Pavel Salz, FRAMIAN BV, Netherlands
Erik Buisman, LEI BV, Netherlands
Loretta Malvarosa, IREPA, Italy
Fabienne Daures and Emilie Leblond, IFREMER, France
Jesper L. Andersen, FOI, Denmark
Kim N. Andersen, FOI, Denmark
Rasmus Nielsen, FOI, Denmark
Susan Anton and Hazel Curtis, SEAFISH, United Kingdom

Calculation of labour including FTE (full-time equivalent) in fisheries

II

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Appendices

Summary

The general objective of the study is to review international practices in measuring employment and calculation of full-time equivalents and to propose a method which could be applied for measuring of employment in the EU fisheries sector. The study should demonstrate that the method is applicable to different fleet segments, ranging from small to large scale fishing.

The study has reviewed proposed approaches by UN, Eurostat and FADN. In particular the FADN approach has been developed in great detail and seems suited for application in fishing, allowing for some simplifications.

It is proposed to distinguish between engaged persons and full-time equivalents, according to the Eurostat definitions for Structural Business Statistics. A simple model has been designed to calculate the two values. Number of engaged persons is defined as the number of workplaces. FTE is related to a threshold in number of worked hours per year. Person working more than the threshold number of hours is counted still as one FTE. Persons working less than the threshold are accounted for as a proportionate percentage of a FTE.

The study focuses primarily at the time based approach, which is consistent with international practices. Income based approach, called for under the ToR, is not proposed by any large statistical system. Therefore assessment of the level of income per employed person or FTE can be only considered as a complementary analytical indicator.

The study points to the current practices where only crew on board is traditionally accounted for as fisheries employment. This entails number of omissions - crew doing work on shore, shore employees and family labour input, which may not be paid. This type of employment has been structurally disregarded. Consequently, also the involvement of women in fisheries related activities on shore has not been given any attention. The study recommends to carry out surveys in order to determine how significant these omissions are and to provide background information for decision whether data on these types of employment should be collected regularly.

None of the statistical systems appear to give attention to employment of foreigners. It is known that on some fleets foreigners represent a significant share of the crew. Accounting for foreigners may affect conclusions on employment effects of the fishing industry in the Member States. It is also recommended to carry out a survey to determine which fleets rely on foreign labour and how closely this aspect should be monitored in the future.

The proposed method for calculation of employment on board fishing vessels is applied to different fleet segments in 5 countries. In principle no conceptual problems have been encountered. However, the method requires detailed information regarding crews size and numbers of hours of work on board. Data about the number of working hours per day per man is currently not collected in any of the participating countries. Therefore assumptions had to be made, which affect the calculation of the full-time employment in particular. Some partner also question the feasibility of the collection of reliable data in this

respect. Clearly, regular collection of more detailed data may lead to disproportionately higher costs, an aspect which has not been addressed under this study. It is recommended to implement first a survey to establish the relevance of the missing data and how its eventual collection should be addressed.

1. Introduction

1.1 Background

During the last STCF/SGEGA Working Group (Brussels 4-8 October 2004) carried out to revise the economic parameters required to be collected by the Community data collection framework (Commission Regulation N°1639/2001 and N°1581/2004) the use of FTE (Full-time equivalent) as an indicator for the employment in the fisheries sector was discussed. It was agreed to adapt the definition of the European Business Statistics (Commission Regulation EC N° 2700/1998):

    Code: 16 14 0

    Title: Number of employees in full-time equivalent units

    Definition   The number of employees converted into full-time equivalents (FTE). Figures for the number of persons working less than the standard working time of a full-year full-time worker, should be converted into full-time equivalents, with regard to the working time of a full-time full-year employee in the unit. Included in this category are people working less than a standard working day, less than the standard number of working days in the week, or less than the standard number of weeks/months in the year. The conversion should be carried out on the basis of the number of hours, days, weeks or months worked.

It was also observed that there are some major problems to apply this definition to fisheries: Standard working time of a full-year full-time worker is not provided in the definition and varies between countries, fisheries, and even fishing firms. A small-scale fisherman might have a standard working week of 10 hours, whereas in the industrial fishery, workers might work up to 100 hours a week. The standard working week might also change throughout the year e.g. seasonal fisheries. This implicates that comparison of FTE's between fisheries and countries is hardly possible

It was agreed that a methodological study to address these issues is necessary to continue the current economic data collection according to Council Regulation 1543/2,000.

1.2 Objectives and Terms of Reference

The main goals of the study are the following:

- to provide a comprehensive overview of methods used to define and estimate the standard working time of a full-year full-time worker in other sectors as fisheries (e.g. agriculture, SME). Possible methods investigated should at least use both the proportion of revenue of workers received from the fishery and proportion of time spent in the fishery;

- to describe the problems connected to the different methods of estimating FTE and solutions proposed;
- to analyse the effects of applying the different methods to two extreme case studies: a small-scale fishery and an industrial fishery. The analysis should compare the results obtained when using the different methods to different fisheries and countries;
- to provide STECF/SGECA with a background document. This document will be used to decide which methodology can be applied for FTE.

1.3   Structure of the report

After this introduction, the second chapter presents the proposed method for the determination of employment in fishing. A distinction is made between 'engaged crew' and 'full-time equivalents', calculated on the basis of hours worked. This time based approach is supplemented by the 'income based approach', assessing the relation between earnings in fisheries and in other sectors.

Chapter three presents some approaches for measurement of employment practiced by various statistical organizations. This overview shows that only time based approach is used, but not the income based approach. In some cases full-time employment is assessed on the basis of the perception of the workers.

Finally, Chapter four compares briefly the main result of the case studies, which are presented in the appendices.

2. Proposed method

2.1 Time based approach

National and international statistics (propose to) measure labour input in terms of hours or AWUs (annual work units used in FADN). The threshold for one FTE applied by FADN and some other statistical systems is usually 2,000 hours, although in certain countries and/or sectors a different threshold value is applied. A person working more than the threshold (holding one or more jobs) is still counted as one FTE only. A person working less than the threshold represents a certain percentage of a FTE.

The following types of labour input can be distinguished in fishing:
- crew working on board, incl. the skipper-owner if he works on board;
- rotation crew, i.e. extra crew staying on shore during one trip, but remaining on the pay-roll of the vessel;
- temporary and/or seasonal crew, i.e. labour hired on short term basis and not paid when on shore;
- personnel in administration on shore;
- unpaid labour (e.g. family members).

Traditionally only crew working on board have been accounted for, and in some cases also the rotation crew. Personnel on shore and unpaid labour (wives or retired fathers of fishermen, performing administrative, marketing or other support tasks) are almost never included in employment statistics on fisheries. Most currently used statistical collection systems are not suitable to collect this kind of information because they focus on the operation of the vessel as a basic statistical unit. Collection of this data was not foreseen under the data collection regulation.

The proposed method in this study elaborates an approach of measuring labour input in fishing activities. Regarding shore personnel and unpaid labour, it is proposed to carry out specific surveys as soon as possible and, if the surveys conclude that this is an important omission (either in general or in specific segments), to include collection of this information under the next revised data collection regulation.

It is proposed to trace the reality of labour input in fishing as closely as possible. This implies that measuring labour input takes place at the level of ' metier', i.e. specific activity of a fleet segment. The métiers are defined at level 4 (EU level, see appendix G)1. The métier approach is appropriate for several reasons:
- the new DCR, which will be introduced in 2008, will require the use of the métiers;

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[1] Table 3.2.2 EC, Commission Staff Working Paper: Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, Nantes, 12-16 June 2006.

- different fisheries may be characterised by different labour intensities and consequently by different levels of labour productivity. This is an important aspect of economic analysis;
- using métiers in general improves the analytical understanding of the operation of the various fleets.

A distinction is made between engaged and full-time crew.

'Engaged crew is defined as the number jobs on board, incl. rotation'.[1] Number of jobs is equal to the average number of persons working for and paid by the vessel. This includes temporary crew as well as rotation crew.

The calculation of engaged crew is presented in figure 2.1 and the mathematical presentation is given in table 2.1. It takes place in the following steps:
- a fleet segment using specific combination of gears is composed of a certain number of vessels;
- the vessels are involved in specific fisheries (métiers), which are characterized by the use of different gears. It is possible that some vessels are involved in all métiers and other vessels only in one. Therefore number of vessels in the segment is equal or smaller than the sum of the vessels involved in all métiers (equation 1);
- the average engaged crew per vessel (including rotation crew) (equation 4) of the segment is calculated as weighted average crews per métier, using the relative share of days at sea of each métier as weights (equations 2 and 3);
- crew engaged in one métier or in the total segment is the product of the average crew per vessel and the number of vessels (equations 5 and 6);
- total engaged crew in the segments is smaller than the sum of all métiers, as same workplace recur in different métiers (equation 7).

Table 2.1   Mathematical description of the calculation of Engaged crew

	Equation	Description of variables
1.	Fleets =< $\sum$Fleetn	Fleets = Total number of vessels in the segment
		Fleetn = Number of vessels in métier n
2.	DaSs = ($\sum$DaSn * Fleetn)/Fleets	DaSs = Average number of days at sea per year of vessels in the segment
		DaSn = Average number of days per year at sea of vessels in métier n
3.	ShareDaSn = DaSn * Fleetn/DaSs * Fleets	ShareDaSs = Relative share of days at sea
4.	Crew-ins = $\sum$Crew-inn * ShareDaSn	Crew-ins = Average crew of vessels in the segment, incl. rotation
		Crew-inn = Average crew of vessels in métier n, incl. rotation
5.	EngEmpn = Crewn * Fleetn	EngEmpn = Engaged crew in métier n
6.	EngEmps = Crews * Fleets	EngEmps = Total engaged crew in the segment
7.	EngEmps =< $\sum$ EngEmpn	

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[1] This definition is consistent with the SBS definition of number of employed persons which states inter alia: *The number of employees is calculated in the same manner as the number of persons employed, namely as the number of jobs and is measured as an annual average.,* see Appendix D, 16 13 0.

METIER 1	SEGMENT	METIER 2

Number of vessels (Fleet$_1$)

Number of vessels (Fleet$_s$)

Number of vessels (Fleet$_2$)

Days-at-sea / vessel (DaS$_1$)

Days-at-sea / vessel (DaS$_2$)

Crew incl rotation (Crew-in$_1$)

Crew incl rotation (Crew-in$_2$)

Relative share days at sea
ShareDaS$_1$ = DaS$_1$ * Fleet$_1$ / DaS$_s$ *

Relative share days at sea
ShareDaS$_2$ = DaS$_2$ * Fleet$_2$ / DaS$_s$ *

Average crew - segment incl rotation
Crew-in$_s$ = ∑Crew-in$_n$ * ShareDaS$_n$

Crew engaged - métier 1
EngCr$_1$ = Crew$_1$ * Fleet$_1$

Crew engaged - segment
EngCr$_s$ = Crew$_s$ * Fleet$_s$

Crew engaged - métier 2
EngCr$_2$ = Crew$_2$ * Fleet$_2$

Figure 2.1   Derivation of employment in terms 'Engaged crew'

FTE is defined as follows (using a threshold of 2,000 hours as example):
- each crewman working annually 2,000 hours or more is counted as one FTE;
- each crewman working less than 2,000 hours per year is counted as a percentage of a FTE according to the number of hours worked in relation to the threshold of 2,000 hours;
- working time is the time spent on fishing and related activities on board or on shore. This means that working time is only a part of the duration of a fishing trip.

FTEs are related to a threshold value in number of hours. Therefore it is necessary to collect data regarding the number of hours of actual work on board in each métier per day per man. Furthermore a distinction must be made between crew including and excluding rotation. The number of hours actually worked per year is determined by the crew excluding rotation. But the FTE calculation must be based on the crew including rotation.

The calculation of FTEs is presented in figure 2.2 and the mathematical presentation is given in table 2.2. It takes place in the following steps:

- total man hours worked in each métier are calculated on the basis of the fleet, days at sea, crew and average hours per man per day, using crew on board (i.e. excluding rotation);
- total man hours of the segment amount to the sum over the métiers;
- from the total man-hours, hours per man per year based on crew including rotation can be calculated;
- annual man hours for crew including rotation is compared to the FTE threshold, from which the number of FTEs follow.

Table 2.2   Mathematical description of the calculation of full-time equivalents (FTE)

	Equation	Description of variables
1.	$Fleet_s = < \sum Fleet_n$	$Fleet_s$ = Total number of vessels in the segment
		$Fleet_n$ = Number of vessels in métier n
2.	$DaS_s = (\sum DaS_n * Fleet_n) / Fleet_s$	DaS_s = Average number of days at sea of vessels in the segment
		DaS_n = Average number of days at sea of vessels in métier n
3.	$ShareDaS_n = DaS_n * Fleet_n / DaS_s * Fleet_s$	$ShareDaS_s$ = Relative share of days at sea
4	$Crew\text{-}ex_s = \sum Crew\text{-}ex_n * ShareDaS_n$	$Crew\text{-}ex_s$ = Crew on board, excl rotation, segment
		$Crew\text{-}ex_n$ = Crew on board, excl rotation, métier n
5	$TotHours_s =$ $\sum Fleet_n * DaS_n * Crew\text{-}ex_n * HMD_n$	$TotHours_s$ = Total man-hours, segment HMD_n = Hours per man per day at sea, métier n
6	$HMD_s =$ $TotHours_s / (Fleet_s * DaS_s * Crew\text{-}ex_s)$	HMD_s = Hours per man per day at sea, segment
6a	$HMY_s =$ $DaS_s * Crew\text{-}ex_s * HMD_s / Crew\text{-}in_s$	HMY_s = Hours per man per year, segment, based on crew incl. rotation
6b	$HMY_n =$ $DaS_n * Crew\text{-}ex_n * HMD_n / Crew\text{-}in_n$	HMY_n = Hours per man per year, métier, based on crew incl. rotation
7a	If $(HMY_s / Th) > 1$ Than $FTE_s = Crew\text{-}in_s * Fleet_s$ Else $FTE_s =$ $(HMY_s / Th) * Crew\text{-}in_s * Fleet_s$	FTE_s = Number of full-time equivalents in the segment Th = Threshold - number of annual working hours per FTE
7b	If $(HMY_s / Th) > 1$ Than $FTE_n = Crew\text{-}in_n * Fleet_n$ Else $FTE_n =$ $(HMY_n / Th) * Crew\text{-}in_n * Fleet_n$	FTE_n = Number of full-time equivalents in the métier n

METIER 1	SEGMENT	METIER 2

Number of vessels $Fleet_1$	Number of vessels $Fleet_s$	Number of vessels $Fleet_2$

DaS /vessel DaS_1	DaS / vessel DaS_s	DaS /vessel DaS_2

Crew excl rotation $Crew\text{-}ex_1$	Crew excl rotation $Crew\text{-}ex_s = \sum Crew\text{-}ex_n * ShareDaS_n$	Crew excl rotation $Crew\text{-}ex_2$

Hours / man / das HMD_1		Hours / man / das HMD_2

Total hours $TotHours_1 = Fleet_1 * DaS_1 * Crew\text{-}ex_1 * HMD_1$	Total hours $TotHours_s = \sum TotHours_n$	Total hours $TotHours_2 = Fleet_2 * DaS_2 * Crew\text{-}ex_2 * HMD_2$

Crew incl rotation $Crew\text{-}in_1$	Average crew incl rotation $Crew\text{-}in_s = \sum Crew\text{-}in_n * ShareDaS_n$	Crew incl rotation $Crew\text{-}in_2$

Hours / man / year based on crew incl rotation $HMY_1 = TotHours_1 / Crew\text{-}in_1$	Hours per man per year based on crew incl rotation $HMY_s = TotHours_s / Crew\text{-}in_s$	Hours / man / year based on crew incl rotation $HMY_1 = TotHours_1 / Crew\text{-}in_1$

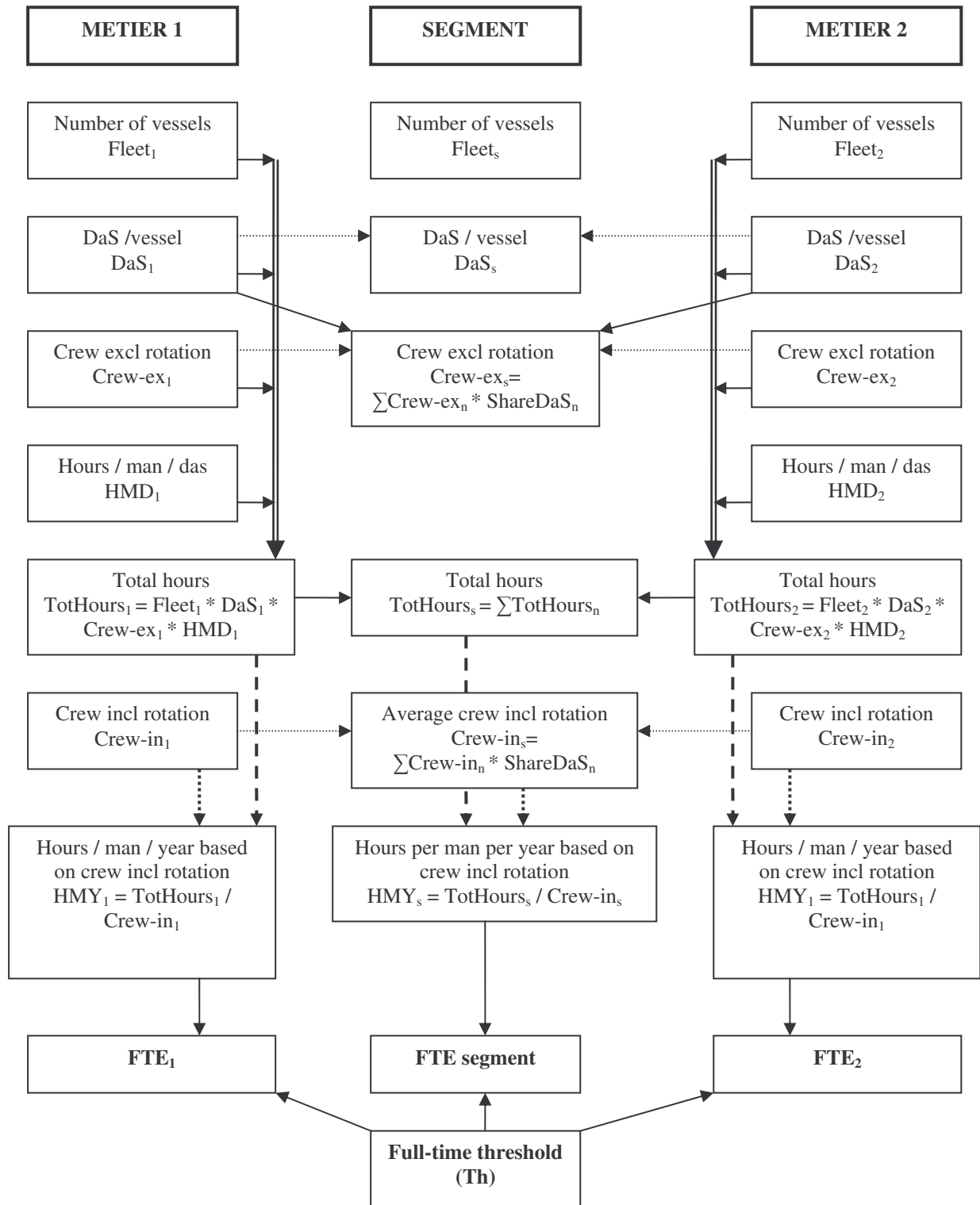| **FTE_1**	**FTE segment**	**FTE_2**

Full-time threshold (Th)

Figure 2.2   Derivation of employment in terms FTE

The calculations of Engaged crew and FTE is done in a simple spreadsheet, presented in figure 2.3.

		Total	PTB	OTB
Data or assumptions				
Required for calculation of average crew and hours per day				
Calculated				
Consistency calculation, may not be required with real data				
Segment name				
		Total	**PTB**	**OTB**
Number of vessels		150	150	30
Average days at sea		**170**	150	100
Average crew on board, excl. rotation		2,12	2	3
Hours worked per days at sea per crewman on board		**10,0**	10	10
Average crew per vessel, incl rotation		2,62	2,5	3,5
Average hours per engaged crew (incl rotation)		1.375	1.200	857
FTE Threshold per year per crewman (hours)		2.000	2.000	2.000
Engaged crew		**393**	**375**	**105**
FTE		**270**	**225**	**45**
Total number of days at sea		25.500	22.500	3.000
			88%	12%
Total number of 'work hours' at sea		540.000	450.000	90.000

Figure 2.3   Spreadsheet for calculation of Engaged crew and FTE

## 2.2   Income based approach

The terms of reference require the study group to investigate the determination of employment also on the basis of level of income received from fishing. This requirement is based on the empirical evidence which shows that in some fisheries and countries the income levels from fishing are so low, that fishing can barely be considered as a main or sole source of income.

Review of international practices of measuring employment shows that income levels are not used as a basis for the estimation of employment (see appendices on Eurostat and ILO). Information on income can be used only for analytical purposes to determine how rewarding it is to work in a certain activity. In fact some statistical systems propose to determine whether a person is full-time employed on the basis of his / her own perception and use neither the time based nor the income based approach.

For the purposes of analysing employment in fishing it is therefore proposed to use the income as a complementary indicator. The following comparisons may be considered (fishing sector - national economy):

- average crew share / person - minimum wage;
- average crew share / person - average wage;
- gross value added / person - gross national product / employed;
- gross value added / person - gross value added /man in other sectors (e.g. agriculture).

The results can be presented graphically as shown in figure 2.4.
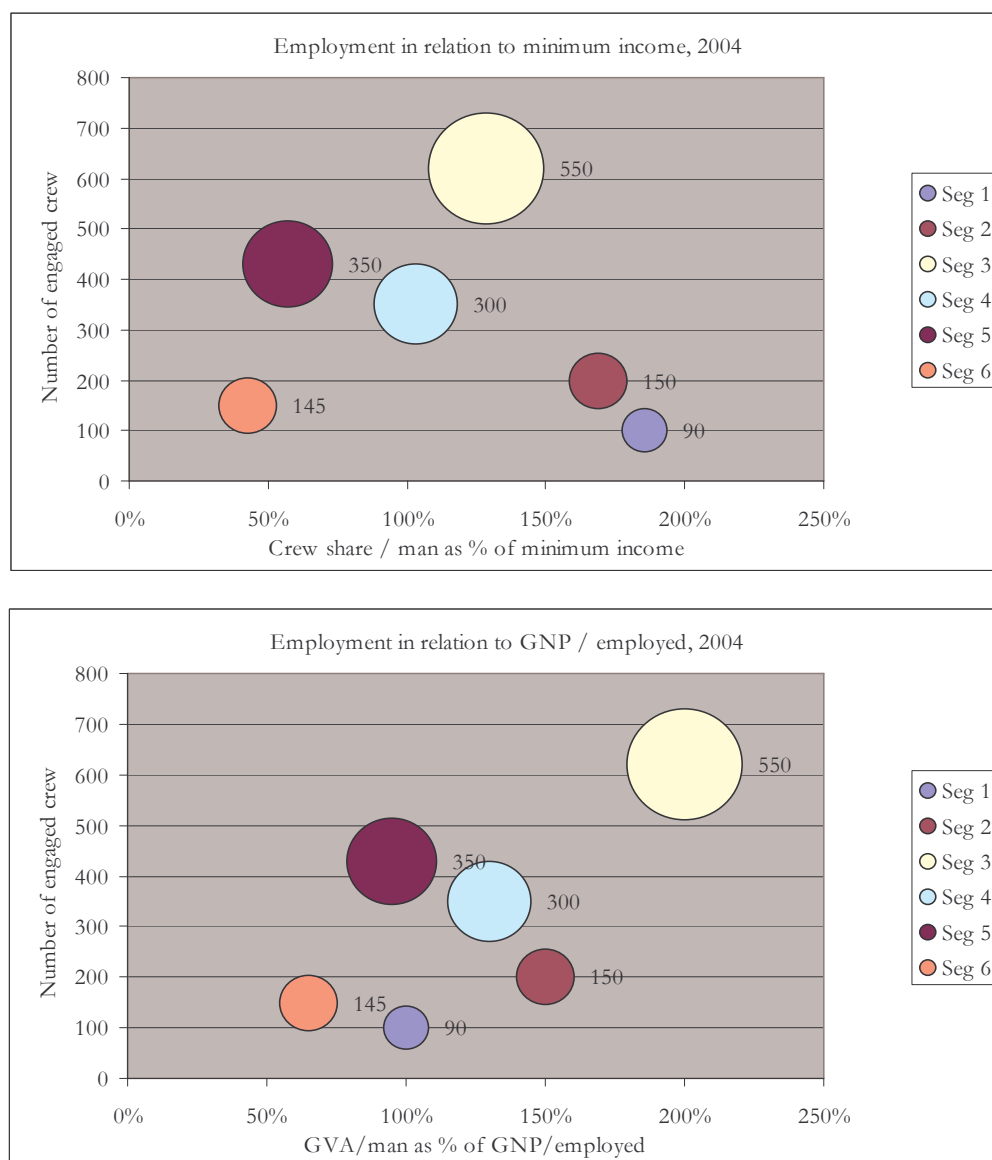
Figure 2.4 *Fishing income in relation to national minimum income levels and fishing productivity in relation to national average levels.*
(y-axis reflects 'engaged crew', size of circle reflect FTE)

2.3   General evaluation

The following evaluation is based on general considerations as well as experiences with the application of the proposed method in the case studies.

Number of vessels
There are differences in definitions of active fleet among the various countries. Some propose to use define active fleet as all vessels which fished at least one day in a given year (France). Other countries determine first what is considered as a commercially active fleet, using a threshold on value of landings (Denmark) or level of activity (Netherlands).

The differences in fleet definitions lead to incomparable results, unless the level of activity is used as a weight. It is evidently essential that the sample fleet reflects the total fleet (population) properly[1].

Average days at sea
Data on average number of days at sea per vessel is always available. However, applying strictly international definitions of working and resting time, it would be more correct to use 'working' days only, along with the number of hours worked during those days. Therefore the sea days and working days must not be confused and correct number of working hours per sea day must be determined.

When applying the métier approach, an assumption needs to be made whether a vessel can carry out one or more métiers per day, as that may affect the number of hours of work. This may not affect the calculated employment significantly.

Average crew on board, excl. rotation
This data poses no problem.

Hours worked per days at sea per crewman on board
There is very little or no statistical information about the number of working hours on board of a fishing vessel. An assumption had to be made in all countries. A specific survey will be required. For segments which operate on distant grounds, with long steaming times, total working hours per trip need to be recalculated into average hours per sea day.

Average crew per vessel, incl rotation
The issue of rotation created problems during the calculations, depending on the data available. In the sense of Eurostat definitions, rotation should be interpreted as 'persons absent for a short period'. This definition assumes a certain regularity of employment and/or certain relation of firm and employed (incl owner). The definition is well applicable to fisheries where vessels make a high number of days at sea and where one or more men remain regularly on shore in order to get the necessary rest. In those situations they are part of the production process.

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[1] Evidently it must avoided to extrapolate activity level of commercially active fleet, over the whole registered fleet.

In some fisheries, however, the crew shifts from one vessel to another apparently irregularly. To count each man-vessel combination as engaged crew would inflate the number engaged men. On the other hand to count only 'jobs' (see below) and the number of hours of those jobs would reduce disproportionately the number of FTEs. In these situations it is necessary to determine the average crew per trip incl and excl rotation.

Average working hours on board
The average working hours on board are not collected in any country. Consequently assumptions had to be made. It may not be necessary to collect this information on annual basis. Surveys carried out once in several years should be largely sufficient.

FTE threshold
Application of FTE threshold is required to calculate the number of FTEs. Several problems have been identified:
- apart from the FADN convention of 2,000 hours[1] and the proposal by Eurostat Fishery Statistics group that '..full time work will usually start at 30 hours ...'(per week) , there is little substantiation which value should be used;
- some statistical systems propose to ask the respondents whether they consider themselves full-time employed or not. Such approach disregards any threshold and it introduces a certain subjectivity of the respondent. However, it is certain that in some fisheries the engaged fishermen consider themselves full-time employed, even if they do not meet the FTE threshold (Italy);
- in segments with relatively high level of change of crews (Denmark), specific problems arise to calculate the number of FTEs because it is impossible to determine what the number of working hours per engaged person is.

Application of the metier approach
In case that the average crews and the number of working hours per metier do not significantly differ within one specific segment, the application of the metier approach does not have any added value. It generates the same results which would have been obtained if only simple segment averages would have been applied.

Engaged crew and FTE
The concept of engaged crew is based on the Eurostat SBS definition of 'Number of persons employed' (16 11 0). Eurostat proposes to measure this as 'annual average number of jobs' (see text in 16 13 0). The Eurostat definition of FTE is not clear regarding the precise method of calculation. Therefore the FADN approach is followed, where person working more than the threshold number of hours is counted only as one FTE.

This creates one practical problem. One job may imply more hours than the FTE threshold, but it can also be carried out by several persons. The proposed approach relates to the average number of jobs (engaged crew) and FTEs per year, which implicitly assumes a regularity of such relation. In segments where this assumption is not valid an addi-

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[1] This value is not applied in all countries.

tional adjustment of the calculation may be required, if it can be expected that the result will be significantly affected.

Employment on shore
Various types of fisheries related employment on shore (paid and unpaid, family members or employees, etc.) are not incorporated in the proposed approach due to almost complete lack of data. Currently only Denmark collects information on labour input on shore It is recommended to carry out specific surveys to determine the extent of this employment and its variability. On the basis of the results of such survey, it should be decide whether and how regularly this information should be collected, taking the expenses of such data collection into account,

3. PRACTICES OF EMPLOYMENT MEASUREMENT

3.1   International organizations

Three international organizations are involved in issues on employment in general and in relation to fisheries in particular and/or in compilation of statistics on these topics[1]:
-        United Nations - System of National Accounts (1993) (see appendix A);
-        ILO (see appendix B);
-        Eurostat :
    -        Labour Force Survey (see appendix C);
    -        Structural Business Statistics (see appendix D);
    -        Fisheries Statistics;
    -        Farming Accountancy Data Network (see appendix E and F).

These organizations have specified concepts and framework on measuring employment in general and calculation of full-time equivalents in particular. The relevant full texts will be presented in appendices of the report. Below the most important issues are summarized.

3.1.1 United Nations - SNA (1993)

A job is defined as an explicit or implicit contract between a person and an institutional unit to perform work in return for compensation for a defined period or until further notice. The institutional unit may be the proprietor of an unincorporated enterprise; in this case the person is described as being self-employed and earns a mixed income.

Output per job would be an excessively crude measure of productivity and total hours worked is the preferred measure of labour inputs for the System.

Full-time equivalent employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

3.1.2 ILO

ILO hosts the International Conferences of Labour Statisticians. Many of their recommendations have been implemented in national and international statistical systems.

ILO promotes working conditions of workers through international agreements and conventions. The working hours of seafarers should adhere to the following principles[2]:

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[1] Also OECD and FAO have been involved in this area, but in the context of this report their contribution is not relevant.

2 C180 Seafarers' Hours of Work and the Manning of Ships Convention, 1996. The convention has been adopted to EU law by the council Directive 1999/63 of 21.6.1999.

The limits on hours of work or rest shall be as follows:
- maximum hours of work shall not exceed:
    - 14 hours in any 24-hour period; and
    - 72 hours in any seven-day period; or
- minimum hours of rest shall not be less than:
    - ten hours in any 24-hour period; and
    - 77 hours in any seven-day period.

The term hours of work means time during which a seafarer is required to do work on account of the ship. The term hours of rest means time outside hours of work; this term does not include short breaks. This Convention acknowledges that the normal working hours' standard for seafarers, like that for other workers, shall be based on an eight-hour day with one day of rest per week and rest on public holidays. However, this shall not prevent the Member from having procedures to authorize or register a collective agreement which determines seafarers' normal working hours on a basis no less favourable than this standard.

3.1.3 Eurostat - Labour force survey

Employment

A person is considered as having an employment if he or she did any work for pay or profit during the reference week. 'Work' means any work for pay or profit during the reference week, even for as little as one hour. Pay includes cash payments or 'payment in kind' (payment in goods or services rather than money), whether payment was received in the week the work was done or not. Also counted as working is anyone who receives wages for on-the-job training which involves the production of goods or services (ESA 11.13 f). Self-employed persons with a business, farm or professional practice are also considered to be working if one of the following applies :
- a person works in his own business, professional practice or farm for the purpose of earning a profit, even if the enterprise is failing to make a profit;
- a person spends time on the operation of a business, professional practice or farm even if no sales were made, no professional services were rendered, or nothing was actually produced (for example, a farmer who engages in farm maintenance activities; an architect who spends time waiting for clients in his/her office; a fisherman who repairs his boat or nets for future operations; a person who attends a convention or seminar);
- a person is in the process of setting up a business, farm or professional practice; this includes the buying or installing of equipment, and ordering of supplies in preparation for opening a new business. An unpaid family worker is said to be working if the work contributes directly to a business, farm or professional practice owned or operated by a related member of the same household.

Unpaid family workers

The unpaid family worker can be said to have a job but not be at work if there is a definite commitment by the employer (a related household member) to accept his/her return to work and the total absence does not exceed a period of 3 months. In this point Eurostat diverges from the ILO recommendation.

Full-time / part-time distinction

This variable refers to the main job. The distinction between full-time and part-time work should be made on the basis of a spontaneous answer given by the respondent. It is impossible to establish a more exact distinction between part-time and full-time work, due to variations in working hours between Member States and also between branches of industry. By checking the answer with the number of hours usually worked, it should be possible to detect and even to correct implausible answers, since part-time work will hardly ever exceed 35 hours, while full-time work will usually start at about 30 hours.

3.1.4 Eurostat - Structural Business Statistics (SBS)

SBS makes a distinction in the following categories of employment:
- number of persons employed (16 11 0);
- number of employees (16 13 0);
- number of part-time employees (16 13 1);
- number of apprentices (16 13 2);
- number of home workers (16 13 5);
- number of employees in full-time equivalent units (16 14 0).

