FINAL REPORT

Fish / 2006 / 09

European Commission

Studies in the Field of the Common Fisheries Policy and Maritime Affairs

Lot 4: Impact Assessment Studies related to the CFP

Environmental, Economic, Social and Governance impacts of the STATUS QUO scenario for the 2012 revision of the Common Fisheries Policy

March 2010

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This report does not necessarily reflect the view of the European Commission and in no way anticipates the Commission's future policy in this area.

Project no:	ZF0926_S06
Issue ref:	R1
Date of issue:	March 2010
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Acronyms

ACFM	Advisory Committee on Fishery Management

ACP	African, Caribbean and Pacific
AER	Annual Economic Report
B	Maximum biomass
B_{msy}	Biomass of the population at which MSY is taken
B_{pa}	Target biomass set as a precautionary approach
CAP	Common Agricultural Policy
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy
CIF	Cost Insurance *and* Freight
DCR	Data Collection Regulation
DG MARE	Directorate-General for maritime Affairs and Fisheries
EC	European Commission
EEC	European Economic Community
EEZ	Exclusive Economic Zone
EFF	European Fishing Fund
EPA	Economic Partnership Agreements
ERDF	European Regional Development Fund
ETC/BD	European Topic Centre on Biological Diversity
EU	European Union
F	Fishing mortality
F_{msy}	F giving maximum sustainable yield
F_{max}	F where total yield is highest
$F_{0.1}$	F where slope of yield per recruit is one-tenth of its value near the origin
FIFG	Financial Instrument for Fisheries Guidance
FPAs	Fisheries Partnership Agreements
FTE	Full Time Equivalent
GCFM	General Fisheries Commission for the Mediterranean
GDP	Gross Domestic Product
GT	Gross Tonnage
GVA	Gross Value Added
HACCP	Hazard Analysis and Critical Control Point
HCR	Harvest control rule
ICES	International Council for the Exploration of the Sea
IE	Individual Non-Transferable Effort Quotas
IMF	International Monetary Fund
IQ	Individual Non-Transferable Quotas
ITE	Individual Transferable Effort Quotas
ITQ	Individual Transferable Quota
IUU	Illegal, Unregulated and Unreported
JDP	Joint Deployment Plan of the CFCA
LTMP	Long term management plan
MAGP	Multi-annual Guidance Programmes
MPA	Marine Protected Area
MS	Member States
MSFD	Marine Strategy Framework Directive
MSY	Maximum Sustainable Yield
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
PCD	Policy Coherence for Development
PO	Producer organisations
RBM	Rights based management
ROI	Return on Investment
SAC	Special Areas of Conservation
SBL	Safe biological limits
SCI	Sites of Community Importance
SCM	Standard Cost Model
SGECA	Sub-Group on Economic Assessment
SMS	Stochastic Multi-Species Model
SPA	Special Protection Areas
SRP	Simplification Rolling Programme

SSB	Spawning Stock Biomass
STECF	Scientific, Technical and economic Committee for Fisheries
TAC	Total Allowable Catch
UNCLOS	United Nations Convention on the Law of the Sea
WTO	World Trade Organization

Country codes

BE	BEL	Belgium
CY	CYP	Cyprus
DE	DEU	Germany
DK	DNK	Denmark
ES	ESP	Spain
EE	EST	Estonia
FI	FIN	Finland
FR	FRA	France
GR	GRC	Greece
IE	IRL	Ireland
IT	ITA	Italy
LT	LTU	Lithuania
LV	LVA	Latvia
ML	MLT	Malta
NL	NLD	Netherlands
PO	POL	Poland
PT	PRT	Portugal
UK	GBR	United Kingdom
SI	SVN	Slovenia
SE	SWE	Sweden

AER Sector types

DFN	Drift nets and fixed nets
DRB	Dredges
DTS	Demersal trawl and demersal seiner
FPO	Pots and traps
HOK	Gears using hooks
MGO	Other mobile gears
MGP	Polyvalent mobile gears
NONACTIVE	Non active vessels
PG	Passive gears
PGO	Other passive gears
PGP	Polyvalent passive gears
PMP	Combining mobile & passive gears
PTS	Pelagic trawls and seiners
TBB	Beam trawl

VL0012	<12 m length vessels
VL1224	12-24 m length vessels
VL2440	24-40 m length vessels
VL40XX	>40 m length vessels

Species codes

ALB	Albacore
ALF	Alfonsinos nei
ANE	European anchovy
ANF	Anglerfishes nei
ARU	Greater argentine
BET	Bigeye tuna
BFT	Atlantic bluefin tuna
BLI	Blue ling
BSF	Black scabbardfish
CAT	Wolf fishes (=Catfishes) nei
COD	Atlantic cod
DGS	Picked dogfish
DWS	Deep-water sharks nei
FLX	Flatfishes nei
GFB	Greater forkbeard
GHL	Greenland halibut
HAD	Haddock
HAL	Atlantic halibut
HER	Atlantic herring
HKE	European hake
HKW	White hake
JAX	Jack and horse mackerels nei
LEZ	Megrims nei
LIN	Ling
MAC	Atlantic mackerel
NEP	Norway lobster
NOP	Norway pout
ORY	Orange roughy
OTH	Others
PLE	European plaice
POK	Saithe (=Pollock)
POL	Pollack
POR	Porbeagle
PRA	Northern prawn
RED	Atlantic redfishes nei
RNG	Roundnose grenadier
SAL	Atlantic salmon
SAN	Sandeels (=Sandlances) nei
SBR	Blackspot (=red) seabream
SOL	Common sole
SOX	Soles nei
SPR	European sprat
SQI	Northern shortfin squid
SRX	Rays, stingrays, mantas nei
SWO	Swordfish
USK	Tusk (=Cusk)
WHB	Blue whiting(=Poutassou)
WHG	Whiting

1 INTRODUCTION

1.1 Introduction to this document

The impact assessment of the proposals for the 2012 reform of the CFP has been conducted in two phases. Phase I, undertaken between October and December 2009, reviewed the current performance of the CFP and assessed the impact of a continuation of status quo policy, i.e. a continuation through the period 2012 to 2022 without any change in policy beyond that initiated in the 2002 reform and further elaborated into legislation since that time. Phase II, to be undertaken in the first half of 2010, will examine the impact of proposed new policy which will contribute to the 2012 reform.

This report addresses Phase I, the status quo Impact Assessment.

1.2 Guidance to this document

This document it laid out in the general approach of an impact assessment document, although there is only one policy being assessed at this point – the Status Quo, or "do nothing" policy. The sections of the document are as follows.

- The rest of the **introduction** gives general background on the CFP reform process and then describes the methods that we have used to undertake the impact assessment.

- Then follows Chapter 2 which describes the **current performance** of the CFP, expressed as an analysis of trends in a number of indicators. Chapter 2 also presents a summary of the impact assessments of existing policy that has been introduced during the 2002-2012 period of the CFP.

- Chapter 3 describes our approach to defining the **status quo option** and some alternative scenarios for Status Quo

- Chapter 4 undertakes the formal **impact assessment** by analysing the likely trend in the indicators presented in Chapter 2, integrating modelling results and the results of policy analysis.

- Chapter 5 provides a brief **summary**.

There are a number of supporting Annexes to these sections.

- **Annex A** – additional tables supporting the section 2 of the report, Indicators

- **Annex B** – detailed methodology and results from the modelling

- **Annex C** – additional background information on the aquaculture industry in the EU

- **Annex D** – detailed AER data used in the modelling

1.3 Problem definition and background to the 2012 reform of the CFP

A number of founding objectives for a Common Agricultural Policy (CAP), 1957 were established by the Treaty of Rome. The Treaty states in the section on agricultural policy

that the agricultural policy includes fisheries (Article 32: "*1. The common market shall extend to agriculture and trade in agricultural products. 'Agricultural products' means the products of the soil, of stock farming and of fisheries and products of first-stage processing directly related to these products"*) and that the objectives are (Article 33):

1. The objectives of the common agricultural policy shall be:

> *(a) to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour;*
>
> *(b)thus to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture;*
>
> *(c) to stabilise markets;*
>
> *(d) to assure the availability of supplies;*
>
> *(e) to ensure that supplies reach consumers at reasonable prices.*

2. In working out the common agricultural policy and the special methods for its application, account shall be taken of:

> *(a) the particular nature of agricultural activity, which results from the social structure of agriculture and from structural and natural disparities between the various agricultural regions;*
>
> *(b) the need to effect the appropriate adjustments by degrees;*
>
> *(c) the fact that in the Member States agriculture constitutes a sector closely linked with the economy as a whole.*"

- increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour;
- ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture;
- stabilise markets;
- assure availability of supplies; and
- ensure that supplies reach consumers at reasonable prices.[1]

Although the CAP has since evolved, these underlying objectives still apply today.[2]

The CFP was eventually born in 1983, and has since been the subject of two reviews, in 1992 and 2002. The 1992 reform addressed the imbalance between the MS fleets fishing capacity and the available fishing opportunities. Regulation 3760/1992 also introduced the concept of fishing effort and obliged the MS to operate a national licensing scheme. The greening of the CFP, which began in the early 1990s, also found its expression in the 1992 review. The 1992 basic Regulation clearly stated its aims, namely to protect and conserve

[1] *Ibid.*, Article 39.
[2] Treaty Establishing the European Community [consolidated version], OJ N° C 325, 24/12/2002, p. 33-184, Article 33.

the marine aquatic resources. Furthermore, it included a requirement to take account of the implications on the marine ecosystem when adopting management measures.[3]

A 1999 scientific review on the status of EC fish stocks carried out by the Scientific, Technical and economic Committee for Fisheries (STECF) concluded that 67% were overfished, 40% were 'depleted' and 37% of species were both depleted and overfished.[4] Furthermore, a 1999 survey in the North East Atlantic confirmed that 40 out of the 60 main commercial fish stocks were outside Safe Biological Limits (SBL). The most severely depleted species was cod. In the EC, the average landings for the period 1995-1999 were down 65% compared to 1978-1982 with a major decline in the numbers of larger, mature fish by 73% in the same period.[5] The European Commission's Green Book in 2001 painted a very bleak picture of EC fish stocks stating that in the Baltic, 'the current situation does not seem sustainable'; that in the North Sea, 'it has not been possible to reverse the decline of round fish stocks'; that in the western waters, fishing mortality (F) rates 'have far exceeded historical levels observed in the North Sea' and that in the Mediterranean, 'many important stocks have been over-fished'.[6]

The need to protect jobs was often given as a reason for not addressing the overcapacity problem. However, in the 1990s up to the time of the 2002 reform, it was obvious that the CFP had failed to save jobs. In the period 1990-1997, the number of fishermen in the European Union (EU) fell by 60,000 – a decline of 30%[7] - but the decline in catches and landings was progressively worsening with negative impacts on the industry. For the period 1960-1999, total fish landings in the United Kingdom, for example, declined from 900,000 to 400,000 tonnes, with the value of the catch falling from a peak of £880 million to just less than £200 million in 1999.[8]

The 2002 CFP reform was much more comprehensive than legally required, covering a larger range of issues than previously dealt with under the CFP, setting broader objectives and resulting in a number of significant changes. They reflected:

1. A move towards a more long-term approach to fisheries management;
2. A new fleet policy to limit and gradually reduce over-capacity. With the aim of matching capacity with fishing possibilities, while subsidies contributing to an increase of fishing capacity are phased out;
3. An attempt to improve compliance with the rules of the CFP through greater stakeholder involvement and specifically the creation of the RACs.

Although an attempt to define objectives was done in the 2002 reform, but the final formula of Article 2 of Regulation 2371/2002 does not establish a clear hierarchy of objectives among the ecological, economic and social conditions.

In April 2009, the Green Paper[9] was launched and marked the beginning of the official reform process which will last until 2012, when it is expected that the Council will adopt a new framework regulation. This review is expected to be the most radical review since the CFP adoption in 1983. This is because, as the Commission points out in its earlier non-

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[3] Council Regulation 3760/92 of 20 December 1992 *Establishing a Community System for Fisheries and Aquaculture*, OJ N° L 389, 21/12/1992, Article 2 (1).
[4] COM (2000) 272, Report from the Commission to the Council - *Preparation for a mid-term review of the Multi-annual Guidance Programmes* (MAGP), 10.5.2000.
[5] COM (2001) 135*, Green Paper on the Future of the Common Fisheries Policy*, Volume I, 20.3.200.
[6] Ibid.
[7] Ibid.
[8] WWF (2007) *Mid-Term Review of the Common Fisheries Policy*, October 2007.
[9] COM (2009)163. Green Paper. *Reform of the Common Fisheries Policy.*

paper[10], whilst there has been some progress towards better management of European fisheries, there is still more to be done. Fishing fleets are still too large, and most European fish stocks in a worse position than they were even before the 2002 reform. This had led to poor economic performance. The Green Paper sets out an ambitious vision for European fisheries by 2020, and identifies five structural failings of the CFP (Table 1).

Table 1 The five structural failings of the CFP

Main Structural Failings		Outline
1	**A deep-rooted problem of fleet overcapacity**	• Remains a fundamental problem of the CFP. • Too many vessels for the available resource, this imbalance is at the root of the problem related to low economic performance, weak enforcement and overexploited stocks. • The future CFP must address this in order for other pillars of the policy to work. • Attempts have been made to address it including: Structural measures such as vessel scraping schemes, lessons from this show that one-off scraping schemes are more likely to be efficient; Market instruments such as transferability of rights.
2	**Imprecise policy objectives resulting in insufficient guidance for decisions and implementation**	• CFP states *"ensure exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions"*. • No priority is set for the objectives. • Whilst 'environmental' conditions are referred to in terms of adopting a precautionary and ecosystem approach, the policy does not make direct references to economic and social conditions. • No clear indicators for guidance or to measure policy achievements. • Economic and social sustainability require good environmental conditions therefore there is no conflict between the objectives in the long term. However, in the short term, if employment and fishing opportunity is affected by creating conditions for environmental recovery then compromises to mitigate negative impacts on social and economic conditions.
3	**A decision-making system that encourages a short-term focus**	• Current decision-making framework does not distinguish principles from implementation. • All decisions are taken in Council at the highest political level. Under the Lisbon Treaty, the co-decision procedure would apply to all fisheries decisions therefore decision-making under the CFP should be brought in line with other EU policies. • Main criticisms: a focus on short-term considerations at the expense of long-term sustainability; extremely detailed regulations leaving little flexibility for implementation. • Options: delegate more of the management through the so-called comitology procedure; where possible rely on regional management solutions implemented by MS (subject to Community standards & control); delegate implementation decisions to MS leading to cheaper and simpler policy. • There is a need to assess roles of consultative structures e.g., ACFA and the RACs.
4	**A framework that does not give sufficient responsibility to the industry**	• Need to motivate the catching sector, the processing, seafood chain, and consumers to support CFP objectives and take responsibility for implementing them. • Industry should understand the need for the policy, support it and have a stake in its successful outcome. • Co-management arrangements to reverse the situation of top-down approach to-date. • Responsibilities and rights are key elements to involve the industry. Increase involvement through: self-management such as results-based management where public authorities would set the limits, it would also relieve industry and policy-makers of detailed management and technical issues. • Examples of self-management through bottom-up initiatives do exist in the EU. • Rights, responsibility and accountability should go hand in hand.
5	**A lack of political will to ensure compliance and poor compliance by the industry**	• Control has been weak, penalties are not dissuasive and inspections are not frequent enough to encourage compliance. • No checks are in the system to ensure that funding is given to MS which fulfil basic control and conservation responsibilities. • Feeling that enforcement is not uniform. • Unsatisfactory and non-coherent data collection systems for catches in short-term quota-monitoring and medium-term structural evaluations. • Proposal made in November 2008 to move ahead with an in-depth reform of the control and enforcement systems.

[10] Commission working document: *Reflections on further reform of the Common Fisheries Policy*. September 2008.

1.3.1 General Methods

The Phase I review was conducted as follows.

A thorough review of the current state of the CFP was conducted using published and internal (EC) documents. 28 key indicators of performance were defined, covering 7 pillars of the CFP. These are shown in Table 2. Data were acquired to assess the current state of these indicators, and if possible to examine trends in the indicators over the period 2003 – 2007.

Table 2 Key indicators of CFP performance used in this analysis

Areas	Indicators
Environmental	1) Stock situation in terms of fishing mortality in relation to MSY 2) Percentage of stocks and/or catches covered by LTMP 3) Average size (length and weight) of fish 4) Fleet evolution *5) Evolution of fishing mortality/ Fleet size* 6) Area covered by protection regimes (Natura 2000) or special measures EU EEZ.
Economic	7) Gross valued added 8) Economic sustainability: Ratio current revenue-Break even revenue point 9) Net profit margin 10) Economic performance: Return on investment 11) Fish prices, market orientation 12) Level of subsidies
Social	13) Employment 14) Status of fisheries dependent communities/regions/ MS/EU 15) Value added dependency levels 16) Social sustainability: Gross value added per employee 17) Attractiveness of the sector: Distribution of incomes
Governance	18) Departure from quotas by Council (scientific advices in decision making) 19) Management costs for the sector 20) Regions and MS having adopting RBM system 21) Data provided by MS 22) Rate of utilization of allocations (quotas) 23) Level of quotas exchanges
Coherence	24) Level of coherence with WTO and other EC policy
Administrative burden	25) Impact for the private sector
Simplification	26) Level of implementation simplification process by MS and industry
External	27) Governance of EC fishing activities in external waters
Social	28) Safety

(a) Recent internal policy initiatives, including the 2002 reform (Council Regulation 2371/2002) were examined to understand the current impact, and likely future impact, of such policy initiatives on the CFP and on the trends of the indicators identified above. Existing Impact Assessments (IA) were used where possible.

(b) The impact of recent internal policy, inter-European environmental, economic and social trends, and external factors on the indicators was examined through a number of mechanisms, including review of current trends and the creation of bioeconomic models. This resulted in an examination of the possible impacts of pursuing the status quo scenario over a ten-year horizon, 2012 – 2017 – 2022 based on the indicators listed in Table 2.

(c) Finally, a link between the likely trends in indicators under a status quo scenario, and the earlier assessment of the status of the CFP with respect to these indicators, is used to assess the likely performance of the CFP over the period 2012 – 2022.

The overall approach taken to the Phase 1 impact assessment has been one based on desk study work only, and primarily using existing published data sources. Where such data have been found lacking, attempts have been made where possible, and with varying degrees of success, to contact particular administrations to obtain improved data. The study team have also been greatly assisted during this Phase 1 impact assessment by staff within several Units of the Commission, and we would like to acknowledge the important guidance provided on an ongoing basis during the project, and the provision of relevant data and information.

1.3.2 Trend analysis

Throughout Section 2 of the report we analyse the trends in various indicators over at least the last 5 years. For many of these indicators, however, only 5 years of data are available. To avoid the temptation to over-interpret these data we sometimes include the correlation coefficient for the indicators. Whilst this assumes a linear model for any trend, and this may not always be the most appropriate model with which to interpret a trend, it does have the advantage of being able to be used to test for statistical significance. For instance, for 6 data points, a correlation coefficient (r) of ±0.811 would be necessary to conclude that the slope (i.e. trend) of the indicator was statistical different from zero (no slope) at the 5% level.

This significant r value is derived through a two step process. Initially the degrees of freedom (df) is calculated. In all cases through these indicators, there was just as likely probability that the trend could have been increasing or decreasing therefore df were calculated assuming a two-tailed test where df = n - 2 (n = number of data points in the series). Therefore, when n = 6 (as in example above), df = 4. The second step is to find the corresponding significant r value when df = 4 and level is 5%; in this case ±0.811 (Table 3).

Table 3 r value table giving the appropriate significance values for various degrees of freedom

df	1 - confidence level (Level)		
	5%	1%	0.1%
1	0.997	1.000	1.000
2	0.950	0.990	0.999
3	0.878	0.959	0.991
4	0.811	0.917	0.974
5	0.755	0.875	0.951

This is illustrated in Figure 1, where trends in GVA are presented by reference to their correlation coefficient. This figure is presented in the main body of the report alongside a table giving absolute GVA. Correlation coefficient is presented rather than goodness of fit (R^2) so as to preserve information on the direction of trend. What one can interpret from this plot, by way of an example, is that many fleets have rising GVA which is not significantly different from zero, but some have statistically significant rises (e.g. TBB 2440) and one (DRB 1224) has a significantly declining GVA.

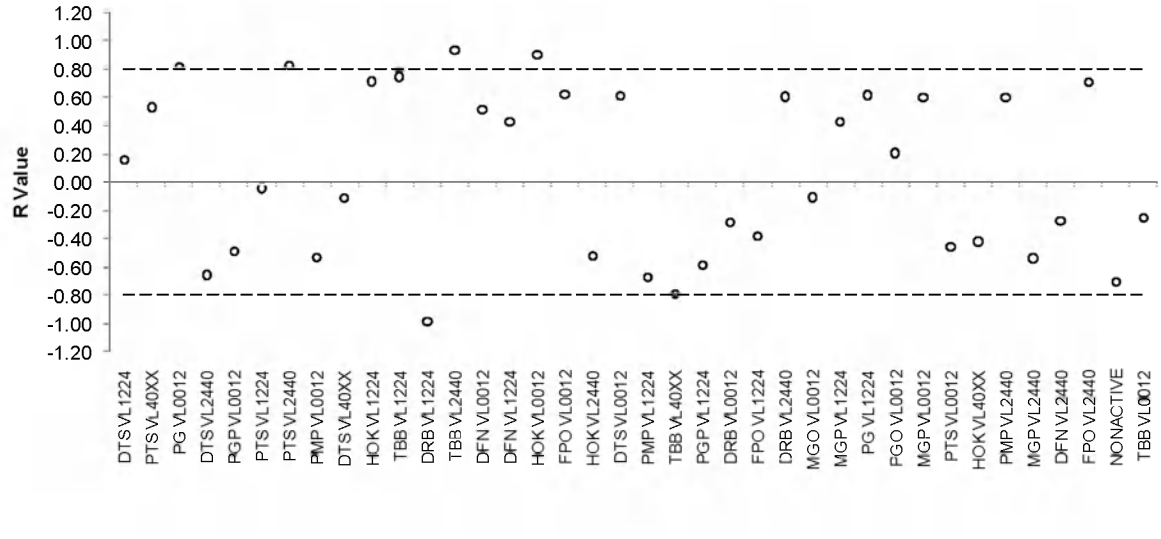

Figure 1 Pearson's correlation coefficients for trends in GVA over time. Statistical significance is indicated if the points fall either above or below the dashed line.

1.3.3 Modelling

Two bioeconomic models were chosen to assist with this task, FLR-EIAA and MEFISTO.

FLR-EIAA

The FLR-EIAA model was a combined bioeconomic model created specifically for this project using established FLR (Fisheries Library in R; Kell et al., 2007[11]) code and the most recent version of the EIAA model (Economic Interpretation of ACFM Advice; Frost et al, 2009[12]). This model is described in detail in Annex B, and in outline below.

Twenty-one stocks covering were explicitly modelled in FLR. Stocks were projected from the most recent ICES assessment (2009, which provided their 2008 stock status) through 2022 with standard assumptions about recruitment (a geometric mean of the last 10 years) and other stock dynamic parameters, and relevant harvest control rules (HCRs). Projections were aligned with current regulations, such that calculated TACs in 2009 corresponded to the actual TACs set for 2009.

Baltic herring 22-24	Cod 25-30	North Sea Plaice
Baltic sprat	Cod northeast Arctic	North Sea Saithe
Bay of Biscay sole VIIIab	Eastern channel sole VIId	North Sea Sole
Blue whiting	Irish Sea sole VIIa	Northern hake
Celtic Sea sole VIIfg	North Sea Cod	Southern hake
Central Baltic herring	North Sea haddock	North East Atlantic mackerel
Cod 22-24	North Sea Herring	Western horse mackerel

[11] Kell, L. T., I. Mosqueira, P. Grosjean, J-M. Fromentin, D. Garcia, R. Hillary, E. Jardim, S. Mardle, M. A. Pastoors, J. J. Poos, F. Scott, and R. D. Scott. 2007. FLR: an open-source framework for the evaluation and development of management strategies. *ICES J. Mar. Sci.* 64 (4):640-646.

[12] Frost H, Andersen J.L, Hoff A and Thøgersen The EIAA model, methodology definitions and model outline, Institute of Food and Resource Economics, Report No, 200, 2009

For stocks with Long Term Management Plans (LTMPs) the HCRs contained in these plans were applied, according to the same year of implementation. The harvest control rule typically specified a target fishing mortality *F*, from which a target TAC could be obtained (see Annex B for details).

LTMPs face three problems.

1. Discarding is significant in some fisheries, and needs to be taken account of. Our assumption, following the consideration of likely status quo policy on discards (see section 2.5) is that discarding is likely to be reduced by only 5% under the current CFP. We dealt with the issue of discarding as follows:

    a. If significant discarding is observed in the fishery, and reported in the assessment, it was possible to partition the total *F* into landing and discard components. Thus, both landings and discards could be estimated. In all such cases, the harvest control rule is assumed to account for the expected level of discards when setting the TAC, thus ensuring the target *F* is reached (in the absence of implementation error). Discarding is assumed to reduce by 5% in 2010.
    b. If there were no discards reported for the fishery, they were assumed to be negligible.

2. Some fisheries experience a high level of unreported catch (also called over-quota catch). This can be considered a feature of imperfect implementation of the quota rules through less than perfect compliance. However, our interpretation of the current policy developments (see section 2.5), particularly the new IUU and Control regulations, suggest that the level of unreported catch in EU fisheries should decline considerably as these policies come into force. Therefore we dealt with this issue as follows:

    c. If a management plan is in place, with significant overcatch in the historic data, the overcatch is assumed to reduce to 5% of the TAC over a period of 5 years.

3. The history of LTMPs suggests that stocks do not recover as fast as would be expected from simple projections – in other words simplistic projections tend to overestimate the ability of stocks to recover. Many factors may influence stock recovery[13], but very often the reluctance of stocks to follow simple projections appears to be the result of both persistent overcatch (dealt with above) and some inertia in the management system (see also Indicator 18 below), so that implementation of a reduced TAC is delayed. We deal with this as follows:

    d. If a management plan is in place, with no significant overcatch, changes in the catch were assumed to lag behind reductions in the TAC by two years. There was no lag in implementation if the TAC was increased.

Implementation error was not introduced for stocks without a management plan.

