



## COUNTRY REPORT

### FIELD WORK MISSION TO ROMANIA

MARCH 2014

This specific contract No 9, SI2.656808 “Field work specific contract for Lithuania, Romania, Spain and United Kingdom”, has been implemented within the framework contract, MARE/2009/08 “Assistance for the monitoring of the implementation of national programmes for the collection, management and use of data in the fisheries sector”, funded by the DG Mare.

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Report delivery date  
25<sup>th</sup> June 2014



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## ACRONYMS

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area
ANPA	Agenția Națională de Pescuit și Acvacultură (National Agency for Fisheries and Aquaculture) (English acronym: NAFA)
AR	Annual Report
AUR	Aquaculture Units Register
BENA	Balkan Environmental Association
BG	Bulgaria
DCF / DCR	Data Collection Framework / Regulation
DG MARE	Directorate General for Maritime Affairs and Fisheries
EC	European Commission
EFF	European Fisheries Fund
EWG	Expert Working Group
FAO	Food and Agriculture Organisation
FFR	Fishing Fleet Register
FTE	Full-time equivalent
FWC	Framework Contract
GFCM	General Fisheries Commission for the Mediterranean
ICZM	Integrated Coastal Zone Management
INS	National Statistical Institute
IRDAEFA	Institute for Research and Development for Aquatic Ecology, Fisheries and Aquaculture
JRC	Joint Research Centre
NC	National Correspondent
NIMRD	National Institute for Marine Research and Development “Grigore Antipa”
MSFD	Marine Strategy Framework Directive
NP	National Programme
RCM	Regional Coordination Meeting
RO	Romania
RV	Research Vessel
SBS	Structural Business Survey
STECF	Scientific, Technical and Economic Committee for Fisheries
ToR	Terms of Reference
TR	Technical Report
VMS	Vessel Monitoring System
WG(s)	Working Group(s)

## 1. EXECUTIVE SUMMARY

This report presents the result of the second field work mission within the Third Horizontal Contract for 2013-2014 of the Framework contract “Assistance for the monitoring of the implementation of national programmes for the collection, management and use of data in the fisheries sector”, which took place in Romania.

This second field work mission took place in Sofia and Constanta from 4<sup>th</sup> to 7<sup>th</sup> March 2014 and it was coordinated together with the UK National Correspondent (NC) Mr Constantin Stroie.

### **Organization**

The main organizations intervening in the DCF in Romania are the National Agency of Fisheries and Aquaculture (ANPA aka NAFA in English) in Bucharest – Ministry of Environment and Climate Change – and two research institutes: the National Institute for Marine Research and Development “Grigore Antipa” (NIMRD) in Constanta and the Institute for Research development for Aquatic Ecology, Fisheries and Aquaculture (IRDAEFA) in Galati.

### ***In relation to biological variables, institutions and their relations / coordination***

The responsibility for the collection of the DCF data is distributed among the three above mentioned actors:

- ANPA ensures the update of the registers and the collection of the control regulation information used for the transversal variables. It also provides them to the research institutes and supports the DCF data collection during the inspector’s visits to the firms.
- IRDAEFA collects the aquaculture and fish processing data, and
- NIMRD compiles the other needed information, meaning all biological data and fleet economy for the Black Sea as well as transversal data in coordination with ANPA.

### ***Guidelines for data collection / division of work***

Administrative data (licenses, authorisations) are collected exhaustively by ANPA for regulatory purposes, and for the basis for establishing statistical registers from which surveys can be carried out. The system imposes a heavy administrative burden on operators (fishermen, industries and aquaculture farms).

Surveys to fishing companies, cooperatives and self-employed fishermen by NIMRD are not based on random samples, but on exhaustive enumerations due to the small target populations. This implies that survey error is purely by non-sampling error (non-response, coverage of registers, etc.) and therefore difficult to assess statistically<sup>1</sup>. A similar situation occurs with surveys to aquaculture farms and processing industries.

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<sup>1</sup> Survey error can be split into sampling and non-sampling error. The former represents the error due to the fact that only a sample and not all the population is studied, while the latter includes all other types of errors. There are mathematical formulas to estimate the sampling error, but quantifying the non-sampling error is much more difficult.

### **IT systems**

For the moment, the “ANPA registers” (Control Regulation database system) run by ANPA as well as the “Pescuit marin” DCF database system used by the research institutes (NIMRD and IRDFAEFA) are under tests and not interoperable. Both are currently mainly designed to ensure the data entry only. The system being on testing phase, most of the operations are still currently made on paper and Excel files. None of the institutions involved has dedicated IT staff to support the work.

### **Biological variables**

**Métier-related:** NIMRD is responsible for the production of métier-related data based on paper logbooks/sales notes provided every month by ANPA. The Romanian fleet uses only selected métiers. For small boats, the métier is assigned based on the data entered in the Coastal Register containing small scale fisheries catches given on a monthly basis. Some inconsistencies in labelling of métiers and unbalance sampling design based on of efforts have been detected. Concerning the coefficient of variation (CV) all data achieve the necessary statistical precision.

**Stock-related:** NIMRD is responsible to compile the data for the biological stock data from samplings on shore, on board, during research cruises and from selected discard samples (only whiting and small sprat). Data for most of the biological parameters are sampled without extra costs annually, age determination by otoliths reading is done in-house at NIMRD by experienced readers and in most cases, more samples than proposed were analysed. The tables are filled properly with one exception: the achieved precision level should be given as percentage value.

**Surveys at sea:** NIMRD is the responsible institution for all biological variables including the conduction of the surveys at sea (cruise leading, fishing and data collection as well as analysis and data compilation). The two demersal trawl surveys in Romanian waters to monitor the turbot biomass are conducted according to the NP.

Only the 2nd pelagic trawl survey has been performed (without hydro acoustic devices) with the Romanian research vessel “Steaua de Mare I” in 2012. The deviation from the planned activities for the pelagic survey has been 50% for the days at sea and 55% of the planned hauls. The planned sample sizes for sprat (length@weight, maturity@length and sex-ratio@length) have not been reached (89%, 69%, 89%), the loss of biological data was 11% and 31%, accordingly. All other values exceed the planned number of samples. In December 2013 a meeting took place in Brussels with the representation of Romanian institutions (the NC), DG MARE, the Chairs of MEDIS and MEDIAS and representative of the Bulgarian institutions (Permanent representation of NAFA Bulgaria) in order to establish an agreement for the implementation of the common surveys on the Black Sea. Despite this, there has been no agreement between the two countries and Romanian Institutions take the decision to carry out the scientific surveys only in the Romanian waters.

### **Recreational fisheries**

The responsible institution is ANPA. However, no recreational fishery is conducted on DCF relevant species (like eel, tuna, cod etc.) as these species do not exist in the waters of Romania. The main species targeted are gobies and horse mackerel. No species related pilot- studies are performed or are planned to be initiated. Anglers need to be registered and to pay an annual authorization fee (tax). There is no particular data collection performed (for e.g. annual catch: number of fish, weight or species composition).

### **Economic data on catching sector**

NIMRD is responsible for the collection of the economic data on the catching sector. The data is collected using paper questionnaires sent to all fishing firms.

In the Annual Report Romania indicates that statistics on the catching sector are based on a census and consequently, it does not calculate CVs (which is a measure of sample precision). In reality the response rate on the survey is about 50-60% and therefore a large non-sampling error is expected<sup>2</sup>. The missing values are set at the average of the responses. In this situation the CVs should be calculated. The current practice of completion of missing values does not have any added value.

Manuals for data processing do not exist, so that transfer of tasks among staff depends on presence of experienced staff members. The efficiency of data processing could be significantly increased if the full potential of Excel would be used.

The quality of the responses seems uncertain in view of the fact that the most fishermen own a single, small vessel and do not maintain solid accounting. The annual questionnaire therefore relies on the memory of the respondents, as in the case in most Mediterranean small scale fisheries. Collaboration with respondents (individual fishermen, association of fishermen) through the provision of training.

### **Aquaculture sector**

Romania has almost exclusively fresh water aquaculture, which falls outside the DCF obligations. IRDAEFA is responsible for the data collection on aquaculture. This is done via survey with paper questionnaires. IRDAEFA is supported by ANPA inspectors, who visit the farms and collect information required for FAO and Eurostat production statistics. The inspectors collect the questionnaires and help also the farmers to fill them in. Interviews do not take place.

The response rate is about 35%, with overrepresentation of state-owned farms and underrepresentation of private farms. The statistical quality of the segment aggregations is therefore uncertain.

Similarly to the fishing sector, missing values are imputed by the average observed value. This practice does not improve the collected statistics. Also in this case, manuals or guidelines for data processing do not exist. Transfer of experience is based on personal contacts.

### **Fish processing industry**

IRDAEFA is also responsible for the collection of data on fish processing industry, but a comprehensive list of these firms does not exist. IRDAEFA has not established any cooperation with the National Statistical Institute (INS) to exploit the Structural Business Survey (SBS) data and the Business Register (REGIS).

The number of fish processors is quite low, so that IRDAEFA manages to carry out a census to all identified units.

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<sup>2</sup> Non-sample error due to non-response is large if the non-responding units are very different from responding ones. Otherwise, by means of statistical imputation of missing values, the error due to non-response may be minimised.



### ***Transversal variables***

ANPA collects all the transversal data. Landings are recorded in logbooks and sale notes. Small scale fleet (there is no minimum size) is obliged to fill in simplified logbooks recorded in the coastal register. Fishing vessels carry a license with unlimited duration, and a fishing authorisation, which must be renewed annually.

NIMRD receives monthly copies of the data in paper. NIMRD is in charge of processing the data for the purpose of DCF.

## 2. INTRODUCTION

This report is the result of the second field work visit planned for 2014 within the 9<sup>th</sup> Specific Contract signed between DevStat and DG MARE on 12<sup>th</sup> July 2013 whose objective is the monitoring of the implementation of the data collection framework in Romania.

The main objective of this field work contract is to verify whether and to which extent the programme implementation is being followed up by the Romanian institutions and whether all the biological, technical, environmental and socio-economic data specified in the programme are being collected according to the specified methods, procedures and quality requirements.

For this specific field work mission, the team members were:

- Mr José Cervera. Project Manager of the Framework Contract and statistical expert;
- Mrs Christine Alberti-Schmitt. Information Systems expert;
- Mr Christoph Petereit. Fisheries biology and environmental expert;
- Mrs Ester Azorín. Project Assistant and socio-economic expert, supported by Mr Pavel Salz<sup>3</sup>.

To achieve the mission objectives, the team of experts conducted a preparatory work for the field work mission to Romania, consisting mainly in the revision of the basic documentation (i.e. Annual Report 2012 and National Programme 2011-2013) and specific technical documentation (e.g. DCF Data Call Coverage Report for the Black Sea in 2012) in order to obtain a first evaluation of the Romanian situation.

After this first revision and diagnosis, the team visited from 4<sup>th</sup> to 7<sup>th</sup> March 2014 the Romanian scientific organisations dealing with the National Programme, in Bucharest and Constanța. The findings of the mission are detailed in this report.

### **Acknowledgements**

The team wants to acknowledge the fruitful collaboration and openness of the National Agency for Fisheries and Aquaculture (Romanian acronym: ANPA/NAFA) as well as of the other Romanian institutions involved in DCF and its staff for their personal contribution to the success of the field work mission.

### **Implementation of the mission (counterparts, calendar)**

The agenda of the mission, shared with Mr Constantin Stroie (National Correspondent for the DCF) prior to the mission, was implemented as planned and all the topics were revised according to the agenda (see Annex 1).

The team worked in parallel during the first, second, third and fourth days of the mission, sharing afterwards the findings of the different meetings.

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<sup>3</sup> Pavel Salz couldn't participate in the mission to Romania but participated in the preparation of this report based on the guide he prepared prior to the mission and the study of relevant documents.



Participants from the Romanian institutions involved in DCF were:

1. **National Agency for Fisheries and Aquaculture.** (Agenția Națională de Pescuit și Acvacultură, **ANPA**)
  - Mr Constantin STROIE, National Correspondent for the DCF
  - Mr Emilian GURITA, Aquaculture Firms Register
  - Mr Vasile BALTETEANU, Processing Industry Register
  - Mrs Otilia ORAC, Aquaculture – ANPA branch in Constanța
  - Mr Mihai SERSTIUC, Inspector – ANPA branch in Constanța
2. **National Institute for Marine Research and Development “Grigore Antipa”. NIMRD**
  - Mr Simion NICOLAEV, NIMRD Director
  - Mr Gheorghe RADU, Chief of the NIMRD Team
  - Mr Valodia MAXIMOV, Biological variables, Surveys at sea, Ecosystem indicators and Recreational fisheries
  - Mr Eugen ANTON, Economic and Transversal variables
  - Mrs Madalina GALATCHI, Economic, Biological and Transversal variables; and Surveys at sea
3. **Institute for Research – Development for Aquatic Ecology, Fisheries and Aquaculture – Galati. IRDAEFA**
  - Mrs Marilena TALPES, Chief of the IRDAEFA Team
  - Mrs Elena JECU, Aquaculture and Processing industry
  - Mrs Elpida PALTENEA, Processing industry
  - Mr Cristian SAVIN, Processing industry, statistical data
  - Mrs Elena MOCANU, Assistant Processing industry
4. **Company ASWIC (subcontracted by IRDAEFA)**
  - Mr Marcel DANITESCU, IT
  - Mrs Laura DANITESCU, IT

### Structure of the report

The mission report is organised according to the requirements of the Terms of Reference (ToR) and includes the following sections:

- Section 3: General Overview.
- Section 4: Biological data – Métier-related variables.
- Section 5: Biological data – Stock-related variables.
- Section 6: Recreational Fisheries.
- Section 7: Transversal data.
- Section 8: Research Survey at Sea.
- Section 9: Economic data – Catching sector.
- Section 10: Economic data – Aquaculture.
- Section 11: Economic data - Processing Industry.
- Section 12: Ecosystem data.
- Section 13: Conclusions.
- Section 14: Recommendations.

The Report is accompanied by 9 Annexes.

### 3. GENERAL OVERVIEW

This chapter contains a presentation of the main Romanian institutions involved in DCF as well as their organization, management, IT infrastructure and inter-institutional coordination established between them, in what respects the implementation of DCF.