3.1.5 Eurostat - FADN

Regularly employed labour is converted into Annual Work Units (AWU). In most countries 1 AWU equals 2,000 hours[1]. One AWU is equivalent to one person working full-time on the holding. A single person cannot exceed 1 AWU equivalent, even if his actual working time exceeds the norm for the region and type of holding.

   For persons employed for less than the whole year on the holding, the fraction of AWU is calculated as :
- hours worked / Hours per AWU for the region / type of holding;
- labour input contains salaried as well as unsalaried labour.

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[1] For Germany and Luxembourg the number of hours per Annual Work Unit is fixed at 2.200 hours and for Greece 2240 hours.

3.1.6 Fisheries statistics[1]

- Full-time (FT) and Part-time (PT):
  The distinction between full-time and part-time work should be made on the basis of a spontaneous answer given by the respondent. It is impossible to establish a more exact distinction between part-time and full-time work, due to variations in working hours between Member States and also between branches of industry. By checking the answer with the number of hours usually worked, it should be possible to detect and even to correct improbable answers, since part-time work will hardly ever exceed 35 hours, while full-time work will usually start at about 30 hours;[2]
- Total (TE): Equals the sum of full-time and part-time jobs;
- Full-time equivalent (FTE): 'Full-time equivalent employment, which equals the number of full-time equivalent jobs, is defined as total hours worked divided by the average annual number of hours worked in full-time jobs within the economic territory'.

3.1.7 Conclusions

Work of fishermen on board fishing vessels as well as on shore has a number of specific characteristics. In view of the described approaches above the following principles for measurement of fisheries employment and calculation of FTE are justified:
- presence on board cannot be considered as working time, even if the ILO convention would not be applied. Periods of 'inactivity' should be considered as 'rest';
- time on shore spent on fishing related activity - company administration, repairs and maintenance, etc. should be considered as working time;
- work done by family members, paid or unpaid, should be considered as labour input, similar to the agricultural practice;
- in case that a fishing enterprise employs other personnel, e.g. in administration, sales, etc. this personnel should be included in the total employment of the sector. In fact if it is not included here it is not included at all, as there is no reason to include it in other statistical classifications by industry;
- many approaches take hours/week as a criterion for full-time and part-time employment, threshold of 30 or 35 hours being used. However, even the ILO convention puts the maximum allowable working time per week at 72 hours, which is approximately equal to effective 2 full-time working weeks. Consequently, it is proposed to apply either total number of hours per year or average number of weekly hours during one year period (which is evidently the same). Preliminarily, the threshold should be set at 2,000 hours per year. However, other threshold should be used if local situations would justify them;
- eurostat's LFS takes the perception of the interviewed persons as the starting point to determine if someone works full or part-time;

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[1] Joint meeting of the Eurostat Working Group "Fishery Statistics" and the ICES Statistics Liaison Working Group 2 – 3 May 2006, ASA/FISH/260
[2] Labour Force Survey Terminology: Council Regulation (EC) N° 577/98 of 9th March 1998 (OJ N° L 77/3)

- none of the documents makes it clear how to deal with employment of foreign nationals;
- the definitions allow for slightly different interpretations of a full-time job. SBS seems to advocate a less stringent quantitative interpretation than FADN.

Further remarks

- in the current practice, many countries calculate the employment on the basis of average crew on board. This, however, disregards the existence of rotation crew, i.e. one man staying on shore every trip. It seems that, if such practice exists, this man should be included in the crew;
- assuming full-time fishing year of 2,000 hours (as in agriculture), labour input below this level should be considered as part-time. However, many documents state that standard working time may vary by country and by economic activity or even region. This means that different standard working times (thresholds) could be applied to different fisheries in order to calculate FTE;
- none of the countries have now data which would allow to determine other labour input than work on board, in particular:
  - work on shore for repairs and maintenance;
  - labour input of family members (paid or non-paid);
  - labour input of administrative personnel on shore;
  - labour input of foreigners;
- The distinction between employed (salaried) and self-employed (share basis) fishermen is not relevant in relation to the determination of employment and FTE;
- None of the documents refers to a threshold in terms of income, as requested in the Terms of Reference. Some countries apply such a threshold (Dk, Fi);
- A minor issue is the distinction between gaining income from fisheries and working in the sector. This refers mainly to 'slipper skippers' and retired vessel owners, who receive part of the profit, but are not actively working. Such individual should be excluded from the employment data, as they do not contribute to labour input.

3.2   National statistical offices

3.2.1 Denmark

Statistics Denmark has compiled establishment-related employment statistics (ERE statistics) since the reference year 1990. They replaced the 'register-based workplace statistics' which covered only establishments with employees. The introduction of the ERE statistics completed the coverage by adding information about self-employed and working spouses. Thus, establishments without employees also became part of the register basis. Furthermore, information about socio-economic status, sex, age and education was included in the ERE statistics.

 The ERE statistics are published annually. They provide information about the number of establishments and the number of jobs at the end of November, plus figures for full-

time equivalent employment and annual wages and salaries. The establishments covered by the ERE statistics are all workplaces connected with real active enterprises and with employment (jobs) at the end of November, according to the information recorded on the Central Business Register. The jobs may be filled by self-employed persons (working proprietors), by working spouses or by employees.

Another employment statistic compiled by Statistics Denmark is the register-based labour force statistics (RAS), which are annual status observations of the population's attachment to the labour market at a given point-in-time at the end of November. In the RAS statistics the population is divided into 3 main groups according to the guidelines laid down by the ILO. The 3 groups are persons in employment, unemployed and persons outside the labour force. Employed persons are either employees, self-employed or assisting spouses.

The ERE statistics are based on the same data material as the register-based labour force statistics (RAS). However, the RAS considers only primary jobs, whereas the ERE covers secondary jobs as well. Conversely, the RAS is more comprehensive than the ERE as regards certain groups of self-employed persons and as regards persons on leave from their jobs at the end of November.

Although Statistics Denmark compiles an exhaustive range of register based and annual statistical survey based statistics on employment it is not possible to link the calculated employment in fisheries directly to vessel segments.

3.2.2 France

Calculation of FTE

INSEE First definition directly linked with OECD definition: Full-time equivalent employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

Another definition provided by INSEE Working document: The French FTE Employment is equal to the total number of persons multiplied by a part-time coefficient which is calculated taking account of average rate of partial working time and average proportion of the number of part-time working persons.

Definition of standard working hours

The legal working time is defined by the French regulation. It is equal to 35 hours per week for all firms whatever the number of person employed. It is the reference working time and the basis for the calculation of additional working hours. It has not to be considered as a minimum (person can be employed part-time) nor a maximum (additional working hours are allowed and must obey the maximum limits fixed by the regulation). However, this legal working time can differ according to the specificity of some sectors (hotels and restaurants for example).

Employed - self-employed persons

No clear and homogeneous information exist for this topic.

Definitions of different categories of employment (Full-time, Part-time, temporary, seasonal employment)

Part-time employment/work
There is no universally accepted definition of part-time work/employment. A definition proposed by the ILO defined part-time work as 'regular employment in which working time is substantially less than normal'. This is the definition used for administrative purposes in some countries. However, such definitions are inconvenient for use in household surveys. These tend to ask employees if they consider themselves as part-time, or base the distinction between full- and part-time working on an 'hour cut-off' considered most suitable for the country concerned.

Employment, temporary
Temporary employment comprises work under a fixed- term contract, in contrast to permanent work where there is no end-date. Employment under temporary contracts often entails a different set of legal obligations on behalf of employers; in particular, certain aspects of employment protection legislation do not apply to temporary contracts.

Workers in seasonal employment
Workers in seasonal employment are workers who hold implicit or explicit contracts of employment where the timing and duration of the contract is significantly influenced by seasonal factors such as the climatic cycle, public holidays and/or agricultural harvests. These workers may be classified as employees or own-account workers according to the specific characteristics of the employment contract.

3.2.3 Italy

Source

ISTAT employment data are obtained by mean of a Labour Force Survey (LFS). The ISTAT LFS is the main national survey on the labour market. During the last decade the survey has been highly improved to take account both of the continuous transformation process of the labour market and of the growing knowledge needs. The last modification has been introduced in 2004 to comply with the EU regulations (EC Reg. 577/98). The new survey is a continuous survey as data are collected in every week of the year instead of in a single week per quarter. Anyway, data release happens quarterly, except for provincial data that are released yearly. The new survey is also characterised by new definitions for employed and unemployed people and by new survey techniques (computer assisted techniques - CAPI and CATI). To homogenise new data with previous ones ISTAT has rebuilt historical series since the fourth quarter of 1992. The LFS is a double stage survey.

The first stage units ate the municipalities while the second stage ones are the families. Every quarter about 76,800 families are drawn, equal to about 175,000 persons.

Calculation of FTE

Definition of standard working hours
In accordance with the ISTAT definition, the FTE or a standard working unit is the quantity of work carried out in one year of full-time employment or the quantity of work carried out by part-time workers or workers with second jobs. This concept cannot be linked to a single person, but is equalised with the number of hours per annum corresponding to a specific job carried out full-time. This number can vary according to different types of work. These working units are therefore used as units to measure the volume of work employed in the production of goods and services falling within the estimate of GNP in a determined reference period.

Employed - self-employed persons
ISTAT classifies people into three groups: employed, finding a job and inactive people. Employed people are persons over 15 years who have worked, being remunerated, for at least one hour in the reference week of the LFS (except the case of people have been sick or in holidays). If the work is carried out inside the family it can be not remunerated. The main change respect the old version of the questionnaire stands in the opening question: the last one started with a question on the perception of the interviewed person on his own labour condition. Hence, while the self-perception was basic for the individuation of employed and unemployed people, in the new LFS a person can be classified, for instance, as employed person while he has a different perception of his own status. As a consequence, unemployed people are those persons that are not classified as employed. Within unemployed people two different status can be distinguished; people finding a job and inactive people. A person finding a job is a person with the following characteristics: a) age between 15 and 74 years; b) to be unemployed; c) to be disposable to work in two weeks from the interview; d) to have made at least one action to find a job in the four weeks previous to the interview. Inactive people are those persons not classified both as employed or finding a job.

In the LFS, employed people are classified into three categories: a) employees, i.e. workers with a labour contract without time limits, b) self-employed people, i.e. manager, free professionals, autonomous workers, people helping a family's member in his work and cooperative's member; c) people working by a continuative and coordinated collaboration or by providing an occasional and specific service.

Definitions of different categories of employment (Full-time, Part-time, temporary, seasonal employment)

Basically, ISTAT does not give a specific definition of full-time and part-time workers as well of temporary and seasonal ones. In the LFS the definition of the worker according to labour time is made by the worker itself. It means, for instance, that in the LFS interviews the classification into full-time or part-time is based on the self-perception and self-

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statement of the interviewee. Anyway, in Italy the part-time contract is defined as a labour contract providing for a labour time shorter than the standard one. The standard or full-time labour time is defined by the collective contracts, for each specific profession. The reference regulation is legislative decree no. 61/2,000, as amended by the legislative decrees no. 100/2001 and 276/2003. According to the fact that the reduction of the labour time is referred to the single day or to longer period (the week, the month or the year), the part-time is defined as horizontal, vertical or mixed. The part -time is:

- horizontal, when the daily labour time is shorter than the standard one;
- vertical, when the daily labour time is equal to the standard one but the employee works for restricted time periods during the week, the month or the year;
- mixed, when the horizontal and the vertical types of part.-time are combined together.

As for part-time, ISTAT refer to the national regulation for the temporary and seasonal jobs. Basically, a temporary worker is a person working on the base of a fixed term contract while a seasonal worker is a person whose job depends on seasonal factors, i.e. climatic conditions, public holidays and/or harvests seasons.

3.2.4 Netherlands

The Dutch national statistical office has definitions for labour input, full-time and part-time jobs and for full-time equivalents.

- *Labour input* ('arbeidsvolume') can be defined as the quantity of labour used in the production process. Labour input can either be expressed in FTEs or in hours worked;
- *The full-time equivalent* of a job is calculated by dividing the annual number of hours by the average number of hours of a full-time job in the industry concerned. The full-time equivalent of self-employed persons is determined by dividing the weekly number of hours by the average weekly number of hours of self-employed with a weekly number of work hours of 37 or more (in the same industry);
- *Full-time jobs and part-time jobs:* In a full-time job the number of hours equals the number of hours of a full working week in that company. All other jobs are considered part-time jobs.

3.2.5 United Kingdom

Source of data

The ONS (Office for National Statistics) calculates Employee and Self-employed jobs through two main sources; the Labour Force Survey (LFS)[1] and Annual Business enquiry (ABI). These two surveys can give different measures of employment as they ask for different factors.

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[1] More information about the Labour Force Survey can be found at :
http://www.statistics.gov.uk/statbase/Product.asp?vlnk=1537

The Labour Force Survey (Eurostat) is a quarterly survey of households living at private addresses in Great Britain, employment estimates reflect the area of residence of people with jobs. This survey aims to capture information for a given 'reference week' and thus provides a snapshot for that week. All details received in the LFS are based on the respondents' perception of their working status, self-classification

The Annual Business Inquiry asks for the number of 'employees' and 'other workers' on the payroll of your business. The same individuals should never be counted as both 'employees' and 'other workers'.

Calculation of FTE

Full time equivalents are not collected or reported by the ABI or the LFS. There are other surveys in the ONS which capture FTEs and they do this by converting part-time employees' hours into those worked by full-time employees. For example, if a part-time employee worked 10 hours per week and the full-time working week in the organisation was 37 hours then the part-time employee would equate to 0.27 FTEs.

Definition of standard working hours

In the ABI standard hours is very much defined by individual businesses. For example if a business defined their normal working day as being 8 hours for five days per week. Standard working hours are not defined in the LFS.

Employed - self-employed persons

The Labour Force Survey classifies employed people into one of four categories: employees, self-employed, unpaid family workers and participants in government-supported training and employment programmes. LFS respondents classify themselves into each of these categories, based on their own assessment of their work situation. Employees work for a company and have their National Insurance paid directly from their wages. The self-employed work for themselves and generally pay their National Insurance themselves. Unpaid family workers are people who do unpaid work for a business they own or for a business a relative owns. Participants in government-supported training and employment programmes are all people aged 16 and over who take part in one of the government's employment and training programmes.

ABI classifies employed people into one of three categories: employees, self-employed and other workers. Employees receive a salary/wage to carry out permanent/temporary/full-time/part-time jobs (or to be on training schemes with contracts of employment). These individuals must be aged over 16 and their jobs/training schemes must be based in the UK and be on the payroll on the date of the survey. The key characteristics of the 'other workers' is that they are not in receipt of a salary/wage. These unpaid workers receive some benefit from the business other than a salary/wage. Self-employed workers include individuals paying tax under schedule D[1] rather than a PAYE scheme.

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[1] The tax schedule under which a self-employed person's profits are assessed

Definitions of different categories of employment (Full Time, Part Time, temporary, seasonal employment)

The LFS survey uses the terms full and part time employed it provides no definitions for the respondent to use as a guide, it is up to the respondent whether they consider themselves to be in full or part-time employment. However, the LFS does go on to additionally classify employed people into full-time workers (those working 30 or more hours a week) and part-time workers (those working less than 30 hours a week).

Full time employment would be counted where there is an employee of a business who works the standard hours of the business. However, the ABI classifies any individual who works under 30 hours as a part time employee and over 30 hours as a full time employee.

Temporary and seasonal workers are captured in the ABI survey as it is a cross-sectional survey, also known as a snapshot or point in time survey. So the ABI is interested in the numbers of employment as at a specific calendar date. If the temporary staff are being supplied through an agency they will be counted as 'employees' on the payroll of the business-site from which they are paid.

4. Case studies

4.1 Denmark

Introduction
Data on labour input in the Danish fishery is collected together with economic data in the Danish account statistics for fishery. The account statistics is based on a sample of 25 per cent of the commercial fishing firm, defined as fishing firms with total revenue over the threshold value. In 2004 the threshold value was EUR 30,600, and the sample included accounts from 311 fishing firms of a population of 1,242 firms[1] representing 98 per cent of the total catch value in Danish fishery.

The information collected in the Danish accounting form for fishery regarding labour input and labour expenses is shown in Table 1.

Table 1   *Yearly data collected in the Danish Accounting form for Fishery*

	A	B	C	D	E	F		G	H
Wage category	Number of persons	Persons * fishing trips	Persons * days at sea	Average number of working hours on days at sea	Persons * working days not at sea	Total working hours C*D 7.4*E	= +	Paid salary	Other wage expenses
Fisherman/owner									
Partner/ Sharehol-der									
Hired skipper									
Hired crew									

The figures in each column are determined as follows:
- Number of persons is the number of individuals that take part in the service provided by each of the four wage categories. The figures are taken from the salary accounts where each person is identified. It gives the information that in several cases one job on board the vessel is actually shared between several persons during the year. The number of persons is equal to or higher than the number of "the crew inclusive rotation". The number can be used to detect whether the vessel uses rotating crew. If the number of persons is higher than (persons*days at sea) divided by vessel-days at sea, then the vessel uses rotating crew. But the figure can not be used to calculate the ro-

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[1] Each fishing firm/unit has only one fishing vessel. Firms with more than one separately operated fishing vessel with own crew are split into vessel units.

tation part of the crew, to do that it is necessary to know the share of the labour input to a job on board over the year that exceed the labour of one "man year". For instance if a vessel has 240 days at sea with 5 men on board, but each man only works 150 days, then the rotation part of the crew is 5*(240-150)/150 = 3, and the crew incl. rotation is 5+3 = 8. In this calculation the number of persons involved in the 8 jobs over the year is not relevant, but in some cases where the hired fishermen are "permanently employed" by the owner of the vessel (and not engaged by other employers), it may be adequate to use the number of persons as the number of jobs (=crew incl. rotation) in the fishing firm;

- The (persons * fishing trips) and (persons * days at sea) are yearly figures which are compared with the number of fishing trips and days at sea for the vessel in order to evaluate the consistence of the data on labour input and calculate the average number of crew members for each wage category. Both the number of crew members and the duration of a fishing trip can vary between trips;

- The average number of working hours on days at sea is skipper's best estimate for the whole year for each wage category. The maximum number of working hours per day is limited for the employees by the departmental order on resting time for fishermen issued by the Danish Maritime Authority. During each 24 hour period an employee must have at least 10 hours rest (12 hours if he is not 18 years of age), and the rest time must be at least 77 hours per week. As the number of working hours is considered to be the less accurate of the measures there is no need for decimals here only whole hours;

- Number of working days on land (not at sea) is also an estimate. The figure indicates the amount of work done by the fisherman and crew to maintain the vessel, prepare for the next trip and rigging of other gears for seasonal changes in fishing methods. Also administrative tasks performed by the fisherman/owner and his family is included in work on land, but not other services or work performed by other than the fisherman/owner and his family and crew. One days work on land counts as 7.4 hours, as the ordinary number of working hours in Denmark is 37 per week (5 days). The number of days on land is multiplied by 7.4 and divided by D, whereupon the unit becomes days at sea, and can be added to the number of working days at sea to calculate the total labour input measured as days at sea. This figure is presented in the national statistics. But it is important to realize that the average number of hours worked on a day at sea varies significantly between vessels and vessel categories;

- The total labour input measured by working hours is calculated by $(C*D + 7.4*E)$, that is the total hours performed at days at sea plus the hours worked on other days. The total number of working hours is calculated separately for each wage category;

- The paid salary is reported by wage categories. Therefore the hourly wage can be calculated for each wage category. For vessels with working partners/shareholders both salaries paid to fisherman/owner and to working partners/shareholders must to be reported separately in the account. When the fisherman has full ownership (100%) of the vessel, the amount of work for the owner is given in the labour input table, but it is not compulsory to report the salary to the fisherman/owner because usually he will not distinguish between remuneration for his labour and his rent on capital input. Thus the remuneration to the fisherman for his labour input is calculated using a

fixed hourly wage for the year. The wage rate is calculated from the wage statistic for industrial machine operators in the provinces. If the remuneration to the fisherman/owner was not calculated using the reported labour input then the value of his work would be very low if not zero in years with losses;

-    Other wage expenses include social expenses and payment in kind to employees, and are deducted for subsidy and repayment for trainees or apprentices, and for employing long-term unemployed. This cost is not divided on wage category.

For fishing firms/fishermen with revenue below the threshold the information on labour input is primarily based on the number of crew members (including skipper) per vessel registered in the Fishing vessel register. For these non-commercial (less active) vessels the labour input can not be calculated in days or hours, only the number of fishermen, which are regarded as part-time fishermen, can be calculated. There are however no minimum number of active fishing days in a year for a part-time fisherman. The landings by species and total revenue from landings by species is known for all fishermen also the non-commercial part-time fisherman, but estimating labour input based on production or the generated income would be very uncertain and extremely questionable for the part-time fishermen.

4.1.1 New calculation of employment

Time based approach

The number of working hours for a Danish employee is in most collective agreements set at 37 hours per week, corresponding to an average of 7.4 hours a day for a normal 5 days week. Multiplied by 225 working-days (excluding weekends and holidays), this equals 1,665 hours a year for a fulltime worker. However, as many fishermen are self-employed the average yearly working hours is considered to be higher in fisheries.

In this project the average work performed is calculated as the number of man hours for days at sea per vessel. The figures for employment in the commercial Danish fishing fleet is shown in Table 2. For segments with five vessels or less, the vessels are placed in the nearest length group below or above.

Table 2 Employment in the Danish commercial fishing fleet, 2004

Segment name		12-24	24-40	0-12	12-24	12-24	12-24	24-40	40-	0-12	12-24	0-12	12-24	0-12	12-24
	Total	TBB	TBB	DTS	SDN	DTS	PTS	PTS	PTS	DRB	DRB	PGP	PGP	PVG	PVG
Number of vessels	1,242	26	7	26	69	237	107	118	45	38	24	312	118	56	60
Average days at sea	161	157	217	131	144	166	195	223	227	171	121	137	143	107	157
Average crew on board, excl. rotation	2.45	2.73	4.85	1.07	2.55	1.94	2.88	3.93	6.03	1.80	1.72	1.22	2.69	1.09	2.18

Table 2 Employment in the Danish commercial fishing fleet, 2004 (sequel)

Segment name		12-24	24-40	0-12	12-24	12-24	12-24	24-40	40-	0-12	12-24	0-12	12-24	0-12	12-24
	Total	TBB	TBB	DTS	SDN	DTS	PTS	PTS	PTS	DRB	DRB	PGP	PGP	PVG	PVG
Hours worked per days at sea per crewman on board	12	12	11	15	13	14	13	12	11	12	12	11	14	12	14
Average crew per vessel, incl. rotation	2.84	2.73	5.85	1.07	2.55	2.24	3.63	5.23	7.33	1.80	1.72	1.22	2.69	1.09	2.33
Average hours per engaged crew (incl. rotation)	1,722	1,919	2,008	2,002	1,898	1,983	2,005	1,996	2,006	1,997	1,452	1,504	1,933	1,288	2,007
FTE Threshold per year per crewman (hours)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Engaged crew	3,189	71	41	28	176	531	388	617	330	68	40	381	317	61	140
FTE	3,033	68	41	28	167	526	388	616	330	67	29	286	307	39	140

Acronyms: TBB-Beam trawl, DTS-Demersal trawl and seiners, SDN-Danish Seiners, PTS-Pelagic trawl and seiners, DRB-Dredges, PGP-Polyvalent passive gears, PVG-Polyvalent gears.

For the AER project all reported labour input, both hours per days at sea and hours spend on land used to make vessel and gear ready for the next fishing trip, were used in the calculation of FTE. 1 FTE equalled 2,000 hours. The 2,000 hours was not used as a threshold, but as a denominator to calculate the number of FTEs.

The number of FTE calculated from the current practice is shown in Table 3, for days at sea inclusive and exclusive hours spend on land preparing and maintaining the vessel respectively.

Income generation capacity

The crew share includes both expenses on hired crew and as well as salary to the owners. If there is more than one owner of the vessel, the salary is reported specified by fisherman and partner. If the fisherman owns 100% of the vessel, the remuneration for his work is calculated based on the reported number of days at sea times average number of working hours for days at sea plus his work on land. To calculate the remuneration for the owner, the hourly wage for process and engineering employee working in the provinces is used. In 2004 that was set at 191 DKK = 26 € per hour.

In Figure 1 and Figure 2, the employment in relation to income levels is shown with the Y-axis reflecting the 'engaged crew' and the size of circle reflecting the Full Time Equivalent.
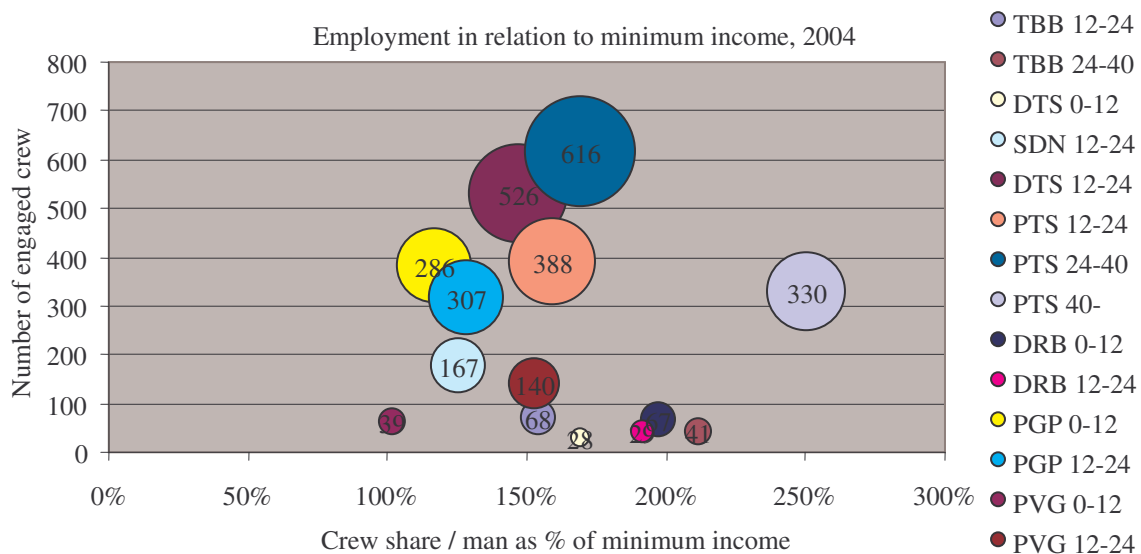
Figure 1 Employment in relation to minimum income, 2004

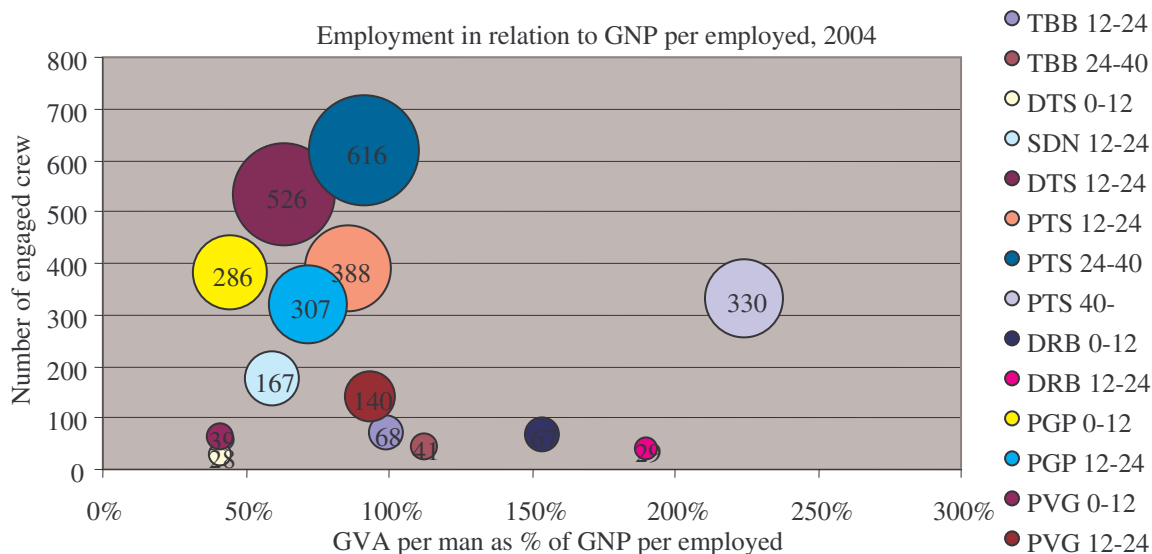*Figure 2 Employment in relation to GNP per employed, 2004*

Comparing the vertical position of the balloons with the number of FTEs indicate whether the crew members in the segment work more than less one FTE on average. The horizontal position in figure 1 shows the crew share per man in comparison with "minimum income", which is calculated as 37hours*45weeks*155 DKK = approx. 34,600€ for 2004.

The crew share per man is calculated from the accounts as the total crew costs inclusive of the owners' remuneration divided with the number of crew members. Also the Gross Value Added (GVA) per man is calculated per crew member. GVA is defined as the total income for the vessel exclusive of fuel costs, vessel cost (repair and maintenance) and operational cost (other running costs), and equal to the definition used in the AER report prepared for STECF.

When comparing the employment and income levels of vessels below 15 metres, attention should be drawn to the fact that these vessels primarily are owned by self-employed fishermen. The remuneration for the self-employed owners are in the Danish Account Statistics calculated as the hours spend at sea and on land multiplied with 191 DKK (26€).

As a result of the calculated remuneration, the net profit may become negative for most of the small vessel segments with a high degree of self-employment. It may be relevant to consider other economic indicators for these vessels segments, for instance the earnings, representing the surplus available for payment of labour and capital. The Gross value added GVA in Figure 2 is the earnings plus depreciation, so the expenditure on capital consumption has not been taken out of the result. The horizontal position in Figure 2 shows GVA per man compared with the Danish Gross National Product per employed person, which for 2004 was 1,467 Billion DKK divided by 2.71 Million employed = 72,567€ per employed person.

4.1.2 Current practice of estimation of employment

In the current approach for estimation of FTE, the total sums of hours spend at sea and hours spend on land maintaining the vessel is included. To calculate the total number of FTE in the Danish fishery the total sum of hours is divided with 2,000. In Table 2 the number of FTE calculated from the current practice is shown, for days at sea inclusive and exclusive hours spend on land maintaining the vessel. The 2,000 hours is not used as a threshold, but only as a denominator to calculate the number of FTE. Using 2,000 hours equal to 1 FTE, and based on the total hours inclusive work on land has showed to give a good estimate for the number of people employed in the Danish fishery and in each segment.

The number of fishermen can also be calculated using the data from the Danish Directorate of Fisheries Vessel register. The vessel register contains information about the average crew size including skipper for each vessel.

4.1.3. Comparison of current and proposed approach

Comparing the current Danish method, cf. section 2, with the proposed approach the shows the following differences:
- The current method for calculating FTE is based on the total amount of hours spend at sea and on land, whereas the proposed approach only uses hours from days at sea;
- The current approach does not use a threshold cut off, but includes decimals when aggregating the calculated labour input from vessel level to a fleet segment level.

The work performed on land is calculated to 262 FTE in 2004 or about 8% of the total labour input in the commercial fishery.

Table 3 Employment in the Danish commercial fishery, 2004

| Segment name | Employment according to current practice (FTE) | | New approach Inclusive rotation | |
	Inclusive work on land	Exclusive work on land	Engaged crew	FTE
TBB 12-24	70	67	71	68
TBB 24-40	43	40	41	41
DTS 0 -12	31	25	28	28
SDN 12-24	178	159	176	167
DTS 12-24	554	506	531	526
PTS 12-24	402	381	388	388
PTS 24-40	633	605	617	616
PTS 40-	338	326	330	330
DRB 0 -12	70	66	68	67
DRB 12-24	31	28	40	29
PGP 0 -12	328	270	381	286
PGP 12-24	329	292	317	307
PVG 0 -12	45	37	61	39
PVG 12-24	146	137	140	140
TOTAL	3,200	2,938	3,189	3,033

Acronyms: TBB-Beam trawl, DTS-Demersal trawl and seiners, SDN-Danish Seiners, PTS-Pelagic trawl and seiners, DRB-Dredges, PGP-Polyvalent passive gears, PVG-Polyvalent gears.

The threshold cut off has mainly influence on the calculation for the beam trawlers, pelagic trawlers and seiners and demersal trawlers and seiners. For these segments the new approach will underestimate the number of FTE for the Danish commercial fleet. The average number of crewmen on board is lower than the actual crewmen engaged. It may be a good idea to have a threshold of hours for the self-employed owners, but not for the employees.

There are rotating crews mainly on the large beam trawlers and vessels using pelagic trawl and seine, and on some of the vessels using demersal trawl and seine. For the pelagic trawlers and seiners segment, which stands for 29 per cent of the employment, the rotation adds a little more than 1 man per vessel to the average crew on board. For the demersal trawlers, rotation adds about 70 men to the average crew on board a fleet of 237 vessels. These calculations are done using the 2,000 hours not as a threshold, but as the number of hours equal to 1 FTE. This way the rotating crew members are not cut of in the calculation.

4.1.4. Evaluation of the proposed approach from the national perspective

Case study

Fisherman Olsen owns a trawler together with his partner. In 2004, the vessel has been on 36 fishing trips with a total of 252 days at sea. The vessel has been engaged in 3

types of fishery (metiers) during the year: Cod fishery in the Baltic, fishery for Norway lobster in Ices 3A, and some pair trawling for Sprat (industrial fishery) in Ices 3. Information about the metiers is registered in the logbooks by trip (and day, and haul, etc.).