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[13] Wakeford, R.C., Agnew D.J. and C.C. Mees. 2009. Review of institutional arrangements and evaluation of factors associated with successful stock recovery plans. *Reviews in Fisheries Science* 17(2):190–222, 2009

For stocks that are of key importance to fleets, but for which explicit age-structured assessments and models do not exist, future trends were either assumed to be constant (i.e. at 2009 TACs and stock size) or, in the case of Nephrops and anglerfish, some extrapolation of current trends in stock size and biomass were made. For Nephrops, in particular, all functional units except those around the Iberian peninsula show strong increasing trends over the last decade. In the status quo scenario this trend was assumed to continue for 3 more years and then level off; in a sensitivity scenario the recovery of whitefish stocks was assumed to lead to a reversal of trends in Nephrops stock size. Details are presented in Annex B.

64 % of the total EU TAC considered in the EIAA model was associated with a stock for which projections were undertaken using either FLR or trend analysis, of which 61 % was accounted for by stocks with FLR projections.

Anglers IV	Nephrops IIa, IV (EU zone)	Nephrops Vb, VI
Anglers VIIb-k and VIII a, b, d (2 species)	Nephrops IIIa, IIIbcd	Nephrops VII

The results of these projections – stock size, exploitation rate, catches, quotas, and average age in the stock over the period 2007 – 2022 – were used to drive a modified EIAA model.

The EIAA model takes as its inputs variables for each vessel segment: gross vessel earnings as determined by annual volume of catches per species and price of those species, fuel costs, other variable costs (which vary as a function of gross sales or effort), crew share, fixed costs (constant costs such as maintenance, insurance and administration), depreciation and catch data (weight and value) for the top 5 species. Other variables include employment, capital costs and vessel characteristics (GT, kW and effort).

So as to be 'proportionate' in the approach to the modeling as required by the IA guidelines, we did not include all NE Atlantic fleet segments for which there are AER data. Mediterranean fleets were not modelled in EIAA. A critical feature of the model given that it does not include all fleet segments is that it is not intended to measure total EU-wide indicators under different policy scenarios. Rather it is used to compare the changes in indicators between the status quo option for the fleets included with the same indicators under different policy options. The main use of the model therefore is to provide the basis for choosing one policy option over another.

The approach taken to select the fleet segments for inclusion in the EIAA model was as follows:

- Review total value of landings, GVA, employment, and number of vessels for each MS as available in the AER data.
- Rank fleets in each MS by value of landings, GVA, employment, and number of vessels.
- Select the most important fleets in each MS based on GVA and employment.
- Calculate the contribution of the fleets selected in each MS to the total a) GVA and b) employment in that MS, to ensure that the fleets provide sufficient coverage
- Indicate the main species caught by each fleet in value terms (to assist with the validation of the stocks proposed for modeling).

Based on this approach, 57 fleets are included in the model, with between two and eight fleets per country depending on the relative size of GVA and employment in each Member State (MS). These fleets represent on average more than 80% of the value-added for MSs (58%-100%) and on average more than 70% of employment for MSs. Fleets proposed

represent a good balance of vessel sizes (14 of 0-12m, 15 of 12-24m, 16 of 24-40m, and 12 of 40+m).

The linkages between the FLR and EIAA models were stock size (Spawning Stock Size) and TAC (Figure 2).

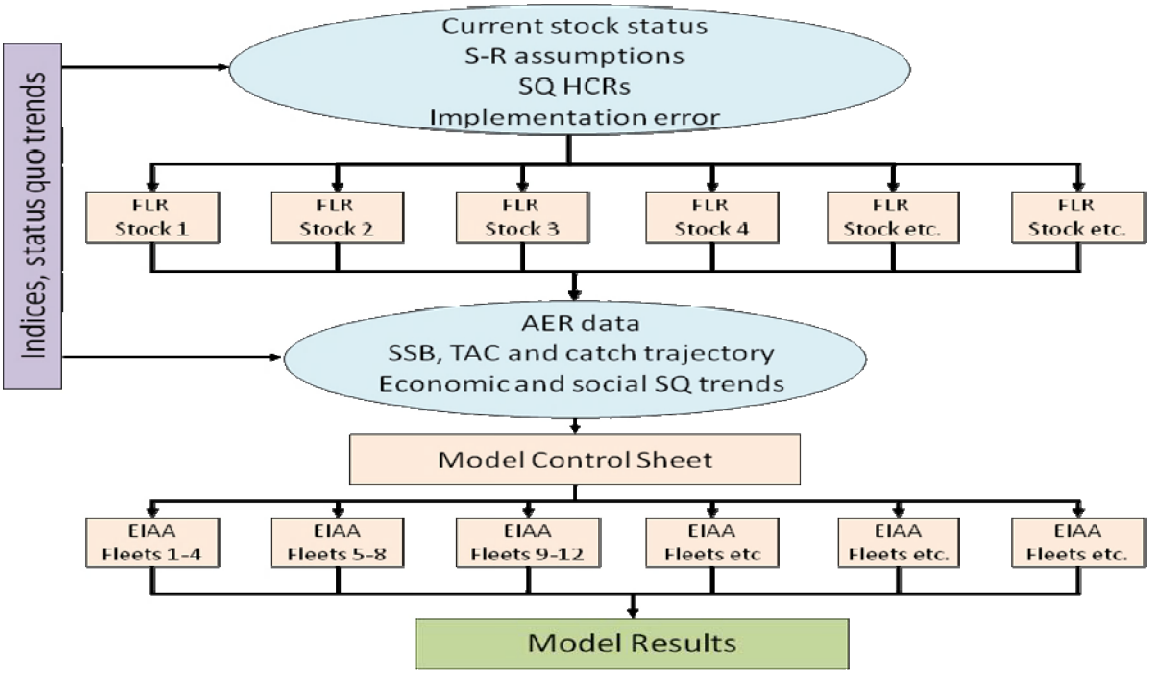

Figure 2 Schematic diagram of the linkages between components of the FLR-EIAA model

We estimate upstream and downstream multipliers as part of the modelling exercise in Section 4, with a methodology described in section 4.2.1.

The EIAA model had the following features:

(a) Calculations of the expected changes in effort required for each sector in each of the years 2012, 2017 and 2022 arising from increasing quotas and stock sizes, based on their catch composition in the reference period 2007-2009. The standard stock flexibilities for different species were used, as estimated by STECF (0.8 for demersal species, 0.1 for pelagic species), and the uptake ratios calculated from the reference period were maintained.

(b) Fish prices were calculated individually by species and sector. Price flexibilities (the relationship between supply volume and price) were assumed to be 0.2 for all species unless other values could be derived from the literature.

Species	Flexibility	Species	Flexibility	Species	Flexibility
Herring	0.3	Norway lobster	0.2	Turbot	0.3
Anchovy	0.6	Northern prawn	0.2	Lemon Sole	0.2
Cod	0.35	Plaice	0.25	Dab	0.2
Megrim	0.2	Pollack	0.2	Skates and rays	0.2
Anglerfish	0.2	Saithe	0.2	Norway pout	0.2
Haddock	0.4	Mackerel	0.4	Sandeel	0.2

Species	Flexibility	Species	Flexibility	Species	Flexibility
Whiting	0.3	Common sole	0.5	Atlantic salmon	0.2
Hake	0.4	Sprat	0.2	Other	0.2
Blue whiting	0.2	Horse mackerel	0.2		

(c) All prices, costs and values are expressed in real terms (i.e. With no inflationary component) relative to the reference period (2005-2007). In some sensitivity scenarios fish and fuel prices were raised/lowered.

(d) Fleet size was modified according to current trends and MS declared objectives for fleet reductions (informed by use of the fuel package by some MS for Fleet Adaptation Schemes[14]). Reference levels of fleet size, number of days fishing per vessel per year, and employment (FTE) were calculated. In some cases increasing TACs and declining fleet size led to an increase in the number of days fishing that each vessel would have to undertake in a year. Examination of AER data indicated that the maximum number of days that vessels should be able to fish was 190 days for vessels in the 00-12m class, 220 days for vessels 12-24m, 250 days for 24-40m and 290 days for 40m+ vessels. When average days at sea per vessel reached these levels, vessel numbers were increased. This is further described in Annex B.

(e) Variable costs were adjusted in proportion to fleet size, whereas fuel costs were adjusted in proportion to effort.

(f) Crew share was defined as a percentage of the gross revenue less variable costs (fuel and running costs). This covers payments to crew members, including the skipper. The percentage relevant to a particular sector was derived from historic crew share calculations. Note that the default EIAA model calculates future wages by maintaining the ratio of average wage to turnover in the reference period. This calculation differs to the standard share remuneration system, and does not allow for the independent performance of the various components of costs to be modelled effectively.

(g) In addition to crew share, the following were calculated: Gross value added, net profit, return on investment.

MEFISTO

In the Mediterranean the EIAA model is not useful because the Mediterranean management system is not based in TAC, but on effort control. For this reason it is necessary to use a model based on effort control, where the input is the level of effort allowed, not the TAC. One such model is MEFISTO (Mediterranean Fisheries Simulation Tool; Lleonart et al, 2009[15]). As noted in a recent report prepared for the European Commission [16]

"MEFISTO produces bio-economic simulations under alternative management scenarios to emulate fisheries management characteristic of the Mediterranean. MEFISTO provides

[14] An emergency package of measures to tackle the fuel crisis in the fisheries sector. An ad hoc special, temporary regime which will derogate from some provisions of the European Fisheries Fund (EFF) regulation for a limited period (up to the end of 2010).

[15] J. Lleonart, R. Franquesa and F. Maynou MEFISTO 3.0. Mediterranean FIsheries Simulation TOol: A bioeconomic model for Mediterranean fisheries. Available at http://www.mefisto.info/

[16] Prellezo, R., Accadia, P., Andersen J. L, Little, A., Nielsen R., Andersen, B.S., Röckmann C., Powell J. and Buisman, E. (2009) Survey of existing bioeconomic models: Final report. Sukarrieta: AZTI-Tecnalia. 283 pages. (SI2.507729)

advice in relation to; fishing effort changes, selectivity changes, price changes, imports, dismissal price and fuel price. These measures can also be modeled as a user defined event, for which a value can be assigned for specified levels (country, fleet, vessel or cohort). MEFISTO is a freeware stand-alone software package. It is possible to use MEFISTO with DCR data even if the original aggregation is at vessel level. The main model limitation comes from the assumption that the secondary species catches are proportional to a target species."

This model was used to examine the likely status quo scenario for the mixed pelagic fishery (midwater pair trawl) in the Adriatic Sea.

HDA-BIRDMOD

BIRDMOD[17] was implemented without the age structured Aladyn model described in Prellezo et al (2009)[18]. Instead a biomass-dynamic production model was implemented, fitted to the latest stock assessments available from SG-MED[19] (based on data from MEDITS and GRUND Programmes). A few adjustments have also been applied to the economic module for estimating additional indicators specifically requested for this study. The new version of BIRDMOD, named the HDA model, was implemented to cover 6 fleets operating in GSA 16 and 8 fleets (2 of them located outside Sicily but exploiting the same stocks) operating in GSA 10 (south and north of Sicily, respectively). These fleets operate within a variety of mixed fisheries, targeting both demersal and pelagic stocks. The demersal species included in the model for simulating landings and revenues are European hake, nephrops, striped mullet, red mullet, deepwater rose shrimp, giant red shrimp, and blue and red shrimp. Pelagic species are European anchovy, European pilchard, swordfish and bluefin tuna. With the exception of the fisheries for swordfish and tuna, all other fisheries are regulated by effort control and mesh size, the latter being determined by the Mediterranean Regulation (Council Regulation (EC) No 1967/2006).

The model is described in detail in Annex B.

Future scenarios were generated principally through reductions in effort associated with the planned reduction in Italian fleet size indicated by the Italian Operational Programme under the EFF, and by reductions in the catch of smaller fish and shrimps likely to be affected by the move to the required 40mm mesh size under regulation 1967/2006. This methodology was adequate for simulating changes in stock status as a response to changing fishing effort. For the quota stocks, tuna and swordfish, catches were pro-rated according to the likely prognosis of the stocks and catches anticipated by ICCAT and SG-MED.

1.4 Who is affected?

The CFP reform has the potential to impact on a wide number of stakeholders. It is recognised that successful reform of the CFP will have long-term benefits to all, but will have

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[17] IREPA. – 2005. A working proposal for the economic and biological data collection of the small scale fisheries. Workshop on Small Scale Fisheries. Kavala, Greece 12th-16th September 2005. Accadia, P. and M. Spagnolo. – 2006. A bio-economic simulation model for the Italian fisheries. 13th IIFET Conference: "Rebuilding Fisheries in an Uncertain Environment", Portsmouth, UK, 11-14 July 2006.

[18] Prellezo, R., Accadia, P., Andersen J. L, Little, A., Nielsen R., Andersen, B.S., Röckmann C., Powell J. and Buisman, E. (2009) Survey of existing bioeconomic models: Final report. Sukarrieta: AZTI-Tecnalia. 283 pages.

[19] Report of the SGMED-09-02 Working Group on the Mediterranean Part I. 8-12 JUNE 2009, Villasimius, Sardinia, ITALY

different implications and impacts on different stakeholders. This impact assessment attempts to capture the economic, environmental, social and governance consequences for, and on, different stakeholders.

As a framework for this assessment, the main stakeholders and their primary interests have been identified as follows:

Table 4 Key stakeholders in the EU fishing industry

Stakeholder	Description	Key interests
Catching sector	EC vessel owners, operators and crew.	Maintaining profitability and livelihoods.
Dependent businesses & communities	Business and communities dependent upon fisheries for their livelihoods.	Maintaining profitability and livelihoods.
Processing sector	Those processing raw material both imported and caught within EC waters	Maintaining profitability and livelihoods.
Sector regulators	Regional, national, provincial and local bodies regulating fishing	Ensuring an efficient, effective and practical management framework that balances a wide range of stakeholder needs.
Sector research	Scientific research bodies contributing to the conservation and management of stocks.	Contribution to an effective fisheries management regime through the timely access to high quality, robust data from fishery dependent and independent sources.
Consumers	Those consuming fisheries products	Availability, cost and quality of fish products with varying degrees of environmental scrutiny.
NGOs	Non-governmental organisations advocating sustainable management of fisheries.	To ensure responsible, science-based fishing limits for long-term sustainability and ecosystem health.
Civil society	The wider public with an interest in and concern for fisheries and the marine environment	To maintain fish populations, marine bio-diversity, and the amenity value of oceans, rivers and lakes.

2 PERFORMANCE OF THE CFP

In this section the current performance of the CFP is addressed through the analysis of the behaviour of various indicators of performance.

Towards the end of the chapter a review of the likely impact of current policy initiatives is derived by reviewing existing impact assessments for these policy initiatives.

2.1 Environmental indicators

2.1.1 Indicator 1 Stock situation in terms of fishing mortality in relation to MSY

Index definition

Indicator 1 describes the number and percentage of EU stocks considered to be exploited sustainably.

Data sources and methodology

Fishing mortality reference points for the northeast Atlantic and northern seas was sourced from International Council for the Exploration of the Sea (ICES) and EC internal reports. Mediterranean data were sourced from General Fisheries Commission for the Mediterranean (GCFM) and EC internal reports

With respect to indicator 1, three sub-indicators are calculated to express how close the current fishing rates are from the maximum sustainable yield (MSY). The two sub-indicators and the methodology used to compute them are as follows:

1. Stocks at MSY: F_{MSY} and B_{msy} are not defined for ICES stocks, so this was calculated in two ways; a) using the assessments of "Fishing mortality in relation to long term yield" made by Advisory Committee on Fishery Management (ACFM) and b) stock status with respect to the yield per recruit proxies for F_{MSY}, F_{max} and $F_{0.1}$.
2. The total number of stocks currently exploited within safe biological limits (SBL; $B>B_{pa}$) was also used as an indicator towards sustainability. The basis for this calculation was the ICES stock assessment data.

It is important to note that the total number of stocks considered for the current analysis corresponds to the total number of stocks listed by ICES/ACFM (even where no scientific advice is provided).

Results

Currently only around 30% of EU stocks are assessed. Furthermore, only a small proportion of the assessed stocks are currently being exploited sustainably. The trend is clearly upwards, but at a slow rate. The proportion of the landings originating from sustainably exploited stocks has increased fourfold in the last 10 years yet still only corresponds to just over 4% of total landings. It is important to note that this proportional increase was partially fuelled by a considerable decrease in total landings for that period rather than a significant increase in the total number of stocks exploited sustainably (Figure 4).

Table 5 Total number of EU stocks, assessed and not assessed (data source ICES/ACFM reports 2009). Not including the Mediterranean.

	2004	2005	2006	2007	2008
Total EU stocks (ICES WGs)	86	96	94	84	89
Total assessed EU stocks (ICES)	30	19	31	29	28
No assessment data	56	77	63	55	61
Overfished	30	18	29	26	25
Number of stocks exploited sustainably	-	1	2	3	3
% overfished (relative to total assessed stocks)	100%	95%	93%	88%	88%

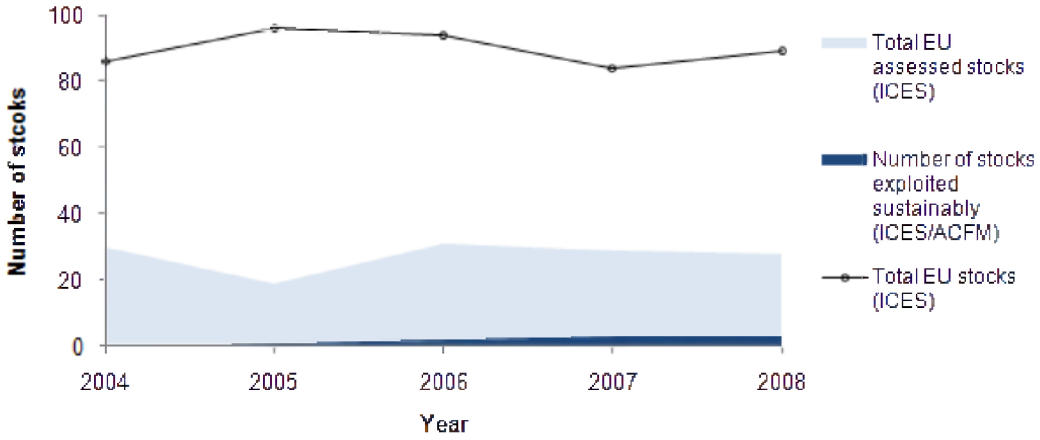


Figure 3 Total number of EU stocks (excluding the Mediterranean), assessed stocks and proportion which are exploited sustainably (data source ICES/ACFM reports 2009).

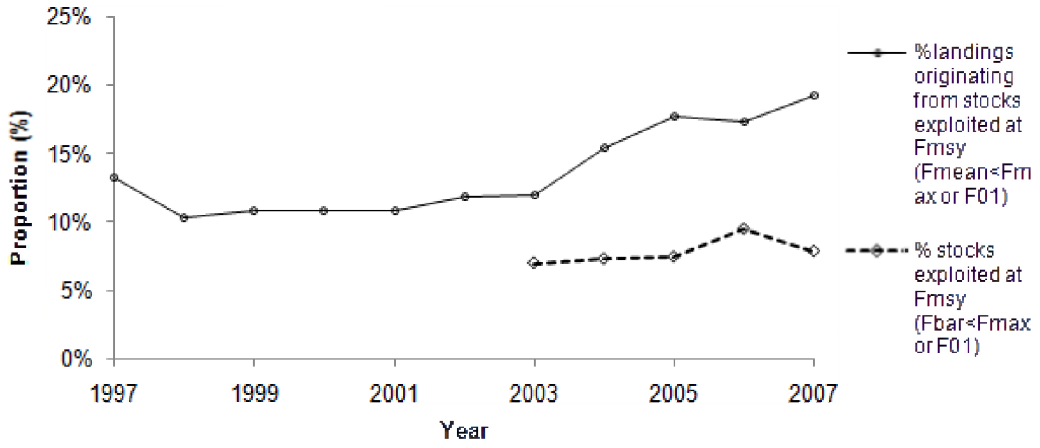


Figure 4 Proportion of EU stocks (excluding the Mediterranean) exploited sustainably and proportion of the landings originating from stocks which are exploited at F_{msy}.

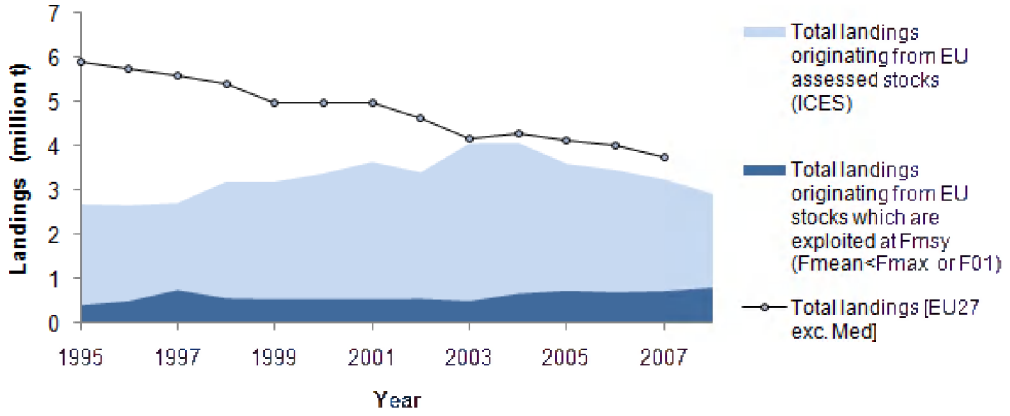


Figure 5 Total landings from EU stocks, assessed stocks and landings originating from those which are exploited below F_{max} and $F_{0.1}$.

The proportion of landings from stocks exploited within SBL is significantly greater than the proportion of landings from stocks exploited sustainably (Figure 6). The stabilisation from 2003 onwards reflects both the decrease in total landings and the lack of increase in the number of stocks exploited within SBL which have been more or less constant for the last 5 years, varying between 10 to 15% (relative to the total number of stocks). Figure 7 provides the relative proportion of the stocks exploited within SBL according to their geographic distribution.

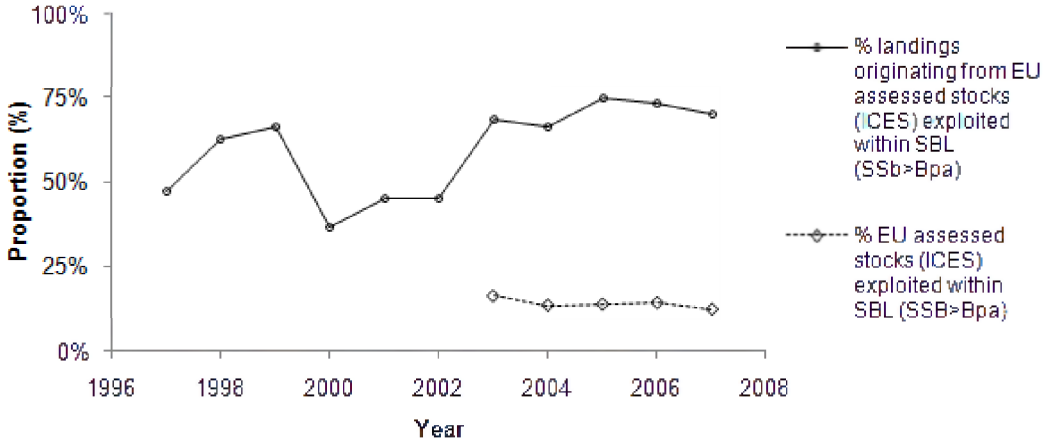


Figure 6 Percentage of ICES assessed EU stocks within SBL and % of landings originating from EU stocks which are exploited within SBL, i.e. where SSB>B_{pa}.

Mediterranean

It is not possible to build the indicators for the stocks in the Mediterranean due to the limited availability of time trend information on key stock parameters such as SSB, F_{msy}, F_{max} and/or $F_{0.1}$. Moreover, some of the assessments covering wider areas are based on preliminary data which render the results inconclusive. Nevertheless, an assessment of the current status of a number of stocks is available, expressed not in terms of their relationship to MSY but to safe biological limits (Figure 7). The status regarding stocks for which information is available status is further summarised in Annex A.

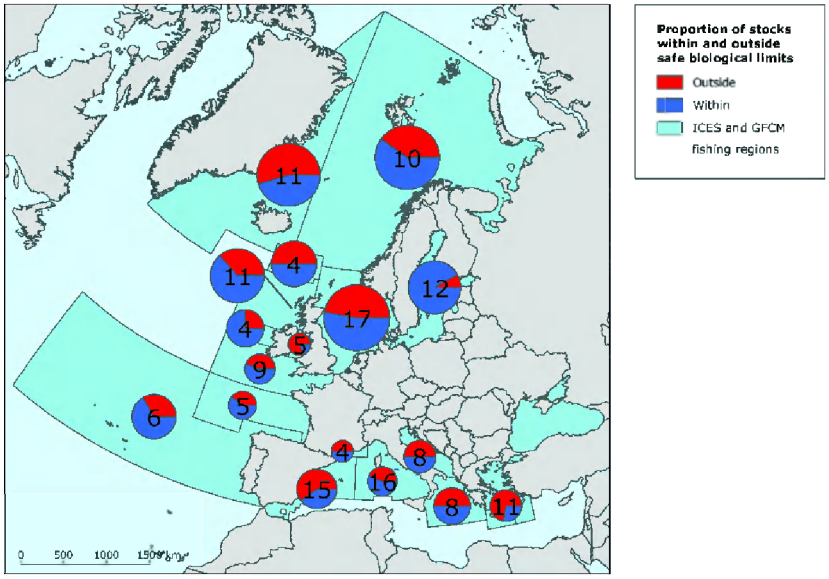


Figure 7 Proportion of stocks fished within and outside SBL for each region (source EAA website; 2006 baseline data).

Black Sea

Similarly to what happened for the Mediterranean, it was also not possible to build indicators for the stocks in the Black Sea mainly due to the lack of robust data. Despite stock assessments for turbot and sprat having been attempted they have both yielded poor results[20].

With respect to sprat, estimates emphasize the very cyclic nature of the population and therefore the inherent difficulty in producing medium to long-term considerations. This particular stock has been considered overexploited, not only due to heavy fishing but also due to low levels of recruitment observed in recent years. Regarding turbot, the STECF was unable to evaluate or comment on the status of the stock and reinforced the idea that its management needs to be coordinated internationally within the RFMO if management targets are to be achieved. It is thought that the current turbot biomass is low and a significant reduction in F should take place to allow for the stock to recover.