Romanian fishing sector is composed of small scale vessels using traditional fishing techniques, for subsistence or local, small markets. There is only limited infrastructure for landing and keeping of catches. This fleet is in poor conditions and needs improvements of safety on-board and facilities for landing. The fleet is typically of artisanal type, of small size (less than 12m), multi-species and multi-gear fisheries, and fishermen switching from one gear to another several times throughout the year.

The activity of active fishing decreased gradually. In 2010, there were 20 vessels with LOA between 24-40m registered, but in the past years only one or two vessels were active for a very short period of time. The total number of vessels in the EU Fishing Fleet Register has also decreased from 502 vessels on 1/1/2012 to 201 vessels on 1/1/2014.

The different types of fishing gears for the active and passive fishery used in the Romanian littoral are as follows:

- Passive fishing gears: long lines and bottom lines; gillnets for the Danube shad and turbot; and pound nets;
- Active fishing gears: beach seine and pelagic trawl.

The main species in 2012 catches were: rapa whelk (*Rapana venosa*), sprat (*Sprattus sprattus*), turbot (*Psetta maxima maeotica*), anchovy (*Engraulis encrasicolus*), horse mackerel (*Trachurus mediterraneus ponticus*) and gobies (several species), most of which were caught with trawls, pound nets and gillnets.

#### 3.1. Organization and management

The main Institutions involved in DCF in Romania are described below:

##### a. ANPA. National Agency for Fisheries and Aquaculture

The National Agency for Fisheries and Aquaculture (ANPA in its Romanian acronym) is the national counterpart for the exchange of information between the European Commission and Romania regarding the DCF, with Mr Constantin Stroie being the National Correspondent.

ANPA belongs to the Ministry of Environment and Climate Change.

The agency covers the whole territory of Romania, through the six regional offices covering 5 regions: Timisoara (region of Transylvania/Ardeal); Constanta and Tulcea (coastal region and Danube delta); Galati (region of Moldova); Râmnicu Vâlcea (region of Oltenia) and Giurgiu (region of Muntenia).

Its main missions include the following, most of which are in relation to DCF:

- **Development of the national strategy and the specific regulations on fishing, aquaculture, fishery products market organization and implementation and enforcement of the Agency:** setting standards for recreational fishing; standards for the protection and regeneration of living aquatic resources (establishment of TACs, quotas and fishing effort, etc.); specific regulations on the exercise of fishing protected species; rules on landing and first sale of fishery products, etc.
- **Management of living aquatic resources:** establishing fisheries management measures in order to obtain a better rationalization of fishing effort; implementing support programmes for finance and research and development; development of procedures for fishing; proposing ports and landings points in the country; issue of permits, licenses and authorisations in accordance with national and international legislation, etc.
- **Management of aquaculture activity:** establishing measures to increase the quality of aquaculture products; measures to ensure to adjust production to market demands; measures for the introduction of best practices; organizing and updating the register of aquaculture production units and issuing aquaculture licenses; etc.
- **Management of fish processing industry:** establishing measures to support the producers' organizations and other associations; organizing and updating the registry of first sales and the register of ports points; organizing and updating the register of processing units; issuing licenses for the processing units; proposing measures in order to improve the quality and promotion of fisheries products; etc.
- **Fisheries control and inspection:** verification of the implementation of security duties and protection of living aquatic resources; ensuring the compliance with the conditions imposed by licenses and permits; prepare annual plans and inspections; establishment of systems of control and inspection of fishing activities; ensuring the operation of satellite monitoring of fishing vessels in the Black Sea, according to the EU regulations; monitoring the organization and development of fisheries, etc.
- **Scientific research:** collaboration with research institutions to achieve the objectives set by the strategy; carrying out studies to assess the impact on marine ecosystem and continental water fisheries and aquaculture and other human activities; studies on the development and diversification of aquaculture; issuing special fishing permits for scientific purposes, etc.
- **Other purposes:** organization and maintenance of the database for fisheries and aquaculture; entering into agreements and protocols with the public institutions involved in the control and inspections activities in the fisheries sector; organize training courses for the staff involved in the fisheries sector; recruitment and financing the development of newsletters, guides, booklets, posters, etc. to disseminate information on fisheries.

#### **Human resources:**

The total number of staff is 90 persons.

ANPA has a central unit in Bucharest and it is staffed with 3 employees involved more or less directly in DCF, being the national coordinator and two persons responsible for the maintenance of the registers (fleet, aquaculture and processing) used mainly for the needs of the Control Regulation (CR) but also as input for DCF activities. Additionally, its regional branch in Constanta is composed by 2 employees dealing with aquaculture and fish processing registers.

ANPA also employs 6 inspectors in the regional branch in Constanta and 60 inspectors around the country.

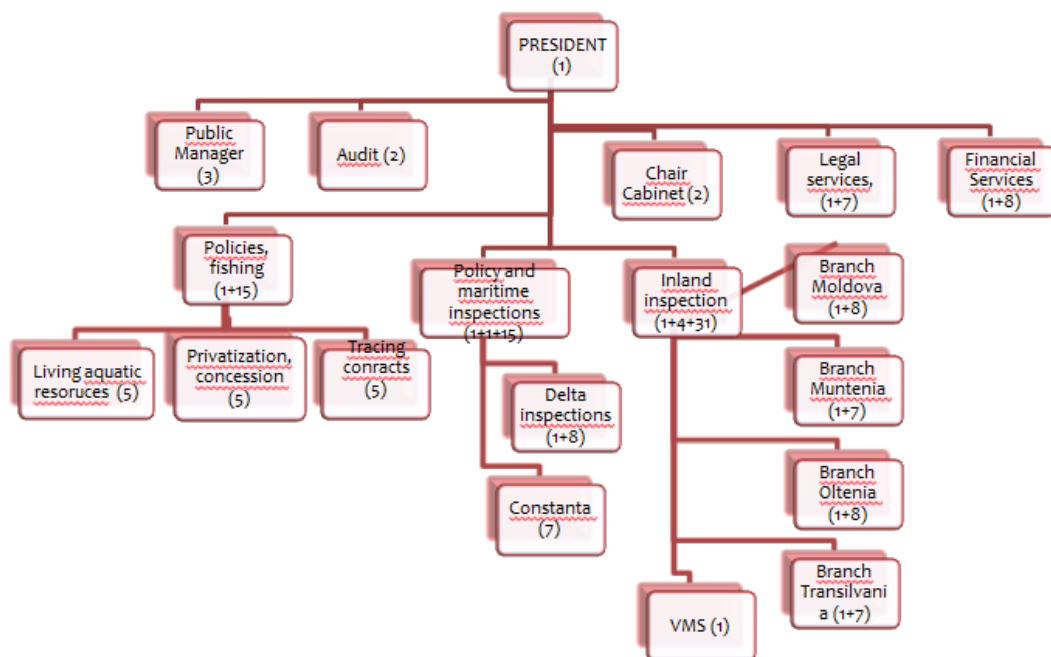
There are no permanent positions for IT-related staff. ANPA has one person subcontracted for the maintenance of the hardware. In addition, the company TEAMNET, subcontracted for developing application for the management authority is also developing a specific interface and database for the management of CR data (logbooks, sales note and registers).

In addition to the NC, ANPA inspectors assist indirectly the IRDAEFA (aquaculture and fish processing) and NIRMMD (economic fleet) by visiting the surveyed companies to push for the returning of the questionnaires for the collection of economic variables.

**Financing issues**

The NC mentioned that late payments from the EC to ANPA are at the origin of delays in payment of services to NIMRMD and IRDAEFA, which are obliged to pre-finance the data collection from their own funds. The mission did not consider in its scope the revision of financial aspects of the implementation of the DCF in Romania.

**Figure 1: ANPA Organigram**



Source: ANPA website

## **b. NIMRD. National Institute for Marine Research and Development “Grigore Antipa”**

NIMRD (INCDM in its Romanian acronym), located in Constanta, is a Public Research Institution (part of the Ministry of Environment and Climate Change), responsible for the national network of physical, chemical and biological monitoring and coastal erosion surveillance. NIMRD provides the scientific basis for the national strategy on marine and coastal environment, based on the results of research and development activities as well as regional and international cooperation activities. The Institute also performed, together with ANPA, the National Programme for Fisheries Data Collection.

The main activities of NIMRD are:

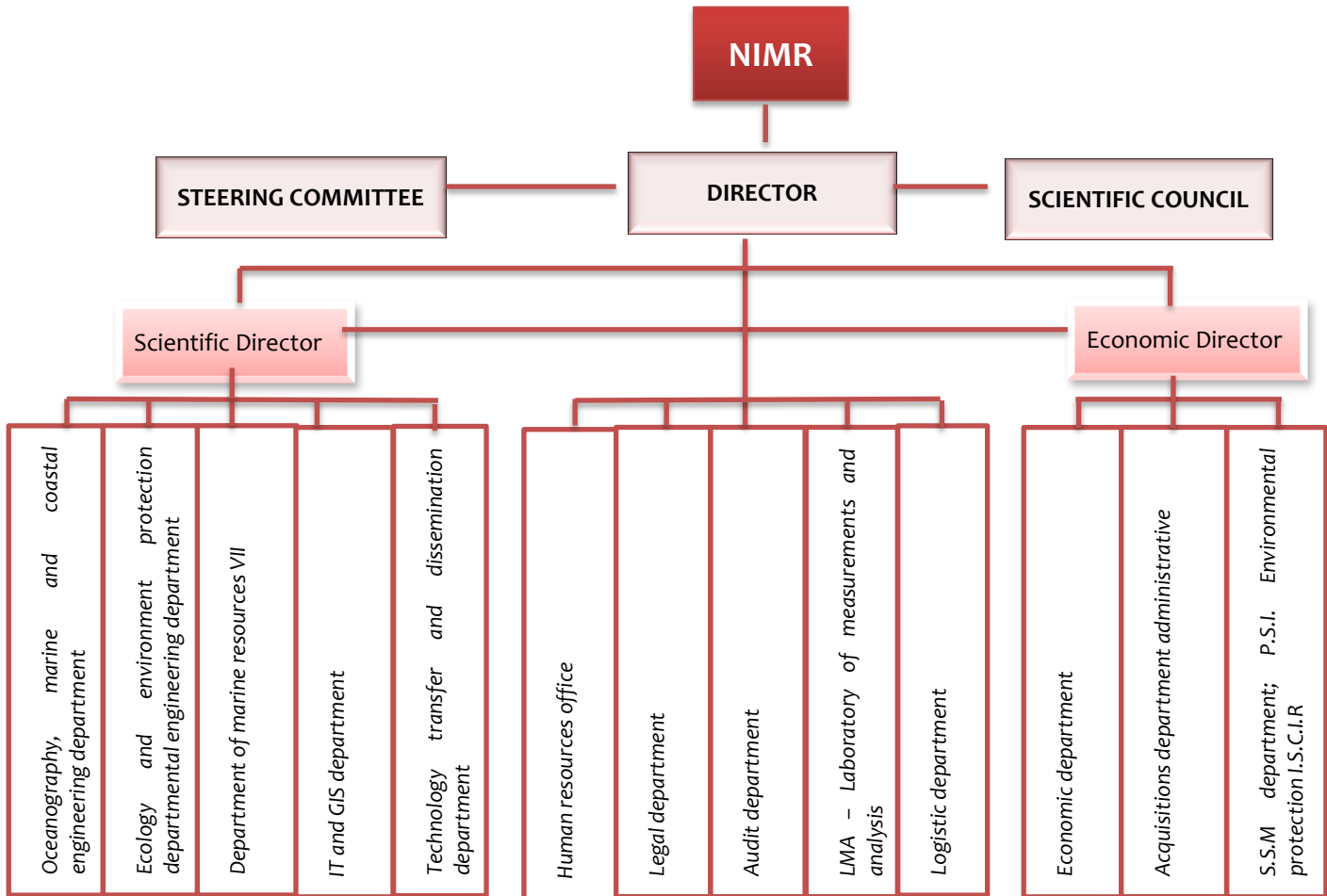
- National Oceanographic and Environmental Data Centre;
- National operator of integrated physical, chemical and biological monitoring system of the marine environment;
- National scientific responsible for the implementation of the Marine Strategy Framework Directive (MSFD);
- Focal points within the Black Sea Commission for: biodiversity, pollution, land-based sources pollution, Integrated Coastal Zone Management (ICZM), Fisheries and other marine living resources; Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) focal point;
- Regional activity centre for environmental aspects of fisheries and other marine living resources management;
- National scientific responsibilities for fisheries data collection and marine living resources stock assessment;
- National scientific responsible for the General Fisheries Commission for the Mediterranean (GFCM);
- Coordinator of the International South-Eastern Europe Secretariat of the Balkan Environmental Association (BENA);
- Coordinator of the environmental professions and fisheries training centres;
- Custodian of the Vama Veche-Doi Mai Marine Reserve.

### **Human resources:**

The staff includes experts in marine biology and related scientific disciplines. Most senior staff have a background in engineering, but there are no economists nor statisticians (despite the responsibility on the economic survey to the fleet).

An IT department is in charge of GIS but no IT support is provided to the scientists for the software development or other IT issues.

Figure 2: NIMRD Organigram



Source: NIRMMD webpage

**c. IRDAEFA. Institute for Research – Development for Aquatic Ecology, Fisheries and Aquaculture**

IRDAEFA, located in Galati, is the scientific body specialized in studying the aquaculture sector, i.e. technologies of growth, nurseries, etc.

Its main activities in relation to DCF are:

- The evaluation of the aquaculture sector and processing industry;
- Data collection and processing of economic and transversal variables;
- Development of the DCF database and associated software.

**Human resources:**

There are 5 persons in IRDAEFA in charge to manage aquaculture and fish processing data specialized in engineering and economics. There are no statisticians.

Only one IT person is responsible for managing the IT infrastructure, but his tasks do not cover IT support and software developments. The company ASWIC was subcontracted to develop the “Pescuit marin” application aiming at centralising all DCF data.

**Recommendation** regarding the human resources in the different institutions:

- ✓ *None of the institutions involved has dedicated IT staff to support, properly follow the outsourced developments, and ensure the future handover and maintenance of the newly developed applications. It would be highly advisable to hire staff with an IT profile being able to follow-up the IT tasks outsourced and the quality of the deliverables produced and being the interface between the users and the developer. This is particularly important to manage properly the application in the future, to introduce the changes when needed and to be able to solve the problem or issues when arising.*
- ✓ *As the “Pescuit marin” DCF database is in development but not yet ready, and most of the tasks are currently performed under Excel for the moment, it could be advisable to improve the skills of the staff on Excel to ensure a better use of the software and better organisation and analysis of the data.*

### 3.2. Inter-institutional Coordination

ANPA is in charge of financing the data collection and is responsible for the implementation of the CR.