Olsen's vessel is drawn for the sample of fishing firms for the account statistics, therefore economic data and employment data was collected from Olsen's fishing firm. The following information was available:

Personnel catalogue for Olsen's fishing firm				
Year = 2004	Name	(1) Paid wage/salary	(2) Number of fishing trips	(3) Number of days at sea
Owners	Owner 1	56,977	20	144
	Owner 2	53,362	19	138
	… owner k			
Employed permanently	Permanently-employ 1	47,894	21	148
	Permanently-employ 2	50,372	23	156
	Permanently-employ 3	45,121	20	139
	… permanently-employ 1			
Employed occasionally	Occasionally-employ 1	31,472	14	99
	Occasionally-employ 2	19,673	9	63
	Occasionally-employ 3	17,152	9	58
	… occasionally-employ 1			

(1)   Paid wage/salary is known precisely.
(2)   Number of fishing trips is well documented (number of payments).
(3)   Number of days at sea could be well documented if registered otherwise it has to be estimated.

Logbook of data for Olsen's vessel 2004				
Trip no.	Métier	(1) Days at sea	(2) Number of crew	(3) Other logbook data
1	A	8	4	…
2	B	9	4	…
3	C	7	4	…
4	D	4	3	…
…	…	…	…	…

Aggregated by metier 2004			
Number of trips	Métier	Vessel at sea	Man * days at sea
8	A	59	236
19	B	130	520
9	C	63	189

(1)   Days at sea is calculated (departure to arrival).
(2)   Number of crew is currently not available in the logbook.

From these data sources, the rapporteur has build the report on the employment and labour input in the fishing firm. Note that logbook data on the number of crew on board is not possible to get at the moment, as this information is currently not included in the logbooks, but it mentioned here to show that this information could be applied into the logbooks to enable the use of the metier concept on employment data.

Based on the accessible information the following data became available through the accounting form:

Table 4 Example of employment data collected for a Danish trawler

Wage category	A Number of persons	B Persons * fishing trips	C Persons * days at sea	D Average number of working hours on days at sea	E Persons * working days not at sea	F Total working hours = C*D + 7.4*E	G Paid salary	H Other wage expenses
Fisherman /owner	1	20	144	13	20	2,020	56,977	
Partner /shareholder	1	19	138	13	20	1,942	53,362	
Hired skipper	0	-	-	-	-	-	-	33,721
Hired crew	6	96	663	12	0	7,956	211,684	

Using the current method the number of FTE is calculated as (2,020+1,942+7,956)/2000 = 5.96 FTE. The decimal figure is used when aggregating the labour input on fleet segments, as the occasionally employed may also have work on other vessels.

In order to use the proposed method, it is necessary to explain the concept of a rotating crew to the rapporteur, and stipulate a model to calculate this figure based on the accessible information. A general procedure explaining how to do that is therefore required.

For the calculation by metier it is equally important to set up a solid definition on how to calculate or allocate the labour input for the individual vessel between metiers. Especially as long as data on crew size is not reported in the logbooks, there has to be rules for assumptions to be made about the crew size for each fishing trip.

Availability of data

- *Number of vessels*
  Available. The numbers of vessels is equal to the number of fishing firms/units in the Account Statistics for Fishery. The population of fishing firms is constructed by extracting all transactions on the Fishing Fleet Register in a year and merging that together by owner. If a fishing firm or fisherman has more than one separately operated vessel with own crew, that firm is split into vessel units. As no transaction escapes

from this merge, all vessels, even vessels that the fisherman had possessed only a few weeks are included. And more important, auxiliary vessels or vessels that a fisherman owns just to have the right to extra quota shares are not given some estimated or calculated crew that does not exist in reality.

The total population of fishery units is split into two populations by a threshold at 30,600 € (in 2004). Fishermen or fishing firms with total revenue from fishery above the threshold value are included in the population of commercial fishermen. The 1242 units in the commercial population in 2004 accounted for 98 per cent of total value of Danish fishery. Fishermen with revenue less than the threshold are considered non-commercial. This group counts 1,134 units (1,300 vessel transactions) in 2004. Only the non-active vessels are not included in the two populations. The labour input in non-active vessels is zero.

The segmentation of the Danish fishing fleet is done according to Appendix III in the Data Collection Regulation. We are preparing to adjust the segmentation to the expected revision of the length groups in the coming DCR.

- *Average days at sea*
  Available. Days at sea for the vessel are included in the reporting form used for the Account Statistics for Fishery. Data from logbooks are also available for calculations.

- *Average crew on board, excl. rotation*
  Available. In the account statistics the average crew on board is calculated by summarizing the persons*days at sea for the four wage categories and dividing this sum with the days at sea for the vessel. Also the Fishing Vessel Register contains information on the average crew size including skipper for each vessel.

- *Hours worked per days at sea per crewman on board*
  Available. Average hours worked per day at sea per man is collected in the Account Statistics for Fishery by four wage categories.

- *Average crew per vessel, incl. rotation*
  Not readily available. The number of persons in the crew over the year can be found in the fishing firm's catalogue of personnel, but these persons may rotate to other vessels as well. The idea in the proposed method is to count the crew incl. rotation as a number of full(-time) jobs, without taking account of time but using men or job as the counting unit. This is obviously possible if the hired crew members are permanently connected with a fishing firm, and not connected with other fishing firms during that year. Unfortunately this is not always the case. In fact many of the hired fishermen migrate between fishing firms. One way to calculate potential rotation as an isolated single vessel concept could be to subtract (Normal hours*Average crew on board) from Total number of hours worked. Where Normal hours could be a fixed number of hours set for instance for each vessel segment.

- *Average hours per engaged crew, incl. rotation*
  Total hours worked available, but average hours requires calculation of the crew incl. rotation, see above.

- *FTE threshold*
  Not used for the time being. It makes good sense to use a threshold to ensure that persons working more than the threshold number of hours are only counted as one

FTE each. On the other hand it is equally important to ensure that persons sharing a job function or working part time are aggregated to the number of full time jobs that is actually present.

Assumptions

The segmentation in the tables is the same as the fleet segments used for the DCR. It may be possible to divide both labour input as well as some of the economic statistical variables between metiers in the Nantes matrix using trip based information from e.g. the logbooks. One important measure, that could be made available if included in the logbooks, is the crew size on each individual trip. Otherwise one would have to make assumptions on the number of crew members on the trips, for instance that the average crew is always on board no matter which metier a specific fishing trip applies to.

Advantages

FTE-time based approach is obviously the best method to compare data on employment. The data used in this approach is comparatively easy to gather. The data should also be easier to compare between the countries.
FTE-income based approach can give an indication of which segments/countries are doing well.

Disadvantages

FTE-time based approach. Using the FTE as a threshold will for the large beam trawlers, the pelagic trawlers and seiners and to some extend for the demersal trawl and seiners cut off the rotation part of the crew, because for those vessels the size of the rotation crew can only be calculated from the number of hours worked on the vessel.
    The métier concept is not usable when collecting yearly data. A year is the standard time frame for setting up an account and therefore the relevant interval for collecting economic data. Métiers can change between fishing trips, and requires thus daily or trip based collection of data. In order to calculation labour input by metier it is necessary to include information on metier and the number of crew members in the EU-logbook.
    FTE-income based approach needs more economic indicators or should maybe be based on earning capability which portrays the surplus available for payment of crew and capital. Most of the small Danish vessels are owned by self-employed fishermen. The remuneration of work for the self-employed owner is calculated as the hours worked multiplied by an hourly wage rate which is fixed for all fleet segments (26 € in 2004). For the small vessels the calculated remuneration may be too high as the net profit is likely to become negative.

Data on other employment

- *Work on shore by the crew*
  Work on shore by the fisherman and his crew is most relevant. In the form used for account statistics a figure for the number of days work on land is given (estimate) for the four salary groups, fisherman/owner, partner/shareholder, hired skipper, hired crew. The data recorded in the Danish accounting form include the rigging of a vessel for changing seasons, and also the maintenance of vessel and gear, which sometimes is done on other days than days at sea. In some cases where the son has taken over as skipper on the vessel and the father now mostly is working on land, that work is also reported. The work performed by the fisherman and the crew on land is included in the Danish statistics on labour input in fisheries along with the work at sea.
- *Administrative staff on shore*
  The use of unpaid family members for administration work on shore should be included in the work on land by fisherman/owner. For the big fishing companies (Ltd.) the use of external administrative staff on shore is not registered in terms of hours and days and salary. But the expenses are registered as administrative expenses such as an extern administrative worker or a consultant, and therefore it is not included as a part of labour input in fisheries.
- *Unpaid labour (e.g. involvement of spouses)*
  Whether all unpaid labour is actually reported in the accounting form is very uncertain. But very little if any labour input comes from spouses. It would be very difficult to collect such data and the level of uncertainty would be high.
- *Employment by gender (mainly on shore*
  Employment on shore by other than crew members is not collected as labour input in fishery. That is only included as a cost item for the provided service. The actual number of women working in fishery and aquaculture in Denmark is 220. We do not register gender separately for fisheries, because very few of these women are involved in fisheries.
- *Employment of foreigners (EU and non-EU).*
  No indication of nationality for the employees in the Danish fishery is registered. Unless there is a specific need for it, collection of such information is not to be made.

Propositions

FTE-time based approach. A clear set of definitions on the variables is essential regarding:
- number of vessels: only active vessels with own separate crew is relevant;
- average days at sea: labour on land is important especially for fishermen using fixed gear;
- average crew on board, excl. rotation: crew on board could be written in the logbook.

Hours worked per days at sea per crewman on board: Skippers best estimate. In the Danish accounts we use four wage categories. We can see that in most cases the skippers work longer hours than the other crew members.

Average crew per vessel, incl. rotation: Can only be collected if the crew is permanently employed by the fisherman, and that is not the case for most crewmembers. Could be calculated using a fixed maximum number of hours worked (for instance per segment).

FTE threshold: A fixed maximum hour could be introduced and used to calculate the rotation crew. To prevent calculating one fisherman as more than one FTE for smaller vessels with self-employed fishermen working long hours, one way could be to use the number of crew members as FTEs (1:1) in this case.

4.2   France Contribution
IFREMER – DAURES Fabienne, LEBLOND Emilie

4.2.1. New calculation of employment

This study refers to the French fleet of vessels less than 40 meters long belonging to the North Sea – Channel and Atlantic coast[1]. It represents around 3,700 vessels in the beginning of 2005, totalizing 87,000 GRT and 584,000 kW. The NSCA fleet of less than 40m long, for which detailed data on labor and "métier" are available, accounts for a very large part of the French metropolitan fishing fleet (5,216 vessels).

Three segments are considered: 1/ less than 12 m. long fleet, 2/ 12 to 24 m. long fleet and 3/ 24 to 40 m. long fleet. They are completely different in terms of fishing activity: types of métier (gear used, fishing areas and target species), pluriactivity and production factors (labor, intensity of capital).

Ten Gears (considered here as métier) are retained in the analysis: POT (Pots and Traps), DRB (Dredge), NET (Net), LIN (Line), HOK (Long line), PSE (Seine), DIV (Diving), EEL (Glass Eel), OTB (Bottom Trawl), OTM (Pelagic Trawl).

A given year, a vessel belongs to one fleet but is able to practice different métiers (or use different gears). Based on an annual activity calendar available for each vessel complementary to logbooks (not exhaustive for small vessels), it is possible to apply a methodology related to the métier-fleet approach for the calculation of employment in the fishing sector.

Time based approach

The primary data used for the time based approach belongs to the data base of the IFREMER Fisheries Observatory Network. This database contains two kinds of information:
-       the annual activity calendar of each fishing vessel registered in the National Fleet Register: the data are exhaustive (census) and the annual activity calendar contains monthly detailed information on fishing activity of each vessel in terms of gears, target species and fishing areas. Therefore, data on crew size and number of days at sea are available on a sample of vessels. (See appendix 1)

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[1] Vessels from Mediterranean coast are totally excluded from this analysis. Moreover, very large vessels registered in Atlantic ports like Tropical seiners, industrial vessels are also excluded.

- the individual economic data of some fishing vessels registered in the Fleet Register a given year and sampled randomly (around 800 vessels per year at metropolitan level): apart from costs and earnings data, detailed information on production factors (including labor on board...) and intensity of activity of the vessel (days at sea, duration of trip...) are collected through an economic questionnaire.

The FTE threshold per year per crewman is very difficult to assess in France. The French law fixes the legal working hours at 35 hours per week which corresponding to an annual working hours of 1500 hours and a daily working hours at 7.6 (based on 5 days per week). It is well known that the working hours of a fisherman per day generally exceed 7.6 h when the vessel is at sea. However, there is currently no precise information on the annual working hours per crewmen. In this context, the level of 2000 hours per year which is applied in the agricultural sector for the calculation of FTE could be an alternative reference. Finally, the choice to present two results of FTE per fleet based on two FTE thresholds of 1500 and 2000 hours is retained. Indeed, it appears that the average hours per engaged crew per year (at the fleet level) are often between 1500 and 2000 hours and hence, the FTE estimations are expected to be very dependent on this threshold.

The "less than 12 m." fleet (NSCA Coast)

In 2004, this total fleet is composed of 2,602 vessels. We consider in this study the subset of active vessels composed of 2,493 units i.e. the vessels which have fished at least one day in 2004. For the inactive ones, the fishing effort (days at sea) per métier equals zero. This "less than 12 m" fleet is much diversified in terms of métier and gears. The following table shows that the spread of gears used is very large and goes from passive to active gears.

In average, a vessel uses between 2 and 3 gears the same year. The average days at sea vary from one métier to another and discriminate seasonal métiers (like DRB and EEL) to other ones. The average days at sea of a vessel are 180 days per year with a high variability between vessels. It is assumed for the FTE calculation that a vessel is not able to practice two métiers the same day. The crew on board varies from one métier to another. Some métiers like OTM, OTB, NET and DRB are more labor intensive than métiers such as LIN, EEL or DIV where the skipper is generally alone on board.

Table 1.1 Employment in Less than 12 m. (NSCA Fleet)

	Total	POT	DRB	NET	LIN	HOK	PSE	DIV	EEL	OTB	OTM
Number of vessels	2493	873	684	1159	320	561	5	62	683	517	28
Average days at sea	180	95	58	108	79	87	83	98	75	127	88
Average crew on board, excl. rotation	2.1	2.1	2.4	2.6	1.0	1.6	4.0	1.0	1.1	2.3	3.2
Hours worked per days at sea per crewman on board	9	8	9	8	8	8	10	8	7	11	11

Table 1.1 Employment in Less than 12 m. (NSCA Fleet) (sequel)

	Total	POT	DRB	NET	LIN	HOK	PSE	DIV	EEL	OTB	OTM
Average crew per vessel, incl rotation	2.1	2.1	2.4	2.6	1.0	1.6	4.0	1.0	1.1	2.3	3.2
Average hours per engaged crew (incl rotation)	1539	763	521	865	633	698	828	782	523	1400	965
FTE Threshold per year per crewman (hours)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	5130	1833	1642	3013	320	898	20	62	751	1189	90
FTE (2000 hours)	3949	699	428	1303	101	313	8	24	197	832	43
FTE (1500 hours)	5130	932	570	1737	135	418	11	32	262	1110	58

Source: IFREMER

Based on an average crew per vessel of 2.1 persons[1], the engaged crew is estimated at 5,130 persons in 2004 with an estimated 1,539 working hours in average per engaged crew. However, due to the high diversity of métier practiced by this fleet, the total number of jobs[2] (the sum of engaged crew per métier) is closed to 10,000 units. Finally, the FTE is 3,949 persons if we consider a threshold of 2000 hours per year and 5,130 persons if the threshold is 1500 hours.

The "12 to 24 m." fleet (NSCA Coast)

In 2004, this fleet is composed of 965 vessels with a subset of 959 active vessels which have fished at least one day (only 6 vessels registered in the fleet are then considered inactive). This fleet seems to be concerned by a large diversity of métiers. However, based on the number of days multiplied by the number of vessels, the gear OTB represents almost 60% of the total effort developed by this fleet. In average, a vessel uses 1.4 gears the same year and spends 211 days at sea.

Very few information exists on the working conditions on board. One major problem comes from the high diversity of patterns according to size of vessels and/or trip duration. The trip duration has a significant influence on the amount of hours worked per day but also on the total number of the crew, including rotation. It is well known that fishermen engaged aboard large vessels with long duration trips work intensively each day at sea. In return, rotation crew systems have been implemented for some years on these vessels and spreading out more and more. This issue has to be more investigated but in the lack of details, two scenarios have been retained for this first calculation of engaged crew and FTE for this fleet. The scenario 1 assumes total hours worked per day and per crew of 14 hours for most of the métiers and the presence of 2 persons (crew member) on shore for 5 persons at sea when the vessel practices Bottom Trawl (OTB) and Net (NET), the two most

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[1] It is reasonable to assume that small vessels are not concerned by crew rotation.
[2] Considering that the person is specialized in only one métier and could not use its skills to carry out another métier.

important métiers of this fleet. A second scenario considers a weak hypothesis of 12.6 hours worked per day and per crew and only 1 crew member on shore for 5 at sea.

Table 1.2 Employment in 12 – 24 m. fleet (NSCA Fleet)

	Total	POT	DRB	NET	LIN	HOK	PSE	DIV	EEL	OTB	OTM
Number of vessels	959	44	231	174	12	37	32	0	1	658	168
Average days at sea	211	118	99	175	35	93	135	0	71	175	122
Average crew on board, excl. rotation	5.0	6.3	4.7	5.3	4.7	4.7	6.6	0.0	1.0	4.7	5.8
Scenario 1											
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	10	0	7	14	14
Average crew per vessel, incl rotation	6.7	7.3	5.7	7.3	5.7	5.7	7.6	0.0	1.0	6.7	6.8
Average hours per engaged crew (incl rotation)	2178	1431	1140	1777	408	1077	1169	0	496	1719	1453
FTE Threshold per year per crewman (hours)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	6426	321	1317	1270	68	211	243	0	1	4409	1142
FTE (2000 hours)	6426	230	751	1128	14	114	142	0	0	3790	830
FTE (1500 hours)	6426	306	1001	1270	19	151	190	0	0	4409	1107
Scenario 2											
Hours worked per days at sea per crewman on board	12.6	12.6	12.6	12.6	12.6	12.6	10	0	7	12.6	12.6
Average crew per vessel, incl rotation	6.0	7.3	5.7	6.3	5.7	5.7	7.6	0.0	1.0	5.7	6.8
Average hours per engaged crew (incl rotation)	2201	1288	1026	1853	368	970	1169	0	496	1819	1308
FTE Threshold per year per crewman (hours)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	5736	321	1317	1096	68	211	243	0	1	3751	1142
FTE (2000 hours)	5736	207	676	1016	13	102	142	0	0	3411	747
FTE (1500 hours)	5736	276	901	1096	17	136	190	0	0	3751	996

Source: IFREMER

Whatever the scenarios, the total hours per crew and per year in average exceed 2000 hours, the highest FTE Threshold. This result is consistent with the conclusion of the inter- views. The engaged crew and FTE varies between 5,700 and 6,400 persons according to the scenario. The contribution of OTB and NET reaches 80% to 90% of the total number of FTE.

The "24 - 40 m." fleet (NSCA Coast)

This fleet is composed of 119 vessels in 2004 much specialized in Trawl and Nets. The OTB gear contributes to 75% of the total effort (number of vessels * number of days at sea) developed by this fleet in 2004. A vessel spends in average 243 days at sea per year with a high variability. In most of cases, a crew rotation system is implemented and the crew is in average composed with 13 persons with 8 on board and 5 on shore.

Table 1.3 Employment in 24 – 40 m. fleet (NSCA Fleet)

	Total	POT	DRB	NET	LIN	HOK	PSE	DIV	EEL	OTB	OTM
Number of vessels	119	0	1	24	1	1	1	0	0	94	21
Average days at sea	243		115	217	15	196	119			229	82
Average crew on board, excl. rotation	7.93		6.0	12.0	6.7	13.0	10.0			7.0	6.7
Average crew per vessel, incl rotation	12.89		6.0	18.0	8.7	18.0	10.0			12.0	8.7
Scenario 1											
Hours worked per days at sea per crew-man on board	14.0	0	14	14	14	14	10	0	0	14	14
Average hours per engaged crew (incl rotation)	2090	0	1604	2024	159	1981	1190	0	0	1872	885
FTE Threshold per year per crewman (hours)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	1534	0	6	432	9	18	10	0	0	1128	183
FTE (2000 hours)	1534	0	5	432	1	18	6	0	0	1056	81
FTE (1500 hours)	1534	0	6	432	1	18	8	0	0	1128	108

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Table 1.3 Employment in 24 – 40 m. fleet (NSCA Fleet) (sequel)

	Total	POT	DRB	NET	LIN	HOK	PSE	DIV	EEL	OTB	OTM
Scenario 2											
Hours worked per days at sea per crewman on board	12.6	0	12.6	12.6	12.6	12.6	10	0	0	12.6	12.6
Average hours per engaged crew (incl rotation)	1882	0	1444	1821	144	1783	1190	0	0	1685	797
FTE Threshold per year per crewman (hours)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	1534	0	6	432	9	18	10	0	0	1128	183
FTE (2000 hours)	1443	0	4	393	1	16	6	0	0	950	73
FTE (1500 hours)	1534	0	6	432	1	18	8	0	0	1128	97

Source: IFREMER

In the lack of detailed information on the hours worked per days at sea, two hypotheses of 12.6 hours in average and 14 hours in average have been retained. The average hours per engaged crew and per year varies from 1,882 to 2,090 hours with an obvious impact on the FTE in this fleet according to the scenario and the FTE threshold. Then, the FTE amounts to 1,443 persons to 1,534 persons (this last figure corresponds to the total engaged crew, whatever the assumptions).

Income generation capacity

The incomes data are collected through the economic questionnaire on a sample of fishing vessels. Personal costs, including net wages and social costs, are calculated for each fleet and a crew share per person can be deduced. This average indicator must be taken with cautious as the crew is generally composed of fishermen of different wage categories. Moreover, some premiums are sometimes offered to crew members but often escape from the personal costs calculation. Finally, for the vessels without any sharing system (generally the vessels where the skipper is the owner), the calculation of the personal costs is based on a specific assumption: it assumes that 50% of the net revenues (gross earnings minus some specific costs like fuel and landing costs) are devoted to the payment of the crew (the owner skipper plus the possible other members) and 50% to the ownership of the vessel (payment of vessels costs plus fixed costs on which the net profit is deduced). The crew share per person varies from 30 to 35 000 € per year but with a high level of impreci-

sion for small vessels. For the calculation of employment in relation to minimum income, the legal Gross minimum wage per hours was chosen as the reference i.e. 7.61€ in 2004, available through the French national statistical Institute (INSEE, http://www.insee.fr/fr/indicateur/smic.htm).

The GVA per employee at national level is in average 60,000 € in 2004 but drops to 40,000 if we consider the specific sector of agriculture. These data are available on: (http://www.insee.fr/fr/indicateur/cnat_annu/base_2000/biens_services/va_emploi_prod.ht m).

The GVA per crewmember is deduced from the Ifremer database and calculated as gross revenues minus total exploitation costs with the exception of crew costs.

Fig. 1. Employment in relation to income levels
   (y-axis reflects 'engaged crew', size of circle reflect FTE)

Employment in relation to minimum income, 2004

Employment in relation to GVA / employed, 2004
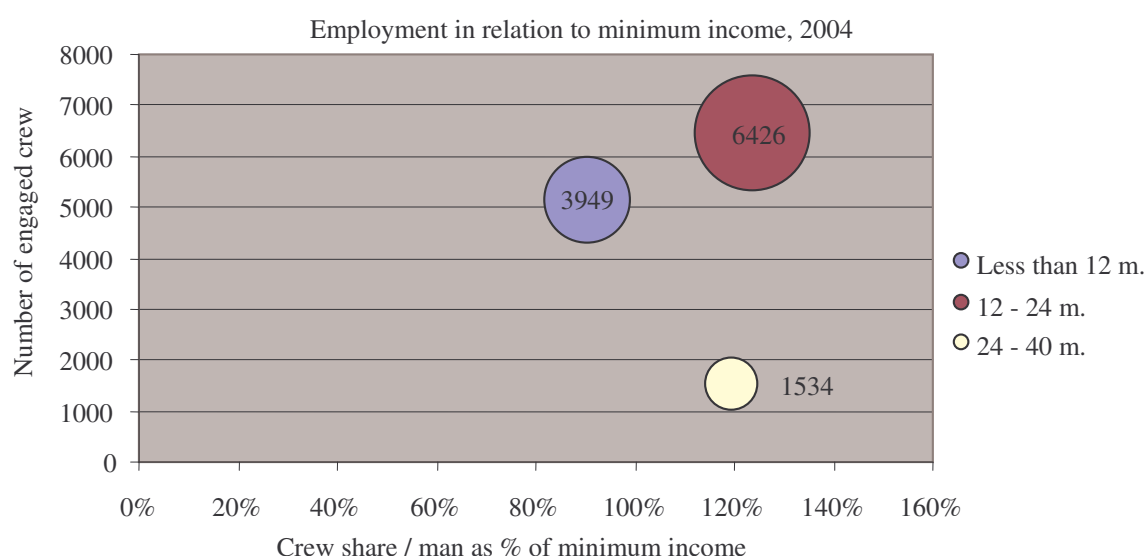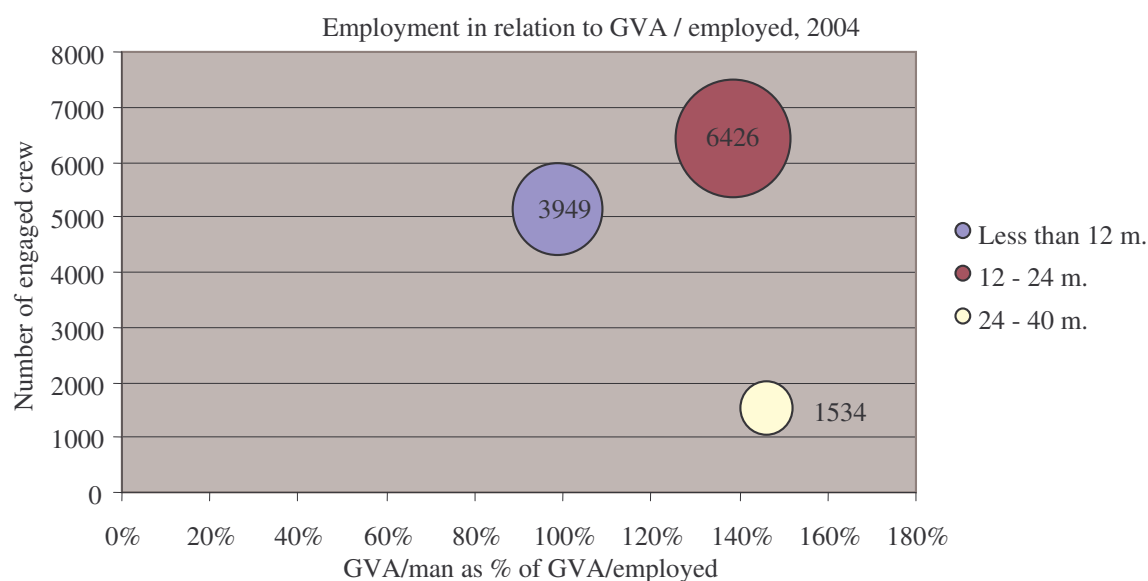
Source: IFREMER

The results from the income based approach are difficult to interpret in our case studies because of the strong assumptions behind the calculation (especially for the less than 12 m. fleet) and the chosen reference points at national level.

4.2.2. Current practice of estimation of employment

Two sources of estimation of employment in the fishing sector already exist:

OFIMER[1] annual report of Fisheries and Aquaculture Production,

(http://www.ofimer.fr/Pages/marche/Marche_AccueilDyna.html)

Based on OFIMER data, 24,922 fishermen were officially registered in the French fishing sector in 2004 (overseas territories are excluded from this analysis), including the Mediterranean coast and all the fishing categories notably the "Aquaculture and very small scale fisheries" category (vessels which can present no fishing activity). This total amount of labor can be split between different categories based on the time spent annually on board by each fisherman.

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[1] Office National Interprofessionnel des Produits de la mer et de l'Aquaculture

	Registered Time (months) – Reference for social costs				
	Less than 3 months	3 to 6 months	6 to 9 months	More than 9 months	Total
Number of fishermen	5,148	2,956	3,402	13,416	24,922

Source: OFIMER

Estimation of the FTE can be obtained by weighting the number of fishermen of each category with the mean of the number of months per category. Thus, a weight equal to 10.5 is attributed to fishermen spending more than 9 months on board, 7.5 months to fishermen spending between 6 and 9 months, 4.5 months to fishermen spending between 3 and 6 months, and finally 1.5 months to fishermen spending less than 3 months. The sum of men*months obtained is 187,407 in 2004 and divide this value by 12 months leads to a result of 15,617 persons in 2004, which can be considered as a proxy of FTE in the French fishing sector.

On the basis of information at regional level provided by OFIMER and assumptions on the total number of persons employed by the largest vessels (over 40 m.), a total number of engaged persons could be estimated at around 20,000 in 2004 and FTE at 12,300 from the OFIMER annual report.

The major limit of these data is the total lack of information on the intensity of work (number of days really spent at sea by fishermen) and the incapacity to split this information between fleet segments and métier. On the contrary, one large interest of this data source is the availability of time series.

IFREMER annual report on fishing sector

(http://www.ifremer.fr/drvrhbr/action_recherche/synthese-pecheries/index.htm)

Since 2001, Ifremer provides estimates of the total employment in the fishing sector (specifically the NSCA fleet). Basic information on métier and crew at the vessel level is collected through the annual activity calendar at a monthly scale. The monthly crew information is the average crew necessary to carry out all the métiers practiced by the vessel one given month. The annual average crew of a vessel is then calculated as the annual mean of the monthly crew data, only on the basis of the active months. An employment indicator which is the sum of individual annual average crew per vessel is finally estimated for each fleet.

	Less than 12 m.	12 – 24 m	24 – 40 m
Number of vessels	2493	959	123
Average crew	1.7	4.8	8.6
Employment indicator	4238	4562	1058

Source: IFREMER

In 2004, the employment of the NSCA less than 40 m. fleet was estimated by Ifremer around 10,000 employees. This indicator is neither the engaged crew because it is based on an average crew per month and not total engaged crew, nor a FTE estimate because it doesn't take into account the intensity of labor (or vessel) activity. In the lack of FTE estimation in the French fishing sector, this indicator has been abusively considered until 2004 as FTE estimation.

4.2.3. Comparison of current and proposed approach

	Employment acc. to current practice		New approach	
	OFIMER	IFREMER annual report	Engaged crew[1]	FTE[2]
Less than 12 m.		4 238	5 130	3 949
12 - 24 m		4 562	6 426	6 426
24 - 40 m.		1 058	1 534	1 534
Less than 40 m (NSCA Fleet)	12 274	10 858	13 090	11 909

Source: IFREMER

The level of employment obtained from the new approach does not differ significantly from the previous level but allows now to evaluate the contribution of each métier (or gear) at the fleet level. From the current OFIMER approach to the previous proposed by Ifremer, the improvement consisted in the transition from a macro perspective to a fleet perspective. With the new approach, the cross level of fleet-métier allows to produce employment indicator at any detailed or aggregated level.

4.2.4. Evaluation of the proposed approach from the national perspective

The information currently available at national level through Ifremer databases and other sources of data allows the implementation of the Métier-Fleet approach for the calculation of employment indicators in the French fishing sector. However, further information needs to be collected to improve estimation and specifically on working hours at sea per crew engaged by large vessels and on the crew rotation systems.

Availability of data
- *Number of vessels*
  This indicator is available at the métier level on the basis of the fishing annual calendars. A vessel can practice more than one métier (gear) during a year. The number of vessels per métier is here the count of the vessels which have practiced this métier

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[1] Scenarios 1 (high hypothesis)
[2] Based on a 2000 hours FTE threshold.

(or used the gear) at least one month[1] a given year. It is expected then to be at least equal to the number of vessels of the fleet.

- *Average days at sea*

The average days at sea per métier per vessel could be easily derived from logbooks. Nevertheless, the logbooks are not exhaustive and thus can not be used in our case studies.

Two other sources can overcome this deficiency:

- annual average days at sea per fleet segment available from the economic sample;
- a list of métiers practiced each month per vessel on a census basis from the annual activity calendar;
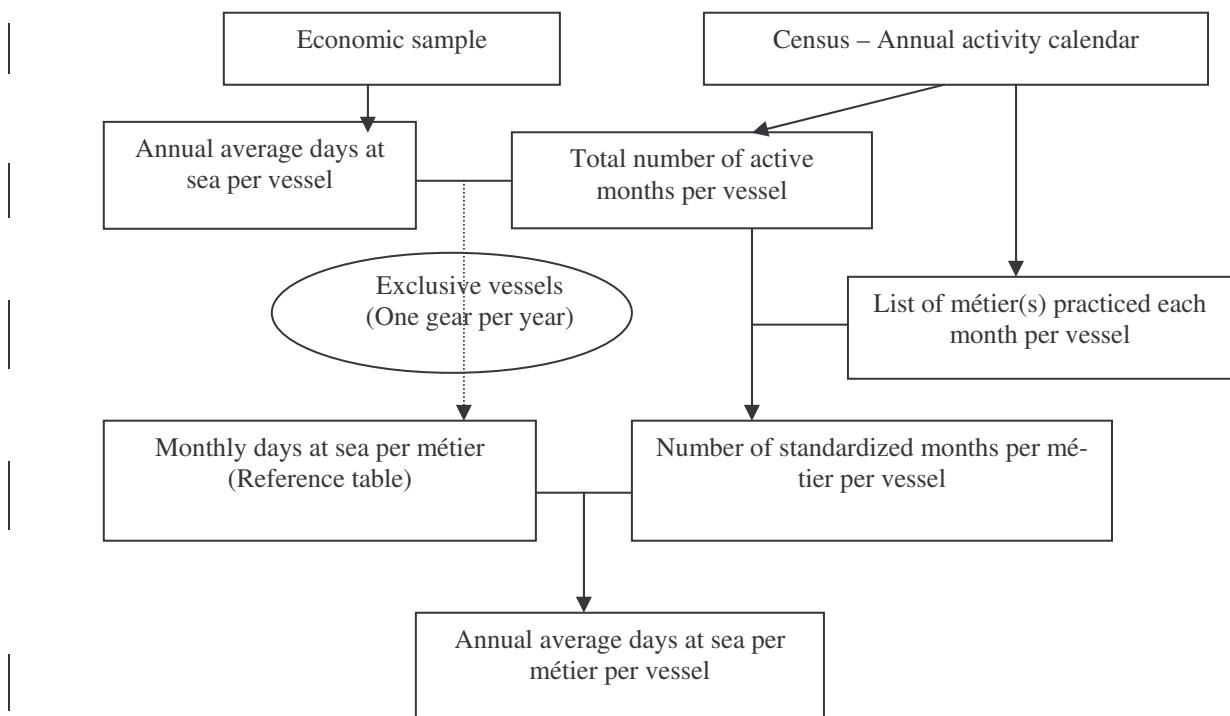
Monthly average days at sea per métier (gear) are estimated on the basis of the exclusive vessels of the economic sample (vessel which has used only one gear during the given year) by dividing the annual days at sea per vessel by the number of active months. One major limit of this estimate is that each month is considered as equivalent in terms of days at sea. It is well known that the intensity of practicing the same métier may vary along the year.