2.1.2 Indicator 2 EU Stocks under a Long Term Management Plan

Index definition

Indicator 2 describes both the number of EU stocks managed under a long term management plan (LTMP), and the volume of landings from stocks under LTMPs as ratio of the total volume of landings.

[20] STECF Report of the SGMED-09-01 Review of advice on Black Sea stocks for 2009. 23-27 March 2009. Ranco, Italy.

Data sources and methodology

Data for northeast Atlantic and northern seas stocks were sourced from ICES and EC internal reports. Data for Mediterranean stocks were available from GCFM and EC internal reports

This indicator was computed by assessing the total number of stocks managed under a LTMP and comparing it to the total number of EU stocks (as defined in the previous section). The proportion of landings originating from a LTMP stock was also calculated relative to the total EU landings.

Results

The results of all LTMPs, including those concluded under bilateral or multilateral agreements, and those recovery plans agreed within RFMOs, are shown in Annex A Table A6. Also shown are plans under development. Unless a stock is close to its target levels when a plan is agreed (as, for instance, were Bay of Biscay sole and North Sea plaice) it appears to take between 2 to 7 years to achieve success of the plans. For some stocks, recovery has not been achieved even after many years. In two stocks there has been a decline in the quality of scientific information to the extent that the true state of the stock is not known.

There are many technical and policy-related reasons why LTMPs have not been effective. The most significant appear to be: an inability to reduce fishing capacity or effort adequately to match desired fishing pressure; an inability to reduce by-catch and discarding; lack of compliance with rules to keep catches within quota; and the implementation of tight constraints on the inter-annual variation in TAC[21].

Figure 8 shows that less than a quarter of all EU stocks are managed under a LTMP and it clearly indicates that the number is increasing. The number of stocks doubled in 4 years from 2004 to 2008, with on average 4 stocks being brought under a LTMP each year. The proportion of catches under LTMP actually declined during this time, due to changes in the total catch of LTMP and non-LTMP stocks (Figure 9)

[21] MRAG (2009) *Fisheries management and recovery plans since 2002. A report to the European Parliament*, IP/B/PECHE/IC/2008-111

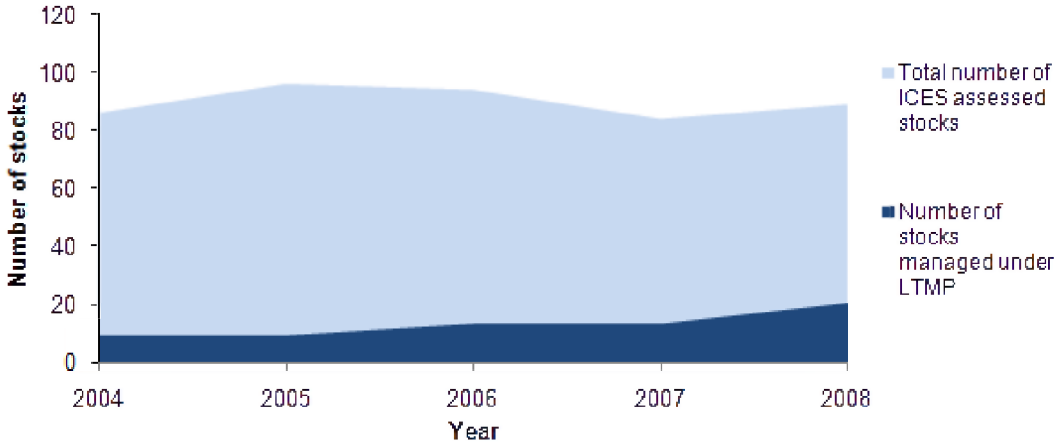


Figure 8 Number of EU stocks managed under a LTMP.

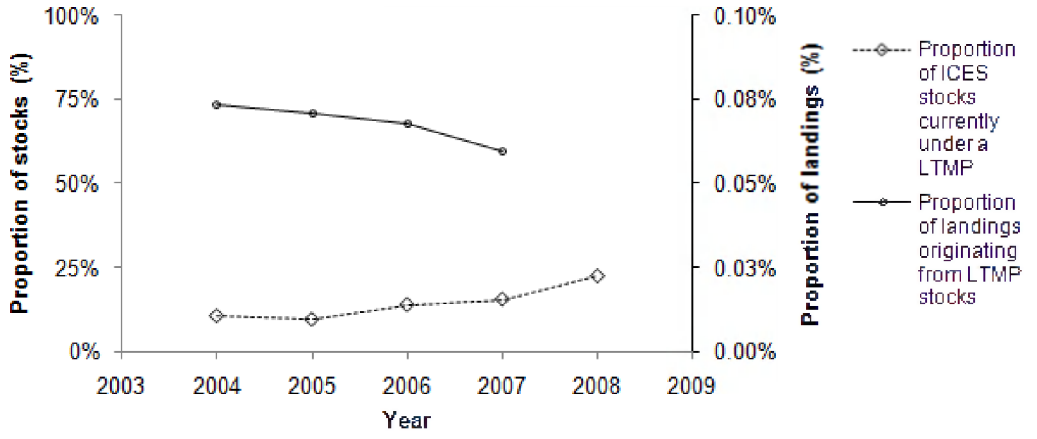


Figure 9 Proportion of EU stocks managed under a LTMP, and proportion of EU landings originating from the stocks managed under a LTMP.

2.1.3 Indicator 3 Average size (length and weight) of fish

Index definition

Indicator 3 describes trends in the average size and distribution (length and weight) of fish.

Data sources and methodology

This indicator is calculated based on the DATRAS database for bottom trawl surveys in the northeast Atlantic. Because of differences in gears and survey design between areas, the indicator is calculated for each survey separately. The indicator is calculated using both 30 cm as well as 40 cm as cut-off for defining 'large fish'.

Results

These indicators show that the proportion of small fish caught in surveys has been greater than 50%, generally fluctuating around 60 to 80%, in recent years (Figure 10). Given that large fish are generally acknowledged to have a higher breeding capacity than smaller fish, the fact that this proportion remains above 65% suggests that the stocks are more dependent on annual recruitment for growth rather than on the fraction of large fish within the stock.

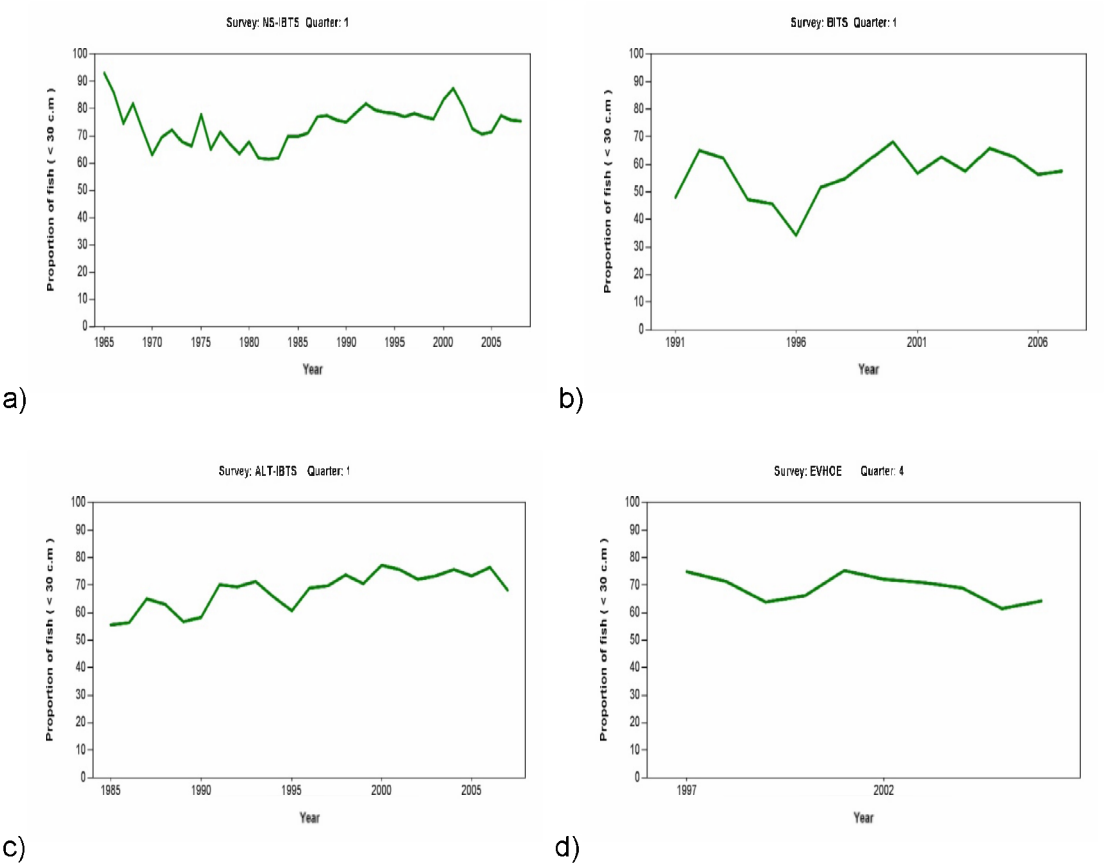


Figure 10 a) Baltic Sea – database only includes cod and flounder and the graph therefore in effect shows the development of the cod length; b) West of Scotland – Atlantic Bottom Trawl Survey (ALT-IBTS); c) North Sea Bottom Trawl Survey (IBTS) and d) Bay of Biscay (EVHOE).

The following indicator relates to the mean maximum length of fishes in the North Sea. This indicator is also based on the IBTS North Sea bottom Trawl Survey (Q1) data in the DATRAS database. A detailed description of each survey is provided in the ICES website[22]

The indicator is calculated as the maximum length of each fish species found in each haul and then for each year calculating the average of this length. Figure 11 demonstrates that the mean maximum length has decreased systematically throughout the years. This is most likely to result from heavy exploitation throughout this period. The key information provided by this figure is, however, the decreasing trend for the whole period. Notice particularly that there has been no reversal of the trend in recent years since the implementation of specific measures on cod (starting in 2001, with the first Recovery Plan from 2004).

[22] ICES. *Trawl Survey Details.* Available at: http://datras.ices.dk/Home/Descriptions.aspx

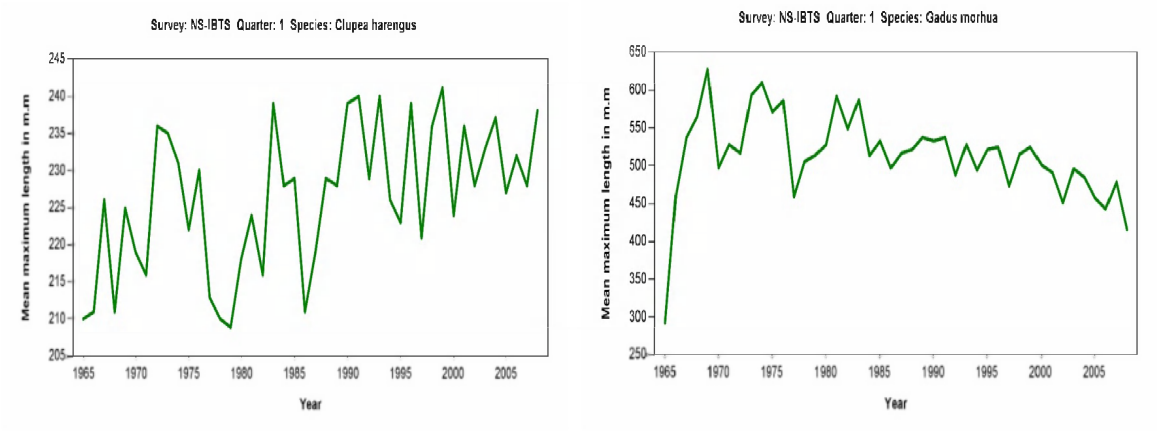


Figure 11 Mean maximum length for North Sea herring and cod. It is crucial to note that the data collected before 1970 is unreliable and therefore little meaning should be extracted from it. Data from the early years come from surveys which were originally designed as young herring surveys.

2.1.4 Indicator 4 Evolution of the fleet

Index definition

Indicator 4 describes fleet evolution in terms of number of fishing vessels, gross tonnage (GT) and power (kW).

Data sources and methodology

The main data source used in the computation of this indicator was the EC's fleet register website and the Facts and Figures of the CFP[23].

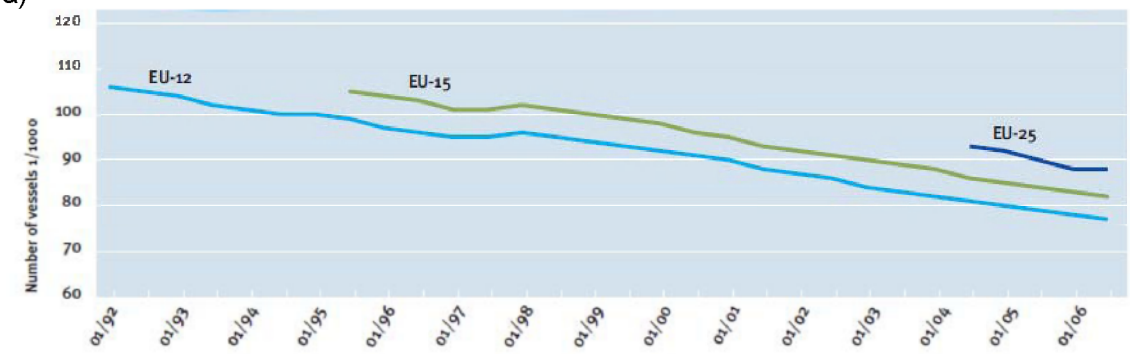
Results

The evolution of the EU fleet is shown below. It is clear that the number of vessels, GT and kW has decreased systematically for the last 15 years in accordance with the successive Multi-annual Guidance Programmes (MAGP) and the Entry / Exit rules adopted in 2002 to replace MAGPs.

The general conclusion regarding the trends observed in the composition of the fishing fleet is that the overall number of vessels has steadily declined since the early 1990s when considering the EU as a whole.

[23] European Commission (2008) *Facts and Figures on the CFP: Basic data on the Common Fisheries Policy – Edition 2008. Luxembourg: Office for Official Publications of the European Communities* - 39 pp

a)



b)

Figure 12 a) Evolution of the EU fleet in terms of number of vessels b) evolution of the EU fleet in terms if GT and kW (Source: Facts and Figures on the CFP, 2008).

Figure 13 describes the EU fleet by length class. In terms of capacity (GT) the 5 most important countries are Spain, UK, France, Italy, Netherlands and Portugal, yet in terms of number of vessels Greece leads followed by Italy, Spain, Portugal and France which have very large numbers of small vessels (see Annex A Table A 7). Small-scale fishing vessels (less than 12 m) make up around 82% of the whole of the EU fleet in terms of number.

Table 6 Number of vessels by country and by length segment (EC fleet register, 2008).

Country	00-06	06-12	12-18	18-24	24-30	30-36	36-45	45-60	60-75	75+	Total
BEL	-	1	8	42	3	25	27	-	-	-	106
BGR	845	1607	64	27	11	-	1	-	-	-	2,555
CYP	102	712	34	10	10	-	-	-	-	-	868
DEU	816	731	222	101	20	15	15	3	1	7	1,931
DNK	1105	1254	390	128	34	31	42	14	6	1	3,005
ESP	5185	4450	1396	972	558	276	146	61	23	23	13,090
EST	441	420	55	2	34	3	-	5	5	-	965
FIN	1520	1527	83	19	2	9	5	1	-	-	3,166
FRA	1037	5235	615	456	147	52	26	14	11	14	7,607
GBR	1765	4014	530	286	146	53	68	10	21	4	6,897
GRC	6545	10139	579	283	186	39	8	2	-	-	17,781
IRL	479	1073	121	122	62	29	18	12	4	-	1,920
ITA	3039	6500	2888	999	410	79	34	10	-	1	13,960
LTU	109	76	8	-	39	4	2	4	2	10	254

Country	00-06	06-12	12-18	18-24	24-30	30-36	36-45	45-60	60-75	75+	Total
LVA	494	238	35	6	94	5		4	2	3	881
MLT	724	580	62	27	7	2	1	-	-	2	1,405
NLD	116	175	53	196	59	57	155	11		12	834
POL	68	543	146	40	77	2	1		2	2	881
PRT	4258	3577	437	177	142	52	12	6	8	9	8,678
ROM	49	368	6	4	11	-	1	-	-	-	439
SVN	73	69	20	1	2	-	-	-	-	-	165
SWE	204	1078	146	63	22	27	28	3	-	-	1,571
Total	**28974**	**44367**	**7898**	**3961**	**2076**	**760**	**590**	**160**	**85**	**88**	**88,959**

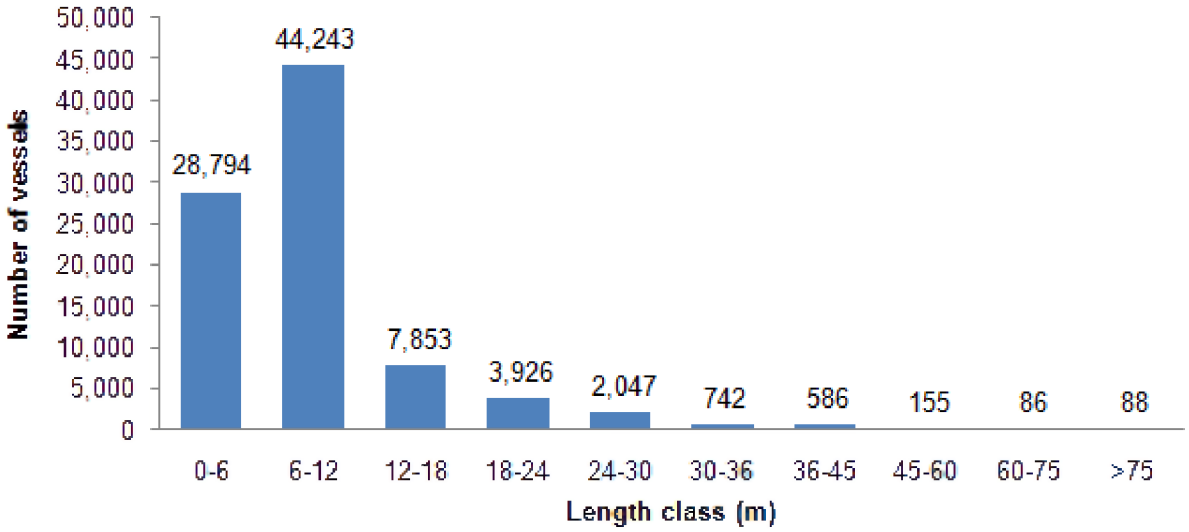


Figure 13 EU-27 fleet by length class (Facts and Figures on the CFP, 2008).

2.1.5 Indicator 6 Area covered by marine protection regimes

Index definition

Indicator 6 describes the proportion of area covered by marine protection regimes within the EU, presented separately as two sub-indicators; (1) existing protected areas, (2) areas receiving protection under fisheries management regulations.

Data sources and methodology

Data for existing Marine Protected Areas (MPAs) were extracted from the global MPA database[24], which provides information on the location, total size and marine area covered by MPAs, each EU MS. Although this database provides the most complete resource of MPA metadata, it does not contain a complete listing of Natura 2000 sites within the EU. This information was instead sourced from the Natura 2000 database[25], which calculates the total marine area covered under both the Birds Directive (Special Protection Areas [SPAs])

[24] Wood, L. J. (2007). *MPA Global: A database of the world's marine protected areas. Sea Around Us Project*, UNEP-WCMC & WWF.
[25] EC Europa. *Building a GIS for Natura 2000*

and the Habitat Directive (Special Areas of Conservation [SACs[and Sites of Community Importance [SCIs]). Although the directives have been in place since 1979 and 1992 respectively, data for the total marine area falling within Natura 2000 sites has only been available since 2004, and trends can only be described from this point.

Information regarding areas where fishing activity has been regulated or prohibited under a management decision is contained within relevant European Council regulations. These have included areas with temporary closures or restrictions described within annual TACs and quotas regulations, as well as more established, long-term areas of protection designed to contribute to the conservation and sustainable exploitation of fisheries resources under the CFP (e.g. Council Regulation (EC) No 2371/2002).

Once extracted, the various areas under protection were summed separately for the two sub-indicators. Total MPA coverage was expressed as the proportion of total EU waters (calculated at 5,824,593 square km (inclusive of territorial sea, contiguous waters and Exclusive Economic Zone [EEZ] combined[26]), whereas total area receiving protection under fisheries management regulations was expressed as the proportion of area shallower than 1500m, which is the depth limit for most conventional demersal trawlers[27]. This latter area was calculated at 2,264,291 square km using the geographical analysis package MapInfo.

Results

The total marine area protected under MS national legislation (excluding Ramsar Wetlands of Importance, United Nations Educational, Scientific and Cultural Organisation Biosphere areas and Natura 2000 sites) has been increasing steadily since 1990, although since 2000 the trend has been static (Figure 14). Currently this area covers approximately 23,900 sq km, which relates to 0.41% of combined EU waters.

The extension of Natura 2000 to the marine environment, including the offshore marine environment, is one of the priorities of the EU action to halt the loss of biodiversity. With Natura 2000 sites (marine components only) included, the total area under protection increases to 176,002 sq km, covering just over 3% of total EU waters. Overall, the Natura 2000 marine area covers 17% of the total Natura 2000 area.

Conservation of marine habitats through protected areas is still very much a developing area. Data quality for marine populations is noted as poor almost twice as often for terrestrial species (60% for marine species, 35% for terrestrial species)[28]. It should be considered that the Natura 2000 network is still under construction (especially for the marine environment) and that restoration measures often take considerable time to show effect on habitats and species. Where there has been a will to make substantial interventions, it is noticeable these have had measurable positive impacts on conservation status.

[26] Data sourced from the Global Maritime Boundaries Database, available at: http://www.gd-ais.com/index.cfm?acronym=gmbd

[27] Fishing restrictions specified in the relevant EC regulations invariably apply to demersal trawl gear.

[28] Natura 2000 Newsletter No 26, July 2009.

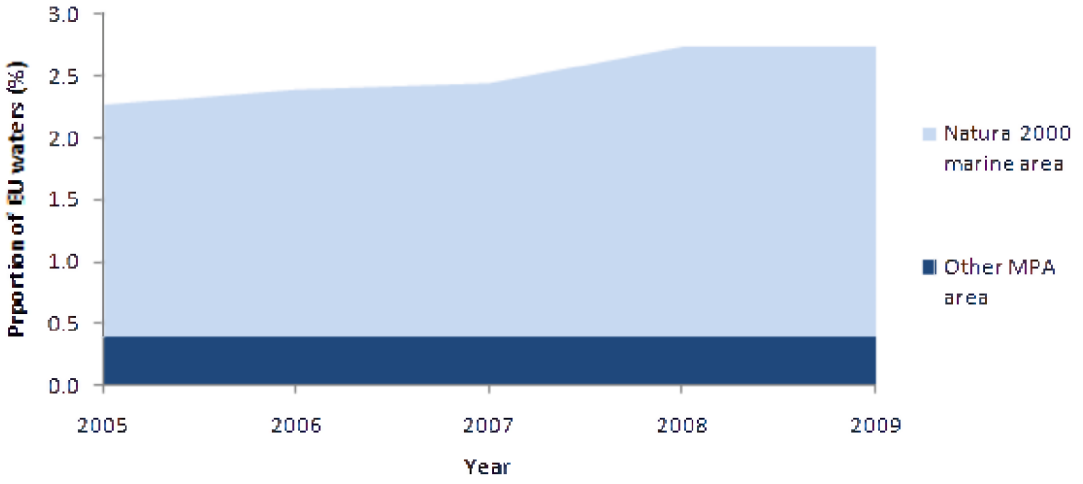


Figure 14 Total area covered under SCIs, SPAs and non-Natura 2000 MPAs as a proportion of total EU waters.

Areas not officially classed as MPAs, but which have some form of fishing prohibition or restriction have increased dramatically since 2000 from around 4% to 16% (Figure 15)[29]. Within these areas gear restrictions prohibit the use of demersal trawling[30].

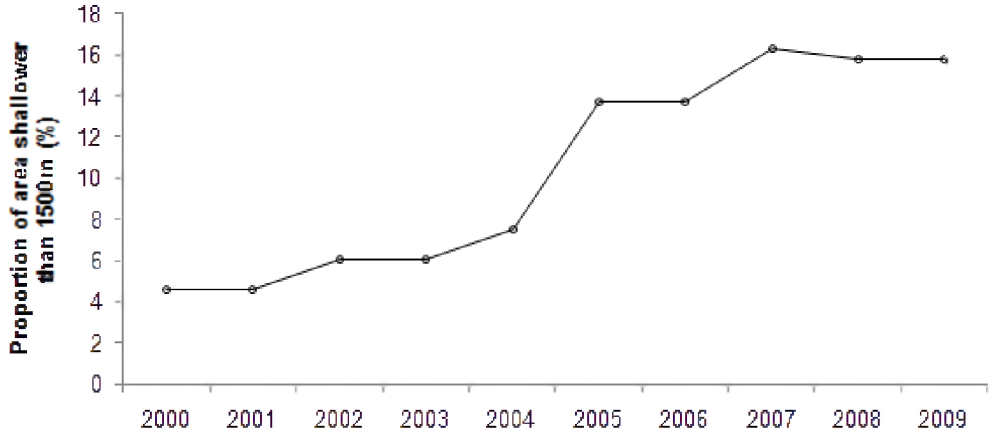


Figure 15 Total area with some form of prohibitive or restrictive management regulation as a proportion of total area shallower than 1500m.

[29] An area of 1.2 sq km around the Macronesian Isles was established in 2005 but is not included in this analysis given its disproportionate coverage.

[30] With the exception of the Plaice Box, where the restriction applies to the number of vessels allowed.

2.2 Economic indicators

2.2.1 Indicator 7 Gross Value Added

Index definition

Gross Value Added (GVA) is defined as the net profit from fishing (or processing), plus crew/labour earnings, plus depreciation costs, plus interest.

Data sources and methodology

For the catching sector this indicator is derived from Annual Economic Report (AER) socio-economic data on MS fishing fleets provided under the Data Collection Regulation. GVA for each fleet segment is the sum of GVA for that fleet segment across all MS (country-specific data on GVA are contained in annual AER reports). Total GVA for each year is the sum of all GVA generated across all fleet segments for that year. Data are provided in real terms below and in Annex A based on Eurostat price indices so as to more accurately display trends.