#### **Committees and Working Groups (WGs), regularity of meetings**

Meetings are organised on an ad hoc basis.

#### **Relation between DCF and Control Regulation data**

NIMRD has access the CR data on paper. NIMRD and ANPA are capturing electronically independently the paper forms and conciliating the total figures which allows performing double-checks for the consistency of transversal data (see chapter 4.2).

ANPA is also transmitting electronically VMS data to the NIRMD as well as electronic files for the registers (aquaculture, fish processing) to IRDAEFA.

ANPA inspectors assist in the collection by visiting the non-respondent companies indicated by the research institutes.

#### **International coordination (e.g. Regional Coordination Meetings - RCM)**

The selection of participants to the meeting is made based on the interest of the meeting for the daily job of the participant and on the responsibilities and technical skills of the staff required.

### Cooperation with the National Statistical Institute (INS)

Data collection operations on fisheries are not included into the National Statistical Programme for 2013<sup>4</sup>.

**Recommendation: The following data sources should be checked for coherence:**

- ✓ **The statistical business register (REGIS), which includes all active business units and is kept to date by INS, should be cross-checked with the registers of aquaculture and fish processing industries;**
- ✓ **The data collected for the Structural Business Survey (“Ancheta Structurală”), which includes the fish processing activity.**

The NC mentioned the preparation of a protocol of collaboration between ANPA and INS, but the draft was not available.

### Protocol for the preparation of National Programmes and Annual Reports on the implementation of DCF

The NC revises all the information (as input to the preparation of the NP and AR) received from IRDAEFA and NIMRD. These institutions prepare a draft of the AR and submit it to the NC for revision. Once the documents are revised, the NC sends the draft report back to IRDAEFA and NIMRD for final comments. After the second submission to the NC, he sends the final version of the report to DG MARE.

The ANPA headquarters is assisted by 1 person from the Constanta staff (for fleet, catches and segmentation) who complements the reports with figures on the target populations (however, she only has basic skills for Excel and this requires too much manual and error-prone work).

The consultant has identified mistakes in the Excel forms that accompany the Annual Report. These have been noticed to the NC and other responsible staff for correction in future editions. They consist in:

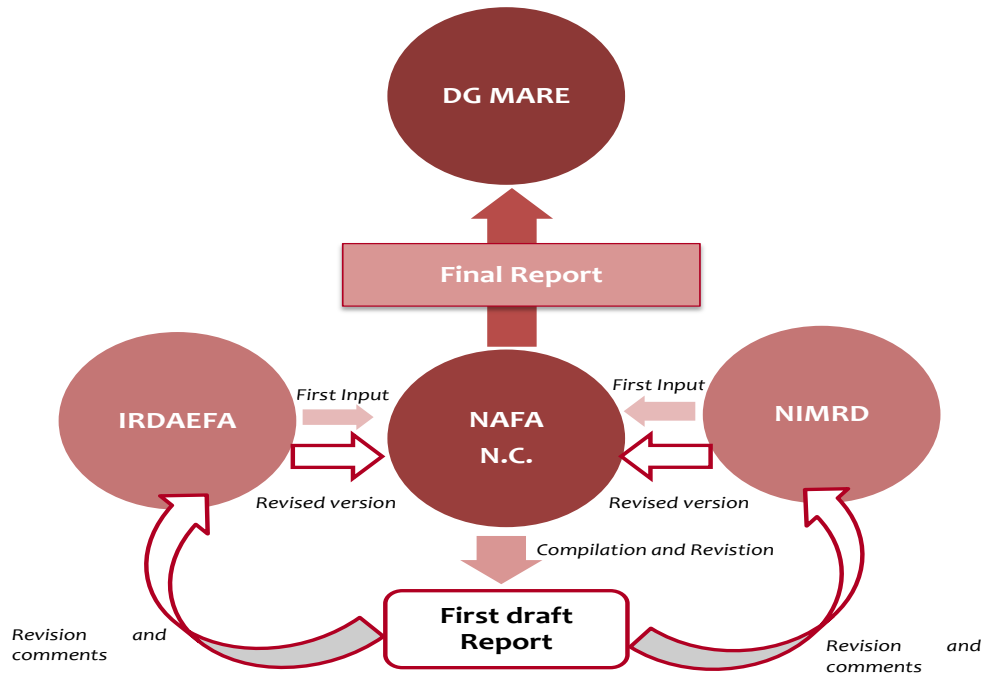
- Incorrect sample rates in several tables
- Different segment or métier names in different tables.
- CVs values are expressed in numbers in several tables and should be presented in percentages.
- Incorrect type of data collection scheme in several tables.

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<sup>4</sup> Latest published, available at [http://www.insse.ro/cms/files/legislatie/programe%20si%20strategii/PSNA%202013\\_final\\_MO%20.pdf](http://www.insse.ro/cms/files/legislatie/programe%20si%20strategii/PSNA%202013_final_MO%20.pdf)



Figure 3: Inter-Institutional coordination for the preparation of NP and AR



Source: Own production

### Data calls

The preparation of responses to the DCF related data calls is considered a major job. IRDAEFA and NAFA respond to eight data calls annually (one biological, one for the fleet economic data, two for aquaculture, two for fishing effort regimes and two data calls for processing industry).

The effort needed to respond data calls (man-days) is between one and three months: one month for data calls concerning the EU fish processing industry, aquaculture and the official call for data on landings, discards, length and age compositions, fishing effort, trawl and hydro surveys in the Mediterranean and Black Sea; and three months for the call for fleet economic scientific data.

### 3.3. IT Infrastructure and flow of information

The standard definition for IT infrastructure refers to the hardware, software, network and services required for delivering IT solutions and services to its employees, partners and/or customers.

The main hardware in place in the institutions involved in DCF is the following:

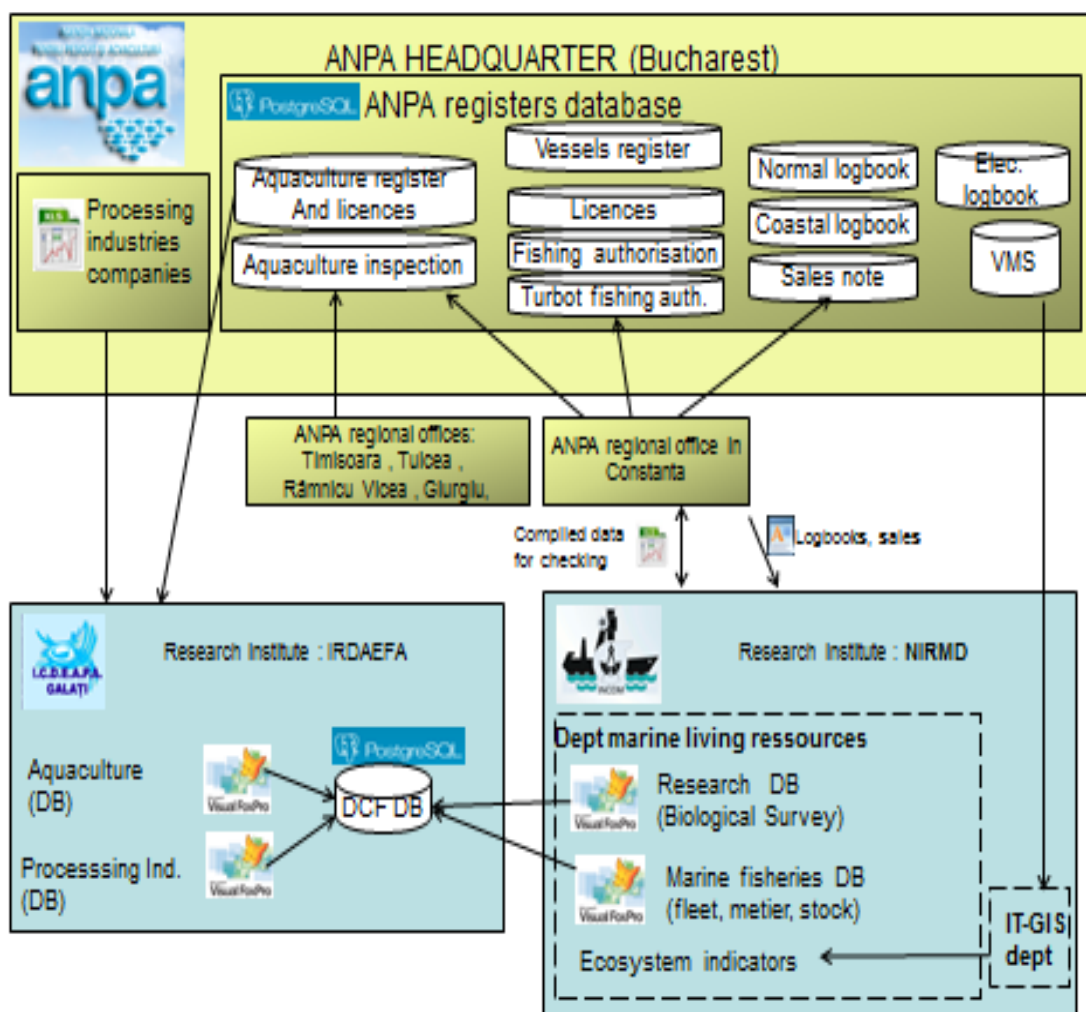
- ANPA: a server used for CR data in Bucharest is connected to the ANPA local network and also via VPN to Constanta and the other ANPA branches;
- NIRMD in Constanta: the IT-GIS department has its own infrastructure which is not used for DCF purposes, all the work being currently done in Excel;
- IRDAEFA in Galati (not visited): A Postgresql server is foreseen to be used in the future for the DCF. At the moment, since the database is not functional, the work is mainly done using Excel.

Backups: the hardware experts (in ANPA headquarters in Bucharest and IRDAEFA) are in charge of the regular backup of the servers, but no backup procedure is in place for the laptops and PC.

At NIRMD, the backup is made until now manually by copying the relevant and up-to-date Excel files on several hard disks, laptops or PC, which spreads the risk of potential data loss. An institutional backup system is foreseen but is not yet available.

The flow of information between the involved institutions is summarised in the figure below.

Figure 4: Flow of Information



Source: Own production

ANPA is in charge of the collection and storage of the administrative information which should be stored in the long term in the ANPA register database. The IRDAEFA collects aquaculture and fish processing industry data while NIRMD is dealing with all marine fisheries data. For the moment, the DCF data are mainly managed and stored in Excel files but they should be centralised in a long term perspective in a common DCF database hosted by IRDAEFA.

### ANPA registers database

Open Postgresl is used for the database.

The application is currently being tested by the inspectors. Further training is foreseen to be organised before its use will be generalised to all ANPA staff (including the NC who does not use it for the moment).

The inspectors should use the application to enter the logbooks and sales notes in the database but there is a very low connection between the branches and the headquarters, either due to concurrent access or to a low Internet band for the transmission. Many incomplete records are found in the database as the inspectors had to stop the data capture due to low connections. The issue is to be solved by the contractor and performance results must be checked by NAFA.

- ✓ **Recommendation:** *The application being multi-user, it is suggested that the acceptance by NAFA of the deliverable prepared by the contractor is conditional to the performance regarding concurrent access.*

**Security:** The staff in regional branches accesses the server in Bucharest using a VPN connection. The different type of users associated to different access right is not yet clearly defined.

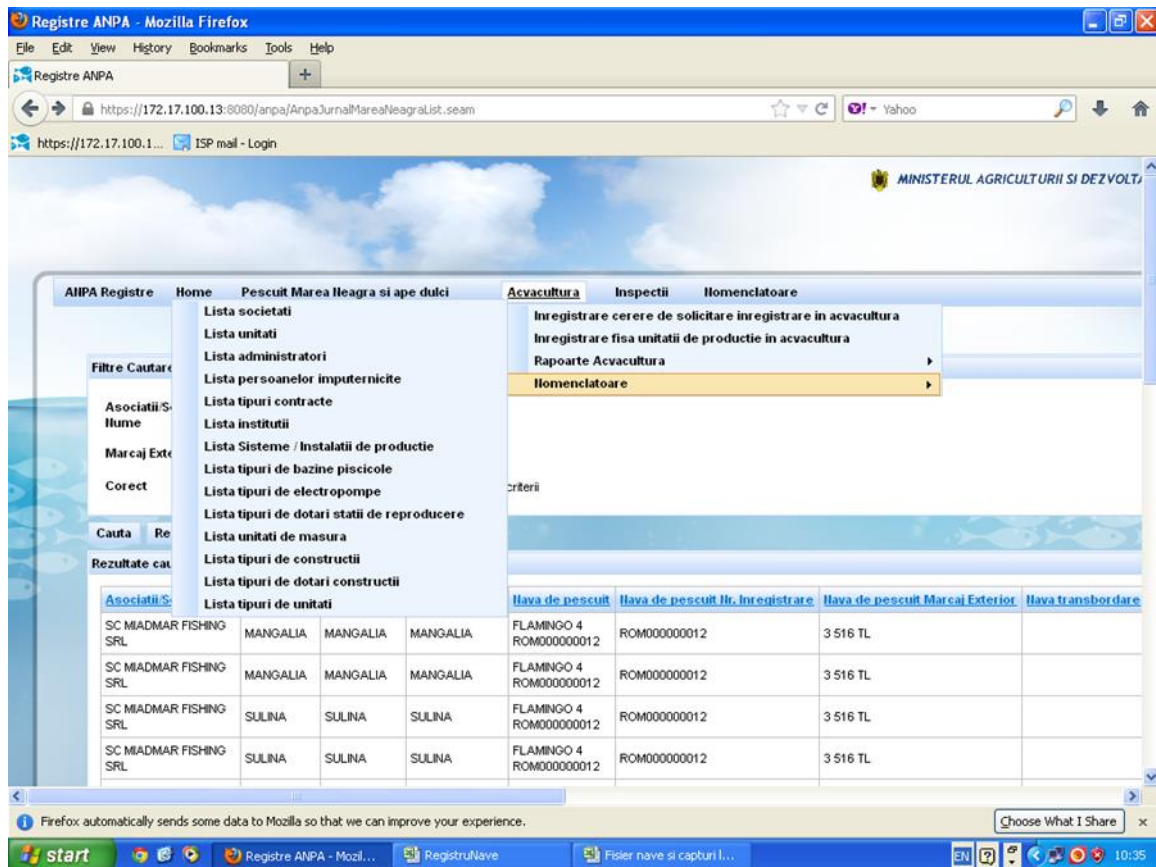
**Technical support/maintenance:** There is no internal support for the maintenance or the development of existing databases or IT applications. ANPA is fully dependent on the company subcontracted for the development of the application as ANPA has no staff qualified to take over the maintenance of the application. The maintenance of the database will then depend then on the renewal of the contract.