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[1] It is important to remind that the basic information available in the fishing annual calendar (exhaustive census) is monthly information. It doesn't take into account the intensity of activity (number of days at sea) developed during the month. In other terms, the weight given to a month is always the same and equals to one whatever the number of days at sea during this month.

Number of standardized months per métier per vessel: the annual activity calendar database contains the number of months practicing each métier for each vessel of the National Fleet (this concept of métier can be more or less aggregated). This data called MO_m is comprised between [0, 12]. Beside this, the total number of months where the vessel is active during the given year (Mi) is also available. This data is necessary ≤ 12 months. A number of standardized months per métier is obtained multiplying the total number of months (Mi) by the ratio $MO_m / \sum MO_m$ which is the contribution of each métier to the total activity of the vessel. The sum of the ratios is 1 and it is consistent with the hypothesis that only one métier can be practiced during a day by a vessel.

NB: The $Mi / \sum MO_m$ could be interpreted as a proxy of the level of fishing activity specialization during a month. A ratio equal to 1 means that the vessel never practices several métiers the same month.

The current calculation of the number of standardized months per métier is based on the assumption that any active month for a métier has the same weight, whatever the number of métiers practiced the same months, and/or whatever the effective days at sea per métier per month. One improvement could be make if we consider the number of métiers registered the same month and give a weight comprised between [0,1] according to the number of métiers practiced the same month.

- *Average crew on board, excl. rotation*

   The annual average crew per vessel is exhaustive data and concerns only fishermen on board. This data is collected through annual activity calendars and cross-checked with administrative data (Crewmember Register for social costs calculation) and Ifremer economic surveys. Based on exclusive vessels data, an average crew per métier is derived.

- *Hours worked per days at sea per crewman on board*

   Direct information on hours worked per days at sea is currently unavailable. Estimation is obtained on the basis of the average trip duration[1] per vessel collected through the economic questionnaire. For small vessels, the trip duration is generally less than one day (between 6 to 12 hours). For over 16 meters vessel, the trip duration is often more than 1 day and a positive relationship is observed between the size of the vessels and the trip duration.

   The assumption that the hours worked per days per crewman are equal to the trip duration seems reasonable for less than 12 m. long vessels. In return no estimation could be easily deduced for over 12 m. long vessels. Data on this field need to be urgently collected in order to improve the estimation of FTE. In the lack of information, two assumptions of 12.6 hours and 14 hours have been retained in this study.

- *Average crew per vessel, including rotation*

   Direct information is not available for the moment. Basic information needs to be collected on this topic and assumptions retained are detailed in the first section.

- *Average hours per engaged crew, including rotation*

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[1] The trip duration is the time between the moment where the vessel leaves the harbour for fishing and the moment where it comes back to the harbour: it comprises the trips between the harbour and the fishing areas including the move between fishing areas and the fishing time.

Not available at the vessel level. The estimates for segment fleet (section 1) are calculated on the basis of some assumptions on hours worked per day and the number of crew (several scenarios have been tested).

- *FTE threshold*
  FTE threshold has never been applied for the calculation of FTE in the French fishing sector. Two thresholds were retained for the study: the legal FTE threshold (1500 hours) and the FTE threshold applied in the agriculture sector (2000 hours).

Assumptions

The main assumptions for the use of fleet-métier time based approach are explained before and summarized as following:
- a basic monthly information per métier is considered sufficient to tackle the intensity of activity[1];
- a vessel is not expected to practice more than one métier during one day;
- the number of days per month (per métier) for exclusive vessels is the same all over the year.

Other assumptions were made on the hours worked per day and the crew rotation and must be validated with future data collection.

Advantages

The time based approach according to a métier-fleet perspective is a significant improvement for the employment calculation. As it is obvious that some métiers (or gears) should not be considered equivalent in terms of skill or capital requirements, energy consuming or ecosystem impact, it is also admitted that the labor engaged for carrying out each métier (and hence the capitalistic intensity) can differ significantly.

Insofar as individual data on métier, crew and intensity of activity are available in each country (through combined sources of logbooks, Fishing fleet register, or annual activity calendars...), the proposed approach allows assessing different indicators of employment at any kinds of fleet level (e.g. the Passive gear segment of less than 12 meters in the Region of Brittany). Moreover, it allows assessing the employment contribution of each métier, which is relevant for several countries where the fleets are polyvalent.

It is also the first opportunity to have comparable data on working conditions in the fishing sector through the assessment of annual worked hours per crewman per fleet at European level.

Disadvantages

In a long term, the advantages of such approach are obvious. However, in the short term, detailed data need to be investigated at countries level in order to apply this methodology with a clear set of definition and make the statistics comparable at the European level.

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[1] Concretely, it is illusive to expect exhaustive information at more detailed level.

Data on other employment

Data on other employment in the fisheries sector are collected through the economic survey managed by the IFREMER Fisheries Observatory Network. On the basis of a yearly sample of 800 vessels (600[1] on the NSCA coast), Ifremer has now an insight of 5 years of social and economic data on the fisheries sector.

The following information concern especially a sample of 800 vessels (NSCA coast) interviewed between the years 2002 to 2004.

- *Work on shore by the crew*

While a crew works onboard between 180 to more than 200 days per year on average, it is relatively frequent that the crew works on shore as well: thus, more than a half of the French fleet is concerned by work on shore carried out by the crewmembers, up to 45 days per year on average, i.e. about one day per week. This work on shore characterizes more particularly the less than 24 meters vessels.

- *Administrative staff on shore*

The employment in the fisheries sector is not restricted to the crew members. Thus, staffs dedicated to administrative work on shore are a characteristic of the biggest vessels (generally more than 24 meters), and especially those owned by the firms whose status is limited or limited-liability company. In the case of smallest vessels, administrative tasks are either contracted out with accounting companies and/or directly in charge of the fishermen or a member of his family (generally his spouse).

It's important to notice that the work on shore doesn't limit to administrative tasks and sometimes consists of maintenance too: a part of the maintenance work on shore is carried out by the crew members, but in some cases, dedicated people on shore are hired.

- *Unpaid labor (e.g. involvement of women)*

The fishing sector (here vessels less than 40 m. long), as well as the agriculture sector, is characterized by a significant contribution of family members in the fishing firms. This labor remains often unpaid for the smallest vessels (less than 12 or even 24 meters long vessels). Thus, in about 40% of the cases, the wife of the fisherman contributes to the activity of the company: most of the time, this involvement concerns accountancy and administrative tasks (close to 9 wives out of 10) and more rarely commercialization of fish (more than 40% of the wives for the less than 12 meters long vessels, 30% for the 12-24 meters long vessels). The level of contribution of the wives are varying, but an average of 90 days par year, i.e. about 2 days per week, is noticed for the less than 24 meters long vessels.

Other members of the family like the son or the parents of the fisherman are involved too, for tasks such as gears or vessel maintenance, commercialization, administrative task, or even fishing, with high varying intensity.

- *Employment by gender (mainly on shore)*

The Ifremer's economic survey doesn't investigate precisely that point, but it seems that the fisheries sector shows straight shared roles between male and female. Except for very rare cases of female crewmembers, the crews are almost purely masculine.

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[1] About half of these vessels compose a constant sample group every year

Nevertheless, the administrative tasks, and especially accounting, are carried out by female whereas business management and inshore maintenance work are specific activities of male.

- *Employment of foreigners (EU and non-EU).*

The foreign labor-force can be significant in some fleets, but is rather difficult to assess. The figures on crewmembers used previously in the estimation of FTE include the foreigners, but it's delicate to know the proportion of foreigners in the total crew. Presently, the involvement of foreigners on board mainly concerns the more than 24 meters long fleet: the proportion of vessels with foreigners is estimated at least to more than a half of this fleet (the proportion of foreigners on these vessels may exceed 50%).

Appendix1: Calendar of activities in XXXX (@ Ifremer / SIH)

Number	CPP	Start validity	End validity	Port	Name	Length	Tonnage	Power	Legal crew	DFE	Port	Segment	Gears : European licence/permit	Year

M	Qim	Port	Owner	H	jm	Jp	Metier 1						Metier 2						Metier 3						Metier 4						Metier 5					
							Metier	o	zone 1	g	zone 2	g	Metier	o	zone 1	g	zone 2	g	Metier	o	zone 1	g	zone 2	g	Metier	o	zone 1	g	zone 2	g	Metier	o	zone 1	g	zone 2	g
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12																																				

Qim = Port of registration / H = Number of men / jm = number of days at sea per month / o = Origin of the information / E = Activity noted by the Questioner / g = gradient (Coast, Large, Mixed, Foreign)

Accuracy of the survey
☐ Direct survey
☐ Indirect survey
☐ Estimated survey

Evolution of the activity time	2004	2005
Number of days at sea / year		
Number of days fishing / year		
Number of engine hours / year		

Evolution in engine hours in 2005 compared with the previous year?

☐ Stable   ☐ Increase   ☐ Decrease

Metiers declared in the ships logs and/or fishing records :

All ☐   Some ☐ (A)   None ☐

Sales ☐

Total landings at auction ☐   Part at auction ☐ (B)   Total landings outside auction

Production Total ☐ (A + B)

FDS: Yes ☐   No ☐   NSP ☐

Species that were sold only at auction: .... / .... / .... / .... / .... / ....

Species, which were sold only outside auction: .... / .... / .... / .... / .... / ....

4.3 Italy

4.3.1 New calculation of employment

The national data source for Italian employment data is the Labour Force Survey (LFS), carried out, by ISTAT, the Italian national statistical office. As better explained in section 3.2.3, this survey is not calibrated on a specific sector. It is, indeed, based on the collection of data by interview on a sample, extracted taking into account a double stratification: the first stage units are the municipalities while the second stage ones are the families. Every quarter about 76,800 families are drawn, equal to about 175,000 persons.

Since 2004, ISTAT is using the output of the LFS in order to comply with the EUROSTAT request to fill up a revised version of the questionnaire for the collection of fishery employment data (based on the recommendations of the Task Force on the Employment in the Fishery sector). These data were obtained by making an extrapolation of micro data from the LFS databank. Data have been reported by NACE Rev. 1.1 four-digits codes (05.01 "fishery", 05.02 "aquaculture" and 15.20 "processing and preserving of fish products"), by employment status (full time and part time), by age classes and by sex. Anyway, in our view these data cannot be used for the purpose of this project and to comply with the EU regulations on data collection for the following reasons:

- the survey has not been built specifically on the fishery sector. As a consequence, more detailed less reliable are the data;
- all the information collected, including the status, are left to the self-perception of the interviewed and to what he/she declares. This implies, for instance, that data on the part-time and full-time employment do not refer to a unique standard. Furthermore, this causes that these data include also people that are employed only for opportunistic reasons. An example of this is the case where fishermen declares to employ on board of their vessels their own spouses, sons, brothers even if they do not work in the fishery sector. They do this, generally, just to have some fiscal benefit or economic returns (i.e. compensation for temporal withdrawal, etc…). This could also explain the reason why the ISTAT data appear to overestimate the female employment in the fishery sector;
- data collected through the LFS cannot give the details by fishing segment and, even more, by métier, as proposed by this project.

For these and other reasons, data on employment in the fishery sector are provided by IREPA.
IREPA has provided data on employment in the fishery sector for the AER and, since 2002, for the DCR.

Time based approach

In line with the proposed approach and in order to trace the reality of labour input in fishing as closely as possible, the estimation of labour input in the Italian fishing sector has been made at the level of 'métier', i.e. specific activity of a segment or the use of a specific fishing gear within a segment (where the segment is the combination of a fishing technique

and a LOA class and is defined based on the predominant gear). The métiers are defined at level 4 (EU level, see appendix G)[1].

To do this each of the fishing gear monitored by the IREPA sampling system has been classified by the use of the level 4 codes decided in the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, held in Nantes.

The following 18 "métiers" have been identified:

Level 4 code	Métiers description
DRB	boat dredge
DRH	hand dredge
FPO	pots and traps
GND	driftnet
GNS	set gillnet
GTR	trammel net
HAR	harpoon
LHP	hand and pole lines
LLD	drifting longlines
LLS	set longlines
MIS	miscellaneous
OTB	bottom otter trawl
OTM	midwater otter trawl
PS	purse seine
PTM	pelagic pair trawl
SB	beach seine
SV	boat seine
TBB	beam trawl

The estimation of the data requested by the proposed methodology have been made by taking into account the combination fishing segment (as defined by the DCR regulation) - métier. Deeper details are shown in paragraph 4.3.4.1.

The main assumption made for this study, calibrated on the Italian fishing sector, concerns the determination of the FTE threshold.

Usually, and in particular by the Italian official statistics, the standard working time is fixed based on the collective national agreements referring to the sector where the FTE is wanted to be calculated. Taking into account that a) in the Italian fishery sector a standard working time does not exist;[2] b) considering the great differences among the various

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[1] Table 3.2.2 EC, Commission Staff Working Paper: Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, Nantes, 12-16 June 2006

[2] The national collective labour agreement for the personnel employed on the fishing vessels for the period 01.01.2005-31.12.2008 establishes, at art. 16, that in the fishery sector, giving the specificity of the fishing activity due to the great uncertainty of catches and weather and to the arrangement of catches and equipments, the working time cannot be defined *a-priori* and will depend on the specific needs of the fishing trip.

fishing technique and c) referring to what happens in other sector (i.e. agriculture[1]), we have done the estimation based on the average days at sea per vessel in the last 6 years.

It is assumed that giving the inexistence of rotation, on average, each crewman engaged on a vessel works for a number of days per year equal to the days at sea of the vessel he is employed on. In this way we calculated the FTE threshold per year per crewman in terms of days per fishing segment. It has been calculated as the average over the last 6 years[2].

In order to have the FTE threshold in terms of hours we have multiplied the FTE/days time the "standard" daily working hours[3]. Substantially, the FTE threshold in terms of yearly hours is the result of the product of two FTE thresholds: one in terms of yearly days at sea and the other in terms of daily hours.

In applying the time-base approach we have done two hypothesis:

- we have calculated and applied FTE thresholds at segment level in order to take into account the specificity of each type of fishery. By doing this we have wanted to take into consideration that if a crewman works for 12 hours per day if employed on board of a beam trawl and 8 hours if he works on a dredge, it does not mean that there is part-time employment in the dredge fleet vis-à-vis the beam trawl one. This is not the case for the Italian fishery sector. We know that 12 hours in the beam trawl segment can equal the 8 hours in dredges segment in terms of full time employment;
- we have applied a unique FTE threshold that is equal to the average of the FTE thresholds calculated as in point 1.[4]

The FTE thresholds used for this project are shown in table 1.

Table 1 – FTE thresholds per year per crewman (hours) used for the estimation of the FTE employment in the Italian fishery sector.

Fishing segment	LOA classes	FTE thresholds per year per crewman (days) – 2000-2005 average	Average daily working hours	Hp. 1 FTE thresholds per year per crewman (hours)	Hp. 2 FTE thresholds per year per crewman (hours)
Bottom trawl	<12	158	12	1,500	1,600
	12\24	158	12	1,800	1,600
	24\40	158	16	2,000	1,600
Beam trawl	<12	158	13	2,000	1,600
	12\24	158	14	2,000	1,600
	24\40	158	17	2,000	1,600

[1] The FTE threshold for the Italian agricultural sector has been set in 248 days. It has been estimated based on the 2000 data of the Survey on the economic performance of the agricultural enterprises, that counted the working time for each workplace.

[2] The FTE threshold in terms of yearly days at sea has been set without taking into account the LOA classes for lack of data by vessel length on the first years of the considered period. Anyway, by looking at data we noticed that, within the same segment the vessel length has not a great influence on the yearly days at sea.

[3] This factor is equal to the weighted average of the assumed working hours daily worked per crewman per métier where the weights are the average days at sea.

[4] In setting this FTE we have not considered exceptional cases as dredges.

Fishing segment	LOA classes	FTE thresholds per year per crewman (days) – 2000-2005 average	Average daily working hours	Hp. 1 FTE thresholds per year per crewman (hours)	Hp. 2 FTE thresholds per year per crewman (hours)
Pelagic trawl	12\24	165	11	1,800	1,600
	24\40	165	11	1,800	1,600
Pelagic seiner and purse seiner	12\24	108	8	1,000	1,600
	24\40	108	11	1,200	1,600
Dredges	12\24	95	10	800	1,600
Polyvalent passive (small scale)	<12	136	11	1,200	1,600
Polyvalent passive	12\24	143	10	1,500	1,600
Longlines	<12	143	14	2,000	1,600
	12\24	125	11	1,200	1,600
Combining mobile and passive gears	<12	136	10	1,200	1,600
	12\24	136	10	1,500	1,600

Source: IREPA.

In reading table 1, the reader should take care of the fact that we are considering only *working time spent on-board*. We are not taken into account the hours and the days spent on shore in all the activities connected to the fishing activities, such as maintenance, nets repairing, nets cleaning, etc… If considering also these activities, the number of yearly days and daily hours is undoubtedly destined to be higher. As a consequence, the thresholds should be read in this light.

The proposed time based methodology and the assumptions above illustrated have been applied to the 2005 data. For sake of clarity and to make easier to understand the meaning of the values, in figure 1 the application of the methodology to the bottom trawl 12/24 segment is illustrated.

Figure 1 – Example of the application of the general methodology to the Italian bottom trawl 12/24 LOA segment, 2005 data.

Data or assumptions											
Required for calculation of average crew and hours per day											
Calculated											
Consistency calculation, not required with real data											
Bottom trawl 12/24	**Total**	**GND**	**GNS**	**GTR**	**LHP**	**LLD**	**LLS**	**OTB**	**PS**	**PTM**	**TBB**
Number of vessels	2576	25	26	46	8	23	24	2410	7	10	22
Average days at sea	159	52	2	116	2	46	20	165	46	103	158
Average hours worked per days at sea per crewman	12.0	8	11	11	8	15	17	12	8	11	15
FTE Threshold per year per crewman (hours) - Hp.1	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
FTE Threshold per year per crewman (hours) - Hp.2	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Average crew per vessel	3.0	4.3	2.0	3.0	1.3	3.9	1.8	3.0	4.2	5.0	4.6
Average hours per engaged person per year	1,906	413	21	1,316	12	683	325	1,981	367	1,135	2,375
Total number of days at sea	410,846	1,292	48	5,330	12	1,047	472	397,809	321	1,032	3,483
Total number of 'work hours' at sea	14,768,402	44,224	1,113	182,924	118	61,185	14,025	14,158,824	10,896	56,562	238,530
Share of 'work hours' at sea %		0.00	0.00	0.01	0.00	0.00	0.00	0.96	0.00	0.00	0.02
Average engaged crew	7,748	107	53	139	10	90	43	7,148	30	50	100
FTE - Hp.1	**7,748**	**25**	**1**	**102**	**0**	**34**	**8**	**7,148**	**6**	**31**	**100**
FTE - Hp.2	**7,748**	**28**	**1**	**114**	**0**	**38**	**9**	**7,148**	**7**	**35**	**100**

Source: IREPA

Hence, the output of the application, in terms of average engaged crew and FTE is reported in table 2.[1]

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[1] It should be highlighted that the use of the figures for the "average hours worked per day at sea per crew-man" and for the "daily FTE threshold" vitiates the calculation: we would have the same results if comparing the average days at sea per crewman with the FTE threshold in terms yearly days at sea. Daily hours was considered both for sake of homogeneity with the general procedure and to test the validity of such a methodology.

Table 2 – Estimation of average engaged crew and FTE by fishing segment and métier for the Italian fishery (2005 data).

Fishing segment	Vessel lenght	Type of employment	Total per segment	DRB	DRH	FPO	GND	GNS	GTR	HAR	LHP	LLD	LLS	MIS	OTB	OTM	PS	PTM	SB	SV	TBB
OTB	<12	Average engaged crew	204	-	-	-	-	-	-	-	-	-	-	-	204	-	-	-	-	-	-
		FTE - Hp. 1	165	-	-	-	-	-	-	-	-	-	-	-	165	-	-	-	-	-	-
		FTE - Hp. 2	154	-	-	-	-	-	-	-	-	-	-	-	154	-	-	-	-	-	-
	12/24	Average engaged crew	7,748	-	-	-	107	53	139	-	10	90	43	-	7,148	-	30	50	-	-	100
		FTE - Hp. 1	7,748	-	-	-	25	1	102	-	0	34	8	-	7,148	-	6	31	-	-	100
		FTE - Hp. 2	7,748	-	-	-	28	1	114	-	0	38	9	-	7,148	-	7	35	-	-	100
	24/40	Average engaged crew	2,089	-	-	-	-	-	-	-	-	-	-	-	2,053	30	-	-	-	-	-
		FTE - Hp. 1	2,089	-	-	-	-	-	-	-	-	-	-	-	2,053	19	-	-	-	-	-
		FTE - Hp. 2	2,089	-	-	-	-	-	-	-	-	-	-	-	2,053	24	-	-	-	-	-
TBB	<12	Average engaged crew	69	-	-	11	-	11	-	-	-	-	-	-	46	-	-	-	-	-	25
		FTE - Hp. 1	69	-	-	5	-	7	-	-	-	-	-	-	46	-	-	-	-	-	25
		FTE - Hp. 2	69	-	-	5	-	7	-	-	-	-	-	-	46	-	-	-	-	-	25
	12/24	Average engaged crew	176	-	-	-	-	-	-	-	-	-	-	-	76	-	-	-	-	-	118
		FTE - Hp. 1	176	-	-	-	-	-	-	-	-	-	-	-	76	-	-	-	-	-	118
		FTE - Hp. 2	176	-	-	-	-	-	-	-	-	-	-	-	76	-	-	-	-	-	118
	24/40	Average engaged crew	56	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	55
		FTE - Hp. 1	56	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	51
		FTE - Hp. 2	56	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	55
OTM	12/24	Average engaged crew	446	-	-	-	-	-	-	-	-	-	-	-	10	-	18	402	-	-	49
		FTE - Hp. 1	446	-	-	-	-	-	-	-	-	-	-	-	10	-	6	402	-	-	39
		FTE - Hp. 2	446	-	-	-	-	-	-	-	-	-	-	-	10	-	7	402	-	-	43
	24/40	Average engaged	307	-	-	-	-	-	-	-	-	-	-	-	28	-	-	284	-	-	-

Fishing segment	Vessel lenght	Type of employment	Total per segment	DRB	DRH	FPO	GND	GNS	GTR	HAR	LHP	LLD	LLS	MIS	OTB	OTM	PS	PTM	SB	SV	TBB
		gaged crew																			
		FTE - Hp. 1	278	-	-	-	-	-	-	-	-	-	-	-	28	-	-	251	-	-	-
		FTE - Hp. 2	307	-	-	-	-	-	-	-	-	-	-	-	28	-	-	282	-	-	-
PEL	12/24	Average engaged crew	1,311	-	-	-	92	45	133	19	-	25	51	-	82	-	1,213	21	-	-	-
		FTE - Hp. 1	1,236	-	-	-	32	13	23	9	-	20	12	-	41	-	1,038	21	-	-	-
		FTE - Hp. 2	773	-	-	-	20	8	14	6	-	12	7	-	26	-	649	21	-	-	-
	24/40	Average engaged crew	169	-	-	-	-	-	-	-	-	-	-	-	28	-	93	140	-	-	-
		FTE - Hp. 1	169	-	-	-	-	-	-	-	-	-	-	-	23	-	36	118	-	-	-
		FTE - Hp. 2	132	-	-	-	-	-	-	-	-	-	-	-	17	-	27	88	-	-	-
DRB	12/24	Average engaged crew	1,439	1,439	-	19	-	-	-	-	-	-	-	-	118	-	-	-	-	-	-
		FTE - Hp. 1	1,304	1,288	-	2	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-
		FTE - Hp. 2	652	644	-	1	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-
PGP	<12	Average engaged crew	13,865	-	130	1,627	1,113	6,292	5,249	69	1,088	704	3,269	300	22	51	2,081	-	1,168	1,426	-
		FTE - Hp. 1	12,543	-	73	597	319	4,379	4,269	53	298	184	802	265	18	8	558	-	299	421	-
		FTE - Hp. 2	9,407	-	54	448	239	3,284	3,202	40	224	138	601	199	14	6	418	-	224	316	-
	12/24	Average engaged crew	920	-	-	135	277	247	332	-	38	191	329	-	57	-	136	-	-	129	-
		FTE - Hp. 1	920	-	-	47	138	203	332	-	1	80	37	-	27	-	18	-	-	32	-
		FTE - Hp. 2	758	-	-	35	103	152	320	-	1	60	28	-	20	-	14	-	-	24	-
LON	<12	Average engaged crew	471	-	14	-	62	118	64	-	36	31	282	-	-	-	-	-	-	-	-
		FTE - Hp. 1	471	-	7	-	3	79	64	-	32	7	282	-	-	-	-	-	-	-	-
		FTE - Hp. 2	471	-	7	-	3	74	64	-	30	7	271	-	-	-	-	-	-	-	-
	12/24	Average engaged crew	1,363	-	-	39	148	88	109	-	66	1,104	346	-	112	-	91	-	-	79	-
		FTE - Hp. 1	1,260	-	-	4	24	14	23	-	14	941	163	-	47	-	11	-	-	19	-

Fishing segment	Vessel lenght	Type of employment	Total per segment	DRB	DRH	FPO	GND	GNS	GTR	HAR	LHP	LLD	LLS	MIS	OTB	OTM	PS	PTM	SB	SV	TBB
		FTE - Hp. 2	1,363	-	-	5	29	18	29	-	17	1,104	204	-	59	-	14	-	-	23	-
PMP	<12	Average engaged crew	1,702	-	-	41	407	648	205	51	116	144	345	109	59	-	1,032	-	263	553	-
		FTE - Hp. 1	1,593	-	-	12	86	548	36	15	18	26	162	106	43	-	364	-	47	132	-
		FTE - Hp. 2	1,195	-	-	9	65	411	27	11	13	20	121	79	32	-	273	-	35	99	-
	12/24	Average engaged crew	229	-	-	-	197	-	-	-	-	75	76	-	88	-	155	-	-	-	-
		FTE - Hp. 1	229	-	-	-	73	-	-	-	-	41	12	-	88	-	62	-	-	-	-
		FTE - Hp. 2	229	-	-	-	68	-	-	-	-	38	12	-	88	-	58	-	-	-	-
Total fleet		Average engaged crew	32,564	1,439	143	1,871	2,403	7,502	6,231	138	1,353	2,363	4,741	409	10,140	81	4,849	897	1,431	2,187	347
		FTE - Hp. 1	30,753	1,288	80	668	699	5,243	4,849	77	363	1,332	1,478	371	9,835	27	2,100	822	346	603	333
		FTE - Hp. 2	26,026	644	61	504	556	3,955	3,771	56	285	1,417	1,253	278	9,787	30	1,467	828	259	462	342

Source: IREPA database, 2005.

The results of the application of the time base approach to the Italian case shows that it is of primary importance to take care on the determination of the FTE threshold, in order to not underestimate nor overestimate the number of jobs equivalent to full time units. Indeed we can see that the two different hypothesis lead, in the Italian case, to completely different numbers of FTE units.

Income generation capacity

Following the general approach, we have not determined the FTE based on an income approach. The review of international practices of measuring employment shows, indeed, that income levels are not generally used as a basis for the estimation of employment.

Hence, income data have been used only as complementary indicators, to know how rewarding is to work in the fishery sector *vis-à-vis* other sectors.

As proposed in the general introduction, we tried to compare the income from the fishing sector with the income from other sectors and the national economy – table 4.

Table 4 - Income levels and gross value added in other sectors, Italy 2005 (€)

	Average income / man[1]	Gross Value Added / man[2]
Minimum salary[3]	11,239	
Agriculture (including fishery)	18,494	21,660
Industry[4]	33,075	45,001
Total economy	33,593	54,985

Sources: ISTAT, Italian Statistical Yearbook 2005

Note: 1. Labour income for salaried labour unit. 2. Value added at basic prices/Labour units (salaried and not salaried) 3.Calculated on the basis of the standard of poverty line established, in Italy, for 2005 at 936,58 per month. 4."Industry in the strict sense", i.e. excluding the building sector.

Anyway, considering that in some segments, especially in the small-scale fishery, people are mostly self-employed, it has been though more appropriate to not compare income data with the crew share per man. In case of self-employment, indeed, the remuneration per man should be given by the crew share plus the net profit. Taking into account the relevance, in Italy, of the artisanal fishery we used the G.V.A. indicators in the following comparisons:

- G.V.A./crewman – G.V.A./man in agriculture;
- G.V.A./crewman – G.V.A./man in industry;
- G.V.A./crewman – G.V.A./employed in total economy.

In order to do this we used data G.V.A./man for fishery obtained from the IREPA survey on revenues and costs for 2005. Data have been estimated by fishing segment and are reported in table 5.

Table 5 – Income levels and gross value added per crewman for the Italian fishery sector by segment, 2005 (€)

Fishing segment	LOA classes	G.V.A./man
Bottom trawl	<12	17,687
	12/24	35,609
	24/40	38,710
Beam trawl	<12	35,590
	12/24	24,913
	2440	42,675
Pelagic trawl	12/24	40,480
	2440	29,033
Pelagic seiner and purse seiner	12/24	36,138
	2440	53,131
Dredges	12/24	32,192
Polyvalent passive (small scale)	<12	17,346
Polyvalent passive	12/24	24,912
Longlines	<12	15,968
	12/24	34,582
Combining mobile and passive gears	<12	14,753
	12/24	28,394
Total		26,070

Source: IREPA

In the following figures the employment indicators - average engaged crew on the Y-axis and the size of circle reflecting the FTE (calculated through the time-based approach and, for sake of simplicity, considering only Hp.1) - is put in relation to G.V.A. levels - on the X-axis.

Figure 2 – Fishery employment in relation to G.V.A./man in agriculture, 2005

Figure 3 – Fishery employment in relation to G.V.A./man in industry, 2005

Figure 4 – Fishery employment in relation to G.V.A./man in total economy, 2005
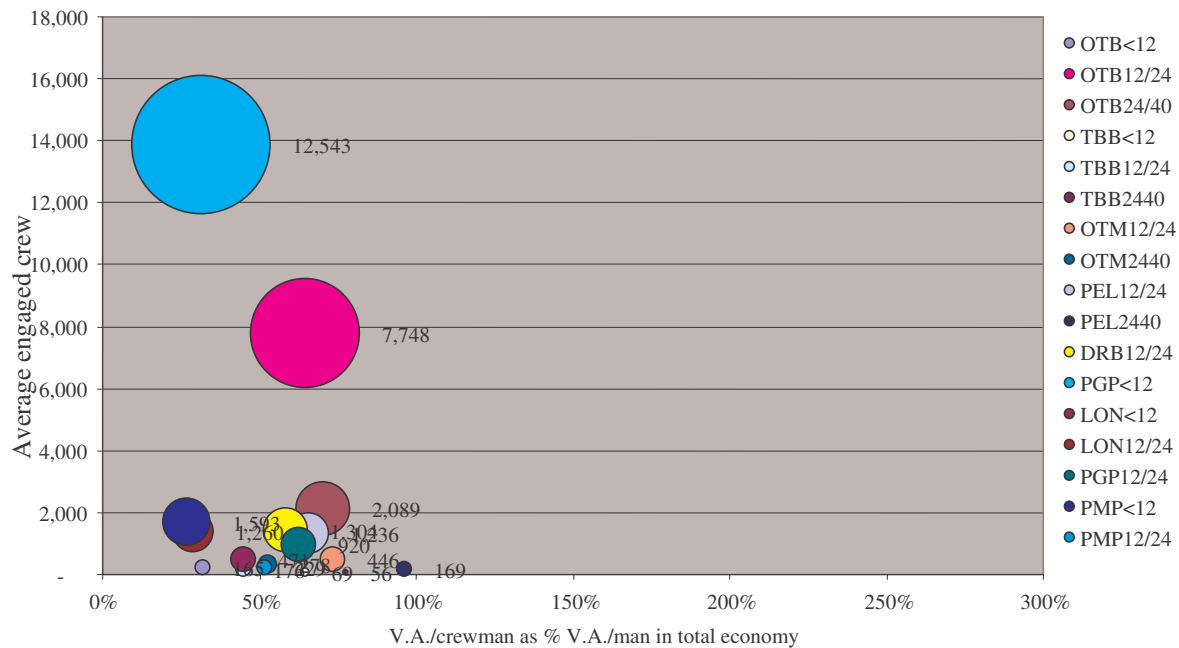
As specified before, in the above figures the income levels only contribute to better explain the employment features in a certain fishery. They help to know what fishing segments is doing well, in economic terms, if compared with standard parameters.