For the processing sector data in Table 8 for selected countries are based on the recent meeting of the STECF- Sub-Group on Economic Assessment (SGECA) (October 2009)[31]. Text is also informed by Salz and Macfadyen (2007)[32].

No data on GVA for the aquaculture sector in the EU are available at the present time.

Results

In the catching sector, average GVA across all fishing fleets in the EU over the last three years for which data are available (2005-2007) was EUR3.73 billion or EUR3.36 billion at 2003 prices. The top ten most important fleets account for more than 75% of total GVA, and include 3 segments of 0-12m in length, 3 of 12-24m, 2 of 24-40m, and 2 of over 40m. The most important three fleet segments are demersal trawl and seines of 12-24m, pelagic trawls and seines of >40m, and passive gear 0-12m. Trend data show that, even when examining GVA in real rather than absolute prices, GVA in recent years shows no strong clear upward or downward trend. In light of declining vessel numbers over the same period, which one might expect would lead to increased economic performance for those vessels remaining in the fleet, these data are worrying. Declines in GVA per vessel may be the result of many factors, including declining catches (and catch limitations) and increases in costs, such as fuel.

It should be noted that during 2007 and the first half of 2008 fuel prices rose dramatically while fish landing prices declined compared to 2006 levels (see indicator 12 Section 2.2.5), and that since mid-2008 fuel prices have fallen considerably. High fuel prices coupled with low landings prices resulted in significant additional financial pressures on the catching sector during 2008, pressures which may have eased slightly in 2009 (subject to changes in fish prices, which may themselves have been impacted by the global financial crisis). These

[31] Note that there are two regulations pertaining to the collection of fish processing data, NACE and ProdCom. NACE is a systematic approach to data collection from a company perspective following the main activity. A company may have many activities, one of which is fish processing. In cases where fish processing activity is of minor importance to the company it is not reported as fish processing. Especially in large companies this might lead to bias in the data. Equally it is possible that where fish processing is the main, but exclusive activity, data may be provided for the company as a whole, again leading to bias in the data.

[32] Salz and Macfadyen (2007) *Regional dependency on fisheries (European Parliament)* IP/B/PECH/ST/IC/2006-198).

impacts were felt to different degrees by fleet segments with differing operating cost profiles (and fuel dependencies) and by those targeting species with different price flexibilities of income - fuel intensive vessels such as the larger beam trawlers can be expected to have seen larger fluctuations in financial performance since 2007 than smaller passive gear vessels with lower fuel costs as a percentage of operating costs; likewise, while vessels targeting species with low price flexibilities of income can be expected to have been less affected by fluctuating financial performance if demand, and prices, remained strong for their product despite the global economic downturn. These comments apply also to the results described below for indicators 8-10 inclusive.

In the processing sector, trend data for GVA are not available, and recent data for 2007 are only available for some countries (Table 7). Data for the EU as a whole for 2005 suggest GVA of EUR4.6 billion, comprising of value added from both EU-caught fish and value-added from imports to the EU for processing. Fish processing is particularly important in the UK, France and Spain. Income generated in these countries in 2005 was 2.4 billion Euro, or 52% of the income from fish processing in the EU as a whole.

The aquaculture sector is estimated to generate 1.6 billion EUR of value added (2005) although again data trends by year are not available. Aquaculture plays a particularly pronounced role in Italy, Greece, Spain and the UK. These four countries represent 65% of the total income from this activity. Value added from ancillary activities is estimated for 2005 at 0.8 billion EUR.

Table 7 Trends in GVA for fleet segments 2003 to 2007 (mEUR in real values, 2006 = 100). Note: Top ten fleet are shaded blue; fleet segments with significant trends are shown in bold italics. Only fleets with full time series data were included in correlation analysis (*n* = 32).

Fleet segment	2003	2004	2005	2006	2007	% of EU	r value
DTS VL1224	593.98	617.83	604.51	631.99	594.92	16.36%	0.1566
PTS VL40XX	294.63	278.76	441.29	444.35	343.78	10.96%	0.5293
PG VL0012	15.40	332.91	382.35	432.47	406.55	10.92%	0.8160
DTS VL2440	399.74	315.88	327.88	331.51	320.30	8.75%	-0.6571
PGP VL0012	307.24	300.51	284.33	318.17	267.52	7.77%	-0.4908
PTS VL1224	215.26	221.78	222.06	257.09	194.43	6.01%	-0.0445
PTS VL2440	115.80	144.81	156.66	207.41	173.25	4.80%	0.8260
PMP VL0012	221.91	157.21	179.79	158.57	177.08	4.60%	-0.5336
DTS VL40XX	118.76	75.05	126.43	87.03	104.98	2.84%	-0.1150
HOK VL1224	20.61	77.35	92.78	95.91	80.02	2.40%	0.7115
TBB VL1224	63.15	72.68	94.12	72.85	100.23	2.39%	0.7450
DRB VL1224	**128.02**	**111.54**	**96.92**	**89.70**	**79.28**	***2.37%***	**-0.9884**
TBB VL2440	**70.24**	**69.77**	**74.84**	**85.43**	**97.69**	***2.31%***	**0.9362**
DFN VL0012	72.88	74.92	76.07	73.00	76.64	2.02%	0.5141
DFN VL1224	56.80	57.03	87.18	72.68	66.01	2.01%	0.4259
HOK VL0012	**32.93**	**59.25**	**52.39**	**67.02**	**74.47**	***1.74%***	**0.9035**
FPO VL0012	49.55	47.80	33.09	88.28	71.97	1.74%	0.6177
HOK VL2440	52.36	70.46	69.35	62.75	26.16	1.41%	-0.5200
DTS VL0012	45.56	23.33	41.37	54.73	55.02	1.35%	0.6134
PMP VL1224	164.42	43.89	51.13	44.75	53.43	1.33%	-0.6712
TBB VL40XX	65.07	55.97	42.38	44.82	47.15	1.20%	-0.7944
PGP VL1224	66.85	37.09	43.45	45.13	41.15	1.16%	-0.5888
DRB VL0012	22.84	24.43	22.93	24.42	21.82	0.62%	-0.2872

Fleet segment	2003	2004	2005	2006	2007	% of EU	r value
FPO VL1224	24.08	21.45	27.99	20.58	20.73	0.62%	-0.3813
DRB VL2440	6.88	12.17	14.24	22.60	12.57	0.44%	0.6054
MGO VL0012	12.76	11.55	15.88	11.37	12.22	0.35%	-0.1079
MGP VL1224	8.31	6.55	11.21	8.32	9.81	0.26%	0.4295
PG VL1224	-	10.39	8.58	12.04	8.24	0.26%	-
PGO VL0012	10.31	7.91	8.46	7.71	11.48	0.25%	0.2052
MGP VL0012	3.70	4.93	10.37	8.09	7.12	0.23%	0.6022
PTS VL0012	6.96	26.10	10.46	3.47	5.12	0.17%	-0.4549
HOK VL40XX	8.95	12.84	21.26	-8.70	4.98	0.15%	-0.4219
PMP VL2440	-4.90	4.91	1.43	-	5.47	0.09%	-
MGP VL2440	6.21	-	-	3.01	-	0.08%	-
DFN VL2440	2.16	3.25	3.04	2.82	1.87	0.07%	-0.2740
FPO VL2440	-	-	-	-	1.47	0.04%	-
NONACTIVE	-	-	-	-	-0.04	0.00%	-
TBB VL0012	-	-	-	-6.78	0.86	-0.08%	-
Total	**2,891**	**3,112**	**3,577**	**3,875**	**3,745**	100.00%	-
Average	**85.0**	**91.5**	**105.2**	**110.7**	**101.2**	-	-

Table 8 Gross value added in the processing sector (selected countries only), 2007

Country	GVA (EUR '000s)
Belgium	84,668
Denmark	222,550
Estonia	23,756
Finland	28,700
Italy	358,188
Lithuania	27,546
Netherlands	165,329
Poland	202,089
Portugal	171,205
Romania	15,634
Slovenia	11,572
Spain	1,611,276
Sweden	114,861
United Kingdom	607,737

2.2.2 Indicator 8 Ratio of Revenue to Break-Even Revenue

Index definition

Break-even revenue (or break-even point) is the point at which income or turnover is equal to costs (excluding depreciation and interest). The ratio of revenue to break-even revenue is therefore calculated by taking the revenue and dividing it by the costs (excluding capital costs). An indicator of greater than one provides some confidence in economic sustainability.

Data sources and methodology

For the catching sector this indicator is derived from AER socio-economic data on MS fishing fleets provided under the Data Collection Regulation. Ratios are calculated for each fleet segment across all MS. For each fleet segment, using the AER data the sum all 'TOTALINCOMES' cells is divided by the sum of all 'total costs' less the sum of all 'CAPCOSTS' for each year. The average ratio presented is the average of the individual fleet segment ratios.

For the processing sector, data from the recent meeting of the STECF-SGECA (October 2009) made available under the Data Collection Regulation (DCR) have been examined.

Data are not available at the present time to allow for a calculation of a ratio of revenue to break-even revenue for the aquaculture sector in the EU.

Results

For the catching sector 13 fleets show ratios greater than 1, and 14 fleets show ratios lower than 1 (indicating that revenues are not sufficient to cover costs (excluding depreciation and interest) and that fleet segments are not economically viable in the long-term based on current economic performance. None of the demersal or pelagic trawl segments show ratios greater than 1. Across the EU fleet as a whole, the average ratio over 2005-2007 is calculated as 1.01.

For the fleet segments that contribute the greatest levels of GVA to total EU GVA as shown in indicator 7, only six of the 20 most important fleets, and 3 of the 10 most important fleets, have a ratio of revenue to break-even revenue of greater than 1. Trends over 2003 to 2007 in the ratio for the most important fleets in terms of EU GVA, and for the EU as a whole, are shown in Table 9, and for most fleets show a static or very slight declining trend in the ability of revenues to cover costs. As with indicator 7 (GVA) this may be the result of many factors, including declining catches (and catch limitations, especially for the over 10m sector) for these segments and increases in costs, such as fuel.

Data recently made available at the STECF-SGECA meeting suggest that for the processing sector in 2007, when aggregated at MS-level, all processing sectors were generating income sufficient to cover operational costs. Spain, Romania and Slovenia performed especially well in comparison to other countries for which data are available. However, with ratios only just greater than 1 for most other countries, and bearing in mind that ratios are calculated based on operating costs only, data suggest that the sector in most MS is facing financial difficulties.

As noted above, data are not available to calculate this indicator for the aquaculture sector at the present time.

Table 9 Trends of ratio of revenue to break-even revenue 2003 to 2007 by fleet segments. Note: Top ten fleet are shaded blue; fleet segments with significant trends are shown in bold italics. Pearson's correlation coefficient (r) is also shown.

Fleet segment	2003	2004	2005	2006	2007	r value
PGP VL0012	1.27	1.40	1.26	1.21	1.57	0.4369
MGP VL0012	1.16	1.28	1.38	1.25	1.17	-0.0444
MGO VL0012	1.26	1.32	1.31	1.23	1.25	-0.4361
PGO VL0012	1.32	1.28	1.29	1.21	1.29	-0.5149
MGP VL1224	1.20	1.20	1.25	1.25	1.15	-0.2139
PGP VL1224	1.01	0.66	0.77	1.13	1.52	0.6970
PMP VL0012	1.20	1.05	1.12	1.21	1.09	-0.1601
DFN VL0012	1.23	1.23	1.24	1.15	0.97	-0.8247

Fleet segment	2003	2004	2005	2006	2007	r value
MGP VL2440	1.17	-	-	1.12	-	-
DRB VL1224	1.22	1.08	1.08	1.11	1.05	-0.7472
HOK VL1224	0.89	1.08	1.05	1.07	1.09	0.7327
DRB VL0012	***1.29***	***1.21***	***1.21***	***1.05***	***0.95***	***-0.9630***
DFN VL1224	0.96	0.91	1.05	0.98	0.99	0.4120
PTS VL1224	1.09	0.96	0.95	0.99	1.02	-0.3024
PMP VL1224	1.31	0.86	0.99	0.98	0.96	-0.5439
HOK VL40XX	1.03	1.17	1.30	0.66	0.92	-0.4703
PTS VL40XX	1.03	1.04	0.93	0.98	0.90	-0.8230
TBB VL40XX	1.04	0.99	0.91	0.93	0.94	-0.7906
DTS VL1224	0.96	0.90	0.90	0.91	0.87	-0.8011
DTS VL40XX	0.88	0.73	0.90	0.89	0.85	0.1776
PTS VL0012	1.17	0.87	1.15	0.49	0.98	-0.4309
HOK VL2440	0.93	0.97	0.94	0.77	0.86	-0.6902
PTS VL2440	0.86	0.76	0.68	0.88	0.95	0.4562
HOK VL0012	***1.30***	***1.07***	***1.04***	***0.77***	***0.69***	***-0.9752***
DTS VL0012	1.03	0.73	1.01	0.80	0.59	-0.6785
DTS VL2440	0.84	0.70	0.76	0.78	0.82	0.1247
FPO VL0012	0.99	0.93	1.24	0.50	0.54	-0.6735
Average	**1.10**	**1.02**	**1.07**	**0.97**	**1.00**	**-**

Table 10 Ratio of revenue to break-even revenue for processing sector, 2007

Country	Ratio revenue to break-even revenue
Belgium	1.07
Denmark	1.01
Estonia	1.01
Finland	1.04
Italy	1.04
Lithuania	1.03
Netherlands	1.08
Poland	1.07
Portugal	1.08
Romania	1.26
Slovenia	1.33
Spain	1.3
Sweden	1.07
United Kingdom	1.03

2.2.3 Indicator 9 Net Profit Margin

Index definition

Net profit margin is defined as the net profit divided by the total income i.e. the value of landings (in the case of the catching sector) or turnover or sales (for the processing sector), plus subsidies and additional income.

Data sources and methodology

For the catching sector this indicator is derived from AER socio-economic data on MS fishing fleets provided under the Data Collection Regulation. The indicator for each fleet segment for each year is therefore calculated as the sum of all 'PROFIT (LOSS)' cells in the AER data divided by sum of the 'TOTAL INCOME' cells in the AER data, expressed as percentage. Total Net Profit Margin for the EU as a whole is calculated on the same basis but across the whole AER data set.

For the processing sector, data from the recent meeting of the STECF-SGECA (October 2009) made available under the DCR have been examined.

It is not possible to calculate net profit margins for the aquaculture sector in the EU at the present time due to a lack of available data to do so.

Results

For the catching sector, Table 11 shows that the smaller fleet segments, and those using passive gear, appear to be performing better than larger vessels and vessels using active gears. This may in part be due to the owner/operator nature of much of the small-scale fleet. In many artisanal fleets, net profits are likely to be accounting for the unpaid remuneration of the operators, when they are owners or family members working in the family business. It is likely that the effective net profits of the artisanal fleets are lower, and this may be especially the case in southern countries. Also of interest is that analysis of the difference between landed catch values and total income, shows that for the small scale fleet in particular total income is often considerably greater than the value of landings. The scale of subsidies to this sector is generally thought to be small suggesting that the differences between income and landed values arises from additional income generation not from subsidies

Trends in net profit margins over 2003 to 2007 for the 10 most important fleets in terms of EU GVA (as shown in indicator 7), and for the EU as a whole, are shown in Table 11. The Figure shows slightly improving performance over recent years for most of the fleets concerned, but for many of these important fleets, net profit margins remain poor.

For the processing sector, data are available to calculate the indicator for some countries, as show in Table 12. Lithuania and Denmark show negative net profit margins, while other countries show positive margins. Romania, Spain and Portugal are the three best performing countries, but with net profit margins of less than 5% being common, overall processing sector performance suggests considerable pressures currently facing the industry.

Data are not available to calculate this indicator for the aquaculture sector at the present time.

Table 11 Trends in net profit margin 2003 to 2007 for fleet segments. Note: Top ten fleet are shaded blue; fleet segments with significant trends are shown in bold italics. Pearson's correlation coefficient (r) is also shown.

Fleet segment	2003	2004	2005	2006	2007	r value
PG VL0012	0.8%	53.8%	55.9%	60.2%	62.2%	0.79
PG VL1224	-	52.5%	38.5%	66.1%	54.8%	-
PMP VL0012	22.5%	15.0%	21.3%	32.3%	28.3%	0.68
PGP VL0012	***-1.4%***	***-1.3%***	***19.6%***	***19.1%***	***24.0%***	***0.91***
HOK VL0012	8.6%	18.2%	12.7%	20.5%	28.5%	0.87
PGO VL0012	20.0%	15.3%	17.6%	12.4%	16.9%	-0.52
PTS VL1224	2.0%	4.0%	13.2%	16.5%	12.5%	0.84

Fleet segment	2003	2004	2005	2006	2007	r value
DRB VL2440	1.4%	-0.2%	1.0%	24.6%	14.9%	0.75
FPO VL0012	19.1%	14.0%	13.5%	17.8%	8.4%	-0.66
DRB VL0012	16.2%	13.8%	14.9%	14.6%	9.2%	-0.77
DRB VL1224	3.1%	1.2%	12.7%	12.8%	11.8%	0.81
HOK VL1224	***0.3%***	***-0.1%***	***6.1%***	***11.0%***	***17.8%***	***0.96***
MGP VL0012	4.3%	9.7%	18.1%	9.0%	7.6%	0.18
FPO VL1224	18.7%	7.7%	16.0%	11.5%	5.9%	-0.64
PGP VL1224	***-1.9%***	***-1.8%***	***2.8%***	***10.1%***	***15.1%***	***0.96***
DFN VL1224	6.2%	5.0%	10.3%	8.3%	8.8%	0.63
MGO VL0012	11.6%	14.7%	7.6%	6.5%	11.1%	-0.44
PTS VL40XX	5.7%	1.4%	8.1%	12.2%	3.2%	0.22
DTS VL1224	1.1%	-0.8%	5.6%	6.8%	7.6%	0.88
DFN VL0012	6.5%	9.1%	10.9%	6.8%	0.9%	-0.57
PTS VL2440	-2.4%	-0.5%	-8.1%	11.7%	11.4%	0.71
DTS VL0012	7.0%	4.6%	6.8%	7.4%	0.5%	-0.56
MGP VL1224	7.1%	2.4%	9.0%	7.7%	-3.7%	-0.49
TBB VL2440	-1.3%	-4.8%	-0.5%	1.8%	8.6%	0.84
PMP VL1224	2.0%	-3.5%	5.3%	5.3%	-3.5%	-0.08
PTS VL0012	3.8%	-	2.8%	-2.8%	3.4%	-
TBB VL1224	-6.5%	-11.5%	3.3%	-6.5%	6.2%	0.65
DTS VL40XX	-1.5%	-6.5%	4.8%	-2.6%	0.6%	0.30
DFN VL2440	-	-4.7%	2.1%	-	-	-
DTS VL2440	0.5%	-1.8%	-4.9%	-0.3%	1.9%	0.26
MGP VL2440	14.3%	-	-	-5.2%	-	-
HOK VL2440	-3.4%	-7.9%	-6.4%	-2.5%	-5.5%	0.09
Total	2.5%	4.0%	8.9%	12.5%	11.9%	-

Table 12 Net profit margin in processing sector, selected countries 2007

Country	Net profit margin (%)
Belgium	3.6
Denmark	-1.8
Estonia	1.1
Finland	4.2
Italy	2
Lithuania	-3
Netherlands	3.9
Poland	4.4
Portugal	5.5
Romania	13.1
Slovenia	12
Spain	5.5
Sweden	4.5
United Kingdom	0.2

2.2.4 Indicator 10 Return on Investment

Index definition

Return on Investment (ROI) is defined as the operating profit (or gross cash flow) divided by the total investment.[33]

Data sources and methodology

For the catching sector this indicator is derived from AER socio-economic data on MS fishing fleets provided under the Data Collection Regulation[34]. Using the AER data, for each year, the sum of the 'CASHFLOW' cells for each segment is divided by the sum of the 'investment cells' for each segment, and expressed as a percentage. Total ROI for the EU as a whole is calculated on the same basis but across the whole AER data set.

For the processing sector, data from the recent meeting of the STECF-SGECA (October 2009) made available under the DCR have been examined.

So as to better reflect the opportunity cost of capital, the indicator in both the catching and processing sectors can be compared to average EU bond rates in recent years i.e. fisheries sector ROI should not just be positive, but should be greater than bond rates. Given the relatively high risks of investing in the fisheries sector, and inherent uncertainties compared to investing bonds, it can also be assumed that for returns on investment to be deemed 'sufficient' they should incorporate a risk premium over and above bond rates. In the catching sector an appropriate premium might be considered as +/-5%, while in the processing sector a lower risk premium of +/-3% might be considered appropriate. The average interest rate for long-term government bonds in the Euro-zone (October 2008 to November 2009) are 4.27%, while the corresponding rate for the non-Euro zone is 7.13%. These figures, along with an appropriate risk premium, suggest that a ROI of around 15% for the catching sector and 10% for the processing sector can be considered a minimum 'sufficient' ROI given the opportunity cost of capital.

It is not possible to calculate break-even revenue for the aquaculture sector in the EU at the present time due to a lack of data.

Results

Given EC bond rates, certain fleets provide a better ROI than could be obtained by buying bonds with no risk. However, given the financial risks involved with investing in the fishing sector, one would expect investors to expect a considerable premium over and above returns from bonds.

Trends in ROI over 2003 to 2007 for the 10 most important fleets in terms of EU GVA, and for the EU as a whole, show no significant increasing or decreasing trends in recent years (see Table 13).

---

[33] Return on Investment (or return on capital employed) is normally estimated based on net operating profit as the numerator rather than 'net profit' as suggested and defined by STECF-SGECA 2008 (i.e. it excludes depreciation and interest because the denominator includes debt capital. The STECF-SGECA basis for estimating ROI has therefore not been used for this indicator

[34] Note that there are differences between MS in the methodology used to define and collect capital costs

For the processing sector, data are available to calculate the indicator for some countries, as show in Table 14. Poland and Lithuania show higher levels of performance compared to other countries. Data are not available to calculate this indicator for the aquaculture sector at the present time.

Table 13 Significant trends in ROI in 2003 to 2007 for fleet segments. Note: Top ten fleet are shaded blue; fleet segments with significant trends are shown in bold italics*. Pearson's correlation coefficient (r) is also shown.

Fleet segment	2003	2004	2005	2006	2007	r value
PG VL1224	-	194.7%	113.1%	267.8%	115.3%	-
PG VL0012	18.5%	157.6%	140.8%	154.1%	147.6%	0.6808
PGP VL0012	***285.4%***	***274.7%***	***79.2%***	***72.4%***	***65.8%***	***-0.8909***
PGO VL0012	79.5%	53.5%	60.9%	36.4%	66.6%	-0.4239
HOK VL0012	24.2%	77.3%	37.9%	24.3%	45.8%	-0.0711
PGP VL1224	86.1%	35.9%	26.7%	38.6%	39.6%	-0.6116
DFN VL2440	21.3%	4.0%	11.3%	59.1%	34.6%	0.5945
MGO VL0012	29.3%	32.2%	34.2%	18.7%	27.4%	-0.4528
PMP VL0012	22.3%	21.9%	10.9%	32.7%	31.2%	0.5156
FPO VL0012	***61.7%***	***44.4%***	***25.9%***	***38.5%***	***9.7%***	***-0.8884***
DRB VL1224	***68.1%***	***62.4%***	***29.3%***	***28.6%***	***15.8%***	***-0.9514***
FPO VL1224	***40.3%***	***28.9%***	***32.2%***	***25.6%***	***9.4%***	***-0.9042***
DFN VL0012	26.7%	28.5%	31.3%	19.9%	11.0%	-0.7762
PTS VL1224	15.3%	16.2%	22.2%	21.9%	15.9%	0.3205
HOK VL1224	***-2.1%***	***11.5%***	***15.1%***	***22.0%***	***19.1%***	***0.8899***
MGP VL0012	12.7%	21.4%	25.6%	11.7%	17.0%	-0.0268
TBB VL1224	9.0%	6.4%	18.8%	6.3%	26.9%	0.6198
DRB VL0012	***28.5%***	***31.6%***	***23.6%***	***20.2%***	***6.4%***	***-0.8972***
TBB VL2440	13.3%	7.0%	11.5%	11.5%	26.9%	0.6639
TBB VL40XX	20.7%	17.8%	9.2%	11.1%	29.4%	0.2101
DFN VL1224	12.0%	11.7%	16.3%	14.0%	12.5%	0.2848
PTS VL2440	6.1%	13.0%	5.7%	19.0%	16.5%	0.7032
MGP VL1224	9.6%	12.1%	14.6%	15.4%	10.0%	0.2397
DTS VL1224	15.5%	18.2%	13.7%	14.9%	10.5%	-0.7561
DTS VL0012	23.2%	-9.4%	18.8%	14.7%	3.7%	-0.1784
PTS VL0012	11.7%	-228.3%	12.4%	-0.2%	21.1%	0.3636
PTS VL40XX	7.4%	6.9%	15.5%	9.3%	5.9%	-0.0270
DRB VL2440	22.8%	32.3%	7.9%	15.4%	6.2%	-0.7304
PMP VL1224	34.0%	4.1%	8.0%	5.9%	0.5%	-0.7685
DTS VL2440	5.4%	6.5%	3.3%	5.0%	4.5%	-0.4491
DTS VL40XX	1.1%	-1.1%	2.7%	0.9%	3.6%	0.6189
HOK VL40XX	1.1%	8.0%	12.2%	-14.5%	-2.0%	-0.4405
HOK VL2440	-2.6%	0.5%	-0.4%	-0.4%	-5.7%	-0.4501
Total	**12.4%**	**15.3%**	**15.0%**	**15.8%**	**12.7%**	

Table 14 Return on Investment in processing sector, selected countries, 2007

Country	ROI (%)
Belgium	5
Denmark	2
Estonia	3

Country	ROI (%)
Finland	0
Italy	3
Lithuania	11
Netherlands	2
Poland	16
Portugal	9
Romania	8
Slovenia	-
Spain	-
Sweden	5
United Kingdom	-

2.2.5 Indicator 11 Fish Prices and Market Orientation

Index definition

The overall objectives of the Common Agriculture Policy (particularly Article 33) apply *mutadis mutandis* to the Common Fisheries Policy and have particular relevance to this indicator given their emphasis on ensuring stable markets, available supplies, and reasonable prices.

