Assessment Infrastructures	
	Global Assessment (Evaluator's Report)	
Preparation of Census 4	Certification from the Administration of Evaluator's Report	
The QCS	National Fishing Fleet Register (Mechanised/Semi/Manual)	
	National Fishing Fleet Register. Check consistency	
The QCS 1	National Fishing Fleet Register. Coverage Check Survey. Number of vessels	
The QCS 2	National Fishing Fleet Register. Coverage Check Survey. Vessel Characteristics	
The QCS 3	National Fishing Fleet Register. Coverage Check Survey. Vessel typology	
The QCS	Overall Assessment	
Preparing Census Survey 1	Ministerial / Parliament approval to start exercise	
	Consultation with National Statistical Office	
	Consultation with Fisheries Department	
	Consultation with Research Institute	
Preparing Census Survey 2	Nomination of a National Focal Point	
	Codification and Field Definitions designed.	
	First level stratification decided upon.	
Preparing Census Survey 3	Data Set. Compulsory data elements.	
	Data Set. Common data elements.	
	Data Set. Complementary data elements.	
Preparing Census Survey 4	Data Base model. Working environment evaluated.	
	Data Base model. Type of application decided upon (stand alone/corporate, etc)	
	Data Base model. Implementation Approach (top-down / bottom-up / mixed)	
Preparing Census Survey 5	Questionnaire. Fields, Descriptions & Codes are consistent. Validation.	
	Questionnaire. Codification and Reference system updated or developed.	
	Questionnaire. Paper questionnaires available.	
Preparing Census Survey 6	Outputs. List of requirements from official institutions.	
Preparing Census Survey 7	Training. Theoretical training has been carried out.	
	Training. On-the-job training has been carried out.	
Preparing Census Survey 8	Pilot Survey.	
	Pilot Survey. FAQs (Frequently Asked Questions) file created.	
	Pilot Survey. Revision of Design and Planning of Census Survey.	
	Pilot Survey. Database revised for errors, discrepancies, redundancies, etc.	
The Field Work	Carried out Census Demonstration Seminar to local authorities/fishermen.	
	Booklets distributed in the ports/landing places.	
	Workload distributed among recorders. Logistics organised.	
	Informing port authorities and fishing cooperatives on activities and timing.	
	Second seminar on Courtesy Progress Report.	
	Distributed leaflets with information on basic results.	

Appendix 14: Dos and don'ts

DOs	DON'Ts
Always seek Ministerial (and/or Parliament) Agreement before starting any activity.	Never propose a new census survey if not really necessary.
Revise all national information available, including: previous census, reports, licenses, etc.	Do not start a new census without considering previous data available.
Seek collaboration and/or feedback from national institutions.	Do not leave missing values in the QCS data.
Consider updating the current system before considering proposing a new one.	Do not lose trained recorders
Seek expert assistance to assess the situation (Senior Evaluator).	Do not go to the port/landing place without informing local authorities first.
Get Certification of Evaluator's report from the Administration before going ahead.	Do not force or threaten fishermen in order to get the information.
Plan and design of the Census Survey has to be done in collaboration with national staff.	Do not interview fishermen when they are tired (find another time).
Collect the lowest level of data so that it can be freely aggregated afterwards according to needs.	
Always use paper questionnaire as basis of data collection.	
Codify all answers possible of the questionnaire (drop-down list).	
Use same trained recorders for the fishing vessel registry and the CAS.	
Use common sense with delicate issues when interviewing fishermen.	

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The *MedFisis* (Mediterranean Fishery Statistics and Information System) regional project was set up in response to an increasing need to monitor fishing activities and provide fishery management systems in several GFCM (General Fisheries Commission for the Mediterranean) countries. Specifically, there was an urgent need for a comprehensive fisheries statistics collection and analysis system. From the outset of the project it was recognised that to be effective such a system must be designed to meet the needs of all stakeholders in the fishery involved, and that all resulting statistics must be reliable, timely and backed by relevant research.

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