In particular, the above figures highlights the fact that there are some fishing fleet segments more "industrialised" than others. Indeed, if we compare the G.V.A. per crewman of vessels with a LOA>12 with the one attributable to the agricultural sector, it appears that working in the fishery sector is more rewarding than working in agriculture (fig.2). The situation is completely different if we use, as term of comparison, the G.V.A. produced in the industrial sector. In this case only one fleet segment (pelagic 24/40) maintains his "industrial" position, with a G.V.A. per crewman equal to 118% of that produced in the industry sector (fig.3). Finally, if we compare the G.V.A. per crewman of the all the Italian fleet segments with the G.V.A. per man of the total Italian economy, it appears that, on average, the G.V.A. produced by the Italian fleet is about the 50% of the one produced by the overall Italian economy. Anyway, there are some particular case, as the small scale fishery and all the fleet segments with LOA <12, where this percentage is not higher than 32% (fig.4). On the same time, there are case, as the large beam trawl and the large pelagic where the G.V.A. produced is equal, respectively, to 78% and 97% of the totally economy one.

4.3.2 Current practice of estimation of employment (AER)

The methodology for the estimation of the employment in fisheries (NACE activity code 05.01) used by IREPA is based on a sample survey, also used for the estimation of landings, revenues and effort.

Data are collected by a network of interviewers distributed along the Italian coast. The interviewed are the owners of the boat (or persons having a leading role on the boat).

Data on the average number of the crew and on the days at sea (as well as data on landings and prices) are collected weekly by the interviewers (or for period having shorter or longer duration, depending on the specific features of the interviewed).

The number of employees estimated by the following methodology is to be intended as average daily number of people employed on board.

For each stratum, defined by a specific area, fishing technique and LOA class, the average number of crew members $\hat{E}_s$ is calculated by the following formula:

$$\hat{E}_s = \frac{\displaystyle\sum_{w=1}^{W} \sum_{i=1}^{n_s} E_{isw}\, g_{isw}\, p_i}{\displaystyle\sum_{w=1}^{W} \sum_{i=1}^{n_s} g_{isw}\, p_i}$$

where:

E_{isw} = average daily number of employees for the i-th vessel of the s-th stratum in the w-th week of the year under analysis;

g_{isw} = activity days of the i-th vessel of the s-th stratum in the w-th week of the year under analysis;

p_i = sample weight associated to the i-th sampled unit (equal to the inverse of the inclusion probability of the first order, calculated on the basis of the LOA of the stratum)

W = total number of weeks in the year under analysis, then

n_s = number of sampled vessels of the s-th stratum.

The national average number of people employed on board is, then, represented by the sum of the average number of employees for all the strata observed.

Employment by status, sex, seasonal employment and FTE
The IREPA current methodology for the estimation of the employment in the fishery sector does not take into account the working time, in the sense that there is no distinction between PT and FT workers. The working hours are, in fact, not collected through the sample survey. Hence, two fishermen working for, respectively, 4 or 8 hours per day are considered to be equal in terms of employments status.

Furthermore no information are collected on the sex of people employed on board, on the seasonal employment, on the number of people working on land in fishing related activities.

The only attempt to draw some information on these items was the Socio-economic study[1] carried out by IREPA, in collaboration with other European partners. In that study, beside total employment, an estimation of the number of fishers by sex, by employment (employees and self-employed) and by socio-economic status (full-time and part-time) was made. In that study it was highlighted that "……the employees are all men, since culture and tradition have excluded women from fishing activities. Because the vessels are mainly small the main activities carried out on board are fishing and a first discarding of the catch. All other activities relating to processing (cleaning and filleting) are carried out on land. This is a full time activity, which takes place during the whole course of the year with the exception of a few short periods of inactivity due to technical or voluntary reasons". Also an estimation of the number of fishers in FTE terms was made. The FTE data for sea fishing workers have been taken from data supplied by IREPA on average fishing hours per fishing techniques. Average fishing hours include the navigation times taken to reach the fishing grounds and actual fishing time. The figures, however, do not include the time taken before departure nor after arrival in port (unloading and maintenance), and the figures are therefore underestimated. 8 fishing hours were taken on average per boat.

4.3.3 Comparison of current and proposed approach

In table 3 the comparison between the current IREPA methodology used for the estimation of employment in the Italian fishery sector and the output of the proposed time-based approach is shown. The comparison is made only between the number of engaged crew because, at now, the IREPA methodology does not include the calculation of the FTE employment. This depends, substantially, on the assumption that all the persons engaged on the Italian fishing vessels are full time workers. It is taken into account that even if a fisherman works for 5 hours per day (because he is employed, for instance, on a small scale vessel), it does not mean that he is a part-time worker: generally he will not dedicate the remaining hours to other jobs but, at least, to fishery related activities.

The difference between the two methodology consists in the fact that in the current methodology the concept of métier is not taken into account.

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[1] Regional Socio-Economic study in the fishery sector: Lot 12/13/14 - Italy. (Contract N° 98/S63 – 37476). Report to the General Directorate for Fisheries (DG XIV), EC, Bruxelles, July 1999.

Table 3 - Comparison between the current and the proposed methodology, 2005 data.

Fishing segment	LOA classes	Average engaged crew	
		Current methodology	Proposed methodology
Bottom trawl	<12	204	204
	12/24	7,706	7,748
	24/40	2,087	2,089
Beam trawl	<12	68	69
	12/24	175	176
	2440	56	56
Pelagic trawl	12/24	447	446
	2440	307	307
Pelagic seiner and purse seiner	12/24	1,296	1,311
	2440	166	169
Dredges	12/24	1,439	1,439
Polyvalent passive (small scale)	<12	13,173	13,865
Polyvalent passive	12/24	906	920
Longlines	<12	458	471
	12/24	1,322	1,363
Combining mobile and passive gears	<12	1,462	1,702
	12/24	232	229
Total		31.502	32,564

Source: IREPA

The comparison made in table 3 shows that a very small difference between the two methodology exists. Table 3 highlights a difference, between the two methods, of about 1,062 units, equal to 3% of total employment. Substantially, the main difference between the two methodologies consists in the factor used to weight the average crewmen. While in the proposed approach the weighting procedure use the time spent at sea in terms of hours per year, in the current IREPA methodology for the estimation of fishery employment the weights are the days at sea, where no duration, in terms of hours, is taken into account.

4.3.4 Evaluation of the proposed approach from the national perspective

Availability of data

The main data source for data requested by the proposed methodology is the IREPA sample monitoring system used for the estimation of efforts, catches, revenues and costs. A detail for each type of data is provided in the following lines:
- *Number of vessels*
  The number of vessels per métier is an information collected through the IREPA survey. It is equal to the number of vessels that have used a certain type of fishing gear in the year under analysis. Information is drawn on the sample and hence estimated for the overall population by mean of the IREPA sampling procedure. It is important to outline that if a vessel has used the trammel net and the long-line, it will appear two times, i.e. in the number of vessels of both the métiers. The total per segment will be lower or at least equal to the sum of the number of vessels per métier.

- *Average days at sea*
  Also for the average days at sea the data source is the IREPA survey. The information collected is the number of days at sea spent in the use of a certain fishing gear in a determined period (generally equal to a week). These data have been estimated for the overall fishing fleet (overall population) by the use of the IREPA raising procedure. Considering the above example, if a vessel has spent 1 day fishing with both the trammel net and the long-line, we will have 1 day per each métier. In this sense, the total per segment will not be equal to the sum of the average days at sea per métier.
- *Average crew on board, excl. rotation*
  The IREPA survey has been the data source also for the average crew on board at metier level. The information is collected as average number of crewmen per fishing trip per fishing gear. These data have been estimated for the overall fishing fleet (overall population) by the use of the IREPA raising procedure.
- *Hours worked per days at sea per crewman on board*
  This type of data is not collected by the IREPA survey. To overcome this lack of information we have done assumptions based on what is generally known to be the usual working hours on board of the vessel per crewman. The assumption have been made by segment and métiers, giving the large differences existing in the time needed for each fishing gears. We assume that the daily working time of a crewman starts on the time he goes up on the vessels and stops when he goes down. Hence, the average hours per day per crewman include fishing time and also sailing hours.
- *Average crew per vessel, incl rotation*
  As far as the average crew per vessel including rotation, it should be highlighted that the rotation phenomenon is not predominant in Italy as it is mainly a feature of the large scale fisheries and the Italian fisheries is primarily characterized by the small-scale. As a consequence information on rotation is not collected through the sample survey carried out by IREPA and, in this project, we assume that no rotation exist.
- *Average hours per engaged crew, incl rotation*
  Rotation has not be taken into account.
- *FTE threshold*
  FTE threshold has never been applied for the calculation of FTE employment in the Italian fishing sector. In this study two type of hypothesis on FTE thresholds have been made: one based on the difference existing in the working time among fishing fleet segments and one based on an FTE threshold equal to the average of the thresholds used in the first hypothesis.

Assumptions

The main assumptions for this study concerns hours worked per day. Of course, these assumptions has been used to test the methodology. If the methodology will be accepted, it is straightforward that a more proper estimation or collection of this type of data will be necessary.

Advantages

For our point of view, considering the approach by metier, the proposed methodology can give further details on the estimation of employment if compared with the current procedures at now applied in the European countries. Furthermore, as far as the estimation of the engaged crew for the Italian case, the comparison between the current and the proposed methodology made in table 3 shows that if the proposed approach by métier will be adopted it will not create a large gap *vis-à-vis* data estimated through the current methodology.

Disadvantages

- If it is true, as said in paragraph 2.1 of the introduction, that the new DCR, which will be introduced in 2008 will require the use of the métiers, it is also true that the métier level will be undoubtedly required for biological data. It is indeed recognised the not easy task to collect economic data at mètier level as, in most of the data collection procedures around Europe, the survey unit is the vessel. In particular, for the Italian case, some problems could be faced in collecting data, at metier level, vessels with LOA<12. These difficulties derive from: 1) the high number of metiers practised by these vessels during the year and to 2) the typology of gears used (in the case of pots and nets, the concept according to which "presence on board cannot be considered always as working time" could lead to underestimates of the FTE as the real time spent on direct use of the gear is often small compared to periods of 'inactivity' on board or to the time on shore spent on fishing related activities, such as nets' cleaning or repairing).
- Taking into account the unavailability, at now, of data concerning on-shore works, one disadvantage of the proposed methodology is the fact that it is based only on the work at sea, where time spent on-shore is relevant.
- Giving the high uncertainty of the fishing sector, due to the resource abundance and to the weather condition that highly influence the fishing time (both in terms of days and hours), probably the application of the FTE concept to the fishing sector is not appropriate. In some cases (as experience in the application of the methodology to Italian fishery) an FTE threshold set on a yearly basis does not reflect the proper meaning of the FTE concept. If a yearly threshold is set it can happen, as in the Italian case study, that the number of FTE labour units is lower than the average engaged crew not because there is part-time work but because, for instance, the 2005 average fishing days are, for some segments, lower than the set FTE threshold. In this case, from our point of view, the correct meaning of the FTE is more or less a "loss of work" due to major forces. There is strong evidence, in the Italian fishery, where if a person work a limited number of hours (i.e. less than 8 hours per day that is the standard in all the economic sector) it happens not because he/she does not want to work more but simply because those hours per day are all he can do (given the weather conditions or the resource condition in that moment or because a specific regulation set limits on the days at sea.

Data on other employment

- *Work on shore by the crew*
  Work on shore by the fisherman and his crew, as maintenance of vessel and gear, is relevant. Sometimes these activities are done on other days than days at sea. At the moment the IREPA survey does not collect information on this type of work, being built solely around the concept of work on board of the vessels.
- *Administrative staff on shore*
  In the case of the small scale fishery, administrative tasks are carried out by the fishermen co-operative to which the fishermen adhere. In a minority of the cases these activities are carried by fishermen themselves or by their wives. As far as the large scale, it is not rare that administrative tasks are committed to specialised companies. At the moment, the IREPA survey does not collect information on this aspect.
- *Seasonal employment*
  In Italy the seasonal employment is not very relevant. It is a feature of just a small part of the Italian fishing fleet. In these cases, when employed in seasonal fisheries usually fishermen spent the rest of the time in other fisheries or activities in some way related to the fishery sector. An evidence of this is the tuna fisheries. In most cases the tuna fishery is connected to tuna farming. People employed on board on the tuna vessel during the tuna fishing season (from May to July) are usually employed on the tuna farms during the rest of the year, when they are employed in activities as feeding, taking tuna from cages, etc…
- *Employment by gender (mainly on shore)*
  No registration of gender is currently done, because the number of women in fisheries is considered to be very small. For this reason at the moment this type of information is not collected. Women are generally involved in fishery related activities when they belong to the fishermen's families. This raise the question of the unpaid labour.
- *Unpaid labour (e.g. involvement of spouses)*
  In Italy wives generally participate to the fisheries activities in book-keeping tasks or in processing activities related to the landings of some special fisheries (i.e. canning and salting of "bianchetto", the juveniles of sardines or tuna). At the moment this type of information is not collected.
- *Employment of foreigners (EU and non-EU)*
  The current methodology for the estimation of employment does not take into account the difference between national and foreigner crewmen. In particular, the information on the average number of crewmen per vessels include both national and foreigner people.

4.4 Netherlands

4.4.1. New calculation of employment

This chapter presents the results of the proposed method for calculating employment in the Dutch fleet (cutters and pelagic freezer trawlers) in terms of engaged persons and FTE's.

Chapter 1.1 shows the results of a time based approach and in chapter 1.2 the relation between employment and income levels is explored and compared to the national economy.

The Dutch fleet has been divided into segments according to the DCR. The main segments are beam trawlers < 221 kW (NSS) 12-24m , beam trawlers >221 kW (NSL) > 40m, demersal trawlers and seiners (DTS) > 24m and pelagic freezer trawlers (OTM) > 40m. The segment "DTS > 24m" consists of different types of gears, mainly Danish seine, pair trawl and twin rig. Within the segment of beam trawlers < 221 kW two métiers have been distinguished: beam trawling for shrimps and beam trawling for demersal fish. The other segments are rather homogeneous.

Time based approach

In the time based approach employment is calculated from the number of sea-days and man-days and the number of hours worked per day by the crew. This results in two measures for employment:
- engaged crew: the average number of people employed during the year;
- FTE's: the number of full time jobs that would be equivalent to the number of hours worked.

Table 1.1 Employment in the Dutch fleet (2004)

	Total	NSS 12-24m Shrimps	NSS 12-24 m Demersal fish	NSL > 40m	OTM > 40m	DTS >24m
Number of vessels	388	54	171	131	17	15
Average days at sea	154	131	135	182	276	80
Average crew on board, excl. rotation	6.6	2.6	3.3	5.9	33	4.4
Hours worked per days at sea per crewman on board	12.0	12	12	12	12	12
Average crew per vessel, incl rotation	7.4	3.1	3.5	7.0	36	4.8
Average hours per engaged crew, incl rotation	1648	1335	1553	1855	2986	879
FTE threshold	2000	2000	2000	2000	2000	2000
Engaged crew	2359	165	594	911	617	72
FTE	2065	110	461	845	617	32

Income generation capacity

Table 1.2 Income from fisheries compared to minimum income and Gross value added compared to GNP per employed

	NSS 12-24m Shrimps	NSS 12-24 m Demersal fish	NSL > 40m	OTM > 40m	DTS>24m
Share/minimum income (GVA/man) /	149%	123%	135%	334%	310%
(GNP/employed)	47%	54%	59%	136%	167%
Engaged crew	165	594	911	617	72
FTE	110	461	845	617	32
Share/man	25	21	23	57	53
GVA/man	29	33	37	84	103

In all segments the crew share per man is well above the Dutch legal minimum income for a full time employee. Gross value added per employed in the three beam trawling segments is far below the national GNP per employed, while the other two segments have better than average GVA per employed. One would expect the gross value added and crew share per man to be higher in those segments where the number of man-hours per engaged is higher. However, there doesn't seem to be a direct relation between the number of man-hours per engaged person and the GVA per man or crew share per man. Hence, we may conclude that an income based approach for calculating employment in terms of FTE's would not be appropriate for the Dutch fleet.

Fig. 1. Employment in relation to income levels

Employment in relation to GNP / employed, 2004

- NSS (shrimps) 12-24m
- NSS (demersal fish) 12-24m
- NSL>24m
- OTM>40m
- DTS>24m
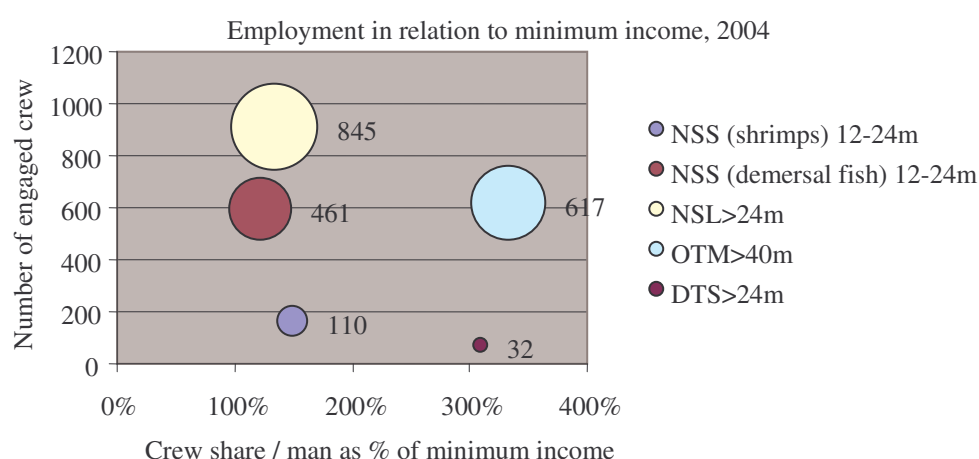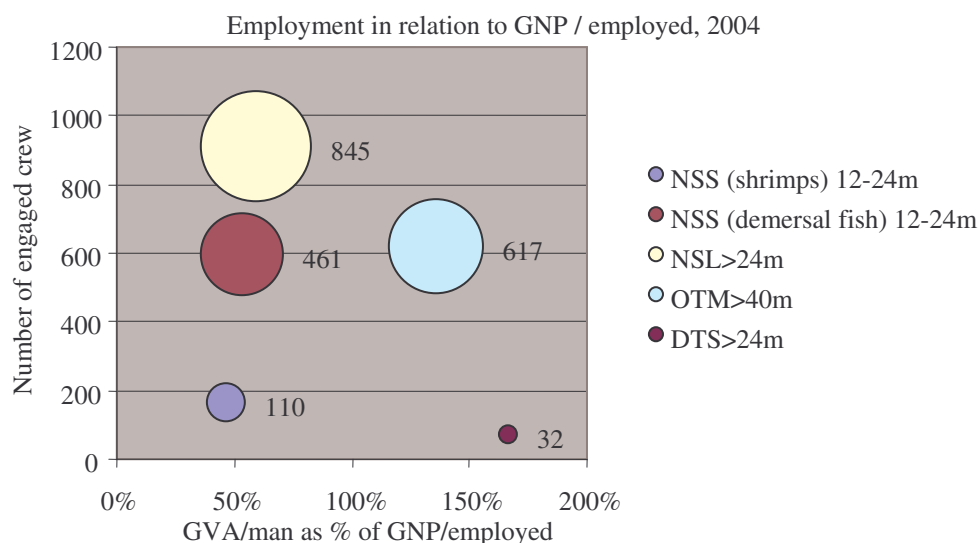
4.4.2. Current practice of estimation of employment (AER)

In current practice employment is calculated in terms of FTE's. Employment data is collected from the "LEI panel", a sample of app. 25% of the Dutch fleet . For each vessel in the panel the steady crew is known on basis of contracts ("maatschapcontracten"), even though not all of them might be going on each trip.

The number of man-days for each trip is calculated by multiplying the number of steady crew (even if they are not all onboard on this trip) plus temporary crew for that particular trip plus the owner if applicable with the number of trip days. The number of man-days is then summed over all trips to get the number of man-days per year.

The number of man-days for the whole year is divided by the number of sea-days to get the number of FTE's. The number of FTE's is then extrapolated from the panel to the whole fleet.

4.4.3. Comparison of current and proposed approach

Like the proposed approach, the current approach of calculating employment at LEI also expresses employment in Full Time Equivalents. However, the number of FTE's is calculated in a different way. The current approach of LEI calculates the number of FTE's as the ratio of the number of man-days and the number of sea-days. Table 3.1 shows that this tends to overestimate the number of FTE's, particularly in cases where the total effort of a vessel is relatively low because in those cases a relatively small number of man-days will be counted as one FTE. In cases where effort is relatively high, like the pelagic freezer trawlers segment, the current approach of LEI may underestimate the number of FTE's because in those cases a larger number of man-days will be counted as one FTE.

Table 3.1 Results of current and proposed approach (2004)

Segment name	Employment acc. to current practice	New approach Engaged crew	FTE
NSS (Shrimps) 12-24m	112	165	110
NSS (Demersal Fish) 12-24m	570	594	461
NSL > 40m	900	911	845
OTM > 40m	613	617	617
DTS > 24m	50	72	32

4.4.4. Evaluation of the proposed approach from the national perspective

Availability of data

For the vessels in the LEI panel, a sample of app. 25% of the Dutch cutter fisheries, data on number of sea-days and number of man-days of the crew are available for the segments and metiers presented here. In order to present data on smaller segments or metiers, the representativeness of the panel for these segments would have to be reconsidered.

There is no data available on work done by the crew onshore and on the personnel that might be employed onshore by fishing companies. There is also no data on unpaid labour, for instance by spouses or other family members.

Assumptions

- In general the Dutch fishermen work two shifts of six hours per day. Therefore the number of hours worked per man-day has been estimated at twelve hours for all fleet segments.
- The FTE threshold has been set at 2000 hours per year which makes employment in the fisheries sector comparable to the agricultural sector.
- There are no data on work on shore. Therefore it is implicitly assumed that the crew only works during the trips and the figures presented do not take into account the administrative personnel that might be employed by (larger) fishing companies.
- There are no data on unpaid labour. For instance, the spouse of a fishermen may take care of administration. The figures presented here do not take this into account.

Advantages

The current method for calculating employment in terms of Full Time Equivalents does not take into account the number of hours worked per year. If the crew works on all sea-days of their vessel, they are considered to work full time. This may over- or underestimate the number of FTE's. This is corrected in the new method by taking into account the number of hours per man-day and by relating the total number of hours worked to the "FTE threshold". When applied properly, this new method will make employment data more transparent and better comparable over different sectors and countries.

Disadvantages

The new calculation of FTE's is based on the estimation of the number of hours per man-day and on the definition of the FTE-threshold. The number of hours per man-day may of course differ in individual cases. For a better estimate of the number of hours per man-day, specific data collection on this issue would be required. Furthermore, choosing the FTE threshold will have to be done carefully taking into account the international comparability of data as well as comparability between different (national) sectors.

Data on other employment

In the current approach work on shore by the crew, administrative staff on shore and unpaid labour is ignored. In the Netherlands all of these aspects seem to be relevant. Hence the present approach tends to underestimate employment in the fisheries sector. For the future, it would be recommendable to include work onshore in the data collection programme.

Up to now, no data have been collected about employment by gender and by nationality. Some segments of the Dutch fleet (mainly the pelagic freezer trawlers) are known to employ a substantial amount of foreigners so collection of data on nationality of the crew could be relevant. Collection of data on gender would show that the fisheries fleet is still a very male-dominated sector. Female employment would be found almost exclusively on shore (paid as well as unpaid).

4.5. United Kingdom

4.5.1. New calculation of employment

Time based approach

The UK case study using the time based approach is presented here. Estimates have been made for each DCR segment split into the following métiers, and then summed for the entire UK fleet.

Description of métiers

Métier code	Gear description
DRB	Boat Dredge
FPO	Pots and traps
GNC	Encircling gillnets
GND	Driftnet
GNS	Set gillnet
GTR	Trammel net
HMD	Mechanised/Suction Dredge
LHP	Hand and pole lines
LLS	Set longlines
NO	No stated métier available
OTB	Bottom otter trawl

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Métier code	Gear description
OTM	Midwater otter trawl
OTT	Multi-rig otter trawl
PS	Purse seine
PTB	Bottom pair trawl
PTM	Pelagic pair trawl
SDN	Anchored seine
SPR	Pair seine
SSC	Fly shooting seine
TBB	Beam Trawl

Tables 1.1 to 1.28 show the UK estimates for employment by DCR segment, based on number of vessels in each segment, average crew sizes and time spent using each métier within the segment. The framework is the standard framework for this study.

For the UK it was assumed that a full working year is 2,000 hours, although in many cases this figure is exceeded by individual fishermen. The method adopted for this study does not allow us to count the work of one person as more than one FTE, even if the hours worked per year exceed the defined threshold of 2,000 hours.

Table 1.1 Employment in Beam trawl 10-11.99m vessels

	Total	FPO	HMD	OTB	OTT	PTM	TBB
Number of vessels	11	1	2	2	1	1	10
Average days at sea	64.32	9.00	13.00	25.25	4.00	4.00	61.40
Average crew on board, excl. rotation	3	3	3	3	3	3	3

Table 1.1 Employment in Beam trawl 10-11.99m vessels (vervolg)

	Total	FPO	HMD	OTB	OTT	PTM	TBB
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	3	3	3	3	3	3	3
Average hours per engaged crew, incl rotation	772	108	156	303	48	48	737
FTE threshold	2000	2000	2000	2000	2000	2000	2000
Engaged crew	33	3	6	6	3	3	30
FTE	13	0	0	1	0	0	11

Table 1.2 Employment in Beam trawl 12-23.99m vessels

	Total	DRB	FPO	LHP	OTB	PTB	PTM	SSC	TBB
Number of vessels	32	7	1	1	5	2	1	1	32
Average days at sea	138.67	30.29	1.00	0.50	31.40	33.50	4.00	2.00	124.81
Average crew on board, excl. rotation	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25

Table 1.2 Employment in Beam trawl 12-23.99m vessels (sequel)

	Total	DRB	FPO	LHP	OTB	PTB	PTM	SSC	TBB
Average hours per engaged crew, incl rotation	1941	424	14	7	440	469	56	28	1747
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	200	44	6	6	31	13	6	6	200
FTE	194	9	0	0	7	3	0	0	175

Table 1.3 Employment in Beam trawl 24-39.99m vessels

	Total	DRB	TBB
Number of vessels	56	3	56
Average days at sea	213.5	32.50	211.76
Average crew on board, excl. rotation	7.20	7.2	7.2
Hours worked per days at sea per crewman on board	14	14	14
Average crew per vessel, incl rotation	7.20	7.2	7.2
Average hours per engaged crew, incl rotation	2989	455	2965
FTE threshold	2000	2000	2000
Engaged crew	403	22	403
FTE	403	5	403

Table 1.4 Employment in Beam trawl 40m+ vessels

	Total	DRB	OTB	TBB
Number of vessels	16	1	2	16
Average days at sea	217.25	26.00	71.25	206.72
Average crew on board, excl. rotation	7	7	7	7
Hours worked per days at sea per crewman on board	14	14	14	14
Average crew per vessel, incl rotation	7	7	7	7
Average hours per engaged crew, incl rotation	3041	364	998	2894
FTE threshold	2000	2000	2000	2000
Engaged crew	112	7	14	112
FTE	112	1	7	112

Table 1.5 Employment in Demersal trawl/seine 10-11.99m vessels

	Total	DRB	FPO	GND	GNS	HMD	LHP	OTB	OTT	PTB	PTM	TBB
Number of vessels	114	10	8	1	1	1	2	111	5	5	4	1
Average days at sea	143.66	27.25	24.50	.50	34.50	8.00	17.50	139.36	37.60	2.90	24.00	63.00
Average crew on board, excl. rotation	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Average hours per engaged crew, incl rotation	1724	327	294	6	414	96	210	1672	451	35	288	756
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	319	28	22	3	3	3	6	311	14	14	11	3
FTE	275	5	3	0	1	0	1	260	3	0	2	1

Table 1.6 Employment in Demersal trawl/seine 12-23.99m vessels

	Total	DRB	FPO	HMD	LHP	NO	OTB	OTM	OTT	PS	PTB	PTM	SDN	SPR	SSC	TBB
Number of vessels	487	18	20	2	2	4	454	38	72	1	57	12	6	5	20	2
Average days at sea	185.99	56.64	7.51	4.50	0.75	2.13	164.44	55.39	66.98	4.00	68.03	43.21	80.08	61.60	130.31	5.25
Average crew on board, excl. rotation	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48
Average hours per engaged crew, incl rotation	2604	793	105	63	11	30	2302	776	938	56	952	605	1121	862	1824	74
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	2182	81	90	9	9	18	2034	170	323	4	255	54	27	22	90	9
FTE	2182	32	5	0	0	0	2034	66	151	0	122	16	15	10	82	0

Table 1.7 Employment in Demersal trawl/seine 24-39.99m vessels

	Total	LLS	OTB	OTM	OTT	PS	PTB	PTM	SPR	SSC	TBB
Number of vessels	113	1	89	7	15	1	29	10	8	11	3
Average days at sea	250.40	1.05	212.08	82.36	139.96	4.50	134.39	22.35	47.06	197.49	22.67
Average crew on board, excl. rotation	6.57	6.57	6.57	6.57	6.57	6.57	6.57	6.57	6.57	6.57	6.57
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Average hours per engaged crew, incl rotation	2879	12	2438	947	1609	52	1545	257	541	2271	261
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	904	8	712	56	120	8	232	80	64	88	24
FTE	904	0	712	27	97	0	179	10	17	88	3

Table 1.8 Employment in Demersal trawl/seine 40m+ vessels

	Total	OTB	TBB
Number of vessels	13	13	1
Average days at sea	293.73	280.08	177.50
Average crew on board, excl. rotation	9	9	9
Hours worked per days at sea per crewman on board	14	14	14
Average crew per vessel, incl rotation	9	9	9
Average hours per engaged crew, incl rotation	4112	3921	2485
FTE threshold	2000	2000	2000
Engaged crew	117	117	9
FTE	117	117	9

Table 1.9 Employment in Pelagic 10-11.99m vessels

	Total	GNC	GNS	LHP	OTB
Number of vessels	5	1	1	3	3
Average days at sea	142.70	179.00	7.00	51.67	124.17
Average crew on board, excl. rotation	2	2	2	2	2
Hours worked per days at sea per crewman on board	12	12	12	12	12
Average crew per vessel, incl rotation	2	2	2	2	2
Average hours per engaged crew, incl rotation	1712	2148	84	620	1490
FTE threshold	2000	2000	2000	2000	2000
Engaged crew	10	2	2	6	6
FTE	9	2	0	2	4

Table 1.10 Employment in Pelagic 12-23.99m vessels

	Total	DRB	GNS	LHP	OTB	OTM	PTB	PTM	TBB
Number of vessels	12	4	1	2	11	1	2	1	2
Average days at sea	200.08	42.00	20.50	30.75	173.23	118.50	35.00	12.00	22.50
Average crew on board, excl. rotation	3	3	3	3	3	3	3	3	3
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	3	3	3	3	3	3	3	3	3
Average hours per engaged crew, incl rotation	2801	588	287	431	2425	1659	490	168	315
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	36	12	3	6	33	3	6	3	6
FTE	36	4	0	1	33	2	1	0	1

Table 1.11 Employment in Pelagic 40m+ vessels

	Total	GNS	OTB	OTM	PS	PTM
Number of vessels	33	1	6	28	2	22
Average days at sea	132.39	4.00	25.33	97.98	50.00	62.25
Average crew on board, excl. rotation	12	12	12	12	12	12
Hours worked per days at sea per crewman on board	14	14	14	14	14	14
Average crew per vessel, incl rotation	12	12	12	12	12	12
Average hours per engaged crew, incl rotation	1854	56	355	1372	700	872
FTE threshold	2000	2000	2000	2000	2000	2000
Engaged crew	396	12	72	336	24	264
FTE	367	0	13	230	8	115

Table 1.12 Employment in Dredgers 10-11.99m vessels

	Total	DRB	FPO	GNS	HMD	LHP	OTB
Number of vessels	20	20	1	1	1	1	6
Average days at sea	155.93	121.13	61.50	21.50	65.50	72.00	79.25
Average crew on board, excl. rotation	3	3	3	3	3	3	3
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	3	3	3	3	3	3	3
Average hours per engaged crew, incl rotation	1871	1454	738	258	786	864	951
FTE threshold	2000	2000	2000	2000	2000	2000	2000
Engaged crew	60	60	3	3	3	3	18
FTE	56	44	1	0	1	1	9

Table 1.13 Employment in Dredgers 12-23.99m vessels

	Total	DRB	FPO	GNS	HMD	LHP	NO	OTB	OTM	OTT	PTB	TBB
Number of vessels	99	94	6	1	10	2	1	32	4	1	1	9
Average days at sea	172.21	145.29	33.50	1.00	26.70	1.50	1.31	51.51	39.88	69.00	9.00	114.78
Average crew on board, excl. rotation	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09
Average hours per engaged crew, incl rotation	2411	2034	469	14	374	21	18	721	558	966	126	1607
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	405	384	25	4	41	8	4	131	16	4	4	37
FTE	405	384	6	0	8	0	0	47	5	2	0	30

Table 1.14 Employment in Dredgers 24-39.99m vessels

	Total	DRB	FPO	HMD	TBB
Number of vessels	20	19	1	6	2
Average days at sea	231.52	219.26	7.00	32.75	130.50
Average crew on board, excl. rotation	6	6	6	6	6
Hours worked per days at sea per crewman on board	14	14	14	14	14
Average crew per vessel, incl rotation	6	6	6	6	6
Average hours per engaged crew, incl rotation	3241	3070	98	459	1827
FTE threshold	2000	2000	2000	2000	2000
Engaged crew	120	114	6	36	12
FTE	120	114	0	8	11