The indicator proposed is a comparison between EC landing prices and prices of fisheries products imported into the Community. Since this indicator is not satisfactory in itself to assess the overall objective of providing the EC consumer with fishery products at reasonable prices, another possible indicator is proposed, consisting in a comparison of consumer prices for fish and other agricultural products.

Data sources and methodology

A - Landing prices versus import prices for fisheries products

Annual average landing prices over 2003-2008 were obtained from publicly available data published by a selection of MS (Denmark, France, Spain and United Kingdom[35]) and for a selection of species (cod, saithe, hake, monkfish, sole, nephrops and mackerel). This sample includes high value species (nephrops, hake, monkfish and sole) and lower value mass species (cod, saithe, mackerel). The species considered are also representative of catches of small-scale vessels (e.g., sole, monkfish, hake) and large-scale vessels (all species). An average price for each species was then estimated by averaging prices obtained from MS, for example:

- Cod : Denmark, France and United Kingdom
- Monkfish : France and United Kingdom
- Hake : France and Spain
- Nephrops : Denmark, France and United Kingdom

[35] Denmark : Fiskeridirektoratet / France : FranceAgriMer / Spain : MAPA / United Kingdom : MAAF

- Sole : Denmark, France and United Kingdom
- Saithe : Denmark, France and United Kingdom
- Mackerel : Denmark, France and United Kingdom

The landing price indicator was estimated by calculating the weighted mean price by weighting the annual mean price for each species by the total TAC available for the EC for such species (base 2008). This weighting allows greater importance to be given to fish species that are caught in large quantities (such as mackerel). The results includes prices in absolute terms (i.e. not accounting for inflation) and in real terms (i.e., accounting for inflation as per Eurostat statistical series prc_hicp_aind).

Import data from the COMEXT database have been extracted (tonnes and value) for cod, mackerel, hake, monkfish, sole and saithe imported from all third countries into the EU. Nephrops have not been included as the import flow into the EC is negligible. For each of the species considered, all related CN items have been included at genus level for the unprocessed forms (e.g. positions 03 02 and 03 03) to avoid the inclusion of the value addition factor on the price. An average price was estimated by dividing the value of imports (Cost Insurance and Freight – [CIF] - basis) by the net weight imported for each species aggregate.

The import CIF price indicator was then estimated by calculating the weighted mean price by weighting the annual import average price for each species by the total quantity imported into the EC. Result is as follows for both current and deflated values.

Table 15 Landing and Import Price indicators (current and real term) 2003-2008

	2003	2004	2005	2006	2007	2008
Landing price						
Price indicator (Euro/kg) current term	2.34	2.49	2.75	2.96	2.83	2.72
Price indicator (Euro/kg) real term 2003	2.34	2.44	2.63	2.78	2.59	2.41
Import price						
Price indicator (Euro/kg) current term	2.27	2.33	2.57	2.76	2.76	2.63
Price indicator (Euro/kg) real term 2003	2.27	2.28	2.47	2.59	2.53	2.33

B - Consumer prices index

National specialised data sources have been investigated to find out if there were exploitable data series on prices of fish products at the retail level. The answer is negative. There are retail price series in France, United Kingdom and Spain, but they are difficult to compare as the methodologies used for their collection are fairly different, as are the precise definitions of products taken into account. This issue has been raised in a study (Masmanap) realised under a concerted action funded under the 4th Framework Research Programme[36].

To overcome this problem, the consumer price indexes published by Eurostat have been used instead (statistical series food_pd_prc2) for all aggregated food products, meat and fish. The details of the methodology used by Eurostat are still to be obtained, but it can be expected that it is harmonised across the food products surveyed. The results are as follows.

36

http://cordis.europa.eu/search/index.cfm?fuseaction=proj.document&CFTOKEN=44277659&PJ_RCN=3940089&CFID=9743137

Table 16 Price Indicator for Food Products (2003-2008)

Index (2005=100)	2003	2004	2005	2006	2007	2008
Food	98	99	100	102	106	113
Meat	97	99	100	102	105	110
Fish	98	98	100	105	107	111

Results

A - Landing prices versus import prices for fisheries products

The following graph shows that landing prices and import prices have a parallel evolution over the last six years, confirming that trade of fisheries products is largely globalised. The correlation coefficient between the two series is 95%. Both price series show a parallel increase between 2003 and 2006, and a decrease over 2007 and 2008. However; the indicator demonstrates that EC fish landing prices are consistently higher than import prices. The gap between the two price series widened between 2003 and 2006 (in 2003, EC landing prices are 3% above import prices and 7% in 2006), but has subsequently narrowed (EC landing prices indicator back to 2 to 3% higher than import prices).

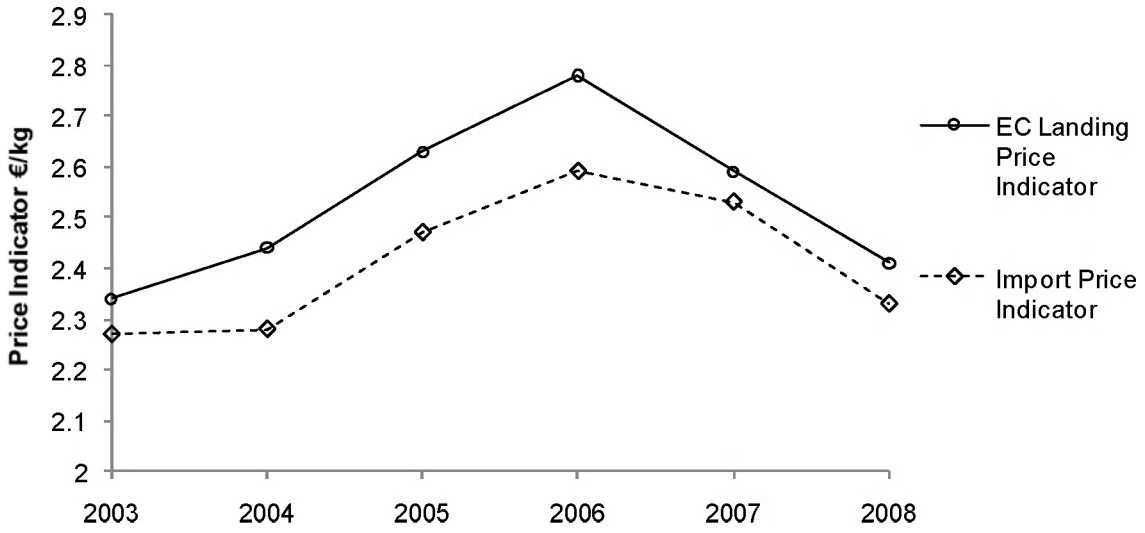


Figure 16 Landing and import price indicator 2003-2008

The gap between the two price series is likely to be a consequence of a willingness of the market to pay for higher quality. Fisheries products landed into the EC have some comparative advantages on imported products in terms of quality and adaptation to market needs (the products landed by EC vessels do not have to be transported over long distances and the offer from the EC fleet generally matches the domestic demand). When the economic situation is good, the market (i.e., the consumers) may accept to pay the quality premium. However, when the economic situation worsens (e.g. through erosion or loss of purchasing power, global economic downturn) consumers may instead favour low prices as opposed to higher quality.

Overall, this indicator tends to confirm that the CAP objectives to ensure that supplies reach consumers at reasonable prices is met if only landing prices and import prices are compared. The indicator demonstrates that both price series have similar variations over the

period. The higher prices paid for products landed in the EC may rather reflect a willingness of the market to pay for higher quality when consumers can afford it.

B - Consumer prices index

The comparison of Eurostat consumer prices indexes for different categories of commodities is displayed in the following figure. The data show that retail fish prices have increased at a greater pace than other food products (inc. meat) between 2003 and 2006. This increase levelled off over 2007 and 2008. In parallel during this same period, food and meat prices increased more markedly. Overall, at the end of the 2003-2008 period, meat price and fish price converge (+13 index points increase), and have increased less than all food products (+15 index points increase).

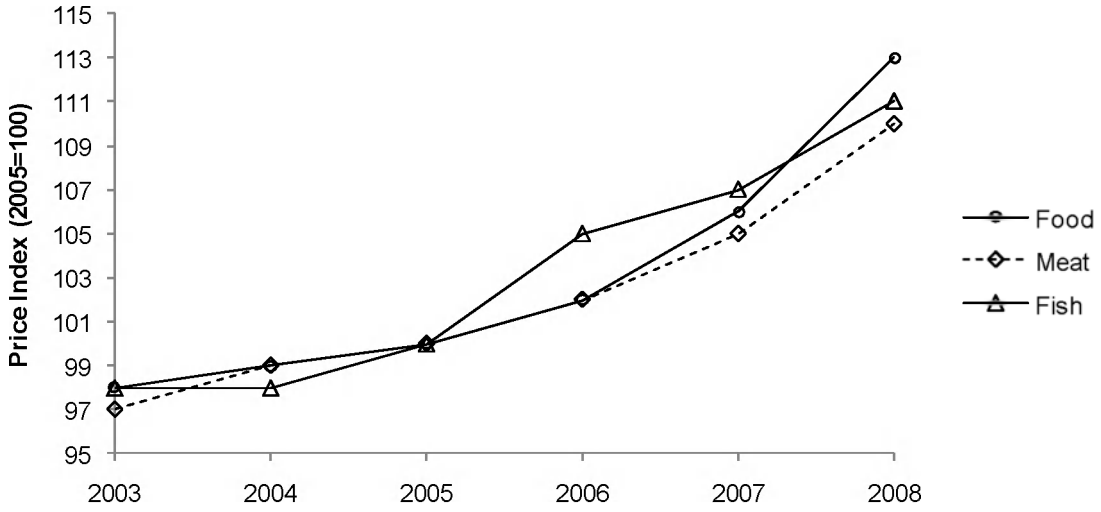


Figure 17 Price index of food products 2003-2008 (2005=100)

Overall, this indicator would tend to demonstrate that the objective to ensure that supplies reach consumers at reasonable prices has not always been met, especially when considering the 2006-2007 period. During these two years, the fish animal protein was more expensive to consumers than meat animal protein, probably triggering a shift in consumption patterns towards meat, and ultimately a drop in market prices for fisheries products caused by a lower demand.

When comparing the two indicators (evolution of fish prices at first landing / import stage and consumer prices), two different trends appear; although the landing and import prices decreased dramatically over 2007 and 2008 compared to 2006 (-13% in real term), consumer fish prices kept increasing over this period (+ 6 index points). These apparently contradictory trends may reflect a market shift towards value added products (consumer prices include this value addition factor) and/or larger margins extracted by the different players of the commercialisation / processing sector along the value chain. The observation of these two indicators demonstrate also that it may be difficult and misleading to compare directly landing / import prices and consumer prices without a detailed knowledge of what products are considered under each series, in particular at the retail level.

2.2.6 Fuel Prices

The 2008 data provide an opportunity to look at changes in fuel price associated with the 50% increase in world oil prices in that year. It should be noted, however, that the average price of fuel during 2008 was only 40% above the average price in the preceding three years, because the maximum prices were not maintained for a long time (Figure 35).

Because each fleet segment uses different amounts of fuel, the problem was examined in terms of the change in the percentage of total costs attributed to fuel over the years 2002-2008.

Fuel price was not used as an indicator of CFP policy because its influence is external to that policy. It was analysed in this section to provide information on the future status quo.

Data sources and methodology

The data used for indicator 30 was the new AER 2010 data. The data were first analysed looking at trends in the raw data. To derive an understanding of the general trend across the fleet a generalised linear model (Gaussian link) was implemneted, with the dependent variable being fuel prices as a proportion of total running costs (i.e. not including depreciation) and whose independent variables were nationality, vessel size, gear and year.

Results

Results in Table 17 were derived from AER data as fuel costs divided by total income. These results indicate that despite the overall rise in fuel price, there have been varying levels of impact on the fleet segments' proportion of fuel cost to value of landings.

Table 17: Percentage of fuel costs to value of landings per fleet segment 2002-2008

Segment	2002	2003	2004	2005	2006	2007	2008
DFN VL0012	4.38%	4.43%	4.97%	5.77%	6.05%	10.14%	8.95%
DFN VL1224	5.23%	6.28%	6.70%	7.55%	9.23%	8.62%	10.62%
DFN VL2440	13.99%	17.75%	18.84%	13.68%	9.94%	8.38%	11.21%
DRB VL0012	4.29%	5.73%	6.33%	8.59%	13.85%	12.47%	12.16%
DRB VL1224	8.51%	9.10%	10.27%	12.43%	13.97%	16.38%	18.20%
DRB VL2440	12.34%	23.98%	18.66%	19.59%	11.21%	18.11%	15.29%
DTS VL0012	10.72%	9.29%	10.99%	14.38%	10.90%	16.54%	18.83%
DTS VL1224	16.62%	17.60%	18.67%	22.18%	22.29%	22.91%	27.60%
DTS VL2440	16.98%	17.61%	19.79%	23.90%	24.95%	23.96%	29.80%
DTS VL40XX	10.84%	15.20%	15.64%	21.07%	22.79%	24.43%	24.52%
FPO VL0012	4.75%	4.36%	7.04%	5.64%	6.17%	10.18%	9.83%
FPO VL1224	6.83%	6.49%	7.19%	9.78%	10.85%	11.29%	22.81%
HOK VL0012	5.39%	5.08%	8.07%	9.96%	8.56%	10.66%	9.81%
HOK VL1224		1.71%	11.84%	12.63%	11.72%	11.69%	17.08%
HOK VL2440		10.78%	10.94%	18.44%	23.47%	20.24%	17.85%
HOK VL40XX		12.43%	10.30%	14.97%	25.44%	21.70%	18.09%
MGO VL0012	5.64%	4.79%	5.45%	5.53%	6.94%	6.22%	7.43%
MGP VL0012	7.73%	7.30%	9.26%	9.92%	10.10%	13.06%	15.96%
MGP VL1224	5.75%	14.03%	15.10%	14.72%	13.89%	21.89%	21.19%
PG VL0012	5.93%	25.25%	11.85%	9.51%	8.73%	10.48%	9.28%
PG VL1224		116.29%	12.27%	13.10%	10.80%		

PGO VL0012	2.88%	2.36%	2.32%	4.17%	39.31%	5.06%	2.98%
PGP VL0012	8.21%	9.87%	9.10%	10.54%	8.36%	10.02%	13.89%
PGP VL1224	4.18%	8.90%	9.70%	10.90%	11.17%	8.43%	12.43%
PMP VL0012	11.41%	15.08%	10.39%	11.26%	6.62%	10.38%	10.76%
PMP VL1224	15.78%	12.00%	9.66%	11.50%	14.97%	13.05%	21.89%
PMP VL2440		21.97%	12.89%	18.06%		19.24%	
PTS VL0012	4.75%	8.72%		8.54%	25.74%	8.04%	
PTS VL1224	10.24%	13.16%	12.93%	15.09%	13.89%	14.92%	
PTS VL2440	10.99%	13.28%	15.51%	17.23%	16.44%	16.88%	
PTS VL40XX	11.58%	13.91%	14.37%	14.50%	16.71%	17.59%	
TBB VL0012					35.48%	7.43%	20.63%
TBB VL1224	12.20%	13.76%	19.58%	20.01%	23.71%	18.73%	22.70%
TBB VL2440	21.48%	22.62%	28.50%	31.09%	32.17%	29.10%	37.23%
TBB VL40XX	26.18%	28.40%	32.27%	44.83%	43.57%	40.29%	40.83%

We also examined the response of the fleet in terms of activity (Table 18). The figures in bold in Table 18 indicate those fleets where fuel consumption in 2008 is less than in 2007 and where the slope from 2002 – 2007 is increasing. For those fleets in bold (<12m (VL0012) and beam trawl (TBB)) this indicates that the change in fuel prices have directly impacted their overall fuel consumption, creating changes in behaviour to reduce fuel consumption. Other fleets did not apparently need to, or could, change their behaviour.

Table 18: Fuel Consumption (mln litres) for each fleet segment 2002-2008. Fleet segments in bold indicate those where fuel consumption in 2008 is below 2007 and where slope from 2002-2007 is increasing.

	2002	2003	2004	2005	2006	2007	2008
DFN VL0012	**11.4**	**11.6**	**11.4**	**17.2**	**16.6**	**26.7**	**13.5**
DFN VL1224	12.6	13.8	17.0	15.8	15.5	12.5	14.2
DRB VL0012	**4.2**	**5.5**	**6.0**	**8.2**	**14.2**	**9.4**	**8.8**
DRB VL1224	49.4	56.2	51.2	43.3	44.3	47.1	39.7
DRB VL2440	11.1	13.2	12.6	10.7	8.8	10.2	8.9
DTS VL0012	**26.6**	**21.2**	**23.8**	**23.5**	**26.4**	**24.3**	**20.9**
DTS VL1224	645.2	542.7	608.3	542.0	467.4	507.5	395.0
DTS VL2440	325.5	280.7	282.2	254.1	231.7	215.2	228.0
FPO VL0012	**11.1**	**9.9**	**14.6**	**6.4**	**36.2**	**33.1**	**23.5**
FPO VL1224	11.4	7.9	9.1	9.3	10.6	9.8	13.2
HOK VL0012	**5.7**	**7.1**	**16.9**	**17.7**	**17.9**	**11.0**	**5.4**
HOK VL1224	1.3	2.1	29.3	27.0	20.4	15.7	22.2
HOK VL2440	1.4	0.9	0.9	4.6	15.5	0.7	5.1
MGO VL0012	**2.5**	**2.3**	**1.9**	**2.3**	**4.2**	**1.9**	**1.5**
MGP VL0012	**3.1**	**1.5**	**1.6**	**4.0**	**3.6**	**3.3**	**1.7**
PG VL0012	7.2	35.7	92.5	102.6	87.0	8.3	27.4
PGO VL0012	0.8	0.8	0.6	0.9	1.4	1.6	2.6
PGP VL0012	110.7	105.3	101.3	84.4	72.4	66.6	66.8
PGP VL1224	6.4	24.5	13.8	14.2	11.7	9.8	10.1
PMP VL0012	60.6	58.3	28.6	22.0	8.1	6.3	6.0
PMP VL1224	81.9	68.2	12.5	10.0	10.8	8.7	7.9

PTS VL1224	72.0	93.5	112.6	109.7	87.8	66.6	5.1
PTS VL2440	118.3	104.1	124.8	109.1	112.1	85.9	6.4
TBB VL1224	**59.8**	**67.9**	**81.8**	**81.7**	**87.0**	**60.2**	**57.1**
TBB VL2440	366.1	182.7	182.6	191.4	178.9	119.3	73.1
TBB VL40XX	**14.8**	**200.0**	**186.5**	**185.1**	**160.9**	**149.6**	**110.2**

If fishing grounds that were not traditionally fished are now targeted by new fleets, it is likely that this will adversely impact the sustainability of stocks in this area. For example, the Sicilian large scale trawl fleet typically fished distant waters. However, in 2008 following the large fuel increase, the fleet targeted shrimp stocks much closer and thus added extra pressure normally not experienced. These potential adjustments in fishing activity will need to be considered in future MCS decisions.

Additionally, fishing activity can be altered by fishers choosing when they leave port. If fishers are able to track their fishing effort with changes in fuel prices – if fuel prices increase, they stay in port – this will positively impact the fleet's profitability. Currently, the option for this is not available in MS where the TAC is still a common resource; fishers must essentially race to resource to obtain the greatest proportion possible.

The ability to control fishing effort will also create the opportunity for fishers to control supply to fish markets. Controlling market supply will ultimately have a positive impact on fish prices which in turn increase fisher's revenue.

The GLM analysis clearly showed the different trends for different sectors. The plot below shows this (Figure 18), as does the predicted trends (Figure 19). All factors except country and year in 40+ fleet were significant. The y-axis in the following figure shows the deviation of the predicted variable (proportion of costs spent on fuel) from the average, depending upon the levels of the independent variables, and panels show different independent variables (country, gear, vessel length and year). Large vessels, and those operating demersal trawls and beam trawls use the most fuel as a proportion of running costs. These fuel costs increased through 2005, stabilised from 2005-7, and then increased again in 2008 for all but the largest fleets.

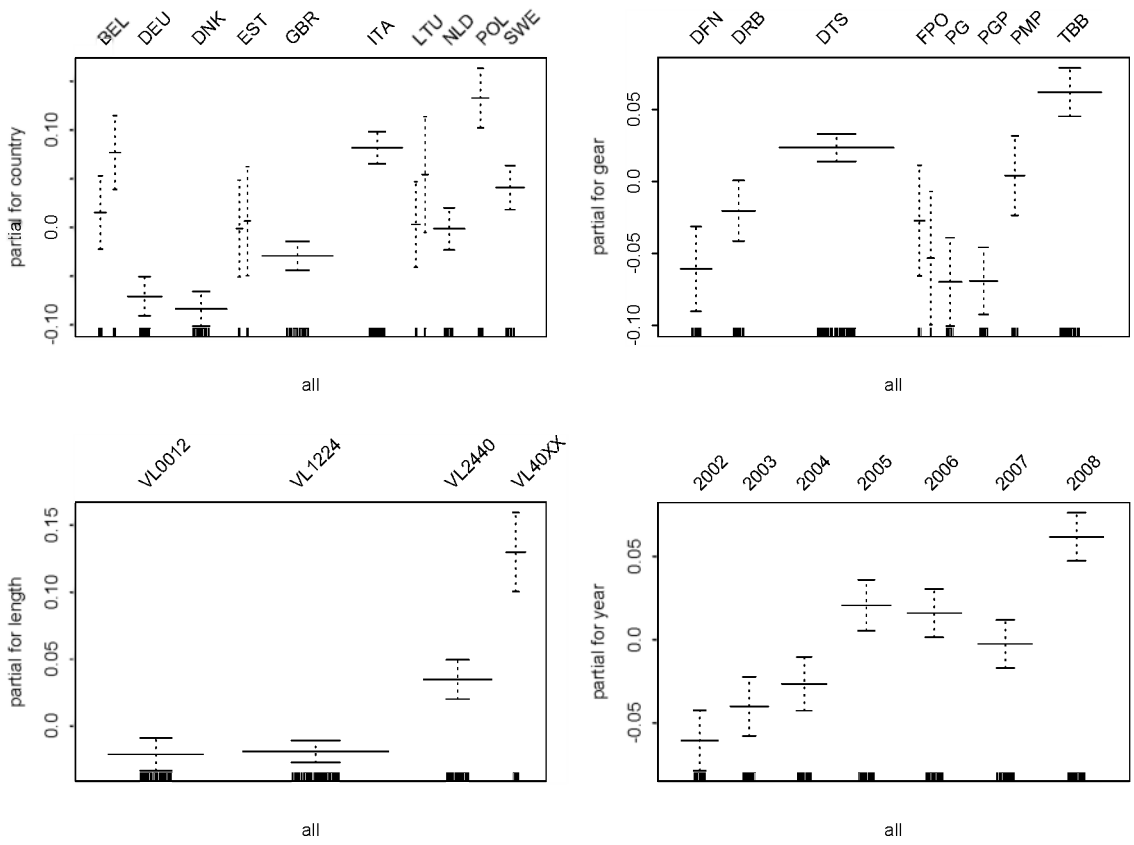


Figure 18 Plots of the relative influence of different factors within independent variables (top left to bottom right: member state, gear, length and year) on fuel costs as a proportion of variable costs (y axis). 336 individual fleet sectors (vessel size + nationality + gear) were included in the model

Predicted proportions for a GBR DTS vessel in each size class were:

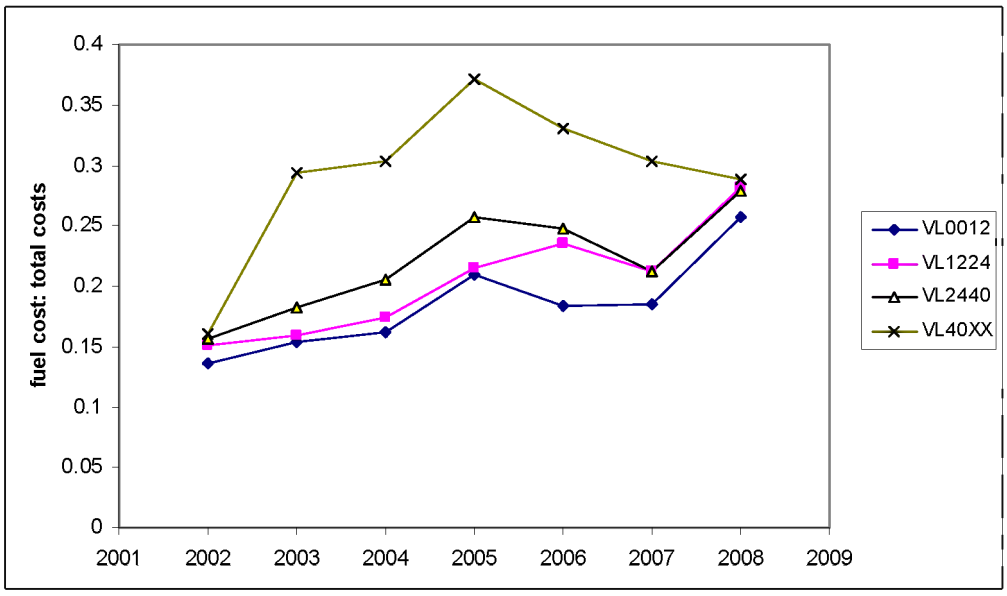


Figure 19 Predicted trends in fuel price proportion for different sized vessels.

The average increase in the proportion for the 4 fleets between 2005-2007 to 2008 was 33%, 27%, 16% and -14% respectively, i.e. higher for the smaller fleets, mostly because they have a lower starting point of proportion. For the fleet as a whole (all 336 sectors) the increase in proportion was 25%, which equated to an average increase in fuel price of 33% between 2005-7 and 2008.

Note that this increase in fuel price is lower than the apparent 40% increase in marine diesel price in 2008 (average price 2008 divided by average price 2005-7). This discrepancy can probably be explained by vessel behaviour changing, for instance in the case of the Sicilian 24-40m fleet, they fished closer to their ports than in earlier years.

The price stability in the years 2005-07 is further support for the choice of those years as reference years for this IA.

In 2008 the price was high only for a few months of 2008 (March through to September), which resulted in the average price in 2008 only being 40% greater than the reference years. The maximum increase during this time compared to 2005-7 was 56%. In going forward it would seem appropriate that it is assumed that the fuel price will increase, and be maintained, by 50% over 2005-07 prices. For our status quo assumption, therefore (see section 3.2) we assume an increase in fuel price of 50% by 2012, which translates to an increase of **45% in fuel cost** to vessels once changes in vessel behaviour are taken into account.