**Documentation:** Not available yet, in addition there are no internal skills at ANPA to evaluate the quality and usefulness of any potential documentation provided.

**Functioning:** The application is mainly foreseen for the capture of data. Nevertheless it is to be noted that no embedded checks are implemented in the data capture screen (e.g. it is possible to give an authorization to a cancelled vessel) and no report or customizable queries are available for the users. As example, the list of licenced vessel cannot be provided directly: it needs to be compiled by extracting all licenses (including the new, modified and deleted records generated for the each boat when a modification on the status is applied) in an Excel file and deleting manually the ones not anymore relevant.

The capture of the information is made through a web interface (see Figure 5).

Figure 5: Screenshot from ANPA register interface



Source: ANPA

### “Pescuit marin” database

For the moment, DCF data are compiled using Excel. There is no national DCF database in place, but one (called “Pescuit Marine”) is under development since 2011. It is already the third test version.

It was initially planned to develop a client server application in .NET accessing a SQL server database. The budget was made available too late to buy the development software and the subcontracted company AWIC started the development with in-house available software Visual FoxPro in 2011. It was decided to continue using this development platform afterwards.

It is to be noted that the Microsoft Visual FoxPro was a good tool for quick development but the development on Visual FoxPro programming language was abandoned by Microsoft since 2007. The current application is working but possibly in a long-term perspective, some problems may arise as the product will not evolve (e.g. the Visual FoxPro is a 32-bit application, it can run on 64 bits machines by selecting a 32-bit ODBC driver but cannot use 64-bit ODBC drivers).

The “Pescuit Marine” application is composed of 4 independent modules managing their own stand-alone database: “Marine fisheries”, “Research”, “Aquaculture” and “Fish processing”. “Aquaculture” and “Fish processing” are installed on two PCs in IRDAEFA while “Marine fisheries” and “Research” modules are installed on two other PCs in NIRMD.

The PC where the modules are installed can transfer the full content of the local database to a central Open Postgresql server used as a data warehouse. **It is to be noted that the current architecture chosen for the development impose that each module is only installed on one single PC and therefore can only be used by the user of one single workstation.**

The modules are currently tested by IRDAEFA and NIRMD: the processing industry data are fully loaded but the database would need to be revised to integrate new user requirements. The other modules are in a less advanced testing phase.

**Security:** The databases are stored on standalone PC and the Postgresql server is only used yet for backup. In the future it could be used as a data warehouse for the DCF web site but adhoc reports/queries would need to be designed to ensure the respect of the confidentiality of the primary data stored.

All users have the same rights except the “administrator” who can create new accounts. It was not requested by the institutes to define different types of users.

The transfer of primary data from the local PC to the server is made securely by ODBC and SSL.

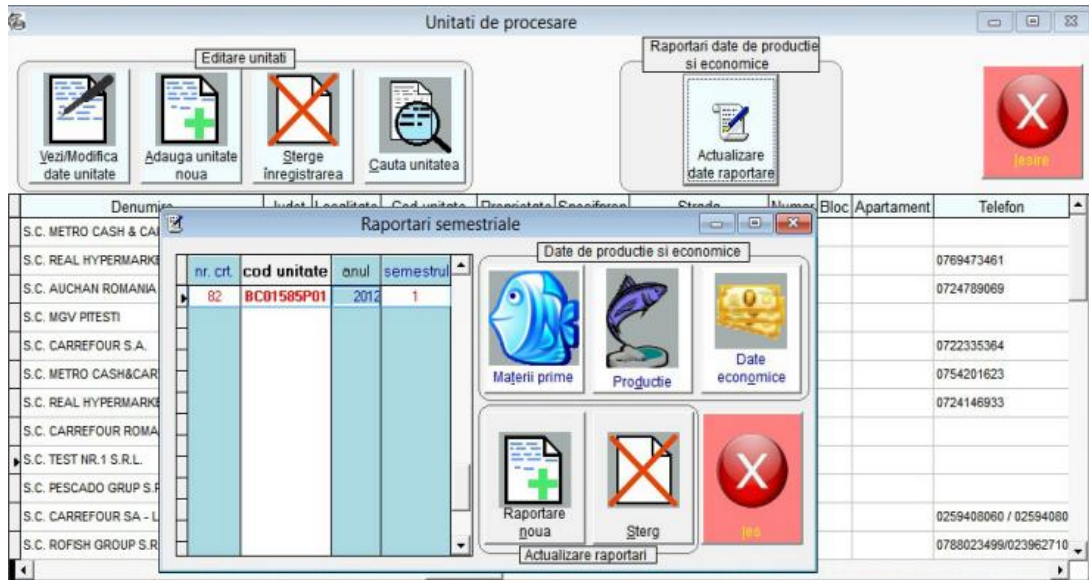
**Technical support/maintenance:** The application is developed by the company AWIC. IRDAEFA has no IT resources to take over the application.

**Documentation:** A manual was written for the first version but it needs to be revised, as the application changed a lot since then.

**Functioning:** Like for the ANPA register, the application is mainly foreseen for the capture of data and no embedded checks are implemented in the data capture screen. The development of report is foreseen in the contract for 2014.

The four modules are working in a similar manner with nested forms based on the information entered in the parent forms. (example: selection of the company, creation of a record linking the information related to a given year for this company, then entry of material, production, economical data...).

Figure 6: Screenshot from Fish processing module interface



Source: IRDAEFA

General IT **recommendations** can be given regarding the development and testing of the two Romanian applications mentioned above:

- ✓ *The need for a database system is obvious as the information is not properly organised and is spread over tens of Excel files. The databases are currently under tests. Nevertheless, clear requirements and specifications should be given to the outsourced companies to ensure a proper database design and data organisation providing the expected outputs.*
- ✓ *Some purely technical tests need to be performed by IT staff. In addition to the technical/performance tests, the testing should be organised very cautiously with a list of dedicated experienced users before the application is set in production and all data are entered in the system.*
- ✓ *The system expected should be more than a data capture tool and should include relevant checks and reporting/query functions.*
- ✓ *The two applications currently developed are not interoperable but the data are also not linked. For example, the identification number used in the Pescuit database is not the fiscal number preventing connecting the information and for example importing easily some data potentially extracted from the “ANPA registers” database. Specifications should be revised to ensure more compatibility between the databases.*

### 3.4. User requests management

#### ***Dissemination: website***

There is no specific DCF dissemination web site or web page yet.

#### ***Management of user requests***

No request has been received yet apart from the DCF data calls. Each institution is responsible according to the task performed, for preparing and sending the required DCF data to JRC or other institutions asking for data (e.g. GFCM Black Sea Convention).

#### ***Transmission of data***

ANPA is responsible for the sending the following data:

- To DG MARE data on fleet register, monthly catches;
- To EUROSTAT: annual catches, and aquaculture data retrieved from the Control information;
- To FAO: annual catches.

IRDAEFA is responsible for the sending aquaculture and fish processing data calls to the JRC.

NIRMD is responsible for the:

- Compilation of fleet economic data, transversal data in coordination with ANPA.
- Compilation of the biological data and the sending to the relevant institutions (GFCM, Black Sea convention).

The country highlighted the burden on preparing different kind of reports but also indicated that complying with DCF, has provided an occasion to Romania to obtain reliable data for economic and stock data which were not foreseen in the National Statistical Programme.

#### ***User satisfaction***

ANPA did not measure user satisfaction until now.

## 4. BIOLOGICAL DATA MÉTIER-RELATED VARIABLES

### 4.1. Programme monitoring

#### Organisation for the production of métier-related data

NIRMD is responsible for the production of métier-related data based on paper logbooks/sales notes (Annexes 4 and 5 respectively) provided every month by ANPA.

The Romanian fleet uses only selected metiers. As active gears, midwater otter trawls (OTM) and beach seines (SB) are used. As passive gears, stationary uncovered pound nets (FPN) and pots and traps (FPO) are applied. Other passive gear types are gillnets (GNS), longlines (LLS) and hand and pole lines (LHM). The most frequently method to collect rapa whelk is by diving.

Each owner of a vessel has to register for a licence; the licence is valid until the owner decides to cancel it. Each year the owner has to register a fishing authorization. The list of active vessel is made comparing the authorized vessels and the logbooks to identify whether the vessel was active or not.

All vessels have to register their catches whatever their size and amounts: the small scale fisheries register in the “Coastal Register” while the sole vessel above 12 m registers the normal logbooks.

4 fleet sections are identified: marine fisheries vessels, inland fisheries (including in the Danube delta) vessels, scientific vessel and auxiliary vessels used not for fisheries (e.g. for transport). When back from the inspection (2 per month in the North and the South Black Sea Romanian coast), the inspectors input the data in the ANPA register database.

The métier allocation is made by NIRMD. Métier is assigned by vessel for the only<sup>5</sup> active large vessels and not by trip, as it is assumed that no change of gears appears for that vessel. For small boats, the métier is assigned based on the data entered in the Coastal Register. All trips of a vessel are classified in the same métier.

Given its growing importance, the fisheries of rapa whelk are considered to be included as a new metier. Given the increasing importance of rapa fisheries, the NIMRD mentioned that there are plans to build a commercial beam trawl vessel.

#### Achievement of objectives with respect to sampling plans

Given the small size of the fleet, there is no selection of métiers, but exhaustive coverage.

**Sampling on shore:** The ANPA Inspector and staff from NIRMD conduct twice a month sampling events in the northern and southern part of the coast.

In general, samples have been collected with respect to sampling plans. However, some important aspects need to be raised with respect to the presentation of Annual Report tables:

- One is the inconsistency of the gear labelling at level 6 (OTM\_MPD\_14\_0\_0 should be labelled as OTM\_MPD\_13-20\_0\_0e.g. Tab. III\_C\_3 in AR 2012).

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<sup>5</sup> Depending on the years, only 1 or 2 vessels of LOA over 12m have been active in Romania.



- Another aspect is the unbalanced sampling intensity which is not proportional to the relative effort, as recommended, of the métier (ex. 8 samplings at 53 trips [OTM] versus 24 samplings at 1070 trips [Misc\_FPN]). The ratio of sampling and effort unit is 15% at OTM versus 2% of FPN. However, these FPN trips yield very small catches.
- Labelling of métiers in Table III.C. should follow the codes, as in tables III.C.2 or III.C.3.
- ✓ **Recommendation: the NC should review the presentation of AR tables in terms of coherence of labelling métiers.**

#### **Sampled trips at sea for a selected number of métiers**

The **sampling on board** is not mandatory during one-day fishing trips. Nevertheless the interpretation of some VMS data leaves the possibility that there might have been fishing trips which could have been longer than one day.

It is unclear, if the samples for the métier OTM\_MPD\_13-20\_0\_0 have really been sampled at sea. It was communicated by the NC that in general no discard sampling has been conducted since only day-trips, also for the largest vessel, have been performed. In table III\_C\_3 onboard trips have been indicated.

#### **Sampled trips on shore for a selected number of métiers**

The data for the other métiers seem reasonable.

The sampling on shore for the large vessel was only half achieved (50% in Table III.C.4), as it was not possible for the inspectors to travel to Sulina (North coast) due to financial constraints.

#### **Number of measured fish per species**

The total number of measured fish per species aggregated from both active and passive métiers is exactly documented. This is clearly traceable (as an example) by the composition of individual data for sprat from 2012 (n=6867 individuals size measured and sex determined) as an example in Figure 7 below. Overall, this aspect is well covered for all species and the total number is reflected in Table III\_C\_5.

Figure 7: Individual data for sprat 2012

TOTAL 2012												
SPRATTUS SPRATTUS - sprat												
TOTAL PESCUIT ACTIV + STATIONAR												
Clasa de lung	F				M				T			
	nr	%	G. totala	G. medie	nr	%	G. totala	G. medie	nr	%	G. totala	G. medie
50-55	9	0,131	8,51	0,946	2	0,029	1,79	0,895	11	0,160	10,30	0,936
55-60	56	0,815	68,72	1,227	31	0,451	32,52	1,049	87	1,267	101,24	1,164
60-65	176	2,563	273,34	1,553	101	1,471	139,21	1,378	277	4,034	412,55	1,489
65-70	551	8,024	969,72	1,760	352	5,126	566,14	1,608	903	13,150	1535,86	1,701
70-75	848	12,349	1669,95	1,969	562	8,184	1082,63	1,926	1410	20,533	2752,58	1,952
75-80	607	8,839	1576,85	2,598	416	6,058	1000,81	2,406	1023	14,897	2577,66	2,520
80-85	409	5,956	1341,46	3,280	302	4,398	946,14	3,133	711	10,354	2287,60	3,217
85-90	498	7,252	1974,37	3,965	420	6,116	1566,99	3,731	918	13,368	3541,36	3,858
90-95	458	6,670	2167,37	4,732	343	4,995	1495,83	4,361	801	11,664	3663,20	4,573
95-100	309	4,500	1646,19	5,327	192	2,796	946,09	4,928	501	7,296	2592,28	5,174
100-105	109	1,587	685,62	6,290	66	0,961	383,66	5,813	175	2,548	1069,28	6,110
105-110	35	0,510	247,34	7,067	9	0,131	61,07	6,786	44	0,641	308,41	7,009
110-115	6	0,087	48,07	8,012	0	0,000	0,00	0,000	6	0,087	48,07	8,012
<b>TOTAL</b>	<b>4071</b>	<b>59,284</b>	<b>12677,51</b>	<b>3,114</b>	<b>2796</b>	<b>40,716</b>	<b>8222,88</b>	<b>2,941</b>	<b>6867</b>	<b>100,00</b>	<b>20900,39</b>	<b>3,044</b>
			Lungimea medie: 80,036 mm				Lungimea medie: 80,397 mm				Lungimea medie: 80,183 mm	

Source: NIMRD

Overall, there is good compliance with the sampling plan.

**Recommendation:**

- ✓ All accomplished sampling trips to landing ports should be mentioned, even if no samples could finally be taken that day. Due to the nature of fishing (gear destruction / technical problems / wrong place / no fish / other species) it can happen that the expected sample cannot be taken at the respective port and vessel at that time.