Table 1.15 Employment in Dredgers 40m+ vessels

	Total	DRB
Number of vessels	1	1
Average days at sea	12.50	12.50
Average crew on board, excl. rotation	6	6
Hours worked per days at sea per crewman on board	14	14
Average crew per vessel, incl rotation	6	6
Average hours per engaged crew, incl rotation	175	175
FTE threshold	2000	2000
Engaged crew	6	6
FTE	1	1

Table 1.16 Employment in Polyvalent active 10-11.99m vessels

	Total	DRB	HMD	LHP	LLS	OTB	PTM	TBB
Number of vessels	4	3	1	2	1	4	1	1
Average days at sea	161.75	52.17	50.00	37.50	1.00	65.13	12.00	92.00
Average crew on board, excl. rotation	4	4	4	4	4	4	4	4
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	4	4	4	4	4	4	4	4
Average hours per engaged crew, incl rotation	1941	626	600	450	12	782	144	1104
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	16	12	4	8	4	16	4	4
FTE	16	4	1	2	0	6	0	2

Table 1.17 Employment in Polyvalent active 12-23.99m vessels

	Total	DRB	FPO	OTB	PTB	PTM	TBB
Number of vessels	4	2	1	4	2	1	2
Average days at sea	176.50	50.00	50.50	92.00	33.25	37.00	42.00
Average crew on board, excl. rotation	4	4	4	4	4	4	4
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	4	4	4	4	4	4	4
Average hours per engaged crew, incl rotation	2471	700	707	1288	466	518	588
FTE threshold	2000	2000	2000	2000	2000	2000	2000
Engaged crew	16	8	4	16	8	4	8
FTE	16	3	1	10	2	1	2

Table 1.18 Employment in Gears using hooks 10-11.99m vessels

	Total	LLS
Number of vessels	1	1
Average days at sea	153.00	153.00
Average crew on board, excl. rotation	2	2
Hours worked per days at sea per crewman on board	12	12
Average crew per vessel, incl rotation	2	2
Average hours per engaged crew, incl rotation	1836	1836
FTE threshold	2000	2000
Engaged crew	2	2
FTE	2	2

Table 1.19 Employment in Gears using hooks 12-23.99m vessels

	Total	LHP	LLS
Number of vessels	1	1	1
Average days at sea	102.00	17.00	85.00
Average crew on board, excl. rotation	3.5	3.5	3.5
Hours worked per days at sea per crewman on board	14	14	14
Average crew per vessel, incl rotation	3.5	3.5	3.5
Average hours per engaged crew, incl rotation	1428	238	1190
FTE threshold	2000	2000	2000
Engaged crew	4	4	4
FTE	2	0	2

Table 1.20 Employment in Gears using hooks 24-39.99m vessels

	Total	LLS	NO
Number of vessels	8	6	4
Average days at sea	257.00	197.50	217.75
Average crew on board, excl. rotation	5	5	5
Hours worked per days at sea per crewman on board	14	14	14
Average crew per vessel, incl rotation	5	5	5
Average hours per engaged crew, incl rotation	3598	2765	3049
FTE threshold	2000	2000	2000
Engaged crew	40	30	20
FTE	40	30	20

Table 1.21 Employment in Gears using hooks 40m+ vessels

	Total	LLS	NO
Number of vessels	1	1	1
Average days at sea	247.04	219.00	28.04
Average crew on board, excl. rotation	6	6	6
Hours worked per days at sea per crewman on board	14	14	14
Average crew per vessel, incl rotation	6	6	6
Average hours per engaged crew, incl rotation	3459	3066	393
FTE threshold	2000	2000	2000
Engaged crew	6	6	6
FTE	6	6	1

Table 1.22 Employment in Drift and fixed nets 10-11.99m vessels

	Total	FPO	GND	GNS	GTR	LHP	LLS	OTB
Number of vessels	15	3	2	14	4	4	4	1
Average days at sea	122.33	49.06	52.50	98.21	26.73	2.50	21.75	4.00
Average crew on board, excl. rotation	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Average hours per engaged crew, incl rotation	1468	589	630	1179	321	30	261	48
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	38	8	5	35	10	10	10	3
FTE	28	2	2	21	2	0	1	0

Table 1.23 Employment in Drift and fixed nets 12-23.99m vessels

	Total	FPO	GNS	GTR	LHP	LLS	OTB	OTT
Number of vessels	23	1	22	5	1	1	3	1
Average days at sea	181.78	5.00	170.74	33.64	2.00	2.00	54.17	85.00
Average crew on board, excl. rotation	5	5	5	5	5	5	5	5
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	5	5	5	5	5	5	5	5
Average hours per engaged crew, incl rotation	2545	70	2390	471	28	28	758	1190
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	115	5	110	25	5	5	15	5
FTE	115	0	110	6	0	0	6	3

Table 1.24 Employment in Drift and fixed nets 24-39.99m vessels

	Total	GNS	GTR	LLS	NO
Number of vessels	23	23	2	2	1
Average days at sea	273.96	259.88	32.33	106.50	46.00
Average crew on board, excl. rotation	5.5	5.5	5.5	5.5	5.5
Hours worked per days at sea per crewman on board	14	14	14	14	14
Average crew per vessel, incl rotation	5.5	5.5	5.5	5.5	5.5
Average hours per engaged crew, incl rotation	3835	3638	453	1491	644
FTE threshold	2000	2000	2000	2000	2000
Engaged crew	127	127	11	11	6
FTE	127	127	2	8	2

Table 1.25 Employment in Pots and traps 10-12.99m vessels

	Total	DRB	FPO	GND	GNS	HMD	LHP	LLS	OTB	TBB
Number of vessels	159	6	159	4	11	4	5	1	14	1
Average days at sea	163.56	14.22	155.90	12.25	23.36	25.46	9.40	5.50	47.53	6.00
Average crew on board, excl. rotation	2	2	2	2	2	2	2	2	2	2
Hours worked per days at sea per crewman on board	12	12	12	12	12	12	12	12	12	12
Average crew per vessel, incl rotation	2	2	2	2	2	2	2	2	2	2
Average hours per engaged crew, incl rotation	1963	171	1871	147	280	306	113	66	570	72
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	318	12	318	8	22	8	10	2	28	2
FTE	312	1	297	1	3	1	1	0	8	0

Table 1.26 Employment in Pots and traps 12-23.99m vessels

	Total	DRB	FPO	GNS	GTR	LHP	LLS	NO	OTB	TBB
Number of vessels	75	1	74	3	1	1	1	1	7	2
Average days at sea	198.97	1.00	194.73	89.33	5.30	2.00	6.00	3.00	25.36	25.00
Average crew on board, excl. rotation	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17
Hours worked per days at sea per crewman on board	14	14	14	14	14	14	14	14	14	14
Average crew per vessel, incl rotation	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.17
Average hours per engaged crew, incl rotation	2786	14	2726	1251	74	28	84	42	355	350
FTE threshold	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Engaged crew	463	6	457	19	6	6	6	6	43	12
FTE	463	0	457	12	0	0	0	0	8	2

Table 1.27 Employment in Pots and traps 24-39.99m vessels

	Total	FPO
Number of vessels	3	3
Average days at sea	329.00	329.00
Average crew on board, excl. rotation	9	9
Hours worked per days at sea per crewman on board	14	14
Average crew per vessel, incl rotation	9	9
Average hours per engaged crew, incl rotation	4606	4606
FTE threshold	2000	2000
Engaged crew	27	27
FTE	27	27

Table 1.28 Employment in Polyvalent passive 12-23.99m vessels

	Total	OTB
Number of vessels	1	1
Average days at sea	100.50	100.50
Average crew on board, excl. rotation	4	4
Hours worked per days at sea per crewman on board	14	14
Average crew per vessel, incl rotation	4	4
Average hours per engaged crew, incl rotation	1407	1407
FTE threshold	2000	2000
Engaged crew	4	4
FTE	3	3

Income generation capacity

The UK case study is presented here. The framework for this study called for a comparison of annual crew share per fisherman with the national minimum wage and the gross value added per fisherman (crew member) compared to the GNP per employed person in the country. In the UK, the Office of National Statistics (ONS) does not produce a GNP figure, so we have used the Gross Domestic Product figure instead, as it is the closest in definition and makes the most useful comparison.

In 2004 there were 28.3 million people recorded as employed in the UK (employed people rather than FTEs) and GDP was €1,756,010 million. Minimum income was taken as being the minimum wage per hour for the UK for people aged 22 or over, which is €8.00 per hour, multiplied by 2,000 hours, which is our assumed threshold for the definition of a full time equivalent.

Gross value added per crewman was available for most segments of the fleet via work done for the DCR, but where it is not available, we have used either the national average based on figures from ONS, or applied our professional judgment and selected an average figure from similar fleet segments. Crew share per man was available for most segments from Seafish surveys, where it was not available estimates were used.

Fig. 1. Fishing incomes in relation to minimum income levels. (y-axis reflects 'engaged crew', size of circle reflect FTE)

Employment in relation to minimum income, 2004
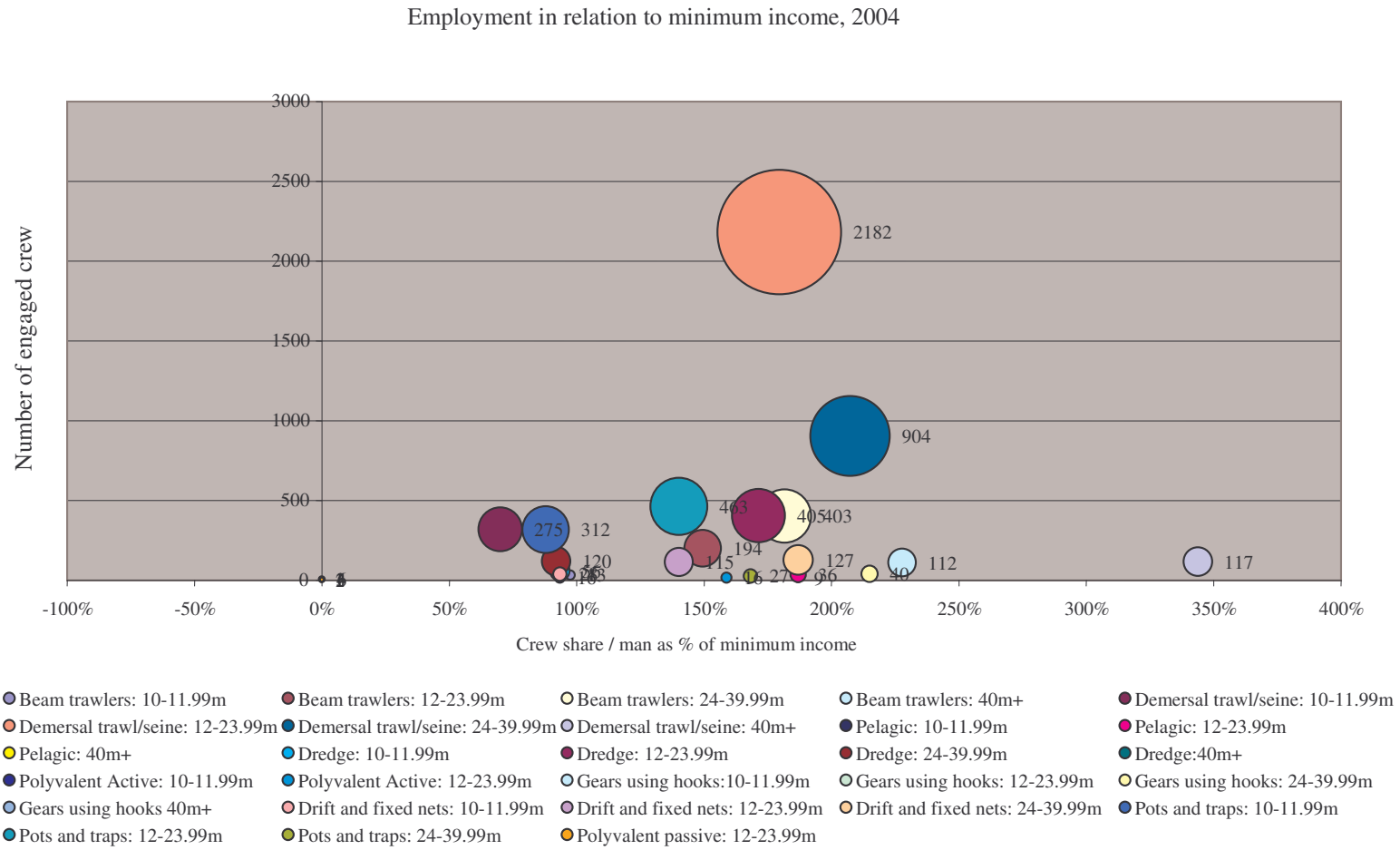
Fig. 2. Fishing crew productivity in relation to national average productivity. (y-axis reflects 'engaged crew', size of circle reflect FTE)

Productivity of crew in relation to GDP / employed person, 2004
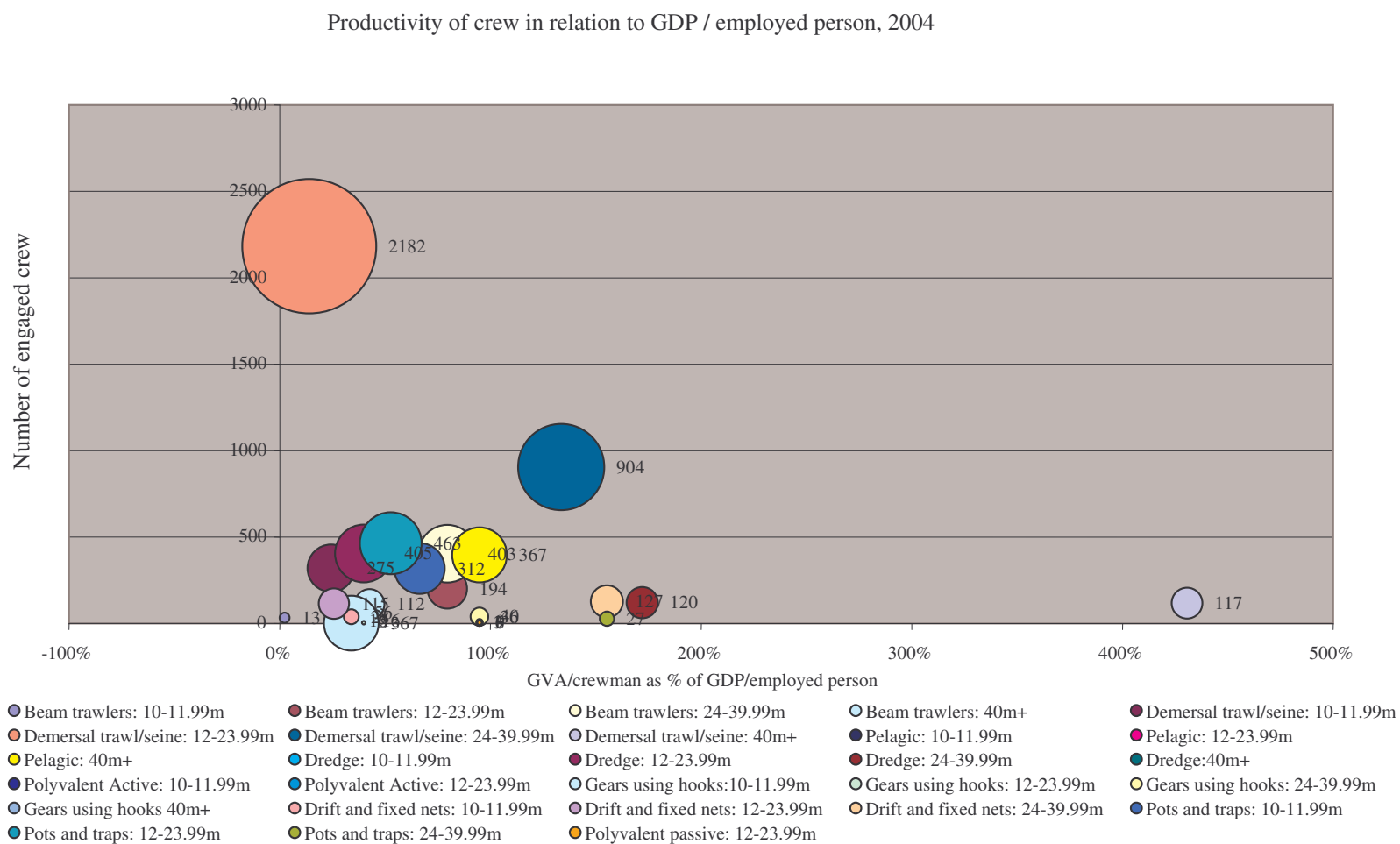
4.5.2 Current practice of estimation of employment (as included in AER)

For the AER, Seafish has calculated employment using the average number of crew per vessel figures obtained by Seafish through surveys, which were then multiplied by the number of active vessels in each segment (provided from official records). The crew per vessel figure is the crew on board, excluding rotation. Vessels whose crew work a low number of days per year are still counted as one employed person.

This method does not count the rotation crew which are used in a few major segments. This method gave a total for the UK fleet of 9,865 for 2004.

To complete the estimate per segment for AER, Seafish then calculates the number employed in each segment as a proportion of the total number of employed crew for the UK fleet. This proportion for each segment is then applied to the official MFA figure for total employed in the whole UK fleet, which was 12,647. This is done because of the need to provide a time series for the DCR, and also because the Seafish survey does not have good coverage of some of the smaller vessel segments.

The MFA uses an entirely different method to estimate total employed which involves local port officials making estimates per boat in their port. MFA also includes vessels from 0m upwards, whereas Seafish does not include vessels below 7m and has relatively poor coverage of under 10m vessels. The MFA method makes no attempt to distinguish FTEs, and only counts number of people engaged in fishing, so for every small boat, they must count at least one person.

Both the Seafish approach and MFA approach have clear weaknesses due to the amount of estimation which is employed.

4.5.3. Comparison of current and proposed approach

Segment name	Employment according to current practice (in AER)*	New approach (time based) Engaged crew	FTE
Beam trawlers: 10-11.99m*	131	33	13
Beam trawlers: 12-23.99m	256	200	194
Beam trawlers: 24-39.99m	517	403	403
Beam trawlers: 40m+	144	112	112
Demersal trawl/seine: 10-11.99m*	1,418	319	275
Demersal trawl/seine: 12-23.99m	2,820	2,182	2,182
Demersal trawl/seine: 24-39.99m	952	904	904
Demersal trawl/seine: 40m+	162	117	117
Pelagic: 10-11.99m*	36	10	9
Pelagic: 12-23.99m	46	36	36
Pelagic: 40m+	508	396	367
Dredge: 10-11.99m*	269	60	56
Dredge: 12-23.99m	519	405	405
Dredge: 24-39.99m	154	120	120
Dredge:40m+	8	6	1
Polyvalent: 10-11.99m*	21	16	16
Polyvalent: 12-23.99m	21	16	16
Gears using hooks:10-11.99m*	423	2	2

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Segment name	Employment according to current practice (in AER)*	New approach (time based) Engaged crew	FTE
Gears using hooks: 12-23.99m	4	4	2
Gears using hooks: 24-39.99m	51	40	40
Gears using hooks 40m+	8	6	6
Drift and fixed nets: 10-11.99m*	833	38	28
Drift and fixed nets: 12-23.99m	147	115	115
Drift and fixed nets: 24-39.99m	162	127	127
Pots and traps: 10-11.99m*	2,387	318	312
Pots and traps: 12-23.99m	585	463	463
Pots and traps: 24-39.99m	35	27	27
Polyvalent passive: 12-23.99m	5	4	3
Total	12,622	6,479	6,351

* The first column, showing figures estimated using current practice, includes all vessels under 12m, not only those from 10m-11.99m. However, in the columns for the new method, only vessels of 10m or more are counted. This is because vessels under 10m have not yet been allocated to DCR segments and so could not be included in estimates using the new methods.

This table shows the comparison of the method currently used to estimate employment for the AER and the time-based approach showing engaged crew and FTEs. There is a very large difference in estimates of total employed between the current and new methods. The differences mostly occur in DCR fleet segments of 10-11.99m because the current method includes vessels from 0m to 11.99m, whereas the proposed methods exclude vessels below 10m in length. The current method is likely to have allocated at least one employed person to each small boat (on an estimated basis).

4.5.4 Evaluation of the proposed (time based) approach from the national perspective

Availability of data

The same method was used for all segments:
- number of vessels - Available from the UK vessel register;
- average days at sea - Available from the UK vessel register;
- average crew on board, excluding rotation - Average taken from data collected during Seafish studies;
- hours worked per day at sea per crewman on board - Calculated using the professional knowledge of Seafish staff and some short interviews with industry representatives and vessel owners. This calculation could be improved upon by incorporating it into a further survey of the UK fleet. This figure is kept constant for all métiers (gear types) used in each segment;
- average crew per vessel, including rotation - Average taken from Seafish studies where crew rotation was mentioned by the segment. Improvements could be made to this estimation by increasing the sample size;
- average hours per engaged crew, including rotation – this figure has been calculated based on the hours worked per day at sea per crewman on board. The total hours

worked on board is divided by the total crew including rotation. This method only applies to one major fleet segment;

- FTE threshold - The UK has no separate measure of the FTE threshold. We have set it at 2000 hours as this is FADN practice in most countries and as this is a reasonable standard for UK workers in practice.

The data available for this calculation is not complete. Under 10m vessels have not been included in the UK calculation of FTEs and engaged crew as effort data is generally not recorded for these vessels and because they have not yet been allocated to DCR segments. For the <u>over</u> 10m fleet, 8% of the vessels which had fishing activity in 2004 were not allocated to a DCR segment and so could not be included in the analysis for this report. Because it was not possible to allocate these 8% of >10m vessels to a segment, we therefore could not allocate average days at sea or average hours per day per man for these vessels. It is expected that these vessels will, in the near future, be allocated to DCR segments by the UK fisheries statistics departments.

The FTE method would need to find a way to cope with the thousands of under 10m vessels which make such a large difference to the totals between the two methods of estimating employment. First, there would need to be adequate survey of these vessels to establish average days per year and hours worked per day. Improvements to the allocation of vessels to correct DCR segments by MFA, along with a yearly revision of vessel allocation would improve the results using this method.

Assumptions

Assumptions made, in relation to the above data by segment and métier:

- average crew on board excluding and including rotation are the same for the majority of segments. Only those segments which mentioned that they rotate crew in the recent Seafish survey were given a proportional increase in the number of crew;
- hours worked per day at sea per crewman on board are estimates made by Seafish staff;
- FTE threshold is set at 2,000 hours, as suggested in the main section of the report, for each segment of the fleet due lack of a more accurate estimate;
- the number of crew on board remains the same for each métier used in each segment due to lack of available data.

Advantages

The advantages of the time based approach depend entirely on the quality and coverage of the survey conducted to establish the estimated average crew per boat in each segment and the number of hours worked per day.

If the survey achieves a sufficiently robust sample size, then the next hurdle for the proposed approach is the accuracy of allocation of vessels to DCR segments. If allocation to segments can be improved to cover all over 7m vessels, then the next requirement is to find some way to account for vessels below 7m in length.

If all these conditions can be met then the proposed time-based approach should be a good method. The method can be explained clearly, to give confidence about the accuracy of the final estimates.

The results of implementing the proposed method in this case study can not be said to be more accurate than the previous method, because the conditions relating to robustness of survey and vessel allocation to segments were not met.

The discounting of part time workers by amalgamating their work into portions of a full time equivalent job, perhaps gives a more realistic estimation of the employment provided by the thousands of very small vessels in the UK fleet. These are currently over estimated, since each small vessel is counted as providing at least one full time job.

The proposed method has the advantage of taking account of rotational crew, which can be a significant proportion of the true total workforce in some fleet segments.

Disadvantages

The method will be expensive to implement to satisfactory levels because of the need to survey thoroughly.

Questions to skippers about average working hours per day per man may not be answered with complete honesty if the answer may show that practices are in breach of legislation relating to working hours in the marine industry.

The assumption that one person cannot work more than one full time equivalent job is a big assumption and in some segments of the fleet, may cause a significant under estimate of the work required to produce the recorded value, and therefore may over estimate productivity per person estimates.

The proposed method focuses on employment on board and does not count the on shore employment required to enable the vessels to function as businesses. This is not a disadvantage compared to the current practice however.

Data on other employment

There may be need to collect employment data also on the following issues:
- *work on shore by the crew*
  The cost of shore labour is included in the vessels' accounts but sometimes it is specified under repairs only – more and more repairs are being done by the crew. Only the skilled crew members are likely to be involved in this. This is an issue which will confuse the issue of productivity per person and it will be very difficult to estimate accurately the extent and impact of this practice;
- *administrative staff on shore*
  In businesses with more than vessel, which employ their own administrative staff, these costs are included in the business accounts. This again can confuse the estimations of productivity per person in the catching industry. It should be possible to find out some data on employed onshore staff in multi-vessel businesses by further survey;
- *unpaid labour (e.g. involvement of women and retired fathers of the current skipper of a vessel)*

In many cases, family members of the current skipper make significant contributions to the administration and marketing functions of the business. Exclusion of the labour in put of these people again affects the estimates of productivity per person in the sector. Some information on the wives wages has been found in the accounts submitted for the UK survey of the fishing fleet. Number of hours worked by the wives was not given. Sometimes the accounts data had national insurance contributions and administrative costs also specified;

- *employment by gender (mainly on shore)*
This should be possible to investigate by survey. It is likely that there is a male / female split in management and administrative roles in the onshore jobs relating to running vessel businesses;

- *employment of foreigners (EU and non-EU)*
Employment of foreigners is happening increasingly in the UK – we can get rough estimate of numbers employed from the Seafish survey, however we may not necessarily know if they are EU or non-EU. We would not know the number of foreign nationals employed on each vessel but would have to use a segment average per vessel.

Appendix A. United nations - SNA 1993: population and labour inputs (chapter 17)

B. Population and labour concepts without national boundaries

17.3. Figure 17.1 summarizes the first part of the chapter. Those concepts which are part of the SNA are in heavy boxes. The formal definition of these concepts are set out in part C of this chapter.

Figure 17.1 Population and labour concepts
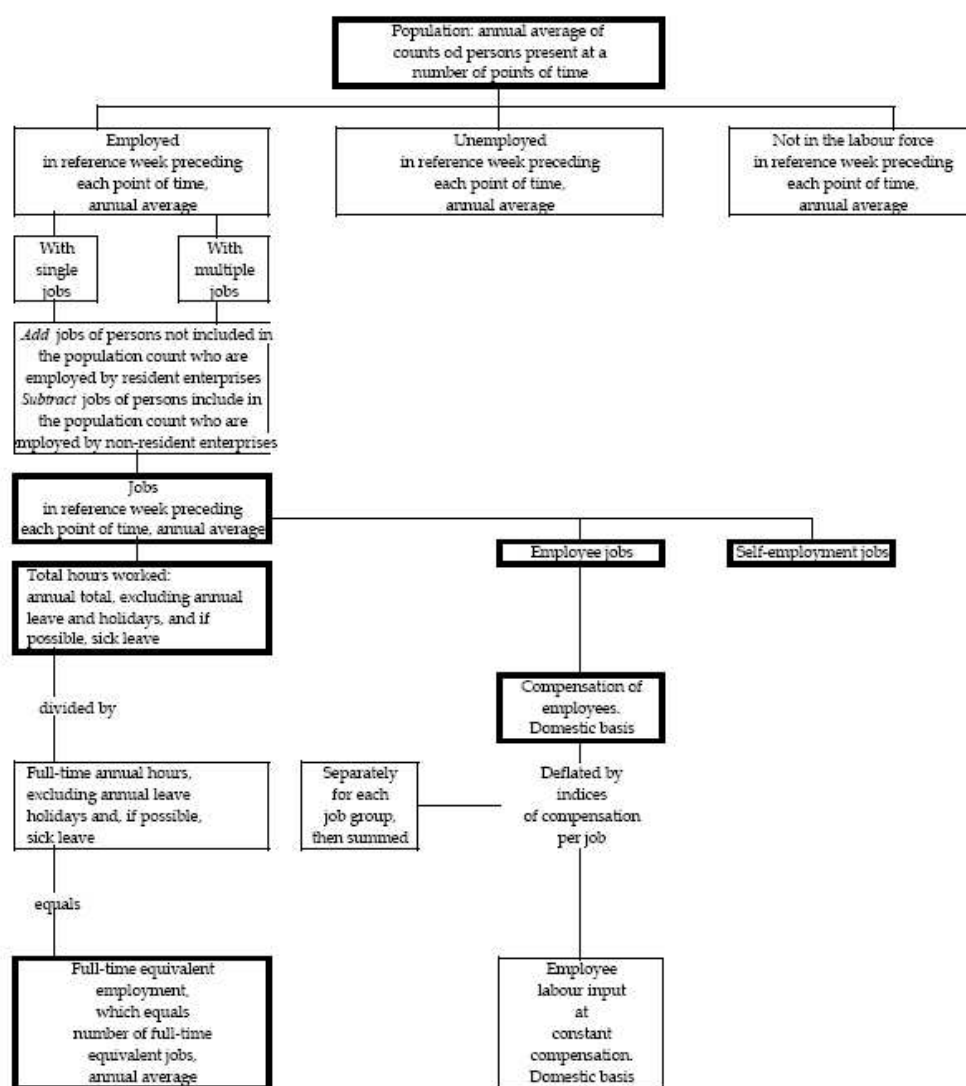
Note: Those concepts which are part of the SNA are in heavy boxes.

1. Population and employment

17.4. Population is, in principle, an annual average of frequent head counts, each of which relates to a point of time. (Censuses usually ascertain the number of people present on a specified night.) Thus population is the annual average number of people present. It includes the institutional population, though this is not covered by most labour force surveys.

17.5. The division of the number enumerated at a point in time into three categories, i.e., 'employed', 'unemployed' and 'not in the labour force' depends upon each person's activity (or lack of it) during a reference period (usually a week) ending with the point in time to which the count relates. Employment has been defined by the International Labour Organization (ILO) in the 'Resolution concerning statistics of the economically active population, employment, unemployment and underemployment', adopted by the thirteenth International Conference of Labour Statisticians. No definition is required here, but, as Figure 1 indicates, provided that the definitions of employment and of jobs match one another, the average annual number of jobs exceeds the annual average number of persons employed by the average annual number of second, third, etc., jobs. Note that the second, third, etc., jobs of a person may either successively follow one another in a reference week or, as when someone has an evening job as well as a daytime job, run in parallel.

17.6. Employed persons who have more than one job during a reference week can only be classified by industry and by status in employment through the application of some essentially arbitrary convention as to which of their jobs is the most important one. On the practical plane, while household surveys can provide data about either or both of employment and jobs, establishment surveys only provide data about jobs, so data on jobs tend to be more plentiful than data on persons employed.

17.7. Employment does not enter into the System, but jobs do; a job is like a transaction, while an employed person is not.

2. Jobs

17.8. In daily speech, a job is used in two senses: first, as a filled post in an institutional unit, e.g., 'B has a job as truck driver with XYZ Company', and, second, to signify the occupation or nature of the activity, e.g., 'B's job is driving an XYZ truck'. The first of these is relevant here. Thus a job is defined as an explicit or implicit contract between a person and an institutional unit to perform work in return for compensation for a defined period or until further notice. The institutional unit may be the proprietor of an unincorporated enterprise; in this case the person is described as being self-employed and earns a mixed income.

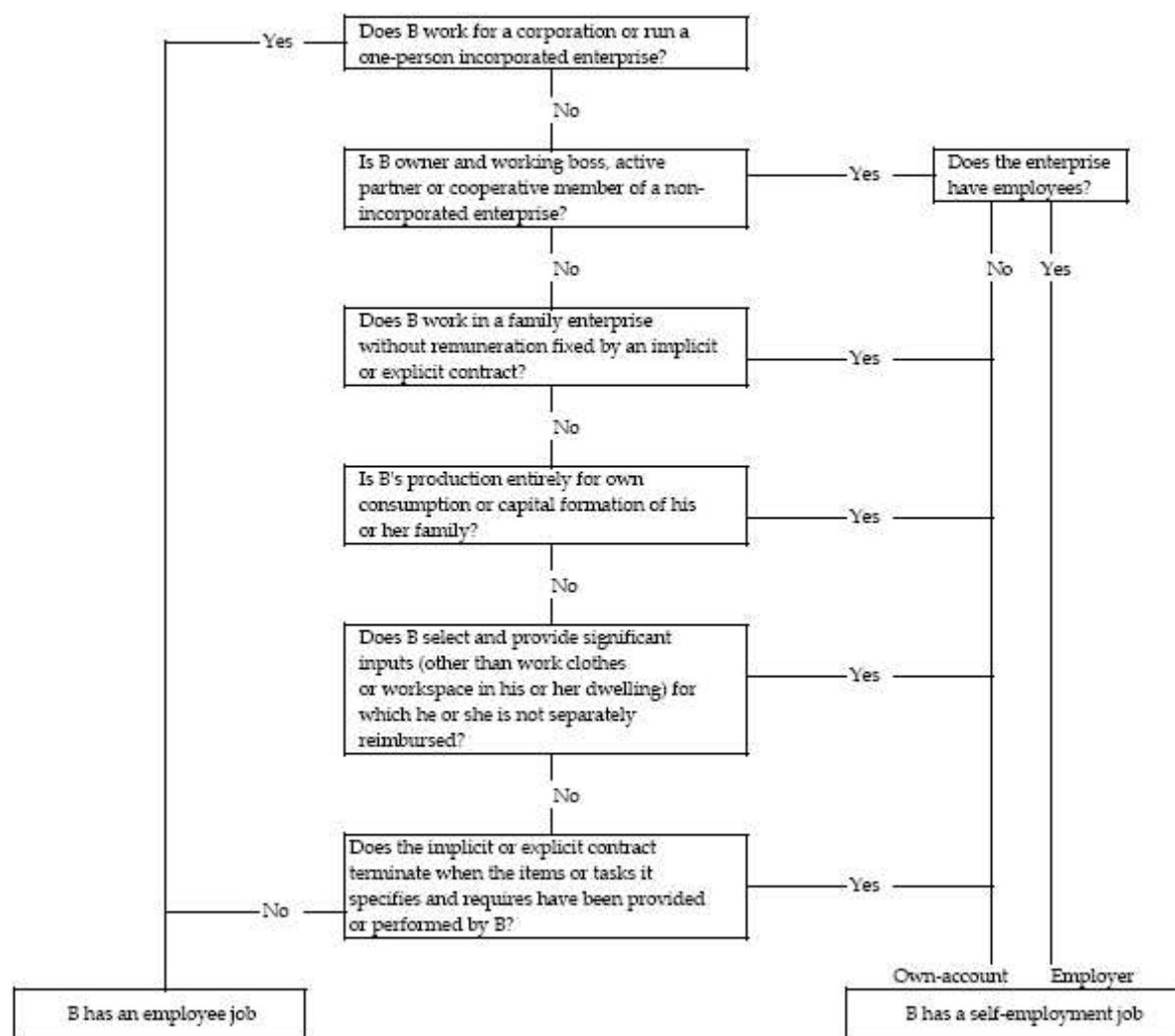17.9. There are a number of points here which require expansion:
a)   both employee jobs and self-employment jobs are covered. The distinction between employee and compensation of employees on the one hand, and self-employment

and mixed income on the other hand, is set out in chapter VII. Chart 17.2 summarizes part of that discussion;

b)   work means any activity which contributes to the production of goods or services within the production boundary as defined in chapter VI. The legality of the work and the age of the worker are, in principle, irrelevant;

c)   mixed income and the compensation of employees are defined in chapter VII. Compensation differs from labour cost, as defined by the ILO 'Resolution concerning statistics of labour cost', adopted by the eleventh International Conference of Labour Statisticians, only in including imputed employer contributions to unfunded social insurance schemes, and in excluding any taxes regarded as labour cost, together with the costs of training, welfare, recruitment and the provision of work clothing;

d)   the explicit or implicit contract relates to the provision of labour input, not to supplying output of a good or service, which is why it is described as for a defined period or until further notice. A bricklaying job, paid by time or according to the number of bricks laid, is an employee job, while a contract to lay a certain number of bricks for a given payment is not a job; the job is the bricklayer's notional self-employment contract. Similarly, a self-employment job of window-cleaning is regarded as an implicit contract by a person to hire himself or herself to do cleaning work. Quite separately, the person has contracts with customers to provide the service of window-cleaning;

e)   there is one minor difference between a job as defined here and the category of persons 'with a job but not at work' who are considered as employed in the ILO resolution adopted by the thirteenth International Conference of Labour Statisticians which, referred to above. This is that, on the ILO definition, the employed may include persons who are not being paid but have a 'formal attachment to their job' in the form of 'an assurance of return to work ... or an agreement as to the date of return'. Such an understanding between an employer and a person on layoff or away on training is not counted as a job in the System.