2.2.7 Indicator 12 Level of Subsidies

Index definition

This indicator compares the level of EU subsidies (Financial Instrument for Fisheries Guidance [FIFG] and EFF) per MS to the value of landings in that MS for a given year.

Data sources and methodology

EU subsidies specific to the fisheries sector are via structural funds. For the period 2007-2013 the financial instrument for this policy is the European Fisheries Fund (EFF) (Council Regulation (EC) No 1198/2006), but for the 12 years before EFF, structural funding for the fishing sector was provided through the FIFG.

Indicator 12 presents the annual FIFG subsidies allocated between 2000 and 2006 against the value of MS landings, and total EFF subsidies proposed between 2007 and 2013 against the value of MS landings for a given reference year (2006).

Data on spend under the FIFG programme and allocations under EFF were supplied by EC Directorate-General for Maritime Affairs and Fisheries (DG MARE), while landed value (2003-2006) was sourced from the AER 2009. Aid granted by the MS to enterprises in the fisheries sector is covered by the State aid rules laid down in Article 87 to 89 of the EC Treaty. The number of notified measures specifically associated with the fishing sector is reported by DG Competition, but available data on the value of notified state aid relates to all sectors of industry and services. This can therefore only be used to illustrate the extent to which MS are inclined to use notified state aid measures, not the relative scale of those used specifically for fisheries. The number of notified state aids associated with the fisheries sector per MS is presented in Table A14 (Annex A). As a result this indicator cannot be calculated for notified State Aid.

In accordance with a specific "*de minimis*" regulation for fisheries (875/2007), which applies from 10 July 2007, aid of a limited amount (30,000 Euro per enterprise over three years) does not have to be notified to the Commission, provided that the cumulative sum of all aid granted in the MS concerned remains below 2.5% of the turnover of its fisheries sector. The assumption is that relatively small amounts of subsidy do not significantly affect trade and competition between MS.

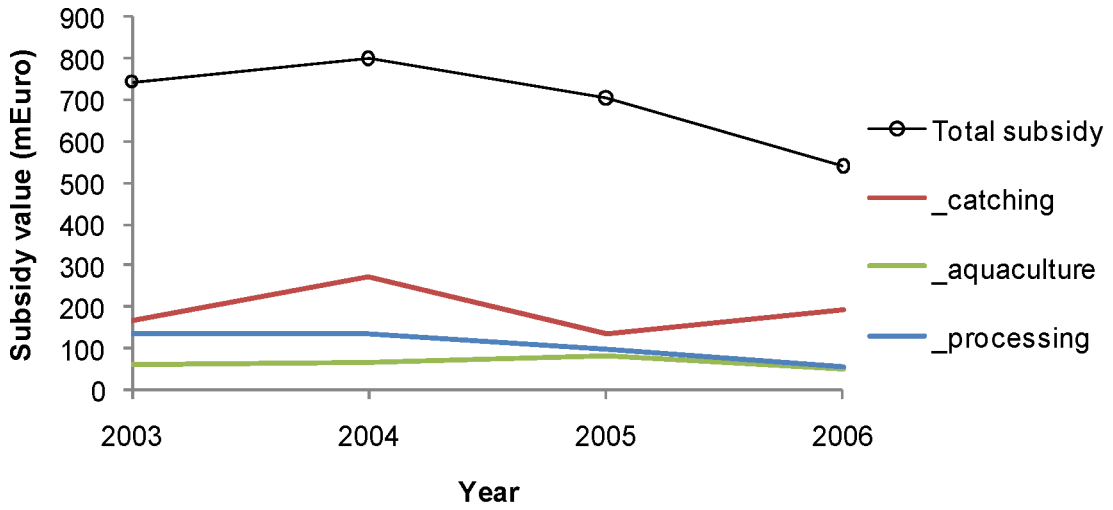
There are also certain types of MS aid such as for research and development, training, environmental improvements and investment for SMEs, that do not require notification to the Commission, as determined under the General Block Exemption Regulation (EC Reg. 800/2008). Commission DG Competition data[37] indicates that the number of state aids recorded under this block exemption has increased significantly since 2006 and now represent around 70% of State aid measures.

It is of course proper to note that in addition to the types and forms of subsidies discussed above, there may be many other informal subsidies being provided by MS and benefiting the fisheries sector. These may include a very wide range of support, including but certainly not limited to: investment incentives, social security systems, fuel tax exemptions, management costs, etc. However, clearly defining such support and quantifying it across MS is not easily achievable given a lack of available data, and is not within the scope of this impact assessment.

Results

FIFG (2000-2006)

The total FIFG expenditure over 2000-2006 was 4.897 billion Euro of EU and Member State subsidy. 32% of FIFG monies were allocated to vessels directly for construction, scrapping or modernisation of marine or inland vessels (Figure 20; see also Annex 1 Tables A 10-11 and Figure A 10). The remaining 68% was allocated to processing and aquaculture, and to other non-fleet measures, e.g. marketing, port infrastructure and co-operative actions.



[37] EC Europa. Competition: State Aid control: Studies and Reports.

Figure 20 Total FIFG subsidy and allocation by sector during the period 2000-2006. Source: Pew/Poseidon

Annual FIFG expenditure compared to the value of landings was 11.9% over 2000-2006, reaching 15% at its peak (Table 19). Fleet subsidies during 2003-2005 accounted for between 2-5% of landed values.

Table 19 Total and catching sector FIFG subsidies as a percentage of landings value (2003-2005 only)

Year	Landings value	Total subsidy	% subsidy/landings value (total)	Catching sector subsidy	% subsidy/landings value (catching)
2003	4837.6	744.4	15%	168.5	3%
2004	5159.2	799.5	15%	271.4	5%
2005	5649.7	704.5	12%	133.2	2%

Source: fishingsubsidies.org

This varied significantly across MS with accession states seeing average annual subsidies in excess of landings value. Bulgaria and Romania joined the EU after the FIFG programme.

Spain, which accounted for 46% of total FIFG spend, and Portugal both received an average annual fleet subsidy totalling 8% of landings value, while for the other MS in the top 10 FIFG recipient countries the level of fleet subsidy as a proportion of landings value was less than the EU average[38].

Table A11 and Figure A6 (Annex A) present a breakdown of fleet subsidies by gear type. Bottom trawlers received the largest amount of subsidy with 46% of total spend overall. Purse seiners accounted for around 20% of modernisation and construction monies but only 9% of subsidies for scrapping.

EFF (2007-2013)

Under EFF the average level of planned subsidy as a proportion of landings value across the EU is 11%. These data however only present EFF allocations rather than actual EFF and MS contributions under the programme as with the FIFG programme.

Allocations to accession states such as Romania, Poland and Bulgaria are often far in excess of landings value, but more modest for others such as Hungary (22%) and Czech Republic (13%).

Overall, the EU budget is 4.3 billion Euro with matched MS contributions of 2.8 billion Euro, 40% of the total and roughly similar to the FIFG. Current expenditure trends compared to the FIFG programme and other EU structural funds are shown in Figure 21. This figure shows the EU contribution only, and is well below the average 614,000 Euro that would be expected by an even distribution of funds over the 7 years. There are reports that in the current financial crisis Member States are finding it difficult to access their matching contributions.

[38] Note it is possible that FIFG expenditure was influenced by monies paid after cessation of the fishing agreement with Morocco

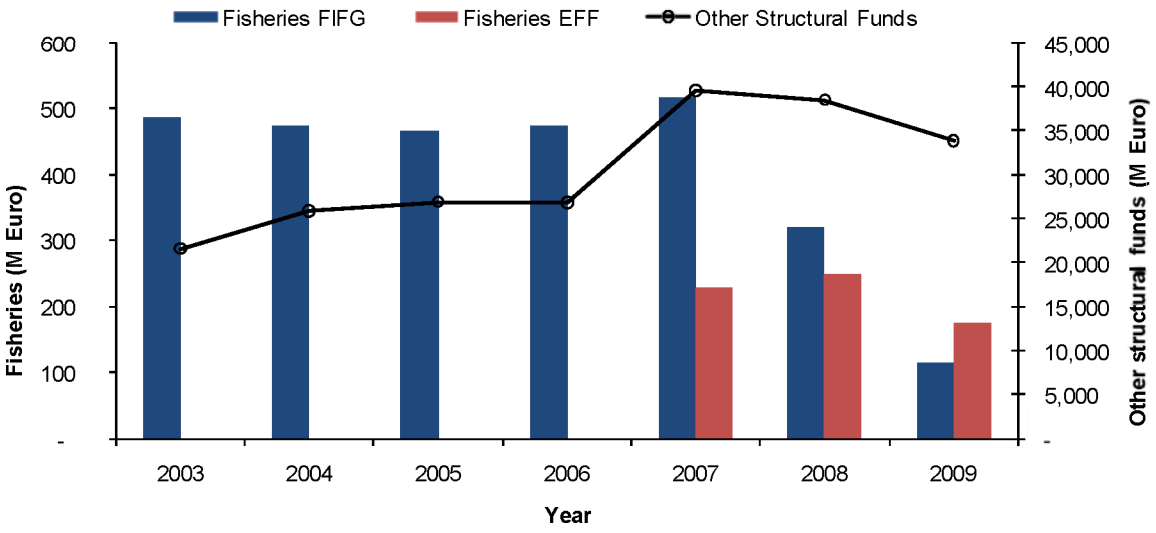


Figure 21 FIFG expenditure over the period 2000-2003 and current EFF expenditure from 2007.

De minimis regulation (2007-2013)

The *de minimis* regulation sets the maximum level of subsidy that a MS is able to allocate to firms within the catching sector (30,000 Euro in every three year cycle).

Table A15 (Annex A) presents the potential allocations of *de minimis* aid per MS. In theory, given the total available envelope of 719 million Euro, there could be almost 24,000 beneficiaries, receiving the maximum allowed amount of 30,000 Euro per firm within one three year period. This includes several small land-locked countries and allows the number of beneficiaries in excess of the number of firms. Several MS would be able to provide assistance to (almost) all vessel owners (or even more than 100%). These are Belgium, Netherlands and Germany and to a slightly lesser extent Denmark and France. On the other hand countries like Italy, Ireland and Portugal could provide assistance to only 8-23% of their vessel owners (Framian, 2009).

The *de minimis* ceiling exceeds for many MS their total allocation to the priority axis 1 under EFF. Apart from extreme cases like Germany and the United Kingdom (where *de minimis* ceiling amounts to 953% and 399% respectively of axis 1), this also applies to Belgium, Denmark, Finland, France, the Netherlands and Sweden. However, considered over the entire period to 2013, the resources required for full implementation of *de minimis* would exceed the priority axis 1 budgets for EFF in all MS with the exception of Bulgaria, Romania and Poland. The ceiling amounts of State aid permitted under the *de minimis* regulation are unlikely to be reached by most MS.

Notified state aid

As noted above, because the amounts of annual notified state aid specifically for the fisheries sector are not available, it is not possible to estimate sector-specific aid as a proportion of landed value (2006).

2.3 Social Indicators

2.3.1 Indicator 13 Employment

Index definition

There are two sub-indicators:

1) percentage fisheries employment direct (harvesting, processing, aquaculture) and indirect (multiplier effects on coastal communities) / total employment

2) percentage fisheries employment/total employment. The indicator is presented separately for fishery (artisanal/high seas), processing, aquaculture and all fishery activities.

Data sources and methodology

AER EU fleets 2002-2009 contains data on number of employees (Full Time Equivalent [FTE]) for most MS for the years 2003 to 2007. AER EU fish processing industry (2009) also provides total employment figures for many of the MS for the years 2006 and 2007. The Framian report (Salz, 2009) contains total employment in aquaculture for many of the MS for the years 2003 to 2006. The Regional Dependency report presents an estimation of employment in ancillary activities to the fisheries sector (Salz and Macfadyen, 2007). Eurostat has information on national averages for employment (FTE) for all MS.

The table on multipliers is based on data from the CFP statistics (2008), which contain information on total number of employees in the fisheries sector.

Results

Employment data

According to the EU Commission (EU Commission 2009), total employment in 2005 in the fisheries sector of the EU-27 amounted to about 407,000 persons. The catching sector offered employment to 187,000 people (46% of total fisheries sector employment), fish processing 138,000 (34%) and aquaculture 63,000 (16%). Employment in ancillary activities is estimated at 18,000 jobs (4%). The number of fishermen has been decreasing since 1996/1997 by 4 to 5% per year.

From an employment perspective, fisheries activities (harvesting, processing, aquaculture, and ancillary activities) are of minor importance at the national level.

The average percentage of the workforce that was employed in capture fisheries varied between 0.07% and 0.11% (Table 20) with a declining tendency from 2003 to 2007. The table also shows that Estonia and Portugal have the highest percentage of the workforce employed in the capture fisheries in the EU.

The average percentage of the national workforce that was employed in the fish processing industry varied between 0.13% in 2006 and 0.14% in 2007 (see Table 21). The table shows that Spain and Ireland have the highest percentage of the workforce employed in activities ancillary to fisheries in the EU (or at least of the MS with reported figures).

The average percentage of the national workforce that was employed in aquaculture varied between 0.04% in 2006 and 0.05% in 2007 (see Table 22). The table shows that Ireland has the highest percentage of the workforce employed in aquaculture in the EU.

In terms of gender, one woman is employed in the fisheries sector for every three men in the sector, but in the processing sector around half of all employees are women. This results in some significant variations across MS – in Malta only 2% of the employees in the fishing sector are women. In Greece and Cyprus, one out of ten employees in the fishing sector is a woman. In Latvia, Germany and Poland, 40%, 42% and 49% respectively of the employees in the fishing sector are women. In these three countries there is a significant processing industry, and this largely explains the higher proportion of female employment compared to countries where the processing sector it less important.

Table 20 Number of employees (FTE) for capture fisheries by year and country (AER, national employment: Eurostat). *Fisheries employment on Malta cannot be separated out from agriculture in either their databases or publications.

Country	2003	2004	2005	2006	2007	Av. 2005-2007	Total employment av. 2005-07	Employment in fishing vs. National av. 05-07
BEL	578	533	570	562	501	544	4,260,067	0.01%
CYP	-	-	1062	1125	747	978	351,400	0.28%
DEU	1697	1676	1526	1579	1617	1574	36,860,833	0.00%
DNK	3339	3040	2906	2636	1925	2489	2,741,500	0.09%
ESP	52,944	32,888	43,354	33,714	35,274	37,447	19,548,400	0.19%
EST	-	-	2701	3187	3367	3085	612,700	0.50%
FIN	462	618	408	1782	-	1095	2,417,400	0.05%
FRA	13,281	12,783	13,087	12,717	12,480	12761	25,107,200	0.05%
GBR	9692	9790	5302	7073	8096	6824	4,358,500	0.16%
GRC	28,636	27,343	27,356	25,808	24745	25,970	28,291,300	0.09%
IRL	3978	3782	3253	3518	3838	3536	1,993,633	0.18%
ITA	-	-	-	26,030	25,426	25,728	22,732,350	0.11%
LTU	-	1884	2138	1988	744	1623	1,041,433	0.16%
LVA	980	951	2420	1676	1632	1909	1,478,567	0.13%
MLT*	-	-	-	-	-	-	-	-
NLD	2160	2139	2011	1884	1953	1949	8,170,133	0.02%
POL	-	3796	3077	2716	2588	2794	14,389,700	0.02%
PRT	19,765	17,899	17,701	14,445	-	17,549	4,815,150	0.33%
SVN	-	-	-	203	110	157	946850	0.02%
SWE	2172	2140	2078	2142	1879	2033	4,359,067	0.05%
Total	**139,684**	**121,262**	**130,950**	**144,785**	**126,922**	-	-	-
Average	**10,745**	**8084**	**7703**	**7620**	**7466**	-	-	-

Table 21 Percentage of national workforce employed in the fish processing industry (FTE) by year and country (own calculations based on data from AER Process industry 2009 and Eurostat). *Fisheries employment on Malta cannot be separated out from agriculture in either their databases or publications.

Country	2006	2007	Av. 2006-2007	Total employment av. 2005-07	Employment in fishing vs. National av. 05-07
BEL	443	993	718	4,260,067	0.02%
CYP	-	-	-	351400	0.00%
DEU	8043	6925	7484	36,860,833	0.02%
DNK	4414	4428	4421	2,741,500	0.16%
ESP	-	-	-	19,548,400	0.00%
EST	2370	2103	2236,5	612,700	0.37%

FIN	687	756	721,5	2,417,400	0.03%
FRA	23821	23240	23530,5	25,107,200	0.09%
GBR	-	16041	8020,5	4,358,500	0.18%
GRC	-	-	-	28,291,300	0.00%
IRL	-	-	-	1,993,633	0.00%
ITA	15500	15500	15500	22,732,350	0.07%
LTU	5035	4632	4833,5	1,041,433	0.46%
LVA	-	-	-	1478567	0.00%
MLT*	-	-	-	-	-
NLD	3501	3120	3310,5	8,170,133	0.04%
POL	12126	14149	13137,5	14,389,700	0.09%
PRT	5934	6301	6117,5	4,815,150	0.13%
SVN	-	-	-	946,850	0.00%
SWE	1819	1867	1843	4,359,067	0.04%
Average	**6974**	**7697**	**-**	-	**-**

Table 22 Percentage of national workforce employed in aquaculture by year and country (own calculations based on data from Framian report and Eurostat). * = FTE. **Fisheries employment on Malta cannot be separated out from agriculture in either their databases or publications.

Country	2003	2004	2005	2006	2007	Av. 2005-2007	MS av. 2005-2007	Fisheries/MS Av. 2005-07
BEL							4260067	0,00%
CYP	-	-	-	-	-	-	351,400	0,00%
DEU	62	62	62	6623	6623	4436	36,860,833	0,01%
DNK	775	684	674	679	679	677	2,741,500	0,02%
ESP	20,856	20394	19708	4068	4068	11888	19,548,400	0,06%
EST	-	-	-	-	-	-	612,700	0,00%
FIN	354	544	332	423	423	378	2,417,400	0,02%
FRA	-	-	-	11449	11,449	11449	25,107,200	0,05%
GBR	2274	2211	2430	2329	2329	2380	4,358,500	0,05%
GRC	239	347	336	12798	12,798	8644	28,291,300	0,03%
IRL	2631	1909	1826	2123	2081	2010	1,993,633	0,10%
ITA	-	-	5783	5299	5523	5535	22,732,350	0,02%
LTU	297	429	333	440	356	376	1,041,433	0,04%
LVA	-	-	-	-	-	-	1,478,567	0,00%
MLT*	-	-	-	-	-	-	-	-
NLD	51	51	185	186	186	186	8,170,133	0,00%
POL				2610	2610	2610	14,389,700	0,02%
PRT	4241	4213	4087	4089	4089	4088	4,815,150	0,08%
SVN	-	-	-	-	-	-	946,850	0,00%
SWE	-	-	-	297	297	297	4,359,067	0,01%
Average	**3178**	**3084**	**3251**	**3815**	**3822**	**3490**	-	-

Multipliers in terms of number of people employed in the processing industry per fishermen are higher in 2007 than in 2005. Explanations for this could be that imports have taken the place of declining catches[39].

[39] One additional reason for this could be that the 2007 data from the AER may include an element of non-fish processing where firms are doing food processing more generally. Although equally true is that some firms not

Table 23 Number of employees in the various fisheries sectors. All black data are AER 2007 data except national employment data, which origins from Eurostat LFS. The blue origins from the EU Commission 2009 and is for 2007. The red data are AER 2006. The green figures come from Salz and Macfadyen (2007).

Country	Capture fisheries	Process industry	Process employee/ fisher	Aquaculture	Direct employment	Ancillary activities	National employment*
BEL	501	993	2.0	100	1594	200	4,348,100
CYP	747	100	0.1	200	1047	100	367,900
DEU	1617	6925	4.3	6623	15165	300	37,611,500
DNK	1925	4428	2.3	679	7032	600	2,756,500
ESP	35,274	22,500	0.6	4068	61842	1500	20,211,300
EST	3367	2103	0.6	100	5570	1000	630,700
FIN	1782	756	0.4	423	2961	0	2,458,500
FRA	12,480	23,240	1.9	11449	47169	2900	25,432,400
GBR	8096	16,041	2.0	2329	26466	1500	4,423,500
GRC	24,745	3700	0.1	12798	41243	2200	28,477,700
IRL	3838	3500	0.9	2081	9419	1200	2,067,000
ITA	25,426	15,500	0.6	5523	46449	2500	22,846,200
LTU	744	4632	6.2	356	5732	1000	1,075,100
LVA	1632	7400	4.5	300	9332	800	1,505,800
MLT	1300	0	0.0	100	1400	100	155,500
NLD	1953	3120	1.6	186	5259	600	8,345,100
POL	2588	14,149	5.5	2610	19347	200	14,996,500
PRT	14,445	6301	0.4	4089	24835	1200	4,836,600
SVN	110	200	1.8	300	610	0	957,000
SWE	1879	1867	1.0	297	4043	300	4,453,300
Total	**144,449**	**137,455**	**1.0**	**54,611**	**336,515**	**18,200**	**187,956,200**

2.3.2 Indicator 14 Status of fisheries dependent communities

Index definition

Dependency is defined as % of income (GVA) and employment related to fishery sector at EU, MS, area, and region (NUTS-2) levels

Data sources and methodology

Data regarding the situation in 2005 has been compiled from a large number of national and EU sources[40,41,42], including the following from Eurostat:

a. Aquaculture production

classified as fish processing, may be processing fish. So it is not clear whether changes between 2005 and 2007 reflect differences in data methodologies or real changes on the ground.

[40] *Fisheries Policy* (2006) Luxembourg: Office for Official Publications of the European Commission, *Facts and figures on the CFP, Basic data on the Common* European Communities.

[41] Salz, P., Buisman, E., Smit, J. and de Vos, B. (2006) *Employment in the fisheries sector: current situation*, Final Report, Report to the European Commission, Contract FISH/2004/4

[42] Salz, P. (ed,) (2006) *Economic performance of selected European fishing fleets, Annual Report 2005*, Report to the European Commission, Contract FISH/2005/12

b. Data on DA152 (Fish processing)
c. Regional employment (Labour Force Survey)
d. Regional income

Results

The contribution from the fisheries sector to total EU Gross Domestic Product (GDP) in 2005 was EUR11 billion, equivalent to 0.1% of total EU GDP. Fisheries sector employment was 407,000 persons in 2005 equivalent to 0.2% of total EU employment. By income the Atlantic areas, the North Sea and the Mediterranean Sea count for 85.5% of total EU sector income. By employment the same three areas account for 73.1% of EU sector. Fisheries employment in the Baltic Sea area is bigger than in the North Sea area, whereas the North Sea area is more important in terms of income as shown in Table 24.

Table 24 EU fisheries sector income and employment by main areas, 2005

Area	Total income from fisheries	% of EU total	Total fisheries employment	% of EU total
Baltic Sea	784.2	7.1	54.1	13.2
North Sea	2,517.5	22.9	47.5	11.7
Atlantic areas	3,780.7	34.4	137.9	33.9
Mediterranean Sea	3,080.2	28.2	112.1	27.5
Black Sea	11.1	0.1	14.1	3.4
Outer Regions	210.3	1.9	12.5	3.2
Non-coastal areas	593.2	5,4	29.0	7.1
EU total	**10,977.0**	**100**	**407.2**	**100**

Four countries Spain, France, Italy and Greece account for 54% of the EU total fisheries employment. The dependency of MS in terms of employment ranges between <0.1% and 1.1% of total national employment with Greece, Latvia, Estonia and Malta topping the list Table 25.

Table 25 Classification of EU MS according to the size of total fisheries employment and the sector's contribution to total national employment (ratio 2), 2005.

Ratio 2	Employment in the fisheries sector				
	>10,000	5-10,000	2,500-5,000	1,000-2,500	<1,000
1.0-1.1%	Greece Latvia	Estonia	-	Malta	-
0.5-0.6%	Portugal Ireland	Lithuania	-	-	-
0.1-0.5%	Bulgaria Spain France Italy Poland United Kingdom	Denmark Netherlands	Sweden	Cyprus	-
<0.1%	Germany	Romania	Czech Rep.	Belgium Finland Hungary Slovakia	Slovenia Austria

The most important NUTS-2 regions appear to have experienced significant decreases in employment in the catching sector from 1996-98 to 2005 as shown in Table 26. In Galicia, Sicilia and Andalucía a total of 21,000 jobs in the catching sector were lost during that period, equal to 28% of the total decrease in employment in this activity.

Table 26 Employment in the catching sector - top-10 NUTS-2 regions in the EU (1000 persons)

NUTS-2 region	1996-8	2005	Change (%)
ES11 Galicia	29.4	17.5	-40
ITg1 Sicilia	13.9	8.9	-36
ES61 Andalucia	11.8	6.9	-42
GR12 Kentr. Makedonia	4.9	5.1	4
GR25 Peloponnisos	3.6	5.1	42
PT11 Norte	9.8	5.0	-49
ITf4 Puglia	6.3	4.7	-25
FR52 Bretagne	6.0	4.2	-30
GR42 Notio Aigaio	4.8	4.0	-20
PT20 Açores	5.2	3.8	-27

Similar to the trends at the national level, trends in employment in fish processing at the level of NUTS-2 regions have been significantly diverging for different regions/countries as illustrated in Table 27. While Galicia and Denmark show decreases of 22% and 40% respectively, employment in Bretagne and Nord Pas-de-Calais has increased.

Table 27 Employment in fish processing - top-10 NUTS-2 regions in the EU (1000 persons)

NUTS-2 region	1996-8	2005	Change (%)
ES11 Galicia	14.0	10.9	-22
LV00 Latvia	n/a	7.4	-
PL63 Pomorskie	n/a	6.8	-
FR52 Bretagne	3.9	6.2	59
DK00 Denmark	8.6	5.2	-40
UKe1 E. Riding, N. Linc.	3.9	4.4	13
LT00 Lithuania	3.4	4.4	29
PL42 Zachod. Pomorskie	n/a	4.2	-
UKm1 N-E Scotland	4.2	3.5	-17
FR30 Nord, Pas-de-Calais	1.9	2.7	42

Most of the major aquaculture NUTS-2 regions show a gradual increase in aquaculture employment as illustrated in Table 28, reflecting growth in the industry generally across the EU (see Annex C).