**4.2. Data upload, storage, processing and access**

In the long term, the data should be stored in the “Pescuit marin” database using the “Marine fisheries” module.

Currently, ANPA provides a paper copy of the logbooks and coastal logbooks to the NIMRD every month (around 90 documents per months on paper). The information provided covers all the fleet segments.

- The paper information is filled in every month by vessel and includes the registration of the catches by gear used.
- The information is compiled and calculated manually in ad hoc Excel files depending on the request to be answered. For example, data can be aggregated by vessel,
  - And the total of the capture, discard by species
  - Or the capture by fishing techniques
  - Or the distribution of the active vessels (based on the catches or not) by size in the four LOA categories (<6, 6-12, 12-18, 24-40m).

- The final tables are compared with those obtained by tabulating the same data as entered by ANPA (by the inspector in the ANPA register database). This process provides a double check.

The compilation job is done very conscientiously but the efficiency is very limited. At NIMRD, the task requires one person full-time. The data are spread in tens of Excel files. The access to the information is then very confusing and the possibility to retrieve the latest valid information depends on the availability of the person in charge. There is no strict system to access the data and no specific formal description available. Within the NIMRD, all people involved in the data collection and compilation have the same access rights to a common server directory.

As indicated in section 1.4, the need for an efficient storage of information and appropriate sharing of information with ANPA is real. In addition, the following **recommendations** can be made:

- ✓ ***Instead of receiving the paper forms from ANPA, it would be advisable to receive directly an extraction from the ANPA register database. This could be envisaged when the ANPA register will work efficiently and the data can be provided on an agreed reference period.***
- ✓ ***Excel is used more as a tool for presenting the data (formatting of tables) than as an efficient tool for manipulating them. Even in the current situation, the work could be done more efficiently if the data were compiled in a more structured way dissociated from the presentation. As example of improvements: numeric field with numeric values and not including text note preventing from applying formulas.... The work and the presentation could be highly simplified by using tools of Excel like for instance the pivot table.***

### 4.3. Statistical quality

NIRMD is responsible to assure statistical quality of the data. However, no specific software or manual checking procedures have been mentioned by NIRMD.

The Excel files have neither embedded functions to validate data from different sources, and therefore all checks are done manually. However, the NC explained that it is due to the fact that data are (in different formats) in ANPA.

#### Achievement of precision levels

Concerning the CV in Table III\_C\_5 all data achieve the necessary statistical precision.

#### Calculation of CVs

The consultants were shown the formulas used in the Excel files for the calculation of CVs for the pelagic trawl. The COST software is considered as very unfriendly tool and is not used.

#### Main problems

##### Table III.C.5

- Table III.C.5. Empty row for discards: because the quantity of discarded fish is very low except for the whiting.
- Table III.C.5. The column for “planned minimum no. of fish to be measured at the regional level” is empty, as there is no collaboration with Bulgaria.

- Table III.C.5. The values of CVs are below the limits.
- BG and RO have no common data to calculate the CVs. There is no current cooperation between these countries.

**Recommendation:**

- ✓ *The CV in the Table III\_C\_5 should for better convenience be expressed in percentage numbers.*

#### **4.4. Conclusions**

The métiers are not always assigned from the logbooks, for the fleet segment with the larger vessels it is often assumed not to change over the year. This procedure is comprehensible given the small number of métiers acting all in the more or less same spatial scale in the Black Sea area. The final numbers of samples from active and passive gear types match the values presented in the tables and are in general in agreement with the format.

However, no written manual exists for data collection, validation and processing therefore the flow of data is closely related to the involved people and their personal skills and experience.

The data checking procedures are mainly visual. ANPA considers the double data captures made by ANPA –NIRMD as a token of good quality. This is possibly true but certainly inefficient and could be improved by capturing the data in a single place and using the time freed on performing other more advanced checks.

Due to the lack of a centralized backup system, the storage of data is spread onto several hard disks or PCs, which is potentially error-prone given the tens of frequently to be updated, Excel documents. This problem should be solved with the data base in development.

## 5. BIOLOGICAL DATA STOCK-RELATED VARIABLES

### 5.1. Programme monitoring

#### Organisation for the production of stock-related data

The responsible institution is NIMRD. The required species for which stock-specific data need to be collected are: *Sprattus sprattus*, *Trachurus mediterraneus ponticus*, *Psetta maxima maeotica*, *Engraulis encrasicolus*, *Squalus acanthias* and *Trachurus trachurus* (not existing in Romanian Black Sea waters – therefore not sampled). Data for most of the biological parameters are sampled annually and not only triennially (as requested by the EC 93/2010 regulation) without extra costs (like weight, sex-ratio, and maturity) since the samples are already available.

The data for the biological stock data are compiled from samplings on shore, on board, during research cruises and from selected discard samples (only whiting and small sprat). Staff from NIMRD, often with support of the local ANPA branches, visit the ports and fishery points according to the NP schedule and participates e.g. twice per year on the largest commercial vessel for on board sampling.

The stock-specific samples are taken during the research cruises (see Chapter 8) and from the unsorted catch during landing in the ports, fishery points and during on-board sampling.

Age determination by otoliths reading is done in-house at NIMRD by experienced readers. Meanwhile, NIMRD includes recently recruited younger scientists in this process, conducts intercalibration and cooperates with specialized scientists outside Romania, e.g. by attending Workshops on otoliths reading etc. to establish coherence in their time series and harmonisation of methods across EU.

#### Achievement of objectives with respect to sampling plans

Sampling is organised twice per month mainly between April and September in North and South randomly for the day. Sampling at sea (on the largest trawler only twice a year). The composition of the catches and its discard is mainly whiting and small sprat, but the quantity is very small. Small sprat is taken to fill up missing smallest size classes for age determination.

Samples have been collected for all planned stocks. In most cases, more samples than proposed were analysed, simply because the fish were available without extra costs.

#### Number of measured fish per species

The numbers of measured fish per species is reached except for sprat. Lower numbers have been collected compared to the planned number. It must be emphasized that this is the cause of a data transmission failure. The reason is the cancelled 2<sup>nd</sup> quarter Pelagic Trawling survey cruise for sprat in 2012, which was intended to be in joined effort with the Bulgarian Research Vessel ‘Akademik’ (Chapter 8 for more details).

### **Conclusion on compliance with sampling plans**

It can be concluded that the biological stock-specific data are sampled at least in the numbers proposed in the NP. Often, the numbers exceed the planned numbers. However, the values for the CV should be given in percentage, not in other formats.

### **5.2. Data upload, storage, processing and access**

The NIRMD officers jointly carry out the sampling with the inspector of the ANPA twice a month. There is no specific registration on the sample mission in a database, only an administrative mission order.

The fish samples are registered in the laboratory in a paper logbook (see Annex 2). The results are then compiled by class size and range in Excel files. Checks on class size are performed.

Later various aggregation levels are performed and the quality of measured variables is checked manually. This usually happens through graphical visualization and plotting, which highlights outliers (typing errors etc.).

The raw data are in Excel files stored on three to four physically different computers/laptops or hard drives. The data are planned to be entered in the long term in the “Pescuit marin” database. However, to date, the module was only installed recently for testing purposes.

The access to biological data is not formally defined. Currently, the data are primarily available in early raw data and first aggregated level from Excel files shared among the group of involved scientists at NIMRD. No access rules for the data are applied. The data are available and could also be distributed on request e.g. by email to the interested public.

### **5.3. Statistical quality**

#### **Sampling**

The selection of trips for sampling individuals is not done at random but based on “convenience sampling” in the landing points.

#### **Quality checks**

There is not specific manual for quality assurance.

Usually, data on length frequency, age, fecundity stage, sex or weight are plotted manually as graphs to determine outliers of probable typing error origin or unreliability. This process is already in the step following the transfer of the data from paper into Excel. As similar data to the collected data under DCF have already been collected under different programmes and projects since more than 10 years, time series data are available to check the quality of the current sampled data. The entered data are also randomly cross-checked against values from already existing data time series of biological characteristics of the key species. Obvious deviations between those are double checked. However, all these processes are manually and depend to a certain way on the level of experience of the person doing the work.

#### **Achievement of precision levels**

For most of the data concerning “weight” information in Table III\_E\_3, the CV values are above the required limits. This was explained by the nature of the biological growth in fish. Differences among individual fish are largest in the relation of weight, not for age or length. The variation among well-fed and poorly-fed individuals can be very significantly high in terms of weight. This is not reflected in that dimension in length or fecundity, or sex-ratio.

#### **5.4. Conclusions and recommendations**

The necessary and proposed stock-related biological data are collected and the tables are filled properly with one exception: the achieved precision level should be given as percentage value. The analysed numbers of individuals exceed for almost all species the planned magnitudes and also data on not (yet) required species are collected, but only presented in the AR (AR 2012, their Annex 26) and not in Table III.E.3. It is very appreciable that an inter-calibration between the established otoliths readers and recently recruited internal young otoliths readers and external experts is established to prevent a break in the current high quality age reading time series. However, this exchange and cooperation should be intensified and strengthened also with non EU-Scientists and the current procedure should be further standardized between otoliths readers working on the commonly shared fish-populations in the Black Sea.

#### **Recommendation:**

- ✓ ***The process of entering the data from paper into Excel is done manually with some manual and visual checks (graphics, time-series). Processing rules should be made explicit in technical documents.***
- ✓ ***The storage of this data is done in many separate Excel sheets which are backed up on PCs or laptops irregularly. The data should be stored and back-up centrally, and a written guidance/manual should be developed how the data is and has to be organized.***

***At the moment, the persons directly involved in the collection of the raw data also compile the further processing including dissemination.*** The statistical quality is checked manually and no written manual exist. Accordingly, many important steps rely on the level of experience of the persons conducting the work. It is recommended to document the process. In addition, ***If the persons in charge achieve the retirement age (which is a reality in the near future), it is important to have trained and well recruited personal for their replacement, capable to reproduce the highly specialized work, currently done with Excel, which is currently behind the data compilation and storage. This remark is also relevant for the research surveys.***

## 6. RECREATIONAL FISHERIES

### 6.1. Programme monitoring

Concerning DCF related species neither eel, salmon, cod or Bluefin tuna are targeted in freshwater or marine areas. No data on effort or catch are accordingly collected.

However, recreational fishery is common for self-consumption, especially in Romanian inland waters. The most common species being caught in the Black Sea are gobies, sometimes horse mackerels or grey mullets. A personal license is needed for recreational anglers and in addition an annual tax needs to be paid, which depends on the age and professional status of the license holder (-approx. 7-8€). No information, in what institution and if the licenses are electronically stored, was retrieved.

One important aspect in relation to the recreational fisheries and aquaculture needs to be mentioned: aquaculture companies may apply for a license to be authorized to offer angling opportunities within their farming facilities. This implies that these companies usually may not have the aquaculture production aspect as its exclusive or main business. The NC “guesstimated” that approximately 15-20% of the aquaculture companies may have such “recreational angling opportunity” license.

No pilot studies are planned in the recreational fishery.

### 6.2. Data upload, storage, processing and access

Not applicable

### 6.3. Statistical quality

Not applicable

### 6.4. Conclusions and recommendations

Due to the absence of DCF relevant species (eel, salmon, cod, Bluefin tuna) in the Romanian waters there is no recreational fisheries on these species. Accordingly, no specific data collection is currently performed or are pilot studies planned in the near future.



## 7. TRANSVERSAL DATA

ANPA collects all the transversal data (capacity, effort, landings). NIMRD is in charge of processing the transversal data for the purposes of DCF (capacity, effort, landings).

There are light deviations in the number of active vessels operating per year, as the calendar for updating the FFR does not match with that of calls. These can be considered minor deviations, though. Two types of logbooks are used. A shortened simplified one is used for the small scale fleet.

### **Transversal variable on Capacity**

The Romanian authorities distinguish 4 types of the vessels, as described in section 4.1: marine fisheries vessels, inland fisheries vessels (including in the Danube delta), scientific vessel and auxiliary vessels not used for fisheries (e.g. for transport).

The fishing vessels must obtain a license. The Fishing License register contains all information on vessel and the registration is valid until it is cancelled by the vessel owner himself or by ANPA inspectors who conclude on the basis of periodic inspections that the license should be cancelled.

ANPA staff produced for the consultant an extraction from the ANPA database in Excel: 193 fishing vessels were registered by the end of 2013. It is noted that the EU fleet register contains 201 vessels for Romania per 1/1/2014. This difference may be caused by the difference of used dates.

In addition to the licensing, the Fishing Authorisations is to be renewed every year. Without a valid fishing authorization, the vessel is considered as inactive from Control Regulation perspective.

Specific Fishing Authorisation is given for turbot to fulfil the obligation related to quota on turbot<sup>6</sup> in Control Regulation.

### **Catches and effort**

As described in previous sections, data on catches and effort is collected using logbooks, landings declarations and sales notes which are also obligatory for the small scale fleet in Romania.

The information received on paper is processed in a multitude of Excel files.

The distribution of landings is considered as the distribution of fishing effort. The allocation is divided in North and South areas. No more geographical detail is considered.

### **7.1. Data storage, processing and access**

Data from logbooks, sales notes and the fleet register are aggregated by NIMRD at the company level (as described in 4.2). Most companies have one vessel. One cooperative of fishermen owns about 50 small boats, being the largest data provider. The aggregation of data is done manually, which can lead to errors, and represent a huge workload. This is disproportionate with the size of the Romanian fleet. Data are also aggregated by fishing techniques, length classes, species, etc. increasing the workload. If data are not coherent, requests to ANPA inspectors for checking the data are made.

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<sup>6</sup> There is a special logbook for turbot on Annex 7

### **7.3. Statistical quality**

Data are exhaustive and therefore no estimates of sampling error are calculated.

The transversal variables are found in the Excel files of the NIRMD and in the ANPA register database (see chapter 4.2). The two institutions double-check the information.

### **7.4. Conclusions and recommendations**

The Romanian controls on catches seem to be stricter than the EU requirements. Small scale fleet must record the catch on a simplified logbook and even landings below the threshold of 50 kg must be recorded.

The volume of logbooks and sales notes which are monthly treated is not large, but its storage into a database (not in Excel) would improve its treatment and reduce the errors caused by manual processing.