Figure 17.2 Distinguishing between employment as employee and in self-employment
Is B's job with an enterprise an employee or a self-employment job?

```
           Yes ─────  Does B work for a corporation or run a
                      one-person incorporated enterprise?

                              │ No

                      Is B owner and working boss, active                Does the enterprise
                      partner or cooperative member of a non-  ── Yes ── have employees?
                      incorporated enterprise?

                              │ No                                     No    Yes

                      Does B work in a family enterprise
                      without remuneration fixed by an implicit  ── Yes ──
                      or explicit contract?

                              │ No

                      Is B's production entirely for own
                      consumption or capital formation of his  ── Yes ──
                      or her family?

                              │ No

                      Does B select and provide significant
                      inputs (other than work clothes
                      or workspace in his or her dwelling) for  ── Yes ──
                      which he or she is not separately
                      reimbursed?

                              │ No

                      Does the implicit or explicit contract
                      terminate when the items or tasks it
           No ─────   specifies and requires have been provided  ── Yes ──
                      or performed by B?

                                                              Own-account    Employer
   B has an employee job                                      B has a self-employment job
```

17.10. Jobs may be classified not only as employee or self-employment, but also according to the standard activity classification.

3. Total hours worked

17.11. Output per job would be an excessively crude measure of productivity and total hours worked is the preferred measure of labour inputs for the System. The ILO 'Resolu-

tion concerning statistics of hours of work', adopted by the tenth International Conference of Labour Statisticians, defines hours worked as follows:

Statistics of hours worked should include:

a) Hours actually worked during normal periods of work;
b) Time worked in addition to hours worked during normal periods of work, and generally paid at higher rates than normal rate (overtime);
c) Time spent at the place of work on work such as the preparation of the workplace, repairs and maintenance, preparation and cleaning of tools, and the preparation of receipts, time sheets and reports;
d) Time spent at the place of work waiting or standing-by for such reasons as lack of supply of work, breakdown of machinery, or accidents, or time spent at the place of work during which no work is done but for which payment is made under a guaranteed employment contract;
e) Time corresponding to short periods of rest at the workplace, including tea and coffee breaks.
f) Statistics of hours actually worked should exclude:
   - hours paid for but not worked, such as paid annual leave, paid public holidays, paid sick leave;
   - meal breaks;
   - time spent on travel from home to work and vice versa.

17.12. Total hours worked is the aggregate number of hours actually worked during the year in employee and self-employment jobs.

17.13. The truism, for employee jobs, that hours worked equal hours paid less hours paid but not worked, plus hours worked but not paid, is a useful one, since many establishment surveys record hours paid, not hours worked, so that hours worked have to be estimated for each job group, using whatever information is available about paid leave, etc.

4. Full-time equivalence

17.14. An inferior alternative to expressing labour input in terms of total hours worked is to measure it in terms of full-time equivalent work years. Full-time equivalent employment is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs.

17.15. The definition does not necessarily describe how the concept is estimated. The method sometimes used, of simply counting all part-time jobs as half a full-time job, is the crudest possible way of making an estimate. Since the length of a full-time job has changed through time and differs between industries, more sophisticated methods which establish the average proportion and average hours of less than full-week full-time jobs in each job group separately are preferable.

17.16. Even if the data are good enough to permit an estimation of total hours worked, full-time equivalent employment should nevertheless also appear in the national accounts. One reason is that this facilitates international comparisons with countries which can only estimate full-time equivalent employment. The other reason is that, since the full-time annual hours of a job group vary through time, the two concepts carry a partially different message. If, for example, more sickness or annual leave is taken, both shortening average annual full-time hours and, ceteris paribus, reducing total hours worked, full-time equivalent employment will scarcely change, while total hours worked will fall. So if the former rather than the latter is used as the denominator in calculating productivity changes, productivity will rise less or fall more. A similar point applies to international comparisons. If, however, full-time annual hours did not exclude paid sick leave, but total hours worked continued to do so, more sickness would cause full-time equivalent employment to rise more or fall less than would an equal increase in annual leave, so that productivity would rise less or fall more. This would make good sense - sickness undesirably interferes with production, while annual leave is a desirable alternative to it. But if information on absence from work through sickness is not available for estimating full-time annual hours, it will not be available either for estimating total hours worked.

17.17. In practice, total hours worked and average annual full-time hours may have to be estimated. In many countries, especially for monthly paid employee jobs, only normal or usual hours, any paid overtime, and annual and holiday leave entitlements can be ascertained, and it may be impossible to estimate the subtraction to be made for average sickness leave from either total hours worked or annual full-time hours. This error will not affect full-time equivalent employment if sickness rates in part-time jobs are the same as in full-time jobs, so can be tolerated if it is unavoidable.

17.18. If the reference weeks used in the surveys that provide the data are not fully representative, the best available information on variations throughout the year should be used in estimating data for the year as a whole.

5. Employee labour input at constant compensation

17.19. Total hours worked and full-time equivalent employment are both physical measures of labour input. Output too can usually be measured in physical terms, such as tons or cubic metres, but this is not done in the national accounts, because the basic value per ton or cubic metre varies so much between products that these physical measures lack general economic significance. But compensation per hour or per full-time year of work varies enormously too, so that the physical measures of labour input also lack general economic significance. Their usefulness thus rests either upon the assumption that the mix of different kinds of labour is much the same in the different countries or at the different times examined, or upon their application in a social or political context, where interest centres upon personal welfare rather than upon the economics of production and income generation.

17.20. When output is measured both at current and at constant prices, it is natural to do the same with labour inputs as well as with intermediate inputs. However, mixed income, which is the return to self-employment, cannot be unambiguously divided between the return to labour and the returns to capital and entrepreneurship. For this reason, only the value of employee labour input (and not self-employed labour input) forms part of the System. Note that the measurement of employee labour inputs at current and constant prices is symmetrical with the measurement of output:

a)   market prices and market compensation are assumed to measure the relative economic importance of different goods, services and jobs; the advantages and disadvantages of this assumption are the same for inputs as for outputs;

b)   though the constant price and constant compensation concepts are defined as revaluations of quantities at base period prices or compensation levels, they can be estimated in practice as the sum, over all groups, of values at current price or compensation levels, each divided by an appropriate index;

c)   these group indices are estimates, calculated for a representative sample of jobs or of goods or services, with weights reflecting the relative importance of each of the subgroups represented by a selected and specified job, or by a selected and specified good or service. In other words, a compensation index is constructed like a price index.

17.21. While the value of employee labour input at constant compensation can be estimated by deflation of current values, as mentioned above, the data may also permit the direct approach of multiplying the current number of jobs in each job group by the base-period average annual compensation for jobs in that job group.

Appendix B SEAFARERS' HOURS OF WORK AND THE MANNING OF SHIPS CONVENTION, 1996 (C180)

PART I. SCOPE AND DEFINITIONS

Article 1
1.   This Convention applies to every seagoing ship, whether publicly or privately owned, which is registered in the territory of any Member for which the Convention is in force and is ordinarily engaged in commercial maritime operations. For the purpose of this Convention, a ship that is on the register of two Members is deemed to be registered in the territory of the Member whose flag it flies.
2.   To the extent it deems practicable, after consulting the representative organizations of fishing-vessel owners and fishermen, the competent authority shall apply the provisions of this Convention to commercial maritime fishing.
3.   In the event of doubt as to whether or not any ships are to be regarded as seagoing ships or engaged in commercial maritime operations or commercial maritime fishing for the purpose of the Convention, the question shall be determined by the competent authority after consulting the organizations of shipowners, seafarers and fishermen concerned.
4.   This Convention does not apply to wooden vessels of traditional build such as dhows and junks.

Article 2
For the purpose of this Convention:
a)   the term *competent authority* means the minister, government department or other authority having power to issue regulations, orders or other instructions having the force of law in respect of seafarers' hours of work or rest or the manning of ships;
b)   the term *hours of work* means time during which a seafarer is required to do work on account of the ship;
c)   the term *hours of rest* means time outside hours of work; this term does not include short breaks;
d)   the term *seafarer* means any person defined as such by national laws or regulations or collective agreements who is employed or engaged in any capacity on board a seagoing ship to which this Convention applies;
e)   the term *shipowner* means the owner of the ship or any other organization or person, such as the manager or bareboat charterer, who has assumed the responsibility for the operation of the ship from the shipowner and who on assuming such responsibility has agreed to take over all the attendant duties and responsibilities.

PART II. SEAFARERS' HOURS OF WORK AND HOURS OF REST

Article 3
Within the limits set out in Article 5, there shall be fixed either a maximum number of hours of work which shall not be exceeded in a given period of time, or a minimum number of hours of rest which shall be provided in a given period of time.

Article 4
A Member which ratifies this Convention acknowledges that the normal working hours' standard for seafarers, like that for other workers, shall be based on an eight-hour day with one day of rest per week and rest on public holidays. However, this shall not prevent the Member from having procedures to authorize or register a collective agreement which determines seafarers' normal working hours on a basis no less favourable than this standard.

Article 5
1. The limits on hours of work or rest shall be as follows:
   - maximum hours of work shall not exceed:
     - 14 hours in any 24-hour period; and
     - 72 hours in any seven-day period; or
   - minimum hours of rest shall not be less than:
     - ten hours in any 24-hour period; and
     - 77 hours in any seven-day period.
2. Hours of rest may be divided into no more than two periods, one of which shall be at least six hours in length, and the interval between consecutive periods of rest shall not exceed 14 hours.
3. Musters, fire-fighting and lifeboat drills, and drills prescribed by national laws and regulations and by international instruments shall be conducted in a manner that minimizes the disturbance of rest periods and does not induce fatigue.
4. In respect of situations when a seafarer is on call, such as when a machinery space is unattended, the seafarer shall have an adequate compensatory rest period if the normal period of rest is disturbed by call-outs to work.
5. If no collective agreement or arbitration award exists or if the competent authority determines that the provisions in the agreement or award in respect of paragraph 3 or 4 are inadequate, the competent authority shall determine such provisions to ensure the seafarers concerned have sufficient rest.
6. Nothing in paragraphs 1 and 2 shall prevent the Member from having national laws or regulations or a procedure for the competent authority to authorize or register collective agreements permitting exceptions to the limits set out. Such exceptions shall, as far as possible, follow the standards set out but may take account of more frequent or longer leave periods or the granting of compensatory leave for watchkeeping seafarers or seafarers working on board ships on short voyages.
7. The Member shall require the posting, in an easily accessible place, of a table with the shipboard working arrangements, which shall contain for every position at least:
   a) the schedule of service at sea and service in port; and

    b)   the maximum hours of work or the minimum hours of rest required by the laws, regulations or collective agreements in force in the flag State.

8.   The table referred to in paragraph 7 shall be established in a standardized format in the working language or languages of the ship and in English.

Article 6

No seafearer under 18 years of age shall work at night. For the purpose of this Article, *night* means a period of at least nine consecutive hours, including the interval from midnight to five a.m. This provision need not be applied when the effective training of young seafarers between the ages of 16 and 18 in accordance with established programmes and schedules would be impaired.

Article 7

1.   Nothing in this Convention shall be deemed to impair the right of the master of a ship to require a seafarer to perform any hours of work necessary for the immediate safety of the ship, persons on board or cargo, or for the purpose of giving assistance to other ships or persons in distress at sea.

2.   In accordance with paragraph 1, the master may suspend the schedule of hours of work or hours of rest and require a seafarer to perform any hours of work necessary until the normal situation has been restored.

3.   As soon as practicable after the normal situation has been restored, the master shall ensure that any seafarers who have performed work in a scheduled rest period are provided with an adequate period of rest.

Article 8

1.   The Member shall require that records of seafarers' daily hours of work or of their daily hours of rest be maintained to allow monitoring of compliance with the provisions set out in Article 5. The seafarer shall receive a copy of the records pertaining to him or her which shall be endorsed by the master, or a person authorized by the master, and by the seafarer.

2.   The competent authority shall determine the procedures for keeping such records on board, including the intervals at which the information shall be recorded. The competent authority shall establish the format of the records of the seafarers' hours of work or of their hours of rest taking into account any available International Labour Organization guidelines or shall use any standard format prepared by the Organization. The format shall be established in the language or languages provided by Article 5, paragraph 8.

3.   A copy of the relevant provisions of the national legislation pertaining to this Convention and the relevant collective agreements shall be kept on board and be easily accessible to the crew.

Article 9

The competent authority shall examine and endorse the records referred to in Article 8, at appropriate intervals, to monitor compliance with the provisions governing hours of work or hours of rest that give effect to this Convention.

Article 10

If the records or other evidence indicate infringement of provisions governing hours of work or hours of rest, the competent authority shall require that measures, including if necessary the revision of the manning of the ship, are taken so as to avoid future infringements.

PART III. MANNING OF SHIPS

Article 11

1.   Every ship to which this Convention applies shall be sufficiently, safely and efficiently manned, in accordance with the minimum safe manning document or an equivalent issued by the competent authority.
2.   When determining, approving or revising manning levels, the competent authority shall take into account:
      a)   the need to avoid or minimize, as far as practicable, excessive hours of work, to ensure sufficient rest and to limit fatigue; and
      b)   the international instruments identified in the Preamble.

Article 12

No person under 16 years of age shall work on a ship.

PART IV. RESPONSIBILITIES OF SHIPOWNERS AND MASTERS

Article 13

The shipowner shall ensure that the master is provided with the necessary resources for the purpose of compliance with obligations under this Convention, including those relating to the appropriate manning of the ship. The master shall take all necessary steps to ensure that the requirements on seafarers' hours of work and rest arising from this Convention are complied with.

PART V. APPLICATION

Article 14

A Member which ratifies this Convention shall be responsible for the application of its provisions by means of laws or regulations, except where effect is given by collective agreements, arbitration awards or court decisions.

Article 15

The Member shall:

a)   take all necessary measures, including the provision of appropriate sanctions and corrective measures, to ensure the effective enforcement of the provisions of this Convention;

b)   have appropriate inspection services to supervise the application of the measures taken in pursuance of this Convention and provide them with the necessary resources for this purpose; and

c)   after consulting shipowners' and seafarers' organizations, have procedures to investigate complaints relating to any matter contained in this Convention.

Appendix C EURSTAT - LABOUR FORCE SURVEY - METHODS AND DEFINITIONS 2001

Basic concepts and definitions

The main statistical objectives of the Labour Force Survey is to divide the population of working age (15 years and above) into three mutually exclusive and exhaustive groups - persons in employment, unemployed persons and inactive persons - and to provide descriptive and explanatory data on each of these categories. Respondents are assigned to one of these groups on the basis of the most objective information possible obtained through the survey questionnaire, which principally relates to their actual activity within a particular reference week.

The section 'EU list of questions' together with the explanatory notes show how the survey questioning is organised. Most questions apply to selected groups only. A filter based on information already obtained specifies who should answer a particular question.

The definitions of employment and unemployment used in the Community Labour Force Survey closely follow those adopted by the 13th International Conference of Labour Statisticians.

Employment

A person is considered as having an employment if he or she did any work for pay or profit during the reference week 'Work' means any work for pay or profit during the reference week, even for as little as one hour. Pay includes cash payments or 'payment in kind' (payment in goods or services rather than money), whether payment was received in the week the work was done or not. Also counted as working is anyone who receives wages for on-the-job training which involves the production of goods or services (ESA 11.13 f). Self-employed persons with a business, farm or professional practice are also considered to be working if one of the following applies :

1) a person works in his own business, professional practice or farm for the purpose of earning a profit, even if the enterprise is failing to make a profit;

2) a person spends time on the operation of a business, professional practice or farm even if no sales were made, no professional services were rendered, or nothing was actually produced (for example, a farmer who engages in farm maintenance activities; an architect who spends time waiting for clients in his/her office; a fisherman who repairs his boat or nets for future operations; a person who attends a convention or seminar);

3) a person is in the process of setting up a business, farm or professional practice; this includes the buying or installing of equipment, and ordering of supplies in preparation for opening a new business. An unpaid family worker is said to be working if the work contributes directly to a business, farm or professional practice owned or operated by a related member of the same household.

Self-employed persons

If self-employed persons are absent from work, then they are regarded as in employment only if they can be said to have a business, farm or professional practice. This is the case if one or more of the following conditions are met:
- machinery or equipment of significant value, in which the person has invested money, is used by him or his employees in conducting his business, an office, store, farm or other place of business is maintained;
- there has been some advertisement of the business or profession by listing the business in the telephone book, displaying a sign, distributing cards or leaflets, etc.

Person who works on their own small agriculture farm, who do not sell their products, but produce only for their own consumption

The classification as employment of persons who works on their own small agriculture farm, who do not sell their products, but produce only for their own consumption depends on whether it falls within the production boundaries. When this production is included in national accounts, underlying employment must be identified. This depends on the relative quantitative importance of the production of agricultural products for own consumption in relation to the total supply of these products in a country (ESA 3.08)

Conscripts

Conscripts who performed some work for pay or profit during the reference week should not be considered in employment.

Seasonal workers

During the off-season, seasonal workers cannot be considered as having a formal attachment to their high-season job— because they do not continue to receive a wage or salary from their employer although they may have an assurance of return to work.

Maternity and paternity leave

Maternity leave is first given to the mother (but may include the leave of the father in the case of a transfer of the entitlements) and corresponds to the compulsory period of the leave stipulated by national legislation to ensure that mothers before and after childbirth have sufficient rest, or for a period to be specified according to national circumstances. People in maternity leave should always be considered in employment.

Parental leave

Parental leave can be taken either by the mother or the father and is the interruption of work in case of childbirth or to bring up a child of young age. It corresponds to the period when parents receive 'parental leave benefit'. People in fulltime parental leave should be treated as a case of long term absence from work.

Unpaid family workers

The unpaid family worker can be said to have a job but not be at work if there is a definite commitment by the employer (a related household member) to accept his/her return to work and the total absence does not exceed a period of 3 months. In this point Eurostat diverges from the ILO recommendation.

Lay-offs

A person on lay-off is one whose written or unwritten contract of employment, or activity, has been suspended by the employer for a specified or unspecified period at the end of which the person concerned has a recognized right or recognized expectation to recover employment with that employer.
Lay-offs are classified as employed if they receive ≥50% of their wage or salary from their employer or have an assurance of return to work within a period of 3 months.

Long-term absence from work

If the total absence from work (measured from the last day of work to the day on which the paid worker will return) exceeds three months then a person is considered to have a job only if he/she continues to receive ≥50% of the wage or salary from their employer (ESA 11.14a).

Appendix D STRUCTURAL BUSINESS STATISTICS - EMPLOYMENT

Code 16 11 0
Title Number of persons employed

Definition

The number of persons employed is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It includes persons absent for a short period (e.g. sick leave, paid leave or special leave), and also those on strike, but not those absent for an indefinite period. It also includes part-time workers who are regarded as such under the laws of the country concerned and who are on the payroll, as well as seasonal workers, apprentices and home workers on the payroll.

The number of persons employed excludes manpower supplied to the unit by other enterprises, persons carrying out repair and maintenance work in the enquiry unit on behalf of other enterprises, as well as those on compulsory military service.

Unpaid family workers refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to those persons who are not included on the payroll of another unit as their principal occupation.

Note: In order to check the comparability of data, it is necessary to indicate whether voluntary workers have been included under this heading or not.

Link to company accounts

The number of persons employed is recorded in the notes on the company accounts (Article 43(8)).

Link to other variables

The number of persons employed may be broken down into the number of employees (16 13 0) and unpaid workers.

Code 16 13 0
Title Number of employees

Definition

The number of employees is defined as those persons who work for an employer and who have a contract of employment and receive compensation in the form of wages, salaries, fees, gratuities, piecework pay or remuneration in kind.

The relationship of employer to employee exists when there is an agreement, which may be formal or informal, between an enterprise and a person, normally entered into voluntarily by both parties, whereby the person works for the enterprise in return for remuneration in cash or in kind.

A worker is considered to be a wage or salary earner of a particular unit if he or she receives a wage or salary from the unit regardless of where the work is done (in or outside the production unit). A worker from a temporary employment agency is considered to be an employee of the temporary employment agency and not of the unit (customer) in which they work.

In particular the following are considered as employees:
- paid working proprietors,
- students who have a formal commitment whereby they contribute to the unit's process of production in return for remuneration and/or education services;
- employees engaged under a contract specifically designed to encourage the recruitment of unemployed persons;
- homeworkers if there is an explicit agreement that the homeworker is remunerated on the basis of the work done and they are included on the payroll.

The number of employees includes part-time workers, seasonal workers, persons on strike or on short-term leave, but excludes those persons on long-term leave.

The number of employees does not include voluntary workers.

The number of employees is calculated in the same manner as the number of persons employed, namely as the number of jobs and is measured as an annual average.

Link to other variables

Part of the Number of persons employed (16 11 0).
Many categories of employees are identified separately:
- number of part-time employees (16 13 1);
- number of apprentices (16 13 2);
- number of homeworkers (16 13 5).

Code 16 13 1
Title Number of part-time employees

Definition

This is a division of the number of employees calculated by reference to the number of hours worked per week for which they are paid; this number of hours is considered in relation to the length of what is considered to be a full-time working week in the Member State or the sector of the unit or the unit itself.

Part-time workers are persons whose usual hours of work are less than the normal working hours. This definition encompasses all forms of part-time work (half-day work, work for one, two or three days a week, etc.). This number may be established at the national, regional, industrial or unit level.

The number of employees may be broken down according to the weekly number of hours which they work. This number of hours is considered in relation to the length of what is regarded as a standard full-time working week in the Member State, region, industry or unit.

It should be noted that whereas the 'full-time employee` category is relatively homogeneous, the same cannot be said of the 'part-time employee` category since this can cover anything between 20 % or even less and 80 % or more of the normal working hours of the employing unit.

It is impossible to establish an exact distinction between part-time and full-time work due to variation in working practices between Member States and industries.

Part-time employees (duration of work less than the norm) and intermittent/seasonal employees (who may work full time but for a fixed short period, e.g. temporary workers, film crew, etc.) should not be confused.

Link to other variables

Part of Number of employees (16 13 0)

Code 16 13 2
Title Number of apprentices

Definition

All employees who do not participate fully in the production process of the unit because they are working under an apprentice's contract or because the fact that they are undertaking vocational training impinges significantly on their productivity are included in this variable.

Link to other variables

Part of Number of employees (16 13 0)

Code 16 13 5
Title Number of homeworkers

Definition

Homeworkers are a sub-division of persons employed of the observation unit who carry out their professional activity from their own home. Only homeworkers who appear on the payroll of the observation unit should be included.

Link to other variables

Part of Number of employees (16 13 0)

Code 16 14 0
Title Number of employees in full-time equivalent units

Definition

The number of employees converted into full-time equivalents (FTE).

Figures for the number of persons working less than the standard working time of a full-year full-time worker, should be converted into full-time equivalents, with regard to the working time of a full-time full-year employee in the unit.

Included in this category are people working less than a standard working day, less than the standard number of working days in the week, or less than the standard number of weeks/months in the year. The conversion should be carried out on the basis of the number of hours, days, weeks or months worked.

Link to other variables

The Number of hours worked by employees (16 15 0) or the Number of part-time employees (16 13 1) may be used in the conversion of the Number of employees (16 13 0) into full-time equivalents.

Code 16 15 0
Title Number of hours worked by employees

Definition

The total number of hours worked by employees represents the aggregate number of hours actually worked for the output of the observation unit during the reference period.

This variable excludes hours paid but not actually worked such as for annual leave, holidays and sick leave. It also excludes meal breaks and commuting between home and work.

Included are hours actually worked during normal working hours; hours worked in addition to those; time which is spent at the place of work on tasks such as preparing the site and time corresponding to short periods of rest at the work place.

If the exact number of hours actually worked is not known, it may be estimated on the basis of the theoretical number of working hours and the average rate of absences (sickness, maternity, etc.).

Link to other variables

The number of hours worked by employees may be used in the conversion of the Number of employees (16 13 0) into the Number of employees in full-time equivalent units (16 14 0).

Appendix E EUROSTAT - TARGET METHODOLOGY FOR AGRICULTURAL LABOUR INPUT (ALI) STATISTICS (Rev. 1)

1. Foreword

1.01. Although Member States have been producing data on the volume of agricultural labour since the 1970s, and labour input has formed an integral part of the three indicators of the income derived from agricultural production that have been published since 1985 (the revised indicators featuring in 2.04.), it was not until 1995 that the Statistical Office of the European Communities laid down the target concepts, methods and definitions behind the data.

1.02. This original target methodology on agricultural labour input statistics was compatible with the concepts, ideas and rules of accounting laid down in the Economic Accounts for Agriculture (EAA), which itself was founded in the European System of Integrated Economic Accounts (ESA).

1.03. The revision of the European System of Integrated Economic Accounts (ESA) in 1995[1] (1) and the need to adapt to economic and structural developments in the agricultural industry have now led to considerable changes in the Economic Accounts for Agriculture. The revised EAA was first published in 1997 and then updated in 2000[2] (2), and accounts, in some cases going back to 1973 and earlier, are being prepared on the basis of the new methodology.

1.04. In order to be fully compatible with the revised EAA, the concepts, methods and definitions for agricultural labour input statistics have also needed to be revised. This publication presents the revised methodology that has been discussed and adopted by the Working Party on the Economic Accounts for Agriculture. The Manual has, like the EAA, had to satisfy methodological consistency on the one hand with practicality on the other.

2. General features of agricultural labour input statistics

Introduction

2.01. Agricultural labour input statistics were established in response to the specific needs of the European Union. The *first and principal objective* of calculating agricultural labour input statistics is to express trends in and levels of agricultural income (one of the basic ob-

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[1] The revision to the ESA was made following the 1993 revision of the System of National Accounts (SNA).

[2] Eurostat (2000) Manual on the Economic Accounts for Agriculture and Forestry, EAA/EAF '97 (Rev. 1.1), produced in the Theme 5, Series E line.

jectives underlying the Economic Accounts for Agriculture) in relation to the trends in agricultural labour input. A *second objective* is general macroeconomic productivity analyses.

2.02. A system of harmonised agricultural labour input statistics within the European Union should provide an overview of the volume of labour in the agricultural industry that is systematic, comparable and as complete as possible, to serve as a basis for analyses, forecasts and political measures.

2.03. The differences in the structure of the agricultural industry among the Member States, in terms of activities, working time and units, mean that general criteria have had to be established and set out clearly. The purpose of this Manual is to do just that.

Summary of the main features of agricultural labour input statistics

2.04. Eurostat's revised Manual on Economic Accounts for Agriculture defines three Income Indicators, the results and analysis of which are published in the annual Income from Agricultural Activity report. These three Income Indicators have been defined as follows:
- index of the real income of factors in agriculture *per annual work unit of total agricultural labour input* (Indicator A);
- index of real net agricultural entrepreneurial income per *annual work unit of non-salaried agricultural labour input* (Indicator B);
- net entrepreneurial income of agriculture (Indicator C).

2.05. The EAA therefore requires that the annual series of the volume of agricultural labour be classified according to non-salaried, salaried and total agricultural labour input[1].

2.06. It also requires that agricultural labour be measured in what are called *Annual Work Units* Cf. 2.10.). There is a considerable degree of part-time work in agriculture. Its importance varies between the Member States, reflecting the structure of agriculture (farm sizes, types of farming etc.) and opportunities for part-time work in other sectors of the economy, among others. For these reasons, analysis of EU-wide income trends and income levels on the basis of the volume of work carried out by those engaged in agricultural production is, therefore, more precise than basing it on the number of persons engaged in agriculture.

2.07. This revised manual on agricultural labour input statistics expands on and defines these requirements in a way that is fully compatible with and integrated into the revised Economic Accounts for Agriculture.

2.08. The essential requirements of agricultural labour input statistics that are summarised below should be read in conjunction with the fuller details in this manual.

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[1] For other purposes, the classification of agricultural labour according to family ties with the holder (family, non-family and total agricultural labour input) remains useful.

2.09. *The definition of work* (Cf. 3.16. - 3.19.): agricultural labour input should include all work actually performed[1] (4) in connection with the production of produce from the agricultural activities and the inseparable non-agricultural activities of the agricultural units defining the industry.

2.10. *The unit of measurement* (Cf. 3.20. - 3.23.): agricultural labour input must be expressed in Annual Work Units (AWUs). The number of hours comprising an AWU should correspond to the number of hours actually worked in a full-time job within agriculture. The definition may vary between Member States (Cf. 3.25.)

2.11. *The coverage of these statistics*: in order to establish the correct measure of the income indicators, the volume of agricultural labour (the denominator) should correspond to that carried out in order to generate the agricultural income (the numerator) recorded for a given year. In this respect, agricultural labour input must correspond to the value of output, intermediate consumption and value added as recorded in the Economic Accounts for Agricultural (EAA). Importantly, the volume of salaried agricultural labour (Cf. 3.31.) should be coherent with the item 'compensation of employees' as recorded in the EAA (Cf. 3.32.).

3. Defintions, methods and features of agricultural labout input statistics

3.01. In order to understand better the measurement of agricultural labour input it first makes sense to examine the scope of the agricultural industry in which this agricultural labour operates. The framework used for this description of the agricultural industry is the revised Economic Accounts for Agriculture.

The agricultural industry

3.02. The output of the agricultural industry results from two kinds of activity, the labour input of which must be taken into account in agricultural labour input statistics (within the constraint mentioned in 3.22.). The activities represent *agricultural activites* (main or secondary) performed by agricultural units and *inseparable non-agricultural secondary activities* of agricultural units.

3.03. The economic *activities characteristic of agriculture* in the EAA have essentially been drawn from a classification scheme known by the abbreviation NACE Rev.1.
Group 01.1: Growing of crops; market gardening; horticulture:
- as regards seeds production, only the activity of reproduction ('multiplication');
- as regards wine/olive oil production, only the production from selfproduced grapes/olives and the production activity of the producers group (co-operatives);
  - group 01.2: Farming of animals;
  - group 01.3: Growing of crops combined with farming of animals;

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[1] Therefore, agricultural labour input should not represent the time available for work.

- group 01.4: Agricultural and animal husbandry service activities, except veterinary services; only the agricultural services which are contract work in the sense of the current EAA;
- group 01.5: Hunting, trapping and game propagation including related service activities.

3.04. The basic unit covered by the Economic Accounts for Agriculture is what is termed the local kind-of-activity unit (local KAUs). The agricultural holding, which is the unit most commonly used for statistical studies on agriculture, constitutes the most appropriate local KAU for the agricultural industry. To this must be added other units such as wine and olive-oil co-operatives, contract work enterprises etc.

3.05. The contract work enterprises that comprise part of the agricultural industry are specialised units which provide machines, equipment and personnel for *the performance of contract work at the agricultural production stage* (commercial enterprises engaged in contract work or agricultural holders providing services as contractors). Under a stricter interpretation, these units, which must be included in the agricultural industry, must perform work that (a) is part of the agricultural production process, (b) is linked to the production of agricultural products, (c) is customarily performed by agricultural holdings and (d) is *actually* performed entirely by specialist units providing machines, equipment and labour. (EAA (Rev. 1.1), p12, 1.15.3).