Table 28 Employment in aquaculture - top-10 NUTS-2 regions in the EU (1000 persons)

NUTS-2 region	1996-8	2005	Change (%)
ES11 Galicia	n/a	5.1	-

NUTS-2 region	1996-8	2005	Change (%)
FR53 Poitou-Charentes	2.7	3.6	33
PT15 Algarve[43]	3.5	3.5	0
FR52 Bretagne	2.0	2.6	30
UKm4 Highl., Islands	1.9	2.2	16
PL63 Pomorskie	n/a	2.1	-
GR12 Kentr. Makedonia	1.3	1.8	38
ITd5 Emilia-Romagna	1.6	1.4	-13
FR23 Haute-Normandie	0.1	1.3	1200
PL42 Zachod. Pomorskie	n/a	1.3	-

Four countries, France, Italy, Spain and UK accounted for 64% of the total EU fisheries sector income. In terms of dependency which ranges between <0.1% and 0.7% of GNP Greece and Latvia again top the list followed by Portugal, Estonia, Lithuania and Denmark.

Table 29 Classification of EU MS according to the size of total fisheries employment and the sector's contribution to GNP (ratio 1)), 2005

Ratio 1	Employment in the fisheries sector				
	>10,000	5-10,000	2,500-5,000	1,000-2,500	<1,000
0.5-0.7%	Greece Latvia	-	-	-	-
0.2-0.3%	Portugal	Estonia Lithuania Denmark	-	-	-
0.1-0.2%	Ireland Spain France Italy United K.	-	-	Cyprus Malta	-
<0.1%	Germany Poland Bulgaria	Romania Netherlands	Sweden Czech R.	Belgium Finland Hungary Slovakia	Slovenia Austria

The EU-27 comprises 125 coastal NUTS-2 regions. The dependence on fisheries in terms of both employment and income varies significantly between the regions as shown in Table 30. Both in terms of total regional income and employment are Galicia (Spain) and Bretagne (France) topping the list, whereas Voreio Aigaio (Greece) is topping the list in relative terms Table 30.

[43] 1999 studies omitted to provide employment figures for the Ria Formosa viveiros in Algarve. For the purpose of this comparison it was assumed that 3,500 persons were employed in this sector.

Table 30 Top 10 ranking regions in EU in terms of fishing sector income, employment, income and employment dependence, 2005

Income (mil. Euro)		Total employment (1000 persons)		Income dependency (%)		Employment dependency (%)	
Galicia (ES)	693	Galicia (ES)	34	Voreio Ai. (GR)	3.2	Voreio Ai. (GR)	5.6
Bretagne (FR)	583	Bretagne (FR)	14	Hig.& Is. (UK)	3.0	Azores (PT)	4.5
Denmark North Sea	462	Pomorskie (PL)	11	Ionia Nisia (GR)	2.2	Algarve (PT)	4.3
Calabria (IT)	268	Latvia	11	Notio Aig. (GR)	1.4	Ionia Nis. (GR)	4.2
High.&Isl (UK)	259	Sicilia (IT)	10	Galicia (ES)	1.4	Notio Aig. (GR)	3.7
E. Riding, (UK)	254	Kentr. Mak. (GR)	8	Peloponn. (GR)	1.4	Galicia (ES)	3.0
N-E Scot. (UK)	252	Algarve (PT)	8	N-E Scot. (UK)	1.3	N-E Scot. (UK)	2.6
Kent. Mak. (GR)	230	Lithuania	7	Açores (PT)	1.3	Peloponn. (GR)	2.3
Puglia (IT)	216	Denmark North Sea	8	Algarve (PT)	1.1	Hi.& Isl. (UK)	1.9
Veneto (IT)	183	Norte (PT)	7	E. Riding (UK)	1.1	Guyane (FR)	1.7

Table 31 combines the two indicators of income dependency on fisheries and number employed. The top five-ranked regions are Galicia (Spain), Highlands and Islands UK), N-E Scotland (UK), Algarve (Portugal) and Peloponnisos (Greece).

Table 31 Distribution of regions with highest employment in the fisheries sector and the highest regional dependency on income from the fisheries sector

% Reg. Income	Employment in the fisheries sector		
	>10,000	5-10,000	2,500-5,000
>=2		UKm4 Highl.& Islands	GR22 Ionia Nisia GR41 Voreio Aigaio
1-2	ES11 Galicia	GR25 Peloponnisos pt15 Algarve UKm1 N-E Scotland	GR11 An. Mak, GR42 Notio Aigaio PT20 Açores UKe1 E. Riding
0.5-1	FR52 Bretagne LV00 Latvia PL63 Pomorskie	GR12 Kentr. Makedonia PL42 Zachod. Pomorskie	FR25 Basse-Norm. GR24 Sterea Ellada itf6 Calabria

2.3.2.1 Selection of case study regions

Four areas were selected for case studies on the impact of the status quo on regions with high dependency on fisheries. The results of these analyses can be seen in section 4.3.2.

2.3.3 Indicator 15 Value added regional dependency levels

Index definition

Value added dependency is defined as the regional importance of sub-sectors (fishing, fish processing, aquaculture and ancillary activities) in absolute and relative terms.

Data sources and methodology

The methodology is the same as for indicator 14. However, for some EU MS GVA data from 2007 (AER) are available at country level. Where 2007 data are missing requests for data has been sent to national agencies.

At country level data from 2005 and 2007 have been compared. The 2005 regional data has been compared to data from 1996-1998 in socio-economic studies carried out in 1999. For reasons of incomparability of income data trends could be evaluated only on the basis of employment.

Results

There are marked differences in the structure of income and employment in the main areas of the EU. As shown in the Mediterranean area the catching sector contributes 50% of income and 70% of employment within the fisheries sector. In the Atlantic area these percentages amount to 35% and 45% respectively. On the other hand in the Baltic and the North Sea area the major component of the fisheries sector is fish processing, which represents around 60% of the total fisheries sector in terms of both income and employment. Aquaculture is also important in the Atlantic and the Mediterranean areas whereas it contributes about 10-20% of total income and employment of the fisheries sector.

Table 32 Income from fisheries by main EU area and activity 2005 (mEuro)

Area	Total fisheries sector	Catching	Processing	Aquaculture	Ancillary activities
Baltic Sea	784.2	157.0	489.6	65.6	72.0
North Sea	2,517.5	698.9	1,562.1	97.9	158.6
Atlantic areas	3,780.7	1,315.2	1,530.3	694.5	240.6
Mediterranean Sea	3,080.2	1,618.1	626.9	577.2	258.0
Black Sea	11.1	2.9	4.5	3.1	0.6
Outer Regions	210.3	140.7	32.0	12.9	24.6
Non-coastal areas	593.2	0.0	391.5	191.6	10.1
Total	**10,977.0**	**3,932.8**	**4,636.9**	**1,642.8**	**764.6**

At country level there are significant developments in GVA from 2005 to 2007 both in the catching and processing sectors as illustrated Table 33. This raises the question if 2005 and 2007 GVA data are collected on the same basis in all countries.

Table 33 Development in GVA by country 2005-2007

GVA (1000 euro)	Catching sector (2005)	Catching sector (2007)	2005-07 (%)	Processing sector (2005)	Processing sector (2007)	2005-07 (%)
BEL	25,500	33,350	31	89,200	84,668	-5
CYP	-	6480	-	2100	-	-
DEU	115,300	82,780	-28	387,900	-	-
DNK	223,000	221,200	1	280,000	222,550	
ESP	574,400	555,890	-3	707,800	1,611,276	128
EST	11,100	19,590	76	23,300	23,756	2
FIN		10,500		54,200	28,700	-47
FRA	640,900	650,410	1	711,600	-	-
GBR	446,000	351,040	-21	978,200	607,737	-38
GRC	563,000	564,450	0	114,800	-	-
IRL		83,860	-	90,000	-	-
ITA	870,800	825,240	1	378,000	358,188	-5
LTU	1300	1450	12	32,500	27,546	-15
LVA	14,300	8720	39	66,700	-	-

GVA (1000 euro)	Catching sector (2005)	Catching sector (2007)	2005-07 (%)	Processing sector (2005)	Processing sector (2007)	2005-07 (%)
MLT		2600	-	1400	-	-
NLD	149,500	165,200	11	340,100	165,329	-51
POL	13,400	22,270	66	114,000	202,089	77
PRT	151,800		-	113,800	171,205	50
SVN	1800	960	-47	2200	11,572	
SWE	27,300	66,460	143	102,000	114,861	13
Total		**3,824,250**	-	-	**5,003,977**	-

Source: 2005 EP report. 2007: AER

2.3.4 Indicator 16 Social sustainability

Index definition

Social sustainability is defined as gross value added[44] (GVA) per employee.

Data sources and methodology

For the catching sector this indicator is derived from AER socio-economic data on MS fishing fleets provided under the Data Collection Regulation. Data are in real terms based on Eurostat price indices so as to more accurately display trends.

For the processing sector, data in Table 35 for selected countries are based on the recent meeting of the STECF-SGECA (October 2009).

No data on GVA for the aquaculture sector in the EU are available at the present time.

Results

The trend in GVA per employee (FTE) in capture fisheries 2003-2007 in real terms (2006 = 100) across all fleet segments shows a fairly stable EU median(Table 34). This average includes very different developments in the various MS over time. However, despite the yearly fluctuations most EU countries show a positive development in GVA per employee during the period, probably reflecting status overall GVA and decreasing employment level reflecting fleet decline, so increases cannot be taken to reflect long term social sustainability in the catching sub-sector. Only France shows a permanent yearly decline of about 2 % during the period. Some MS such as Denmark, UK, Greece, Latvia, and Poland demonstrate increases in GVA per employee above 50% from 2003 -2007.

Table 34 GVA per employee in the catching sector 2006-2007. Euros (Real terms 2006=100).

Country	2003	2004	2005	2006	2007	Av. 2005-07
BEL	73,970	67,546	45,793	36,370	65,046	49,070
CYP	-	-	-1,213	6,773	8,476	4,679
DEU	38,143	37,554	52,727	56,213	50,024	52,988
DNK	60,658	59,983	77,557	97,728	112,283	95,856
ESP	14,068	17,007	16,546	17,511	15,399	16,485

[44] Gross Value Added (GVA) is defined as the net profit from fishing (or processing), plus crew/labour earnings, plus depreciation costs, plus interest (cf. indicator 7)

Country	2003	2004	2005	2006	2007	Av. 2005-07
EST	-	-	2,539	2,771	5,685	3,665
FIN	22,594	18,247	26,552	8,081	-	17,316
FRA	55,454	54,888	53,041	52,524	50,925	52,164
GBR	18,356	19,118	54,693	49,237	42,369	48,766
GRC	-	14,346	17,757	22,887	22,289	20,978
IRL	-	32,716	33,729	40,364	21,351	31,815
ITA	-	-	-	36,096	31,714	33,905
LTU	-	1,790	1,329	1,006	1,904	1,413
LVA	2,663	4,842	4,236	6,062	5,221	5,173
MLT	-	-	-	-	-	-
NLD	-	73,539	75,494	74,788	82,655	77,646
POL	-	3,986	4,464	7,066	8,408	6,646
PRT	-	-	-	-	-	-
SVN	-	-	-	-	8,528	8,528
SWE	30,454	23,786	19,437	15,504	34,562	23,168
Median	**30,454**	**21,452**	**22,994**	**22,887**	**22,289**	**22,073**

In the fish processing sector, trend data for GVA 2003-2007 are not available, and data from 2006-2007 are only available for some countries (Table 35). For this reason no conclusion on sub-sector sustainability can be drawn.

Table 35 GVA per employee in the fish processing industry 2006-2007. Euros (Real terms 2006=100). * EP report for 2005, ** AER Process data.

Country	2005*	2006**	2007**	(%)
BEL	65,116	128,271	83,317	28.0
CYP	21,462	-	-	-
DEU	46,639	-	-	-
DNK	55,031	46,386	49,111	-10.8
ESP	32,150	-	-	-
EST	9,159	8,216	11,038	20.5
FIN	50,357	41,776	37,096	-26.3
FRA	46,029	-	-	-
GBR	26,853	-	37,021	37.9
GRC	31,710	-	-	-
IRL	26,280	-	-	-
ITA	56,811	21,008	22,581	-60.3
LTU	7,549	6,754	5,811	-23.0
LVA	9,212	-	-	-
MLT	-	-	-	-
NLD	53,474	50,238	51,779	-3.2
POL	7,282	11,904	13,957	91.7
PRT	21,538	27,742	26,550	23.3
SVN	11,242	-	-	-
SWE	57,913	58,468	60,116	3.8
Median	31,710	34,759	37,021	8.2

2.3.5 Indicator 17 Attractiveness of the sector

Index definition

Attractiveness of the sector is defined as average wages per full time employee/ median national or/and EU income.

Data sources and methodology

The AER contains information on two variables that are relevant for calculating the average wages in capture fisheries: crew costs and number of employees (FTE). The crew cost included in the AER includes the gross salary paid to fishermen as well as the social taxes (social security, health insurance, pension, etc) paid by the employer, and consequently does not accurately represent the average income of the fisherman. Given that the relative weight of social taxes differs between MS[45], this caveat means that accurate comparison across fleet segments and MS is not possible.

The Eurostat Labour Force Survey (average gross annual earnings in industry and services, by gender) contains data on the average wages EU MS.

DG-MARE internal publication (Joint A3/B4 Collaboration, November 2009, Issue No. 3) presents data on the average gross annual renumeration of employees in the fish processing industries.

Results

Table 37 shows the average crew wages per full time employee in capture fisheries for vessels over 12 meters in Euros by country and year for the years 2003 to 2007. Vessels <12 meters (Table 36) are calculated differently, with crew share and profit combined. This is because in most cases crew costs do not entirely reflect total fishermen income as many vessels in this size class are owner operated.

Table 38 shows that the fisheries sector is particularly attractive in Belgium and Germany compared to the average wages (national wages in real terms are presented in Annex A Table A 30). In France, fishermen experienced a significant drop in their average wages from 2006 to 2007 from 141% to 94% of the national average

There are strong wage disparities across MS potentially reflecting differing fleet structures, differing fleet costs/earnings profiles, and different costs of living in different MS. In addition a comparison between Table 37 and Table 38 reveal that the overall remuneration in the fish processing industry is higher than in the catching sector.

Table 36 Average crew wages (including profit) per full time employee in capture fisheries (vessels <12 meters) in Euros (real term prices: 2006=100) by country and year for the years 2003 to 2007.

Country	2003	2004	2005	2006	2007	Av. 2005-07
BEL	-	-	-	-	-	-
CYP	-	-	588	146	7,377	2,704
DEU	-385	-3,487	-2,532	-135	-2,289	-1,652
DNK	35,830	33,594	37,987	41,550	55,889	45,142

[45] In Spain, social taxes (social security, health insurance) are between 5-10% of gross salary, typically 7%. Income taxes (direct taxation on the rent) range between 20% of gross salary for sailors and 40% for skippers (C. Calvo; pers. comm.)

Country	2003	2004	2005	2006	2007	Av. 2005-07
ESP	13,155	26,501	23,867	26,752	27,632	26,084
EST	-	-	1,015	568	477	687
FIN	961	1,010	1,967	195	-	-
FRA	37,721	39,061	38,255	36,926	38,250	37,810
GBR	3,188	2,672	7,599	20,347	8,206	-
GRC	2,550	13,710	16,088	20,084	20,387	18,853
IRL	10,150	7,014	13,282	27,810	16,678	19,256
ITA	-	-		22,518	17,672	20,095
LTU	-	4,102	1,243	407	2,356	1,335
LVA	-	-	688	214	110	337
MLT	-	-	-	-	-	-
NLD	-	-	0	68,216	11,587	26,601
POL	-	3,639	3,842	5,239	6,174	5,085
PRT	4,126	3,763	3,919	6,452	-	5,186
SVN	-	-	-	-	56,675	-
SWE	11,705	10,710	6,404	1,916	7,175	5,165
Median	7,138	5,558	3,881	6,452	9,897	-

Table 37 Average crew wages (excluding profit) per full time employee in capture fisheries (vessels >12 meters) in Euros (real term prices: 2006=100) by country and year for the years 2003 to 2007.

Country	2003	2004	2005	2006	2007	Av. 2005-07
BEL	63,171	65,548	60,226	68,114	61,516	63,285
CYP	-	-	9,581	3,515	4,479	5,858
DEU	41,041	40,783	47,481	45,036	45,812	46,110
DNK	49,577	49,420	54,439	61,503	67,262	61,068
ESP	13,639	15,672	14,133	14,879	13,920	14,311
EST	-	-	7,321	9,789	15,985	11,031
FIN	25,779	25,156	25,096	37,724	-	31,410
FRA	46,159	45,071	42,427	44,079	42,500	43,002
GBR	-	-	-	-	-	-
GRC	4,163	8,913	8,158	8,730	7,526	8,138
IRL	29,597	36,586	30,471	28,023	15,284	24,593
ITA	-	-	-	20,634	18,886	19,760
LTU	-	560	704	630	2,072	1,135
LVA	5,217	4,721	5,351	3,306	4,217	4,292
MLT	-	-	-	-	-	-
NLD	53,877	49,694	48,956	51,091	55,064	51,704
POL	-	3,408	3,981	4,514	5,459	4,652
PRT	13,254	11,418	11,056	9,175	-	10,116
SVN	-	-	-	-	-	
SWE	21,414	21,140	12,380	13,581	16,230	14,064
Median	27,688	23,148	13,256	14,879	15,985	-

Table 38 Average crew wages per full time employee in capture fisheries (vessels >12 meters)/national average wages by country and year for the years 2003 to 2007. The red figures use extrapolated data to compensate for missing data[46].

Country	2003	2004	2005	2006	2007
BEL	171%	176%	161%	181%	163%
CYP	-	-	46%	16%	21%
DEU	154%	150%	166%	157%	161%
DNK	104%	103%	112%	127%	129%
ESP	67%	76%	68%	70%	66%
EST	-	-	-	-	45%
FIN	78%	75%	74%	111%	127%
FRA	150%	146%	136%	141%	94%
GBR	44%	40%	38%	54%	51%
GRC	23%	-	-	-	-
IRL	-	-	74%	-	-
ITA	-	-	-	-	289%
LTU	-	-	-	-	-
LVA	-	119%	48%	28%	31%
MLT	-	-	-	-	-
NLD	138%	126%	124%	130%	141%
POL	-	52%	62%	-	36%
PRT	85%	74%	71%	62%	56%
SVN	-	-	-	-	-
SWE	62%	61%	36%	39%	45%

Table 39 Average gross annual renumeration of employees in the fish processing industries in Euros compared to the national average wage by MS, 2007. The missing numbers are due to lack of information in Eurostat or AER. The red figures use extrapolated Eurostat data.

Country	Average remuneration in the fish processing industry 2007 (Euro)	Processing vs. national wages in 2007 (%)
BEL	33252	86%
CYP	-	-
DEU	40418	101%
DNK	45862	-
ESP	22297	103%
EST	8305	23%
FIN	29651	91%
FRA	-	-
GBR	-	-
GRC	-	-
IRL	-	-
ITA	22963	343%
LTU	4751	-

[46] Finland and Portugal are extrapolated from AER. Cyprus, Germany, Spain, UK, Latvia, NL, Portugal are extrapolated from national wages from Eurostat.

Country	Average remuneration in the fish processing industry 2007 (Euro)	Processing vs. national wages in 2007 (%)
LVA	3615	64%
MLT	-	-
NLD	-	-
POL	8523	56%
PRT	11420	75%
SVN	-	-
SWE	42556	115%
Average	22801	66%

2.4 Governance indicators

2.4.1 Indicator 18 Departure from Quotas

Index definition

The rationale for this indicator is that scientific advice reflects environmental concerns more than fisheries management decisions. The value of the indicator is the proportion (in percentage terms) of actual recommendations and decisions that deviate from the ICES and Commission recommendations. No weighting according to the importance of the fishery or size of the stocks concerned would be made.

Data sources and methodology

The key data sources for this indicator were the ICES annual advice on fish stocks published on the ICES website[47]; the Commission's annual proposals for fishing opportunities[48]; and the TAC decisions as published in the annual Council Regulations for the period 2003-2009[49].

The following key parameters were calculated: the average deviation between ICES advice and Commission proposal; the average deviation between Commission proposal and Council decision; the average deviation between Council decision and landed catch.

Analysis of the first two parameters was only conducted on the stocks which had complete information on ICES advice, Commission proposal *and* final Council decision, which generally provided a sample of between 20 and 30 stocks per year. Analysis of the third parameter was only conducted on stocks which had complete Council decision and landed catch. This generally provided a sample of between 40 and 50 stocks per year.

Stocks with ICES advice of zero catch were excluded from the above analysis. A second sub-indicator was calculated which shows the proportion of stocks for which ICES has recommended a catch of zero tonnes but for which the Council set a positive TAC.

Results

The average trend in deviation from scientific advice provided by ICES to the Commission, and from the Commission's proposals and the Council Decision for the period 2003 and

[47] International Council for the Exploration of the Sea. Available at: www.ices.dk
[48] EC Europa. Available at: www.europa.eu
[49] Council Regulation (EC) No. 41/2006; No 43/2009; No 51/2006; No 40/2008; No27/2005; No 2287/2003; and No 2341/2002

2009 is presented in Figure 22. Percentage deviation between Commission recommendation and Council decisions from scientific advice have followed similar trends, an increase between 2003-2005, then a decrease and another marginal increase in recent years. Data for 2003 and 2004 were difficult to interpret and consequently any conclusion drawn from the deviation between Commission proposal and Council decision in these years should be treated with caution.

The proportion of stocks for which ICES has recommended zero catch but the Council has set a non-zero TAC has risen over recent years, from 7 stocks in 2003 to 13 in 2009 (Figure 23).

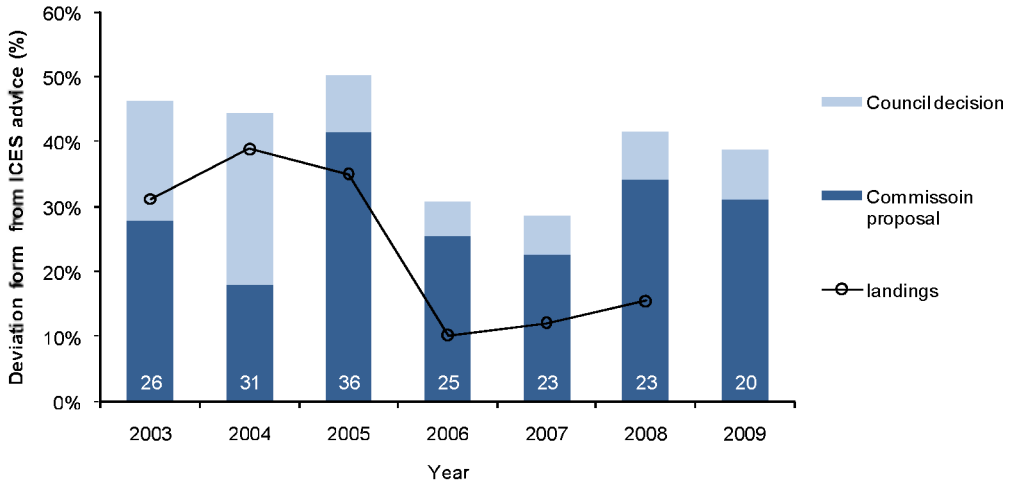


Figure 22 Percent deviation from scientific advice 2003-2008. Supporting data are shown in Annex A. Numeric values indicate the number of stocks in each year which meet the criteria for analysis.

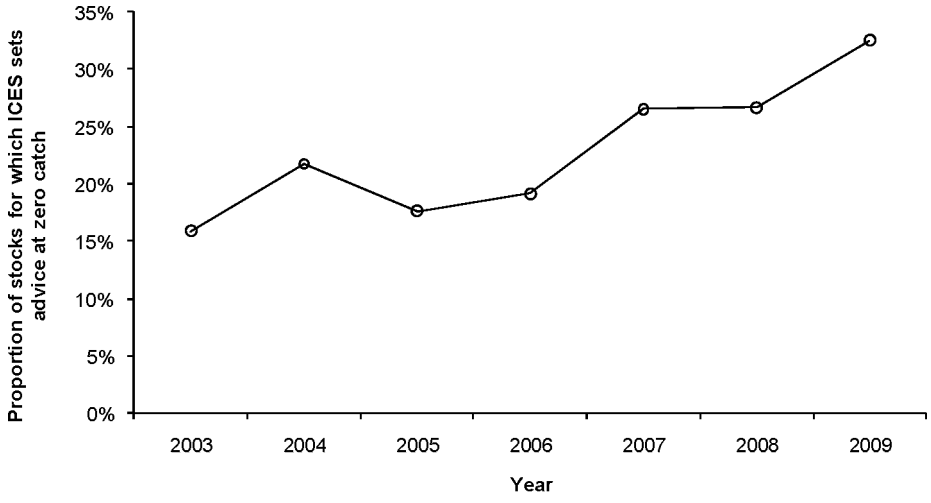


Figure 23 Proportion of stocks in each year for which ICES has recommended zero catch.

2.4.2 Indicator 19 Management Costs for the Sector

Index definition

Indicator 19 is constructed of two sub-indicators:

1) Proportion of Total MS management cost to Total MS GDP and;

2) Proportion of EU Fisheries Sector Commitments to EU GDP.

Data sources and methodology

To establish the total costs of government transfers to marine caught fisheries – the numerator for sub-indicator 1 - data were compiled from the relevant tables by year sourced from the Organisation for Economic Co-operation and Development (OECD)[50]. The values, currently in US$, were converted to EU Euro using the average conversion of US$ to EU Euro for each relevant year. This was in order to align with the currency used for EU MS GDP figures obtained from the International Monetary Fund (IMF[51]). The MS GDP figures were used as the denominator for both sub-indicators. A proportionate value of these two figures was plotted against the time series 2003, 2005-2007.

To ensure consistency of data across all analysis for sub-indicator 1 the following MS were used: Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom.

To construct sub-indicator 2 the numerator was formed of data sourced from MARE[52]. The total MS' figures were summed and proportioned against the denominator referred to in the first paragraph of this section (MS GDP). These proportions were plotted against the time series 2004-2008.

Data used for analysis in sub-indicator 2 was available for the following MS: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia and United Kingdom.

Results

Figure 24 illustrates the points plotted for sub-indicator 1. This indicates that total MS financial inputs against total GDP from 2003-2007 has decreased minimally. As there was limited back dated complete information, it was considered that finding significant contributions would not be of constructive use.