## 8. RESEARCH SURVEYS AT SEA

### 8.1. Programme monitoring

The NIMRD is the responsible institute to fulfil the requested obligations for the Research surveys at Sea. The tasks are coordinated and lead by Dr Georghe Radu. Other scientists involved in the direct DCF sampling are Mr V. Maximov (Cruise leader) and Mr. E. Anton (Gear). Usually 5 people from the NIMRD conduct the surveys, 2-3 Scientists and 2-3 technicians.

In 2012, two demersal trawl surveys (2<sup>nd</sup> and 4<sup>th</sup> quarter) have been conducted and one survey with a pelagic trawl (4<sup>th</sup> quarter). The proposed pelagic acoustic survey (2<sup>nd</sup> quarter 2012) as stated in the agreement of Bulgaria and Romania from 2010 was not performed. Information about performed research activities between 2010 and 2012 are listed in the Tables (source: NIMRD).

In the bilateral agreement from the Coordination Meeting in Bucharest (04-05/02/2010) between Bulgaria and Romania, was stated that both countries conduct a common demersal trawl survey (one in 2<sup>nd</sup> and one in 4<sup>th</sup> quarter) with the Romania vessel “Steaua de Mare I” in the whole Romanian and Bulgarian waters. In conformity with this agreement using hydroacoustic methods the RV “Akademic” from Bulgaria will cover in May/June and September/October the pelagic survey in the Romanian and Bulgarian waters accordingly.

**Table 1: Activities implemented by Romania for Bulgaria (2<sup>nd</sup> quarter + 4<sup>th</sup> quarter survey)**

RO	No. expeditions realized (planned)	No. of stations realized (planned)	No. of hauls
2010	3	30	125
2011 <sup>2</sup>	2 (2)	10+10=20 (10+10=20)	40+37 =77 (60-80)
2012 <sup>3</sup>	1(2)	10+0 (10+10=20)	40+0 (60-80)
2013			
<b>Total</b>	<b>6</b>	<b>60</b>	<b>242</b>

<sup>2</sup> Source: RO AR 2011 from May 2012; <sup>3</sup>Source: RO AR 2012 from May 2013

**Table 2: Activities implemented by Bulgaria for Romania (2<sup>nd</sup> quarter + 4<sup>th</sup> quarter survey)**

BUL	No. expeditions realized (planned)	No. of stations realized (planned)	No. of hauls
2010	1 (2)	1	1
2011 <sup>2</sup>	0+1(2)	10 (10+10=20)	0+14 (60-80)
2012	0 (2)	0 (10+10=20)	0 (60-80)
2013			
<b>Total</b>	<b>2</b>	<b>10</b>	<b>15</b>

There are deviations between the planned and the actually performed cruises. In total during the period of 3 Years, 242 hauls have been performed onboard of the Romanian research vessel (RV) “Steaua de Mare I” in the waters of Bulgaria. In the same time, only 15 hauls have been performed by the Bulgarian research vessel of “Akademik” in the waters of Romania. No sampling was performed in 2012 by Bulgarian activities in Romanian waters. In 2012 it was tried to compensate the not conducted pelagic hydroacoustic spring survey at least by pelagic trawling with the Romanian vessel in the 4<sup>th</sup> quarter.

Some technical problems on the Bulgarian research vessel occurred, namely the use of a pelagic net which could not be satisfactorily operated by the existing infrastructure. The winches had not the capacity to haul the net in time (e.g. a standardized 60 min haul took 4-5 hours to be on deck again). Due to the fact, that the Romanian research vessel is not equipped with hydroacoustic devices (Echosounder and sonar), only the swept area method using pelagic trawling could be performed to estimate sprat abundance.

Accordingly, no hydroacoustic data have been collected and the method of the sampling could not fully meet the MEDIAS (Hydroacoustic Survey protocol in the Mediterranean Sea) standard. MEDIAS recommends to do 2 surveys, 4<sup>th</sup> and 2<sup>nd</sup> quarter.

As mentioned by the responsible person for the RV data collection at NIMRD, the replacement of the RV “Steaua de Mare I” is planned and financial resources for its building should have been allocated. For the new vessel the equipment with a hydroacoustic system (Echosounder) is foreseen. However, a definitive starting date for the construction of this vessel is not set yet.

#### **Recommendation**

- ✓ ***The combination of acoustic methods with actual ad hoc catch information improves the possibility to estimate pelagic species biomass. It also enables to follow the suggested MEDIAS initiative for the Black Sea. Therefore, the equipment of the current RV “Steaua de Mare I” with an acoustic device (Echosounder) is recommended to accurately monitor the distribution and stock of pelagic fish species in the waters of the Black Sea with two surveys in spring and autumn.***

#### **Processing of biological measurements**

Measurements and sampling (for otoliths, stomach) of all larger species like turbot and spiny dogfish are performed immediately after the haul is on deck. For the analyses of the small pelagic species like sprat, anchovy or horse mackerel, random subsamples of several kilograms are taken and deep frozen from each haul for further processing at NIMRD after return. Sensitive parameters like fecundity are determined directly on board for all analysed species.

#### **Achievement of objectives**

Overall the objectives of the research vessel cruise activity have been met. The deviation from the planned activities for the pelagic survey, have been 50% for the days at sea and 55% of the planned hauls. This could be explained by the cancellation of one planned research cruise on the Bulgarian RV “Akademik”. However, the loss of biological data was restricted to sprat only.

In table III\_E\_3 the planned sample sizes for sprat (length@weight, maturity@length and sex-ratio@length) have not been reached (89%, 69%, 89%). For this species, the reduction of biological data for for length@weight, maturity@length and sex-ratio@length was 11% and 31% only, respectively.

All other values exceed the planned number of samples. Horse mackerel sampling was exhaustive with partly >> 500% achievement. Whiting was sampled in addition to plan. Also, other species like bluefish or red mullet have been sampled but data are not shown in the table but are available on request (according to a personal comment from a NIMRD senior expert).

Correction needed in Table III\_E\_3: the CVs need to be given as percentage. As no complete discard sampling has been performed, except for whiting, it should not be mentioned in the column “data source” for the other species. The data, however, should be uploaded to an international database, or to be shared with the GFCM.

**Recommendation**

- ✓ *The team encouraged the NIMRD team to present all measured/analysed fish species in the table and to explain this in the AR. The data are scientifically valuable and could be used for other purposes.*

**Compliance with methods and procedures**

The sampling of the biological data is to a large extent originating from the scientific research vessel cruises. Alternative data sources are the landing data from different métiers, simplified as either coming from active (towed) or standing/stationary (passive) gear. In terms of quantity and quality these data meet the DCF requirements.

**Comment:** The age readings of the otoliths are performed by very experienced otolith reader experts at NIMRD. However, since recently these experts share their knowledge with younger recruited scientists who in addition were sent out to international Workshops for inter-calibrating otolith reading. It needs to be highlighted and appreciated that this initiative prevents the break of the continuous high quality data time series.

**Figure 8: Example of annual age reading (otolith-based) per length class from 2012, Samples are taken from stationary gear (Source: INMDR), [Compare AR 2012, Table III\_E\_3 length@age, n=2001]**

TOTAL-2012											
ENGRAULIS-ENCRASICOLUS--hamsie											
TOTAL-PESCUIT-STATIONAR											
Clasa lung	0::0+		1::1+		2::2+		3::3+		4::4+		TOTAL
	Nr.	G.med	Nr.	G.med	Nr.	G.med	Nr.	G.med	Nr.	G.med	
55-60	8	1,103									8
60-65	13	1,480									13
65-70	42	1,650									42
70-75	94	1,825	12	1,869							106
75-80	100	2,710	61	2,731							161
80-85	90	3,250	160	3,366							250
85-90	80	3,680	208	3,743	12	3,897					300
90-95	24	4,550	315	4,625	28	4,611					367
95-100	17	5,155	260	5,284	57	5,360					334
100-105			104	5,955	64	5,954	10	6,098			178
105-110			28	6,591	66	6,607	13	6,768			107
110-115			10	7,318	38	7,260	9	7,571	2	7,920	59
115-120					16	8,235	12	8,283	4	8,440	32
120-125							9	9,384	4	9,415	22
125-130							3	8,870	7	9,647	14
130-135									3	10,953	5
135-140										3	3
<b>Numar</b>	<b>468</b>		<b>1158</b>		<b>293</b>		<b>63</b>		<b>19</b>		<b>2001</b>
<b>Lm</b>	<b>79,006</b>	<b>23,388</b>	<b>91,779</b>	<b>57,871</b>	<b>104,070</b>	<b>14,643</b>	<b>114,881</b>	<b>124,868</b>	<b>10,950</b>		<b>91,633</b>
<b>Gm</b>		<b>2,8283</b>		<b>4,5023</b>		<b>6,2023</b>		<b>7,9578</b>		<b>10,0669</b>	<b>4,5214</b>
<b>%</b>	<b>14,630</b>		<b>57,628</b>		<b>20,086</b>		<b>5,341</b>		<b>2,114</b>		<b>100,00</b>

Source: NIMRD

## 8.2. Data upload, storage, processing and access

The raw data are first compiled either on board (on paper in protocols) or in the different fish-processing labs of the NIMRD (on paper in lab-books) and then are transferred to Excel sheets of different complexities.

Like for the stock related variables, the raw data are in Excel files, stored on different computers/laptops or hard drives. The data are planned to be entered in the long term in the “Pescuit marin” database. However, to date, the module was only installed recently for testing purposes.

Same data processing and open access to the scientist is in place for research and stock related data (see 5.2).

## 8.3. Statistical quality

The responsible person for the statistical quality of the RV data is a senior expert (G. RADU) from NIMRD.

The CV is calculated according the equation given in the AR. The quality of the age reading of otoliths is e.g. assured due to inter-calibration of random subsamples of otoliths in the frame of international Expert workshops on age reading.

### **Quality checks**

No further checks are carried out.

### **Achievement of precision levels**

The precision levels in Table III\_E\_3 are mostly achieved.

## 8.4. Institutional Issues

In December 2013 a meeting took place in Brussels with the representation on Romanian institutions (the NC); DG MARE; the Chairs of MEDIS and MEDIAS and representative of the Bulgarian institutions (Permanent representation of ANPA Bulgaria) in order to establish an agreement for the implementation of the common surveys on the Black Sea.

The Romanian NC prepared a draft proposal “Joint Programme Agreement” (see Annex 6) to be shared with the Bulgarian NC for the implementation of the CFP in the Black Sea.

The objective of the Joint Programme was to cooperate in the implementation of:

- Multi-annual sampling programmes;
- Scheme for at-sea and land monitoring of commercial, artisanal and recreational fisheries, where necessary;
- Scheme for research surveys-at-sea; and
- Scheme for management and use of data

The Joint Programme also has the purpose of increasing of the efficiency of scientific work of the institutes and the accuracy of collected data and information.

NC Mr Stroie confirmed that the Bulgarian NC never answered to this proposal for agreement. Despite this, there has been no agreement between the two countries and Romania Institutions take the decision to carry out the scientific surveys only in the Romanian waters.

## 8.5. Conclusions and recommendations

- ✓ *The two demersal trawl surveys in Romanian waters to monitor the turbot biomass are conducted according to the NP. Only the 2nd pelagic trawl survey has been performed (without hydro acoustic devices) with the Romanian research vessel “Steaua de Mare I” in 2012. No data are available from the planned 1st pelagic survey. However, the loss of biological data was restricted to sprat only. For sprat, the reduction of biological data for length@weight, maturity@length and sex-ratio@length was 11% and 31%, respectively. In general, the collection of biological data is conducted according to NP. Additional samples are taken for other species on the expenses of NIMRD. The processing of data from the paper to the Excel format is done manually, the further aggregation also. It is recommend to archive the data not only on different local storage devices, it should be tried to upload the data in the DB to be in current development by a subcontractor.*

## 9. ECONOMIC DATA – CATCHING SECTOR

### 9.1. Programme monitoring

#### Organisation for the production

NIMRD is responsible for the collection of fleet economic data. The collection is based on a list of ‘companies’ licensed to operate fishing vessels. ANPA provides capacity information on the basis of the fleet register, while NIMRD provides information on active vessels on the basis of logbooks. The list of companies licensed is double-checked with the list of licensed and authorised vessels in ANPA as well as with the logbooks processed by IRDAEFA. In 2013 112 vessels were active (at least one day) out of a total of 193 registered and licensed vessels.

NIMRD checks the ANPA register and the logbooks to assess the level of activity. In addition, the different dates of reference of the register and logbooks may lead to small deviations.

Data are collected via a questionnaire (Annex 3) which is sent exhaustively to all companies. The questionnaires are filled in by the vessel owners which in most cases are fishermen with no technical background allowing them to understand the economic concepts. Thus, NIMRD has recently organised a training course for about 150 fishermen. The largest owner of vessels (a cooperative in Mangalia) has its own accounting service. Other companies are incorporated as family associations, which are not compelled to keep accounting books.

The paper questionnaires are filled in by the fishermen, sometimes with assistance from the NIMRD staff. The data is then transposed to Excel files by hand, but all the calculations are done manually. This requires a significant time input. It also entails a danger of man-made errors.

#### Achievement of objectives

According to the NP and AR, economic data is collected through a census, i.e. exhaustively. AR 2012 indicates 100% response, which makes the impression that all vessels have responded to all questions. In reality this is not the case. There is a non-response of 50% at the level of units<sup>7</sup>. The missing values are imputed, taking the average value of the respondents.

**Table III.B.3:** NIMRD wrongly indicates 100% achieved sample rate. There is a confusion between Unit and Item non-response in this table. Unit non-response rate should be about 50% (% of companies that fill in the questionnaire) and Item non-response, which reflects the % of the sample that completed a particular item in the questionnaire, can be much higher. For energy costs, the item non-response was particularly high. This table does not required to be filled separately for each fleet segment, since for all of them the type of data collection is the same (exhaustive).

During the interviews and on the basis of the background documentation a number of problems has been identified which need to be addressed:

1. Annual report 2012 (p. 29) shows that Romania does not follow the STECF proposals regarding the calculation of the value of capital and consequently depreciation costs.

<sup>7</sup> This level of response of 50-60% is stated in the file with economic data distributed by STECF/JRC ‘2013\_EU Fleet Econom and Transversal data\_fleet segment level.



Instead, Romania uses the fiscal rules. The choice between economic and fiscal calculation of capital costs has been reviewed in-depth in the IREPA (2006)<sup>8</sup>. It is recommended that Romania starts using the standard approach.

- Romania does not use a consistent classification or terminology of gears, as shown in the following table. Tables III-B-1, 2 and III-B-3 should be using one common set of names for gears, consistent with the pp. III of 10121/2009. The table makes a recommendation how the gears should be classified.