3.06. Since the purpose of the EAA is to measure, describe and analyse the formation of income from agricultural economic activity (which, in the Member States of the EU, is almost exclusively a commercial activity), it was decided to *exclude units that produce solely for own final consumption* (e.g. kitchen gardens and private livestock rearing). This type of 'small' unit should be recorded if it is above the minimum threshold used in the Survey on the Structure of Agricultural Holdings[1] (EAA (Rev. 1.1), p12, 1.16.).

3.07. The use of the local KAU (to which the agricultural holding often approximates) as the basic unit for the agricultural industry also entails recording non-agricultural secondary activities where they cannot be distinguished from the main agricultural activity.

3.08. *Inseparable non-agricultural secondary activities* of local agricultural KAUs are defined as activities closely linked to agricultural production for which information on any of production, intermediate consumption, compensation of employees, *labour input* or gross

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[1] Article 6 of Council Regulation (EEC) N° 571/88 of 29 February 1988 states that the surveys between 1988 and 1997 cover: agricultural holdings where the agricultural area utilised for farming is one hectare or more; agricultural holdings where the agricultural area utilised for farming is less than one hectare, if they produce a certain proportion for sale or if their production unit exceeds certain physical thresholds.

Member States using a different threshold must fix it at a level which excludes only the smallest holdings which together contribute no more than 1% of the total standard gross margin (SGM), within the meaning of Decision 85/377/EEC, for the country concerned.

It has been agreed that the thresholds used by the Member States in the 1999/2000 survey and beyond (for an unspecified time) will remain as in Council Regulation N°571/88. This will be confirmed in a new Regulation appearing in the Autumn 1999.

fixed capital formation cannot be separated from information on the main agricultural activity during the period of statistical observation. (EAA (Rev. 1.1), p12, 1.18.1.).

3.09. The main characteristics of these inseparable non-agricultural secondary activities are as follows:
- they must be intended for sale or barter (during the accounting period or later, after storage), own final consumption by the producer or as payment in kind (including compensation in kind paid to employees);
- they must not be ancillary activities. The latter are supplementary activities (e.g. sales, marketing, warehousing, transport for own account; see ESA 95, 3.12 and 3.13, and SNA 93, 5.9 to 5.16) carried out by an enterprise in order to create the conditions for conducting the main or secondary activities. Typically, the output of ancillary activities appears as input in the different types of productive activity;
- by convention, they may not include activities involving gross fixed capital formation of non-agricultural products (such as buildings or machines) for own account. This production for own final consumption is presumed to be a separable activity and is recorded as the production of an identifiable local KAU. Accommodation services made available to employees as remuneration in kind must be treated in a similar manner (they are recorded as remuneration in kind in the generation of income account);
- they must be characteristic of agricultural holdings, i.e. they must be of significant economic importance for a significant number of holdings;
- agricultural 'contract work' is not a non-agricultural activity since it is a characteristic activity (agricultural services) of the agricultural industry. (EAA (Rev. 1.1), p13, 1.18.2.).

3.10. Only that part of a specific non-agricultural secondary activity which is *not seperable* must be included. As a consequence, a given non-agricultural activity will be included in the agricultural industry if it is impossible to separate it from the main agricultural activity of a local KAU, but will be excluded if it can be separated from the main agricultural activity, in which case the secondary activity gives rise to a nonagricultural local KAU. The selection criterion for non-agricultural secondary activities that are inseparable is not so much the nature of the product as the type of activity[1]. For example, agro-tourism services provided by a farm must only be included if they cannot be separated from its agricultural activities. This would probably not be the case when these activities become important. Thus, non-agricultural products accounted for in the production of the agricultural industry may vary geographically and over time . (EAA (Rev. 1.1), p13, 1.18.3.).

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[1] Note however that some secondary activities are always considered separable from agricultural activity e.g. renting out of buildings or dwellings.

3.11. Two main types of inseparable non-agricultural secondary activity may be distinguished:

- *Activities which represent continuation of Agricultural activity and which use agricultural products*. This type of activity can be found in the European Union Member States. The processing of agricultural products is the typical activity of this group:
  - *Processing agricultural products*:
    - milk into butter, cream, cheeses, yoghurts and other dairy products;
    - fruit and vegetables into fruit juices, tinned foods, alcoholic beverages and other products;
    - grapes, must and wine into alcoholic products (e.g. sparkling wine, such as Champagne, and spirits, such as Cognac);
    - plaiting of vegetable material/textiles/wool;
    - production of pâtés, foie gras and other processed meat products;
    - processing of other agricultural products;
  - *grading and packaging* of agricultural products, e.g. eggs and potatoes;
- *activities involving the Agricultural holding and its means of Agricultural production (equipment, installation buildings, workforce)*. These activities are basically the following:
  - *agro-tourism* - camping, catering, hotels, various kinds of accommodation, etc.
  - *farm shops* - retail trade activities concerning products other than those from the holding. Direct sales of agricultural products raw or processed are recorded in the output of the products concerned.
  - *sports and rural recreation* **-** the use of land for activities such as golf, horse-riding, hunting, fishing, etc.
  - *services ofr third parties* **-** e.g. the renting and repair of agricultural machinery, irrigation projects, agricultural advisory services, product storage, maintenance of farm buildings, commercial services relating to agricultural products, transport of agricultural products, etc. These activities are recorded as secondary activities, only if they are performed for a third party. When performed for own-account, they are ancillary activities, which are not recorded in the accounts.
  - *landscaping services* - grass mowing, hedge trimming, snow clearing, laying out, planting and maintenance of green areas and the like.
  - *fish farming*
  - *other activities involving the sue of land and the means of agricultural production*.

(EAA (Rev. 1.1), p13-14, 1.18.4)

3.12. The list of non-agricultural secondary activities is however given by way of illustration and does not apply in every country. On the contrary, each country has to compile its own list of inseparable non-agricultural secondary activities, depending on the characteristics of its agriculture. (EAA (Rev. 1.1), p14, 1.18.5.).

3.13. The agricultural secondary activities of non-agricultural units are […deemed to be …] negligible and are recorded as zero *by convention. Agricultural production carried out by a non-agricultural unit is in fact considered to be always separable* […and therefore in-

cluded in the EAA…] in terms of accounting data, because of the specific features of the products and the means of agricultural production as well as the data sources and methods used for drawing up the resulting EAA. In order to base the EAA on the industry concept, the output of all agricultural products, excluding those products arising from the secondary activities of nonagricultural local KAUs, has to be measured. As these by convention are deemed to be zero, all agricultural production is recorded (with the exception of kitchen gardens and private livestock rearing). (EAA (Rev. 1.1), p14, 1.18.6.).

3.14. The coverage of the output of the agricultural industry and the labour input used in generating this output must, therefore, be coherent. In theory, this means that the agricultural labour input statistics compiled by Member States should include the agricultural labour input carried out performing agricultural activities and, explicitly, the labour input on inseparable non-agricultural secondary activities of agricultural holdings. However, it should be borne in mind, that no person engaged in these combined activities can be counted as more than 1 Annual Work Unit (AWU) per year.

3.15. As far as agricultural labour input statistics are concerned, this new approach to the accounts better reflects the reality of agriculture (certainly as viewed by a farmer) as it now includes labour used for non-agricultural activities that are inseparable from agricultural activities.

The definition of work

3.16. The total number of hours worked in agriculture represents the aggregate number of hours actually worked as an employee or a self-employed person during the calendar year, when the output of this work is included in the output of the agricultural industry (Cf. 3.02. - 3.15.).

3.17. Total hours actually worked cover:
- hours actually worked during normal working hours;
- hours worked in addition to those worked during normal working hours, and generally paid at higher rates than normal rate (overtime);
- time that is spent at the place of work on tasks such as preparing the site, repair and maintenance work, the preparation and cleaning of tools, and the making-out of receipts, invoices, records of the length of time worked and other reports;
- idle time spent at the place of work waiting or standing by because, for example, of temporary lack of work, the breakdown of machinery or accidents, or time spent at the place of work during which no work is done but for which payment is made under a guaranteed employment contract;
- time corresponding to short periods of rest at the work place, including refreshment breaks.

3.18. Hours actually worked do *not* include:
- hours which are paid but not worked, such as paid annual holidays, public holidays, or sick-leave;

-   breaks for meals;
-   time spent for travelling between home and the place of work, even when paid (perhaps contract workers). However, such travel organised in employers' time is included in hours of work.

3.19. All persons of retiring age who continue to work on the holding are included in the farm labour force.

The unit of measurement

3.20. Total labour input is measured in Annual Work Units (AWUs), which are defined, according to SNA principles, as *full-time equivalent employment, i.e. the total hours worked divided by the average annual hours in full-time jobs within its economic territory* (SNA , 1993, p. 412).

3.21. Unless there are reasons for preferring alternative sources, the AWU representing 'full-time' work should be based on the current definition in Eurostat's Structure on the Survey of Agricultural Holdings *as the minimum hours required by the national provisions governing contract of employment[1]. If these do not indicate the number of actual hours, 1800 hours is to be taken as the minimum figure (225 working days of 8 hours per day).*

3.22. Given that the volume of agricultural labour is being calculated on the basis of full-time equivalent jobs, no one person can therefore represent more than one AWU. This constraint holds even if it is known that someone is working on agricultural activities for more than the number of hours defining full-time in the Member State concerned. It should be noted, however, that there may be an effect to consider from the constraint of 1 AWU per person when using AWUs to represent labour input as part of some productivity measures.

3.23. The theoretical and practical definitions of the AWU imply that the number of hours comprising an AWU can change over time, that it is not necessarily the same for all sectors of the economy within any given country (the co-efficient used to convert hours into AWU or vice-versa may be different in agriculture from the average of the whole economy) and that it is likely to vary from one country to another. This is because the number of hours comprising an Annual Work Unit is in one sense determined by social factors and therefore subject to permanent change.

The method of measurement

3.24. The agricultural labour input of persons who work less than full-time job on agricultural holdings is calculated as the quotient of the number of hours actually worked (per week or per year) and the number of hours actually worked (per week or per year) in a full-time job (c.f. Appendix 1).

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[1] It should be noted that the Labour Force Survey states that part-time work should not exceed 35 hours per week and full-time work should not fall beneath 30 hours per week.

3.25. The number of hours actually worked in a full-time job is not necessarily the same for all categories of labour. It is possible that the number of hours comprising a 'full-time job' used for self-employed persons is greater than that used for employees[1]. For in the latter case, the maximum number of hours to be worked are laid down in a contract. It is also the case that the number of hours comprising a 'full-time job' is partly determined by the social factors at play in the country concerned. Together these reasons explain why the definition of an AWU often varies from one Member State to another[2].

3.26. The number of hours worked by a person is not to be adjusted by some coefficient because of age (i.e. under 16 or over 65) or gender. Equality must be applied. 'Fulltime' is determined by the number of hours worked and not as an evaluation of an amount and/or a quality produced.

3.27. Over time, it is inevitable that social developments affecting the working week will occur, even in agriculture. In practice, this has corresponded to a downward revision in the number of hours defining an Annual Work Unit. Where the ALI have been drawn from data sources that express the volume of labour in hours or in days[3], the downward revision of the AWU can create a discontinuity in the series, if the change in the definition of an AWU is introduced in an abrupt manner. In some Member States there appear to have been such discontinuities in the series. These have resulted in an underestimate of the rate of change in the volume of agricultural labour for the given year, with the associated impact on the estimates of agricultural income per AWU.

3.28. However, if the impact of a definitional change is introduced in small steps, this does not represent a discontinuity in the development of the agricultural labour input, nor therefore in the income aggregates expressed per AWU.

3.29. In order to compile more coherent ALI series, therefore, it is suggested that for those years in which the definition of an AWU is adjusted abruptly and to a large degree, it is preferable to express labour input in terms of both the 'old' and the 'new' AWU definitions.

3.30. Time series for the volume of agricultural labour and the related income indicators could be presented in two ways:
-       by an index-number, without any adjustment for the periodic and abrupt changes of the number of working hours of an AWU; but preferably

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[1] In former Western Germany, full-time equivalent employment was 42 hours per week for family workers but 38 hours per week for non-family workers.

[2] The following definitions of the AWU are currently in use: B: 2200 hours EL: 2200 hours IRL: 1800 hours NL: 1900 hours FIN: 1800 hours DK: 1739 hours E: 1826 hours I: 1800 hours A: 2000 hours S: 1800 hours D: 2218 hours and 2112 hours F: 2200 hours L: 2200 hours P: 2200 hours UK: 2200 hours

[3] In the case of the Farm Structure Survey, the number of working days is only recorded for the category of non-family labour force employed on an occasional or seasonal basis. Family workers and permanent wage earners declare their labour input by reference to a full-time equivalent. Therefore, in the case of the FSS as with other data sources that use reference to a full-time equivalent, the break in the series caused by a downward revision in the definition of an AWU would be relatively small.

- by a chain-index (see Appendix 2), where the periodic and abrupt changes in the definition of an AWU are insulated. The annual rates of change in agricultural labour input, expressed in current AWUs (with exception of the years in which the definition of an AWU is changed), are joined and presented as a chain-index. Implicitly, a time series is being presented, based on the number of working hours of an AWU in a base-period.

The definitions of salaried and non-salaried labour

3.31. *Salaried* labour refers to those persons who, by agreement, work for another residential unit (public or private) and who receive in exchange a remuneration in cash or in kind (recorded as compensation of employees in the EAA). Some black market labour should be considered as salaried labour input in this context.

3.32. The *compensation of employees* comprises the following components (EAA (Rev. 1.1), p70-71, 3.08 and 3.09.1):
- gross wages and salaries (in cash and in kind):
    - direct basic wages and salaries (payable at regular intervals);
    - enhanced rates for overtime, night or weekend work, work of a particularly arduous nature, etc.;
    - cost of living and accommodation allowances;
    - wage benefits such as Christmas, end-of-year, holiday or productivity bonuses and allowances for higher grades; - allowances for transport to and from work;
    - compensation for days not actually worked, paid holidays;
    - commissions, tips, attendance fees;
    - other allowances or occasional payments linked to overall company results as part of profit-sharing schemes;
    - payments made by employers contributing to asset formation by employees;
    - one-off payments to employees when they leave the enterprise, in so far as the payments are not made under a collective agreement;
    - housing allowances payable in cash by employers to their employees;
    - goods and market services made available by employers to their employees free or at reduced prices, insofar as this expenditure is effected clearly and primarily for the benefit of the employees.
- employers' social contributions (actual and imputed).

3.33. *Non-salaried labour* refers to persons whose work is paid through the income generated by agricultural activity. They are mostly sole-owners or joint-owners of unincorporated enterprises or of some companies specific to agriculture.

3.34. *Total agricultural labour input* is the sum of the labour input of both the non-salaried and salaried labour input in the agricultural industry..

3.35. It should be noted that the classification of agricultural labour on the basis of salaried / non-salaried work is different from the previous target classification, that was based on

family links with the holder (family and non-family labour). Quite apart from the coherence with the EAA, there are other reasons for the change in classification of agricultural labour input statistics that make sense.

3.36. In some Member States, a family member being paid a salary for the work carried out on the holding is a growing phenomenon. Additionally, there are an increasing number of farms that have their own legal status. Such farms do not fit into the mould of the traditional family farm. The treatment of such farms is addressed later (Cf. 3.45.).

The treatment of the labour input on various units

3.37. There are various types of agricultural holding in the European Union. The most common form of agricultural unit in the European Union is the unincorporated enterprise (e.g. sole proprietorship). However, there are an increasing number of farms that have a legal status[1]. There are also a number with a quasi-legal basis.

3.38. The volume of agricultural labour of these various agricultural holdings may be analysed differently. General guidelines must therefore be laid out for the Member States explaining how and why the labour input of different types of enterprise may be treated differently.

3.39. As with other decisions regarding the treatment of agricultural labour input, it is necessary to look at the treatment of such units defining the agricultural industry in the revised Manual on the Economic Accounts for Agriculture.

3.40. The net entrepreneurial income of the agricultural industry comprises (EAA (Rev. 1.1), p89, 4.10) :
- the 'mixed' entrepreneurial income of sole proprietorships [(unincorporated enterprises)];
- the 'straight' [(pure)] entrepreneurial income of 'conventional' companies;
- the 'mixed' entrepreneurial income of companies specific to the agricultural industry.

3.41. The labour input of these three general types of enterprise need to be classified under the new system as either 'non-salaried' or 'salaried' work. To help make the choice of which category to take for various forms of enterprise it is necessary to look in greater detail at the meaning of the terms 'conventional' and 'specific'.

3.42. The revised EAA Manual does not include a list of all the types of legal holding in the Member States. However, it does give a general interpretation. 'Conventional' companies have a similar organisational structure to that of companies in other sectors of the economy. 'Specific' companies might be created by a group of farmers to pool land and la-

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[1] The SNA does provide a partial list of what it calls 'corporations' in paragraph 4.23.; 'corporations, incorporated enterprises, public limited companies, public corporations, private companies, joint-stock companies, limited liability companies, limited liability partnerships and so on '.

bour (like a co-operative) or by a farmer, who for tax purposes, creates a specific separate company for the commercial part of his activity (12).

3.43. In the case of *unincorporated enterprises (sole proprietorship)* the labour of the holder should be treated as non-salaried labour input. The labour input of family workers may be treated as either non-salaried or salaried. If the compensation of family members is predefined and calculated according to their actual work, rather than according to the income generated on the holding, then such labour would be considered salaried labour input. Where this is not the case because they share in the income generated by the holding then their remuneration will be recorded as part of mixed income and the labour input as non-salaried. There must be *consistency between the treatment of the compensation of employees in the Economic Accounts for Agriculture and the classification of salaried labour input*. By convention, labour of non-family workers would automatically be classified as salaried labour input

.3.44. In the case of '*conventional*' companies, all the labour input performed on the holding would be considered as salaried labour input.

3.45. In the case of '*specific*' companies, the labour input of workers would generally be treated in the same manner as sole proprietorships. For example, a specific company might employ salaried workers (salaried labour input), whilst the directors / shareholders share in the mixed income of the unit (non-salaried labour input).

3.46. These can currently be no more than general guidelines, since Eurostat does not know all the farm types with a legal entity in the Member States. Additionally, there is likely to be a grey area regarding how some types of farms should be treated in the accounts across Member States, at least in the short-term. This may, therefore, lead to the different treatment of some agricultural enterprises among the Member States.

3.47. Nevertheless, there should be *coherence between the treatment of the compensation of employees and the classification of salaried labour input in the these various forms of agricultural unit*. Where the compensation of employees is calculated for various forms of enterprise, then the corresponding part of the agricultural labour of these enterprises must be recorded as salaried labour input[1].

4. Sources of labour data

4.01. Eurostat gathers data on agricultural labour input statistics according to what is termed a Gentleman's agreement with the Member States. Member States have agreed without the necessity of a legal basis to harmonise their data to an agreed target methodol-

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[1] The SNA also suggests that 'specific' companies include partnerships whose members enjoy limited liability since these are separate legal entities which behave like corporations. In effect, partners are at the same time both shareholders and managers.

ogy. There is no legislation determining which data sources are used in their compilation, nor how the various data sources are combined or estimates derived.

4.02. In the absence of a single legal-based data source just for agricultural labour input statistics, Member States are free to choose from where they source the data whilst observing the agreed target methodology. Nevertheless, Eurostat is in a position to advise what it considers to be data sources that would help Member States in the compilation of ALI data, alongside or apart from other national data sources where these are available.

4.03. The recommended Eurostat data sources have a legal basis. They do, however, differ from the precise requirements of ALI data and this means that the derived ALI series are likely to be different from other labour series. This chapter, therefore, whilst highlighting a key Eurostat data source also sets out the ways in which it differs from the requirements set for ALI statistics.

The Survey of the Structure of Agricultural Holdings
(the Farm Structure Survey - FSS)

4.04. The Member States of the EU are required to carry out a Survey on the Structure of Agricultural Holdings (EU Farm Structure Survey) on a periodic basis (about every two to three years). In some Member States, this is a census on natural persons and legal persons (incorporated enterprises) who produce agricultural products (agricultural holdings), in others a sample survey. A part of this survey concerns questions on labour input.

4.05. In years when this EU Farm Structure Survey is not carried out, there is often some part of the structure survey on agricultural holdings carried out for national purposes (for example, often specific to labour). In some Member States these are sample surveys, in others exhaustive surveys. The scope and the substance of these (national) surveys are (partly) the same as for the EU Farm Structure Survey.

4.06. The Farm Structure Survey gathers information on the *volume of agricultural labour* and measures this in terms of annual work units. Agricultural labour input statistics have adopted the *definition of the AWU* that is used in the Farm Structure Survey (Cf. 3.21.).

4.07. The *classification* of this labour has historically been along the lines of family ties with the holder. However, for the 1999/2000 Census onwards, Member States are free to decide whether to include questions that would enable an additional classification according to salaried / non-salaried labour input.

4.08. In cases where the optional classification of agricultural labour according to non-salaried / salaried labour input has not been taken up, the volume of agricultural labour recorded as family and non-family labour will have to be adjusted to conform with ALI requirements. Member States are requested to inform Eurostat of the methods and figures used in such adjustments. The objective is to record that part of the family employed on the holding as salaried labour, along with all non-family labour that, *by convention*, is also

identified as salaried labour input, so that the total wage bill for salaried labour is synonymous with the item compensation of employees in the EAA.

4.09. In order to better understand the differences in the *coverage* of what is agriculture in the FSS and in the ALI statistics, it is easier to make the comparison between the FSS and the revised EAA. In general though, it is considered that the revisions to both the EAA and the FSS have brought the coverage of the two sources closer to each other and that the coverage of agriculture corresponds well to the scope of the FSS.

4.10. The Economic Accounts for Agriculture have a definition of agricultural activity, derived from the Nomenclature of Agricultural Products (NACE) class 01, slightly larger than the Farm Structure Surveys. More precisely, the Economic Accounts for Agriculture include the production of miscellaneous products of animal origin (corresponding to CPA products 01.25.2., which are excluded from the FSS), of hides, skins and furs (CPA 01.25.3), the gathering of mushrooms, the production of Christmas trees grown in nurseries (included in CPA 02.01.41), agricultural and animal husbandry service activities (NACE 01.4) and hunting (NACE 01.5).

4.11. Those Member States using the Survey on the Structure of Agricultural Holdings to supply data for agricultural labour input statistics and for whom any of the items listed in 'Miscellaneous products of animal origin', 'Hides, skins and furs (other than rabbits and lambs), 'Agricultural and animal husbandry service activities, except veterinary activities', 'Hunting, trapping and game products, including related service activities' and 'the gathering of mushrooms' contribute to the output of the agricultural industry as supplied under the EAA, must include an estimate of the associated labour input in the total, non-salaried and salaried input series.

4.12. It has also been decided in the legislation for the 1999/2000 Census onwards that the definition of 'work which contributes to production' change to specifically include *secondary non-agricultural activities that are inseparable* from agricultural activity and to exclude separable non-agricultural secondary activities.

4.13. An estimate of the number of hours worked by contractors who are not employed directly by the holding carrying out 'farm work', converted into numbers of days or weeks working full-time, is made in the FSS.

4.14. The EAA proposes to use the *threshold* defined by the FSS with exceptions having to be justified by the Member States. Units are included in the FSS if their agricultural activities are of a certain minimum size. The lower limit varies from one Member State to another. In principle, if the Member States do not apply a minimum size of one hectare or a certain ESU size, they should exclude only the smallest holdings that together contribute no more than 1% of the total standard gross margin. In reality, if the value of agricultural output as recorded in the EAA is more comprehensive than that which would otherwise have been the case taking the threshold from the FSS, then the relevant labour input in the FSS should be (re)estimated to be as comprehensive.

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4.15. The *period covered* by the Farm Structure Survey does not coincide with a calendar year (which is the reference in the EAA). The questions about the labour force in the FSS refer to work performed in the 12-month period preceding the Survey date. This is usually the period from April/June of one year to March/May of the next. It does of course cover a complete agricultural production cycle (necessary for crop production in particular). This difference with the EAA is not viewed as a problem.

Recommendation

4.16. The Farm Structure Survey offers a harmonised basis on which to gather labour input information from all of the Member States. Although those Member States using the FSS as a data source[1] would have to take into account the impact of the differences in coverage between their FSS and what is required for the ALI statistics, the Survey on the Structure of Agricultural Holdings does seem to provide a good basis (see Appendix 3). With the FSS not being conducted on an annual basis, however, Eurostat can only promote it as the backbone data source to the annual ALI series. Even as a recommended backbone data source, however, the FSS figures should be cross-checked against figures and trends available from any other relevant data sources. Additionally, if the FSS is used as starting-point for calculating agricultural labour input, then, for years in which the FSS is not conducted, extrapolated and interpolated (provisional) estimates of the development of the agricultural labour input should be made. Clearly, for this purpose, other statistics concerning agricultural labour input should be used.

4.17. There are two possibilities in this respect:
- during years that the FSS is not conducted, there is some kind of (national) structure survey on agricultural holdings for some Member States (Cf. 4.05.)

Sometimes information on agricultural labour input is available and sometimes only information on the number of persons working on an (agricultural) holding. Results of these national structure surveys present sufficient possibilities, with a few supplementary assumptions, to estimate the development of agricultural labour input in years for which there is no FSS. Important assumptions concern for example the distribution of the number of persons over the classes of working hours and the different categories of labour as distinguished in the FSS but not in the national structure survey.

- there are also several Member States where no such national structure surveys are conducted in non-FSS years. In these Member States, (provisional) estimates indicating the development of agricultural labour input could be made, for example, using rates of change in numbers of persons working in agriculture from labour force statistics or statistics on employment. Nevertheless, with agriculture in these statistics being defined differently and questions on labour corresponding less well to the periodic FSS, the number of assumptions required when estimating agricultural labour

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[1] As mentioned in paragraph 4.02., Member States are free to choose from where they source the data whilst observing the agreed target methodology.

input is therefore greater. One way of making (provisional) estimates is by using the changes from other statistics on labour and declaring these changes valid for the latest results of the EU Farm Structure Survey and thus the related agricultural labour input series.

4.18. Results from the FSS generally become available some time after the survey year and therefore present a lack of **timeliness**. This delay means that the estimated development in the volume of agricultural labour at the end of the year, for the current year, cannot be drawn directly from the FSS. Provisional estimates for the current year should therefore be drawn from the same mix of sources and methods as mentioned above.

References

Appendix 1. Examples of calculation of labour input in AWU
Appendix 2. Example of how to establish a chain-index when there is a change in the definition of the AWU
Appendix 3. Schematic presentation of the calculation of agricultural labour input using the Farm Structure Survey as a basic data source.

Appendix F   FADN GUIDELINES - LABOUR

C   LABOUR

Recording of all labour, paid and unpaid **excluding:**

- labour used on work under contract and recorded under ▶ heading 60, table F, which has contributed to production on the farm during the accounting year.
- labour used in the production, replacement or major repair of fixed assets;

Paid labour is regarded as a farm input (▶ table F60). Unpaid labour is considered to be part of the farm's own resources to which income is returned. All labour, which is not part of the farm's own resources, should be valued and recorded as paid labour.

Overview

		Heading number and description	Serial number			
			(1) Code "function performed" or No. persons	(2) Year of birth (last 2 digits)	(3) Number of Annual work units (AWU)(x 100)	(4) Annual time worked (hours)
Unpaid	Regular	13 Holder/manager	Enter code 1/2/3	51 / 52	53	54
				55 / 56	57	58
		14 Holder/not manager		59 / 60	61	62
		15 Manager/not holder		63 / 64	65	66
				67 / 68	69	70
		16 Spouse(s) of holder(s)	Enter number of persons	71		72	73
		17 Other		74		75	76
	Casual	18 Unpaid casual				77
Paid	Regular	19 Manager		78	79	80
		20 Other			81	82
	Casual	21 Paid casual				83

Table C – Labour – Heading definitions

				#		Definition	Type of labour code
Unpaid	**Regular**	Persons working on the farm who do not receive a salary (or which receives less remuneration than the amount normally paid for the services rendered) but are rewarded through the economic result of the farm business.	Persons who have worked for at least a whole day of each week (outside normal holidays) on the holding. (N.B. Number of Annual work units of a regularly employed person can be less than 1 AWU)	13 **Holder/manager**	Individuals are recorded in descending order of (1) responsibility and (2) age	Person who assumes economic and legal responsibility for the holding and undertakes its day-to-day management. In the case of share cropping the share-cropper is indicated as holder/manager.	Type of labour code = 1
				14 **Holder/not manager**		Person(s) who assumes economic and legal responsibility *without* undertaking day-to-day management of the holding.	Type of labour code = 2
				15 **Manager/not holder**		Person(s) who *does not assumes* economic and legal responsibility but undertakes day-to-day management of the holding.	Type of labour code = 3
				16 **Spouse(s)**		Spouse(s) of holder(s). In the case of several holders there may be more than one spouse.	The aggregate labour input (AWU and hours) of these persons is entered.
				17 **Other**		Includes foreman and sub-managers not responsible for management of the whole farm	
	Casual			18 **Unpaid casual**		Aggregate number of hours of persons who have worked on the holding on a casual or seasonal basis.	
Paid	**Regular**	Persons working on the farm who receive a salary (wages or payment in kind) on the normal scale for the services rendered.	Persons who have worked for at least a whole day of each week (excluding vacations) on the holding	19 **Manager**		Person(s) responsible for the day-to-day management of the holding	The aggregate labour input (AWU and hours) of these persons is entered.
				20 **Other**		Includes foreman and sub-managers not responsible for management of the whole farm	
	Casual			21 **Paid casual**		Aggregate number of hours of persons who have worked on the holding on a casual or seasonal basis. Includes piece workers.	

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Table C - column 3: Annual work units (AWU) (x 100)

Regularly employed labour is converted into Annual Work Units (AWU).

One AWU is equivalent to one person working full-time on the holding. A single person cannot exceed 1 AWU equivalent, even if his actual working time exceeds the norm for the region and type of holding.

For persons employed for less than the whole year on the holding, the fraction of AWU is calculated as :

$$\frac{\text{Hours worked}}{\text{Hours per AWU for the region/type of holding}}$$

In the case of less able workers the AWU equivalent should be reduced in proportion to their capacities.

Table C - column 4: Annual time worked (hours)

Time actually devoted to the work on the holding. Work on the holding includes all manual, administrative, executive and supervisory activities concerning production on the holding, **including**:

- *Financial organisation and management;*
- *Work in the field;*
- *Livestock husbandry;*
- *Preparation of products for market, storage and processing on the farm;*
- *Maintenance of buildings, machinery, equipment and land;*
- *Forestry work on woodland included in the agricultural holding and returned in table K;*
- *Work concerning farm tourism connected to the holding and returned in table K.*
- *Occasional contract work for others when its value is included in the holding's output.*

Work on the holding **does not include** :

- *Work in production of fixed assets (building and machinery construction and repairs, planting of orchards, demolition of buildings, grubbing up of orchards);*
- *work for the holder's or manager's household.*

The time equivalent casual work as paid on a piece basis is estimated by dividing the total wage for work done by hourly wage of a time worker.

N.B. For Germany and Luxembourg the number of hours per Annual Work Unit is fixed at 2.200 hours and for Greece 2240 hours

Appendix G LIST OF MÉTIERS -EU LEVEL 2-4

Source: Commission Staff Working Paper: Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, Nantes, 12-16 June 2006, Table 3.2.1. and 3.2.2 Fishing activities identified by the Group by RCM

Level 1 distinguishes: Active vessels
                       Other then fishing
                       Non active vessels

Level 2 Classes of gear	Level 3 Gear Groups	Level 4 - EU level
DREDGES	DREDGES	Boat Dredge [DRB] Mechanised/Suction Dredge [HMD]
TRAWLS	BOTTOM TRAWLS	Bottom otter trawl [OTB] Multi-rig otter trawl [OTT] Bottom pair trawl [PTB] Beam trawl [TBB]
	PELAGIC TRAWLS	Midwater otter trawl [OTM] Pelagic pair trawl [PTM]
HOOKS AND LINES	ROD AND LINES	Hand and pole lines [LHP] [LHM] Trolling lines [LTL]
	LONGLINES	Drifting longlines [LLD] Set longlines [LLS]
TRAPS	TRAPS	Pots and traps [FPO] Fyke nets [FYK] Stationary uncovered pound nets [FPN]
NETS	NETS	Trammel net [GTR] Set gillnet [GNS] Driftnet [GND]
SEINES	SURROUNDING NETS	Purse seine [PS] Lampara nets [LA]
	SEINES	Fly Shooting seine [SSC] Anchored Seine [SDN] Pair Seine [SPR] Beach and boat seine [SB] [SV]
OTHER GEAR	OTHER GEAR	Glass eel fishing
MISC. (SPECIFY)	MISC. (SPECIFY)	

Appendix H Abbreviations

AER   Annual economic report
DCR   Data collection regulation
FADN   Farm accounting data network
FTE   Full-time equivalent
SBS   Structural Business Statistics

Fleet segments, level 2 and 3, according to DCR

MB   Mobile gears
TBB   Beam trawl
NSS   North Sea < 221kW
NSL   North Sea > 221kW
NSO   Outside North Sea
DTS   Demersal trawl and demersal seiner
OTB   Bottom trawl
DSS   Danish and Scottish seiners
SDN   Danish seiners
SSC   Scottish seiners
DTP   Polyvalent
PTS   Pelagic trawls and seiners
OTM   Pelagic trawl
PEL   Pelagic seiner and purse seiner
PPS   Polyvalent
DRB   Dredges
DRH   Hydraulic dredge
DRO   Other dredges
MGP   Polyvalent mobile gears
MGO   Other mobile gears
PG   Passive gears
FGL   Fixed gears and lines
FGN   Fixed nets
HOK   Gears using hooks
LON   Longlines
HOO   Other gears using hooks
DFN   Drift nets and fixed nets
DNE   Drift nets
FPO   Pots and traps
FPT   Fish traps, including trap nets and pound nets
FPC   Crustaceans pots with possible subdivision by target species

PGP	Polyvalent passive gears
PGO	Other passive gears
PVG	Polyvalent gears
PMP	Combining mobile & passive gears
NOL	Vessels with no license