T. III-B-1 Population	T. III-B-2 Clustering	T. III-B-3 Data collection	Proposed terms for gears
<ul style="list-style-type: none"> <li>- Passive gears: pound nets</li> <li>- Passive gears: set gillnet</li> <li>- Passive gears: long lines and hand lines</li> <li>- Pelagic trawlers</li> </ul>	<ul style="list-style-type: none"> <li>- Passive gears: pound nets</li> <li>- Passive gears: set gillnet</li> <li>- Passive gears: long lines and hand lines</li> </ul>	<ul style="list-style-type: none"> <li>- Vessels using other passive gears</li> <li>- Vessels using passive gears only</li> <li>- Vessels using active and passive gears</li> <li>- Vessels using polyvalent passive gears only</li> </ul>	<ul style="list-style-type: none"> <li>- PG (Passive gears) – all vessels in classes &lt;6 and 6-12m, under one gear</li> </ul> <p>Or distinguish gears<sup>9</sup>:</p> <ul style="list-style-type: none"> <li>- DFN (gillnets)</li> <li>- FPO (pound nets)</li> <li>- HOK (long / hand lines)</li> </ul>

- It was noted that the AER 2013 (table 5.48, p.209) presents economic data on the segment PMP 2440 which is composed of 2 vessels only. This is clearly in breach of confidentiality rules given that it may be possible to identify the persons (legal or natural) to which data correspond. Not only Romania, but also JRC and STECF should make sure that such data is not made public.
- Table III-B-1 does not present the inactive fleets, which is an important part of the total fleet and was even more important in the years 2008-2011

## 9.2. Data upload, storage, processing and access

Data are sent to companies by mail or post. NIRMD request the assistance of the inspector for non-respondent.

Paper questionnaire received are keyed in by company in individual Excel files. This increases highly the risk of processing error and very little efficiency in data aggregation. Excel files are located in the computer of the senior expert working on economic data.

There is no weighting of data, since there is no sampling.

In general, the manual processing of all data (no use of automated sums in Excel) makes the whole estimation procedure lengthy and error-prone.

In the long term, the data should be stored in the “Pescuit marin” database using the “Marine Fisheries” module.

<sup>8</sup> IREPA Onlus Co-ordinator, 2006. Evaluation of the capital value, investments and capital costs in the fisheries sector Study N° FISH/2005/03, 203p

<sup>9</sup> This is not obligatory.

In the AR, data are published for very small segments of the fleet, having less than 5 units. This may pose a confidentiality problem, and the transmission of this detailed tabulation to international organizations should be discussed bilaterally to avoid disclosure of data for individual units,

### 9.3. Statistical quality

The economic data is collected using paper questionnaires. The quality of the responses seems uncertain in view of the fact that the most fishermen own a single, small vessel and do not maintain solid accounting. The annual questionnaire therefore relies on the memory of the respondents, as in many other small scale fisheries in the Mediterranean and elsewhere. The data is processed manually. This is a potential source of errors. The quality checks are not formally described. There are no consistent procedures for quality checks.

Table III-B-3 puts achieved sample rate and response rate at 100% and as the survey is presented as census, CVs are not calculated. This presentation does not well reflect the reality. At the level of individual variables, the response rate is about 50%, bearing in mind that full response to the survey is not obligatory, contrary to landings declaration. Imputation of missing values at the level of averages does not improve the statistical quality, while the fact that the CVs are not calculated hides the statistical characteristics of the estimate.

Both the NP and the AR mention that for small vessels it is intended to draw a random, stratified sample. However, the consultant has no evidence of sampling, and the Romanian experts mentioned that the questionnaire is sent to all companies, with a high non-response rate. This should be corrected in the next editions of the NP and AR. The justification by the experts for not calculating the CVs was that there is a debate in STECF meetings about the validity of such measure. Not being a random sample, it is not possible to correctly estimate CVs and other measures of sampling error.

There is a process of manual imputation of average values of the economic variables per fleet segments to the non-responding units. Since non-response rate is about 50%, there is a risk that imputation underestimates the variability in the population (this is a statistical property that derives from the imputation by average values)

### 9.4. Conclusions and recommendations

It is recommended that the future ARs present:

- Actual sample rate and response rates per variable;
- Calculation of the CVs, not so much for the description of precision (as it is not a random sample) but of validity of the imputation procedure<sup>10</sup>.

It is recommended that Romania starts using the standard approach for the calculation of capital costs. Should the application of standard methodology not be clear, Romania should search advice from another EU research institute, e.g. in Italy, the main author of the common methodology.

Data on segments with less than 10 vessels should not be published, even if it is not incorporated in other/adjacent segments because of too large differences, i.e. the two 24-40m PMP vessel would have to be merged either in 6-12m PGO segment (with 149 vessels) or with other PMP vessels 0-6m

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<sup>10</sup> If the CV of observed values from respondents is too high, the imputation by the average value may not be representative.

(3 vessels) and 6-12m (7 vessels). It is clear that merging vessels of so different sizes is at the detriment of the information value provided in the economic parameters.

The discussion of economic variables is not very relevant given the high rates of non-response to the questionnaire. While an effort to estimate totals for the complete population of fishing vessels is made by imputing missing values, there is a risk that the results have little reliability. An effort should be made to increase the collaboration of the fishing industry and so increase the response rate at item level. Given the small scale of fisheries, simplifying the questionnaire could help in increasing the response rate. A special analysis of small scale vessels (the large majority) and in particular of the homogeneity of the economic variables for this segment could lead to estimation models reliable enough and cheap to implement. Alternatively, the efforts in collecting data could be focused on a representative sample, e.g. panel as practiced in many MS. Representativeness of the panel can be checked by comparing indicators, which are available for both panel and the population, e.g. technical characteristics of the vessels (kW, GT, length) and average catches. The panel is then adapted and improved over the years as new vessels may join and others may leave. This would both increase collaboration and reduce workload. In addition, establishment of relations with the panel participants would also allow to guide them in monitoring of their costs and revenues (course in simple bookkeeping), so that the survey would not have to rely on their memory. It is highly probable that the economic structure of small scale fisheries is homogeneous enough to allow extrapolation based on a small sample.

## 10. ECONOMIC DATA – AQUACULTURE

### 10.1. Programme monitoring

#### Organisation for the production: the Aquaculture Units Register (AUR)

IRDAEFA, located in Galati, is the institution in charge to make the general description of situation from the Romanian Aquaculture Sector.

The Aquaculture Units Register (AUR) managed by ANPA contains the aquaculture units registered and licensed. Licenses are granted since 2009 for an undetermined period. Only if there is a modification, the register is updated. One economic agent (firm) can apply for different licenses for aquaculture activities, so an economic agent can have different licenses. In 2012 there were 928 licenses corresponding to 674 societies. The aquaculture register is updated quarterly and is accessible on ANPA web site.

ANPA provides the Aquaculture Units Register (AUR) containing the aquaculture units registered and licensed.

The segmentation of farms is done by IRDAEFA according to DCF regulation. IRDAEFA and ANPA work together for design the questionnaire (see Annex 8), which is sent out by IRDAEFA.

ANPA inspectors assist IRDAEFA in collecting the questionnaires answered and share some data to countercheck information. ANPA inspectors visit each farm at least once a year (usually twice, once in each semester). ANPA inspectors help to obtain the questionnaire back and collect also in parallel for ANPA needs specific information related to the production and aquaculture techniques. This information is used to fulfil the Eurostat questionnaire and to check the reliability of the information given in the questionnaire.

Inspectors also received quarterly production reports (in 2015 it will be monthly reports) from the aquaculture farms. These reports are used by IRDAEFA to check the data submitted by the aquaculture units.

#### Achievement of objectives

In 2012 there were 430 active aquaculture farms of which 153 responded the questionnaire, i.e. a response rate of 35%. Only one farm, producing mussels, falls under marine aquaculture. All others are fresh water, producing trout and cyprinids (mostly carps). It is not quite clear how representative this sample is in relation to the whole population. This should be analysed with the production statistics, which are based on census.

### 10.2. Data upload, storage, processing and access

In the long term, the data should be stored in the “Pescuit marin” database using the “Aquaculture” module. For the moment, the DCF data are produced in Excel.

### 10.3. Statistical quality

IRDAEFA is in charge to carry out the statistical analyses.

There is no random selection of responding firms, but a voluntary process which may present selection bias (i.e. firms that respond may have a different structure of earnings, or conversely, firms with non-declared earnings may have the incentive to avoid responding the questionnaire). Since state-owned aquaculture companies are obliged to provide answers, the results may be biased towards these and not be representative of privately owned farms. These argue that there **is not a legal obligation** to do it. They also argue **confidentiality rights**. IRDAEFA explained the companies that their data will be codified (anonymised) and only will be used for calculation of population aggregates but it does not trigger better response.

The absence of random selection has two consequences on data processing: sampling weights to extrapolate the sample cannot be calculated, and formulas for the calculation of precision (CVs, standard errors) do not apply.

For the firms that do not answer, IRDAEFA imputes the same value (average value for the segment) to non-respondent firms. This procedure, while standard in most statistical applications, usually underestimates the variability in the population.

The segmentation is done by technique and species. This may improve the quality of estimates, since it breaks down the whole population in more homogeneous segments.

The segment for producing trout is well organized (system of data validation) and provides good answers.

#### **Quality checks**

IRDAEFA checks the data with the fiscal administration and also make field work visits by the ANPA inspectors. The inspectors help the respondents to fulfil the questionnaire. Meanwhile, IRDAEFA and ANPA asked the RO Government to make a legal obligation. From the perspective of reducing administrative burden, in particular for micro and small enterprises, such request should be thoroughly justified, before introducing new rules.

#### **Two comments should be made on tables in the AR:**

**Table IV.A.2:** OFF means “Other Fresh Water Farms”.

**Table IV.A.2:** the first three variables of the columns Achieved sample / planned sampled rate are wrong.

### 10.4. Conclusions and recommendations

- ✓ *With the exception of one mussel farm, there is no marine aquaculture, so that data collection is on this sector is not obligatory for Romania, under the present DCF.*
- ✓ *Representativeness of the sample should be evaluated.*
- ✓ *Consider, for the segmentation of farms, the property (private/public), as it may have a positive on impact on estimates by using stratification.*

## 11. ECONOMIC DATA – PROCESSING SECTOR

### 11.1. Programme monitoring

#### Organisation for the production

IRDAEFA Galati is in charge of collecting and managing data on fish processing industry. Until 2005 it was ANPA the responsible institution. ANPA's role is that of granting licenses for the activity, but even that activity has been replaced since 2011 by that of setting and verifying production standards.

A list of approved establishments is available on the website of ANSVSA (The National Sanitary and Food Safety Authority<sup>11</sup>). However, these establishments are not necessarily active, so that the list cannot be directly used for survey purposes. Cooperation with INS<sup>12</sup>, which maintains a statistical register (REGIS) for the collection of SBS data, has not been established.

The list of fish processing firms is compiled from various sources:

- Lists compiled by ANPA on the basis of legislation valid till 2011;
- Observations of ANPA or IRDAEFA staff;
- Requests for EU funding / support;
- Balance sheets, published by the Ministry of Finance.

The register of fish processing units is stored in an Excel file. It also contains, for each company, the different establishments (local units).

IRDAEFA should collect data only for those having fish processing as main activity. However, some units that have declared fish processing as primary activity but have other main source of turnover (e.g. supermarkets). Conversely some units that have declared secondary activity and in reality they are processing fish as main activity.

According to the NP there are:

- 21 units with fish processing as main activity; and
- 24 units have it as secondary activity. STECF 12-01 report on fish processing puts the number of primary fish processors in 2008-9 at 13. It has been recently noticed that companies such as supermarkets are requesting licenses for fish processing.

ANPA Inspectors send questionnaires (see Annex 9) to the companies by email and postal mail. These are transmitted to IRDAEFA.

<sup>11</sup> <http://www.ansva.ro/?pag=523>

<sup>12</sup> Again, the NC mentioned that a protocol is being negotiated with the INS, but the consultants could not get evidence of it.

## 11.2. Data upload, storage, processing and access

Since this year, data received by questionnaires is introduced into the “Pescuit marin” database (cf 3.3.2).

IRDAEFA staff is responsible for checking the information with other sources (balance sheets).

## 11.3. Statistical quality

The NP mentions that there is a “probability sample survey for all variables” (section IV.B.1), and describes the selection process to be followed for each one of the strata defined by number of employees (section IV.B.2). Without commenting that this sample design could be improved, especially for the sampling of larger companies (>50 employees), for which collection should be exhaustive, it has to be noted that the consultants could not find evidence of random selection of units.

The AR is particularly confusing with respect to the description of the target population (active fish processing units) and the collected data (Table 5 of the AR, page 40, incorrectly mentions that the type of data collection for micro-enterprises is “B= sample”, while the planned sample rate is 100%).

There is no need of calculating sampling errors since the collection is exhaustive. It is only necessary to report on the unit and item non-response.

**Table IV.B.1** contains a mistake: all is EXHAUSTIVE.

### **Recommendation**

- ✓ **Energy costs: this variable is collected in the SBS (INS): so for this variable in particular, IRDAEFA could use this source of information.**

To calculate employment in FTE, IRDAEFA uses the same methodology for the balance sheet used by the Ministry of Finance, which consists in counting the number of months that an employee has been effectively working in the company during the year.

## 11.4. Conclusions and recommendations

- ✓ **Cooperation with INS should be established. This could be beneficial for both INS and IRDAEFA.**
- ✓ **Collection of data should be exhaustive: as the current non-response is small, it is recommended that the NP and AR clearly state as objective to carry out a Census, also for the about 20 small firms (<10 employees).**
- ✓ **Item non-response should be calculated as a complement to unit non-response. In case of non-response, imputation can be done for missing values, by segmenting the population of industries by size and main species processed. Preliminary data analysis at the size by main species level should be carried out to establish the validity of imputation method.**

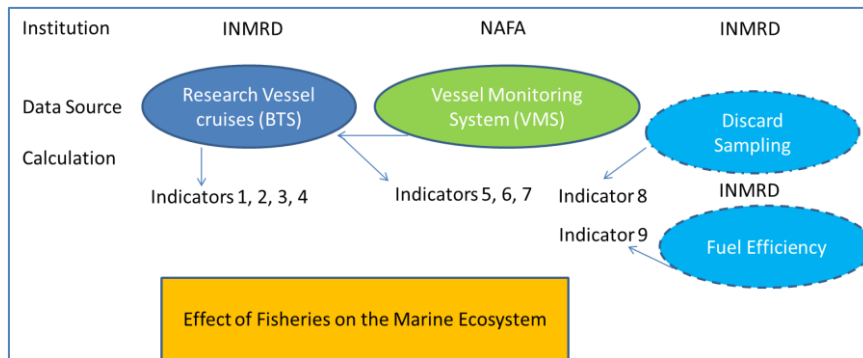
## 12. VARIABLES ON THE EFFECTS OF FISHERIES ON MARINE ECOSYSTEM

### Organisation for the production of related data

The institutional lead has NIMRD and the responsible senior scientist is Dr. G. RADU.

The data for the 9 Indicators (Table V.1) are derived from different sources (Figure 9): For the Indicators 1-4, the data are collected from the Romanian BT Survey for turbot in the 2<sup>nd</sup> and 4<sup>th</sup> quarter. The indicators 5-7 are derived from raw data from the Vessel Monitoring System distributed from ANPA (Bucharest) to NIMRD.

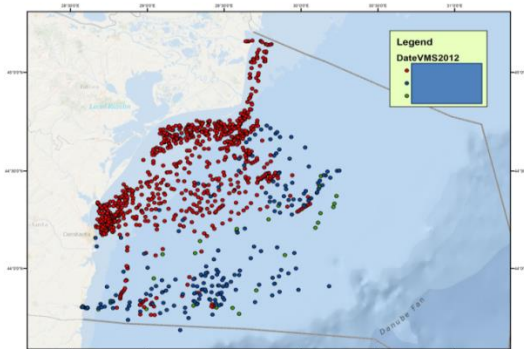
**Figure 9: Compilation of data to assess effects of Fisheries on the Marine Ecosystem- Institutions, Data-sources and calculation. Closed circle Indicators are calculated- dotted circled calculators not.**



SOURCE: Own Survey

The GIS department at NIRMD draws the maps to visualize the distribution and aggregation of fishing activities. Figure 10 shows the distribution of VMS signals of 3 vessels over the entire 2012 period. According ANPA, the only species discarded is whiting, occasionally also very small clupeids too, however no further analyzes are performed to calculate the discard rates of commercially exploited species. Indicators 8 and 9 have not yet been calculated.

**Figure 10: VMS data from 2012 of 3 fishing vessels**



Source: NIMRD



The raw data are in Excel files stored on three to four physically different computers/laptops or hard drives at the NIMRD (personal information from NIMRD: G.RADU). It is planned to built-up an institutional Data Backup System at NIMRD.

#### ***Estimation of indicators***

The Indicator 1-7 have been estimated, indicators 8 and 9 not yet.

#### **Compliance with methods and procedures**

There is no stand-alone description of the method. However, Indicators 1-4 shall also be potentially used as indicators within the Marine Strategy Framework Directive (MSFD) in Romania (Information of Dr. G. RADU (NIMRD) who is also involved in development of suitable MSFD indicators). A working documentation exists, but it is not yet distributable since it is within the national responsible authorities internally discussed.

#### **Conclusion**

7 of 9 ecological indicators are currently calculated based on data derived from Research Surveys, stock and métier-related biological samplings and data from the VMS. The data are all centralized and processed at NIMRD. The discarding rate of commercially important species is not calculated – which is explained by the fact that only the species whiting is discarded (no market for this species) and rarely the smallest size classes of sprat is not landed. The indicator 9 (“fuel efficiency of fish capture”), is not yet calculated. However, the data about value of landing and cost of fuel are collected according Table V.1. The data are all calculated and stored in Excel, and shall in the long term be integrated into the “Pescuit marin” database.

## 13. CONCLUSIONS BY CHAPTER

For the moment, the IT systems are not finalised and the developments are outsourced. The “ANPA registers” control regulation database system run by ANPA as well as the “Pescuit marin” DCF database system used by the research institutes are under tests. The two applications are not interoperable and not connected in any manner. Both are currently mainly designed to ensure the data capture only with a very limited number of built-in data checks and no analysis or reporting functions are implemented yet. The system being on testing phase, most of the operations are still currently made under paper and Excel files. The skills on Excel of the staff could be improved to gain in efficiency and data organisation. None of the institution involved has IT staff to support, follow properly the outsourced developments, and ensure the future handover and maintenance of the applications.

In all sectors, there is a lack of technical documentation and written procedure which could be potentially problematic if the involved staff are close to retirement.

### 13.1. Transversal data

NIMRD has full access to the control data required for the implementation of DCF.

### 13.2. Biological data

#### *Métier related data*

For the small scale fishery segment, the metier is given by the most current gear used. The fleet segment with the larger vessels it is often assumed not to change over the year. This procedure is comprehensible given the reduced number of metiers acting all on the more or less same spatial scale in the Black Sea area. The final numbers of samples from active and passive gear types match the values presented in the tables and are in general in agreement with the format. However, no written manual exists therefore the flow of data is closely related to the involved people and their personal skills and experience. Due to the lack of a centralized backup system, the storage of data is spread onto several hard disks or PCs, which is potentially error-prone given the tens of frequently to be up-dated, Excel documents. This problem should be solved with the data base in development.

#### *Stock related data*

The necessary and proposed stock related biological data are collected and the tables are filled properly with very few exceptions. The analysed numbers of individuals exceed in almost all species the planned magnitudes and also data on not (yet) required species are collected, but only presented in the AR and not in the Table. It is very appreciable that an inter calibration between the established otoliths readers and recruiting internal young otoliths readers and external experts is established to prevent a break in the current high quality age reading time series.

#### *Surveys at sea*

The two demersal trawl surveys in RO waters to monitor the turbot biomass are conducted according NP. Only the 2nd pelagic trawl survey has been performed (without hydro acoustic devices) with the RO RV “Steaua de Mare I” in 2012. No data are available from the planned 1st pelagic survey. However, the loss of biological data was restricted to sprat only. For sprat, the reduction of biological data for length@weight, maturity@length and sex-ratio@length was 11% and

31%, respectively. In general, the collection of biological data is conducted according to NP. Additional samples are taken for other species on the expenses of NIMRD. The processing of data from the paper to the Excel format is done manually, the further aggregation also. It is recommend to archive the data not only on different local storage devices, it should be tried to upload the data in the DB to be in current development by a subcontractor.

### **Recreational fisheries**

Due to the absence of DCF relevant species (eel, salmon, cod, bluefin tuna) in the RO recreational fisheries, no specific data collection is currently performed or are pilot studies planned in the near future.

## **13.3. Economic data**

### **Catching sector**

In the Annual Report Romania indicates that the statistics is based a census and consequently does not calculate the CVs. In reality the response rate on the survey is about 50-60%. The missing values are set at the average of the responses. In this situation the CVs should be calculated. The current practice of completion of missing values does not have any added value.

Manuals for data processing do not exist, so that transfer of tasks among staff depends on presence of experiences staff members. The efficiency of data processing could be significantly increased if the full potential of Excel would be used.

The quality of the responses seems uncertain in view of the fact that the most fishermen own a single, small vessel and do not maintain solid accounting. The annual questionnaire therefore relies on the memory of the respondents.

### **Aquaculture**

Romania has only one marine farm producing mussels, which all other aquaculture is fresh water. This means that Romania is not obliged to collect aquaculture data under the present DCF.

IRDAEFA is responsible for the data collection on aquaculture. This is done in a survey with hard copy questionnaires. IRDAEFA is supported by ANPA inspectors, who visit the farms and collect information required for FAO and Eurostat production statistics. The inspectors collect the questionnaires and help also the farmers to fill them in.

The response rate is about 35%, with overrepresentation of state-owned farms and underrepresentation of private farms. The statistical quality of the segment aggregations is therefore uncertain.

Similarly to the fishing sector, missing values are assumed to be equal to the average observed value. This practice does not improve the collected statistics.

### **Fish processing**

IRDAEFA is also responsible for the collection of data on fish processing industry, but a comprehensive list of these firms does not exist. IRDAEFA has not established any cooperation with INS to exploit the SBS data.

The number of fish processors is quite low, so that IRDAEFA manages to carry out a census.

#### 13.4. Ecosystem indicators

7 of 9 ecological indicators are currently calculated based on data derived from Research Surveys, stock and métier-related biological samplings and data from the VMS. The data are all centralized and processed at NIMRD. The discarding rate of commercially important species is not calculated – which is explained by the fact that only the species whiting is discarded (no market for this species) and rarely the smallest size classes of sprat is not landed. The indicator 9, fuel efficiency of fish capture, is not yet calculated. However, the data about value of landing and cost of fuel are collected according Table V.1. The data are all calculated and stored in Excel, and shall in the long term be integrated into the “Pescuit marin” database.

## 14. RECOMMENDATIONS BY CHAPTER

From the IT point of view, the following recommendations are made:

- ✓ The need for a database system is obvious as the information is not properly organised and spread over tens of Excel files. Clear requirements and specifications should be given to the outsourced companies to ensure a proper database design and data organisation providing the expected outputs. The system expected should be more than a data capture tool and should include relevant checks and reporting/query functions.
- ✓ It is also important to work on the interoperability of the two systems (ANPA register and DCF database) and to be able to upload directly an extraction from the ANPA register into the DCF.
- ✓ It would be important to have dedicated IT resources in the institution to support, follow properly the outsourced developments and ensure technical feedback on the quality of the deliverable and technical solution proposed, and ensure the future handover and maintenance of the newly developed applications.
- ✓ The testing procedure is very important and should be performed from a technical perspective but also from a user perspective.
- ✓ As the final DCF database is currently not ready and most of the tasks are performed under Excel, it could be advisable to improve the skills of the staff on Excel to ensure a better use of the software and better organisation of the data.

In all sectors, it is important to draft a technical documentation and written procedure to build a knowledge database, ensure the sustainability of the system and maintain and improve quality.

### 14.1. Transversal data

Transmission of transversal data takes place on paper. It is recommended that only one institution (either ANPA or NIMRD) digitalize the hard copy logbooks and the data is further exchanged in agreed digital format, e.g. Excel.

### 14.2. Biological data

#### Métier related data

- ✓ Due to the nature of fishing (gear destruction/ technical problems/ wrong place / no fish/ other species) it can happen that the expected sample cannot be taken at the respective port and vessel at that time. Therefore, it is valid relating all accomplished trips to the landing port, even if the final effort results in a zero sample for that particular day.
- ✓ Instead of receiving the paper forms from the ANPA, it would be advisable to receive directly an extraction from the ANPA register database. This could be envisaged when the ANPA register will work efficiently and the data can be provided on an agreed reference period.

- ✓ Excel is used more as a tool for presenting the data than as an efficient tool for manipulating them. Even in the current situation, the work could be done more efficiently if the data were compiled in a more structured way dissociated from the presentation. (Example: vessel identifier instead of vessel name, numeric field with numeric values and not including text note preventing from applying formula...). The work and the presentation could be highly accelerated by using the tools of Excel like the pivot table for instance.

#### **Stock related data**

- ✓ The process of entering the data from paper into Excel is done manually with some manual checks (graphics, vs. time-series). The storage of this data is done in many separate Excel sheets which are back up on PC or laptops unregularly. The data should be stored and backed-up centrally, and a written guidance/manual should be developed how the data is and has to be organized.

#### **Surveys at sea**

- ✓ The combination of acoustic methods with actual ad hoc catch information improves the possibility to estimate pelagic species biomass. It also enables to follow the suggested MEDIAS initiative for the Black Sea. Therefore, the equipment of the current RV “Steau de Mare I” with an acoustic device (Echosounder) is recommended to accurately monitor the distribution and number of pelagic fish species in the waters of the Black Sea.
- ✓ The team encouraged the NIMRD team to present all measured/analyzed fish species in the table and to explain this in the AR. The data are scientifically valuable and could be used for other purposes.

**Comment:** The age readings of the otoliths are performed by very experienced otolith reader experts at NIMRD. However, since recently these experts share their knowledge with younger recruiting scientists who in addition were sent out to international Workshops for inter-calibrating otolith reading. It needs to be highlighted and appreciated that this initiative prevents the break of the continuous high quality data time series.

#### **Recreational fisheries**

**Comment:** One important aspect in relation to recreational fisheries and Aquaculture needs to be mentioned even if this type of recreation may not be relevant for DCF explicitly. Aquaculture companies may apply for a license to be authorized to offer angling opportunities within their farming facilities. This implies that these companies usually may not have the aquaculture production aspect as its exclusive or main business. The NC “guestimated” that approximately 15-20% of the Aquaculture companies may have such “recreational angling opportunity” license.

### 14.3. Economic data

#### **Catching sector**

It is recommended that the future ARs present:

- Actual sample rate and response rates per variable;
- Calculation of the CVs

It is recommended that Romania starts using the standard approach for the calculation of capital costs. Should the application of standard methodology not be clear, Romania should search advice from another EU research institute, e.g. in Italy, the main author of the common methodology.

It is also recommended to shift from census to panel simple, establishing good working relations with a selected group of fishermen willing to provide the required data. This group should be given a simple course in bookkeeping (monitor costs and revenues), so that their responses would not depend on their memory only.

Segments with less than 10 vessels should be merged with adjacent segment (Commission Decision 10121/2009). Publication of the data on small segments should be avoided for confidentiality reasons as the firms providing information can be identified<sup>13</sup>. In case of Romania merging the large PMP vessels with a segment of much smaller vessels has a negative effect on the quality provided information. It is recommended that all segments with a low number of vessels are merged into one segment PMP 0040.

#### **Aquaculture**

- ✓ Representativeness of the received responses should be evaluated, e.g. on the basis of production statistics, water surface of ponds or other available information.
- ✓ The segments should be further stratified according to ownership (private/public) and extrapolation should be made on the basis of these sub-strata. This may improve the quality of the estimates.

#### **Fish processing**

- ✓ Cooperation with INS should be established. This could be beneficial for both INS and IRDAEFA.
- ✓ As the current non-response is small, it is recommended that the NP and AR clearly state as objective to carry out a Census, also for the about 20 small firms (<10 employees).
- ✓ Item non-response should be calculated as a complement to unit non-response. In case of non-response, imputation can be done for missing values, by segmenting the population of industries by size and main species processed. This method should be tested in advance.

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<sup>13</sup> In segments with less than 10 vessels only 1-2 vessels will be providing information for DCF, so that their identity can be determined by “insiders”.