[50] Internal Document "*A Diagnosis of the EU fisheries sector*" – Commission Staff working Document
[51] IMF Database. Available at: http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/index.aspx
[52] See Annex A for definition of EU contributions considered and figures.

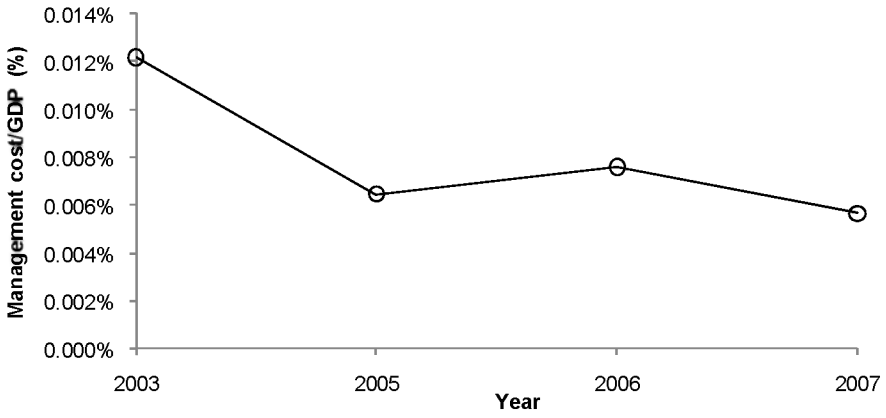


Figure 24 Total MS management costs expressed as a percentage of GDP.

When viewing the results of proportions calculated for sub-indicator 2 (Figure 25) it is clear that while there is a minimal decreasing trend, there is also noticeable variation. Although these points are proportionate to total GDP, this variation is attributable principally to the total commitments inputs by the EU. This is shown in the fact that proportionate curve tracks the peaks and troughs of the EU commitments curve.

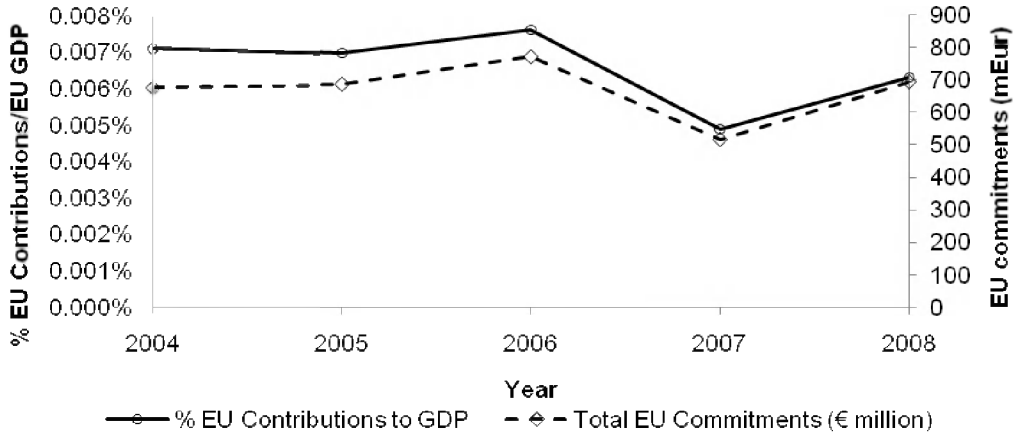


Figure 25 Total MS Fisheries Management Cost to GDP plotted against total EU commitments

Another factor to consider is the proportional breakdown of fisheries management costs per MS sourced from OECD[53]. Long-term management plans should seek to achieve a sustained decline in enforcement costs as management of the fishery becomes more efficient. This theory is discussed in the Control IA and projected that enforcement costs should see a decrease of 42% in 2017 to the level estimated of 287.57 million Euro. This estimation is based on proportion of cost breakdowns in OECD (1997) as follows: research costs – 0.307; management costs – 0.233 and; enforcement costs – 0.461. Despite that these were the proportions calculated from 1997 figures the estimated figure of 287.57 million Euro is similar to costs reported in the Control IA.

[53] http://www.oecd.org/dataoecd/2/52/1917868.pdf

2.4.3 Indicator 20 Rights Based Management Systems

Indicator Description

This indicator examines the number of vessels managed under rights based management systems, divided into vessels <12m and that >12m and two levels of RBM systems: 1) fully owned and transferable systems - Individual Transferable Quota (ITQ) – and systems providing partial benefits (Individual Non-Transferable Quotas (IQ), Individual Non-Transferable Effort Quotas (IE) and Individual Transferable Effort Quotas (ITE)). Annex A contains definitions of RBM and the different types of systems it also discusses the associated benefits and impacts of the ITQ system.

Data sources and methodology

Source data were obtained from MRAG (2009[54]) and corroborated by contacting specific organisations: Marine and Fisheries Agency (UK); Dutch fish marketing board (NL); DKFisk (DK; and Fiskeriverket (SE). Total vessels entering ITQ or other RBM arrangements per year were projected forward under an assumed 2% reduction in fleet size per year and compared with 2008 fleet size data to gain an understanding of the proportion of the total fleet that is operating under ITQ or other RBM systems[55].

Results

Over the last 30 years approximately 14,432 vessels have entered ITQ, IQ, IE or ITE RMB systems, compared to a total 88,520 in the fleet now. More vessels are operating under the IQ, IE and ITE systems (13,920) than the ITQ system (1,903). Out of the former three, the IQ system is the most widely used. Since 1985 the number of vessels operating under IQ, IE and ITE systems has been on the rise, with the overall increase driven largely by the increase of <12m vessels in the late 1990's (Figure 26 2a). The ITQ fleet is comprised solely of vessels >12m (Figure 26 1a) whereas the IQ, IE and ITE fleet is mixed, with 66% of the total <12m and 34% >12m (Figure 26 2a).

As a percentage of the overall EU fleet, the number of vessels operating ITQ systems increased gradually until 2005 and has seen a larger take up since then to 8% of the overall number of >12m vessels (Figure 26 1b). The number of vessels operating under IQ (including CQ's for France), IE and ITE systems and saw their main growth between 1990-1999, and is now approximately 16% of the overall number of <12m vessels (Figure 26 2b).

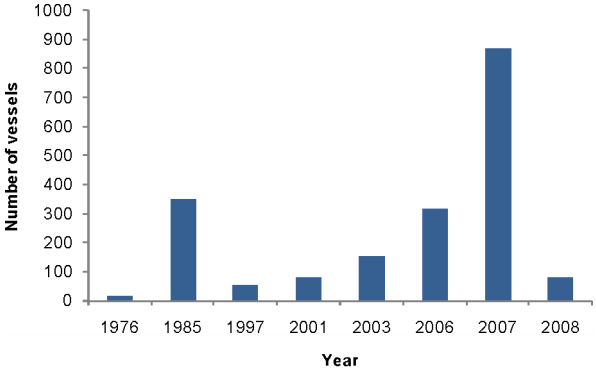
In most countries there are restrictions on transferability, making IQ the commonest form (used in Italy, France, Belgium, Sweden, Germany, Latvia, Lithuania and Poland), but a number of countries have established systems where quota is fully transferable (Denmark, Netherlands, Spain, Portugal and Estonia), although there are often restrictions on transferability (e.g., only within a fleet, or only between POs/nationally-flagged vessels). Despite the very large size of their fleets, Greece, Spain and Portugal have relatively low application of RBM systems, notably restricted to their deep water fleets. Netherlands, UK, Germany have the highest number of vessels in RBM systems. Many systems show a gradual evolution towards increasing transferability, such as the UK (IQ/ITQ), where transferability has gradually increased in the system, as a result of demand from industry,

[54] MRAG, IFM, Cefas, Azti, PolEM 2009. An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU. Final Report to the EC, available at http://ec.europa.eu/fisheries/publications/studies/rbm_2009_part1.pdf

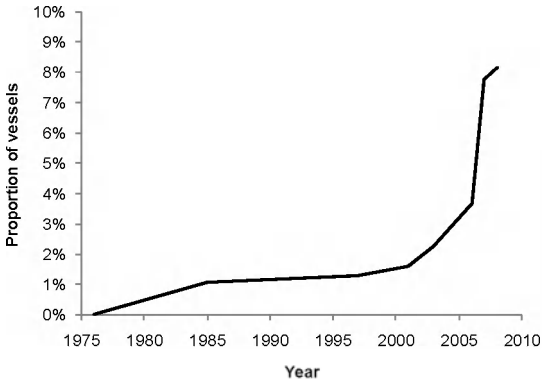
[55] Although counter-intuitive, this method avoids having to make estimates of historical fleet size and then simultaneously account for reductions in RBM and other fleets over time.

although it is not a fully-fledged ITQ system. Vessel catch limits (Ireland) and Community Quota (Portugal, France, Belgium and Poland) are also used, although not so extensively.

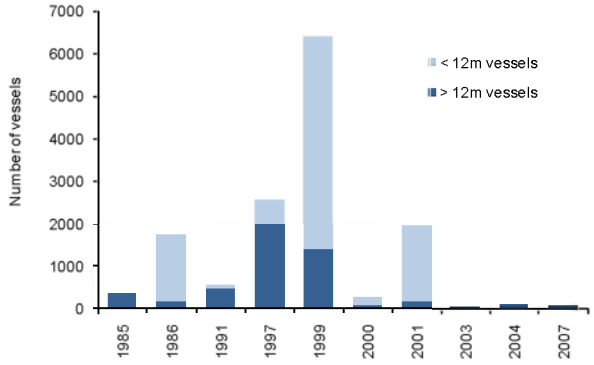
Effort-based quota systems are less common than catch-based quota systems. The majority of effort-based systems exist as an additional measure to a catch quota-based system (commonly as a result of the days-at-sea regulations introduced for a number of stocks). IE and ITE systems are implemented in specific fisheries, e.g., the coastal fishery in Latvia (IE), salmon netting in the UK (ITE), and the coastal fishery in Estonia (ITE). TURFs are also used in a range of MS, most commonly in inshore fisheries for sedentary resources such as shellfish, particularly in Italy.



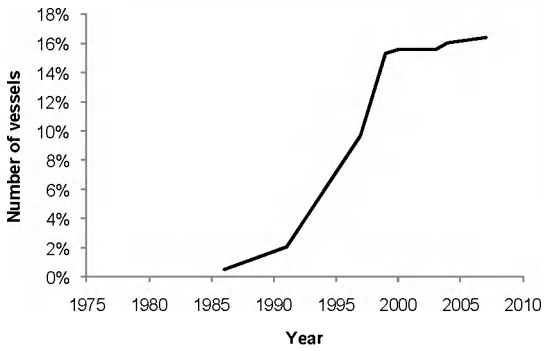
1a) Total number of vessels entering ITQ by yea



1b) ITQ vessels as a % of the total EU fleet (<12m)



2a) Total number of vessels entering IQ, IE, ITE by year



2b) IQ, IE, ITE vessels as a % of the total EU fleet (<12m).

Figure 26 Graphs of the total number vessels, number <12m, number >12m and as a percentage of total EU vessels *Making assumptions of dates for: Netherlands 350 >12m vessels of 1985; and Latvia 170 >12m and 871 <12m vessels of 2001.

Table 40 Summary of the number of vessels operating under ITQ and IQ, ITE, IE systems in MS and the year that they were adopted

Country	RBM System	Number Vessels; Year adopted		
Spain	ITQ	313; 2006	66; 2008	
Portugal	ITQ	13; 2008 (started as IQ in 1992)	52; 1997	
Netherlands	ITQ	Within figure for plaice and sole; 1994	350; 1985	13; 1976
Denmark	ITQ	224; 2003	869; 2007 (VTQ)	
Estonia	ITQ	77; 2001		
Germany	IQ	1200; NS 1986; Baltic 1989.	360; See previous	150; See previous
Poland	IQ	n/a; 1991	71; 1991	468; 1991.
Italy	IQ	212; 1997		
France	CQ & IQ	2353; 1997[56]		
UK	IQ	<10m LOA; 5000; 1999	>10m;1400; 1999	20; 2003
	ITE	Not known (rights holders ~170 in England and Wales); No date.		
Lithuania	IQ	250; 2000		
Estonia	ITE	878 vessels <12m; 2001		
Sweden	IQ	<65; 2007		
Netherlands	ITE	350; No date		
Belgium	CQ & IQ	102: 54 >221kW, 48 ≤ 221 kW, 27 ≤70GT & ≤ 221 kW - some under LL RBM system; No date		
Latvia	IE	737 (all<12m); No date		
	IQ	134 (all <12m); No date	100; No date	70; No date

**92% Baltic allocation managed by IQ, 8% based on historical catches*[57]
Source: Adapted from MRAG RBM report with additional figures added.

The effects of implementing RBM

There are still relatively few ITQ systems in operation in the EU so complete analyses of their affects are difficult, nevertheless we have investigated the trends in vessel numbers and profitability for a number of fleets that have entered ITQ/IQ in the last ten years.

- Over the long-term, there is a suggestion that fleets operating an ITQ continue to be able to rationalise and balance their capacity to opportunity, whereas fleets not in an ITQ system may not exhibit this tendency. For instance the Netherlands beam trawl (the majority of flatfish catch) which implemented an ITQ system in the mid-1980s, continues to rationalise by 13.9 vessels per annum, or 4.1%. On the other hand, the German trawler fleet operating under the IQ system, which also commenced in the mid-1980s, exhibits a comparatively small decline per annum of 0.8 vessels, or 0.8% (data from 2003-2007).

- Trends maybe apparent even over the short-term. For instance the Estonian offshore ITQ fleet (commencing 2001) showed continual rationalisation by 13.5 vessels, or 19% per annum. In Denmark the VTQ (vessel transferrable quota, equivalent to an

[56] Fisheries are regulated by the Act on Sea Fisheries and Aquaculture of 1997 as such, the State is responsible for ensuring its sustainable exploitation and for the allocation of rights to fish (fishing licence, catch quotas, effort quotas, etc). CQ is the main tool while IQ is used for fisheries such as the bluefin tuna and toothfish.
[57] Frey, M. (2003) *Sustainable Fisheries Management Plan for the Estonian Fisheries in the Baltic.* Available at: http://www.unuftp.is/static/fellows/document/merjefrey003prf.pdf

ITQ) demersal fleet has decreased by approximately one third since 2007 (from ~1000 to 670). A similar decline happened when the pelagic fleet entered ITQ in the early 2000s. A recent evaluation of the VQS system by the University of Copenhagen showed that the current number of vessels is about correct for Denmark's quotas. This system could be evaluated as a success given the objective of the VQS not as a decommissioning scheme but as one which seeks to adjust the fleet capacity to the current level of fishing opportunities and not purely that to decommission vessels[58].

- On the other hand the Estonian coastal ITE fleet (commencing 2001, figures from 2005-2007) showed a decrease of only 1 vessel per annum or 0.1% (data from 2004-2007). The UK entire fleet that is operating under the IQ-style system since 1999, has exhibited a decrease of 142 vessels, or 2% per annum (data from 2002-2007).

- These trends in fleet size may not result in better performance in terms of profitability. An analysis of relevant AER data indicates that the profitability[59] of the Dutch ITQ vessels has, until recently, however, been poor: -5% in 2005, but rising to 2% in 2007. The profitability of the German IQ vessels decreased from 2003 to 2004, but has similarly increased in 2007. The profitability of the Estonian ITE fleet has increased each year from 2005 to 2007, despite its negligible decrease in size, as did the Estonian ITQ fleet. The profitability of the UK fleet shows a trend of significant decline from 2003 to 2007.

2.4.4 Indicator 21 Data Provided by MS

Index definition

This indicator is intended to highlight the level of MS compliance with legal obligations to report on their activities relating to the management of fisheries resources, fleet management, structural policy, monitoring and control arrangements including infringements and environmental issues. In particular, the indicator describes the level of failures to comply and a quantitative assessment of level of infringements.

Data sources and methodology

Two indicators were calculated:

(a) The level of compliance with reporting on MS compliance with reporting on their efforts to balance fishing capacity with fishing opportunities. A qualitative review of the level of Member States compliance with the 2003 Regulation was undertaken, based on information from the annual MS reports for the year 2004-2007[60]
(b) Serious infringements during fishing operations, using the annual reports on serious infringements. Data were expressed as a proportion of infringements[61] to fleet size[62] was found per MS for each year. Normalising the data in this method ensured that false trends were not identified due to fleet sizes increasing or decreasing.

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[58] There was some paid decommissioning at the start in 2007.

[59] Profitability figures used were calculated from the unchanged AER data.

[60] EC Europa. Annual Report: Reporting: Fleet management. Available at: http://ec.europa.eu/fisheries/fleet/index.cfm?method=FM_Reporting.AnnualReport

[61] Infringements information from annual report, "Reports from Member States on behaviours which seriously infringed the rules of the Common Fisheries Policy in 2001, 2002, 2003, 2004, 2005 and 2006" http://eur-lex.europa.eu

62 Fleet size information sourced from http://ec.europa.eu/fisheries/fleetstatistics/index.cfm

Results

MS reporting on fleet management

Since 2002, the task of drawing up capacity management plans was given back to MS[63]. Furthermore, MS are obliged to report annually to the EC on their efforts to achieve a sustainable balance between fishing capacity and fishing opportunities[64]. On the basis of this information, the EC produces a summary report for the European Parliament and the Council highlighting the extent to which MS have complied with their obligation to forward data in relation to matching fishing capacity to fishing opportunities. This allows the Commission to comment, on the overall capacity of the EU fleet on an annual basis. Such an assessment is essential for any further attempts to address over-capacity. To date, there have been five annual reports produced by the Commission covering the period 2003–2008.

In 2004, the first year of the implementation of the Regulation, most MS simply summarised the development of the fleet in 2003 and described efforts to comply with the entry/exit regime and the submission of data for the Community fishing fleet register[65]. It was a transitional year, for adaptation from the old to the new fleet-management regime and there were no attempts to report on the level of overcapacity.

In 2005, only-half of the Member States had submitted their annual reports on their 2004 efforts, within the deadline; some reports were up to two months late. The format and the content fixed by the Regulation had not always been respected; the information included was not homogeneous, making a common assessment of the MS' reports problematic and making it difficult to report on levels of over-capacity. The EC concluded that more-detailed guidelines for the content of the annual reports should be established alongside a common harmonised methodological approach, with greater emphasis on the analysis of the development of fishing capacity in relation to available fish stocks[66].

In 2006, the EC again noted a number of shortcomings, including the failure to submit reports on time. In its report to the Council and the Parliament, the Commission noted that most MS tried but failed to assess the balance between fishing fleet capacity and available fishing opportunities. Various approaches were used to identify correlations between fishing fleets and available resources. Consequently, the EC came to the same conclusions with respect to the need for more-detailed reporting guidelines as in 2005.

In 2007, the EC reported that the quality of the MS' reports had steadily improved since the first Commission report[67], was presented. However, still only twelve MS submitted their reports on time; seven reports were between two weeks and two months late. The UK sent its report so late (six months) that its contents could not be included in the European Commission's report. Again, the EC reported that the majority of the MS' reports did not

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[63] Council Regulation (EC) No. 2371/2002 of 20 December 2002 on the Conservation and Sustainable Exploitation of Fisheries Resources under the Common Fisheries Policy, OJ L 358 (31.12.2002) Article 11 (1).
64 COM(2007) 39 final, Communication from the Commission to the Council and the European Parliament on Improving Fishing Capacity and Effort Indicators under the Common Fisheries Policy (05.02.2007).
65 COM(2004) 799 final, Annual Report from the Commission to the Council and the European Parliament on Member States' Efforts During 2003 to Achieve a Sustainable Balance Between Fishing Capacity and Fishing Opportunities. (14/12/2004)
[66] COM(2006) 872 final, Annual Report from the Commission to the Council and the European Parliament on Member States' Efforts During 2005 to Achieve a Sustainable Balance Between Fishing Capacity and Fishing Opportunities (09.01.2007).
[67] COM(2004) 799 final, Annual Report from the Commission to the European Parliament and the Council on Member States' Efforts During 2003 to Achieve a Sustainable Balance Between Fishing Capacity and Fishing Opportunities (14.12.2004).

describe their fleets in relation to fisheries, as required by Article 13 (1) (a) of Regulation 1438/2003, in a manner allowing the Commission to analyse their efforts to achieve a balance between the capacity of the fishing fleet and the available fishing opportunities, as stipulated by Article 14 of Regulation 2371/2002. Similar to previous years, MS had simply described the national fleet management systems implemented and the trends in fleet capacity in relation to the entry/exit scheme[68].

Overall, the level of compliance with timely reporting and quality of the reports has been steadily improving. Member State efforts to assess the balance between fishing capacity and fishing opportunities[69] are still lacking. In 2008 the Commission adopted "Guidelines for an improved analysis of the balance between fishing capacity and fishing opportunities"[70] to assist Member States with their evaluation of national fishing capacity in relation to fishing opportunities. In 2008, only eight Member States reported on their efforts in 2007 using the new indicators recommended in the 2008 Guidelines. The situation is expected to improve in 2009.

Serious infringements

A slightly increasing slope was observed when considering infringements committed across the entire EU (Figure 27). More conclusively though, correlation coefficient analysis identified that France, Ireland and Italy have shown significant increases and although decreases were identified, none of these were found to be significant. It should be noted that data points were only established for MS which had complete data sets for 2001-2006.

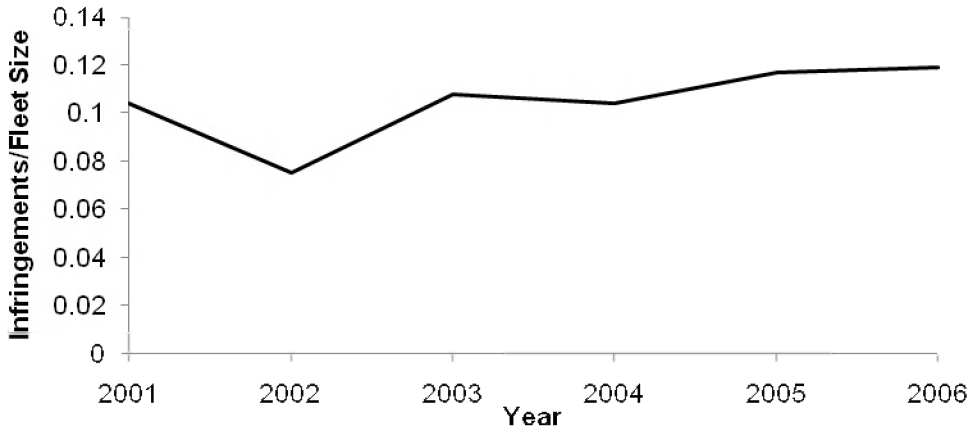


Figure 27 EU Infringements to Number of Vessels (2001-2006)

Additionally, the analysis on categories of infringements committed (Annex A Figure A8) concluded that categories D1, D6, D7, E1 and F2 are showing significant increases (R = ±0.81). Once again, decreases in certain categories were identified, but these were not

[68] COM(2007) 828 final, *supra* note 17.
[69] COM(2008) 902 final, Annual Report from the Commission to the European Parliament and the Council on Member States' Effort During 2007 to Achieve a Sustainable Balance Between Fishing Capacity and Fishing Opportunities, 12pp.
[70] DG Mare, 2008. Guidelines for an improved analysis of the balance between fishing capacity and fishing opportunities. The use of indicators for reporting according to Article 14 of Council Regulation 2371/2002. Version 1, March 2008.

found to be significant. See Annex A Table A39 for list of infringement categories. The increase can also be the result of better control as more infringements might be detected.

2.4.5 Indicator 22 Rate of Utilisation and Allocations (Quotas)

Index definition

This indicator considers the rate of utilisation by MS over a period from 2003-2008. The rate was determined by using total catch as the numerator and adapted quota as the denominator.

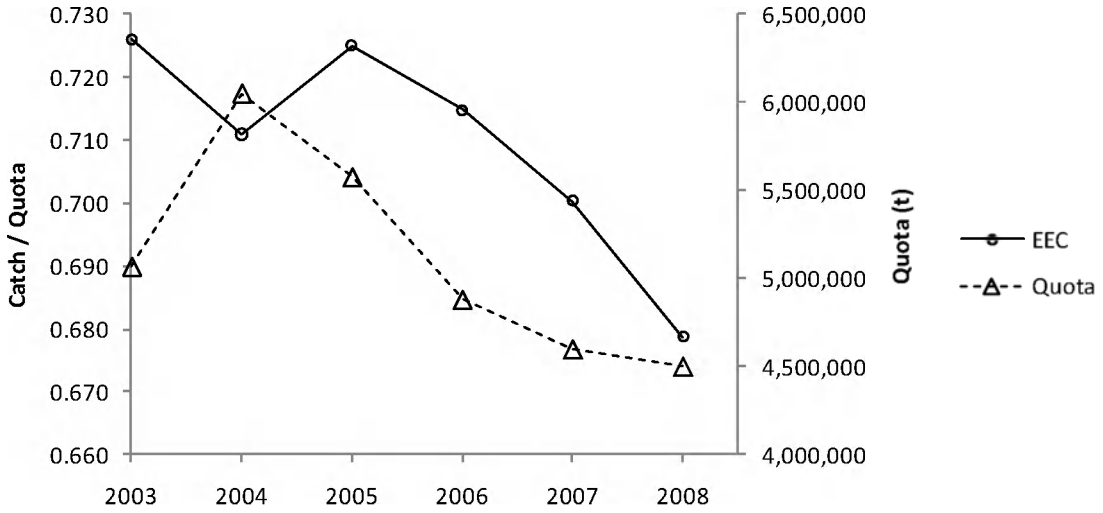
Data sources and methodology

All data for this indicator were collected from annual quota and catch analysis provided by the European Commission[71]. The data in its raw form was broken down in to quota allocated and catches by species, area, and MS. All data was then grouped to MS level.

At this level, a proportion of catch over quota was calculated per year for each MS. Once a clear decreasing trend had been identified analysis was conducted to determine which MS had significant trends. When the correlation coefficient was calculated, MS which had a value greater than 0.81 were considered to have a significant trend over the period 2003-2008 inclusive. It should be noted that MS without proportions recorded through the entire period were not considered in this analysis.

Results

The decreasing curve in Figure 28 indicates that there is a declining trend in rate of catch as a proportion of allocated quota. As indicated on the second axis, given that the quota allocated is also declining, this declining catch rates shows that catch volumes are declining faster than the declining quotas set. To analyse this scenario further, correlation coefficients were calculated for each MS' catch rate.



[71] 2003-2008 European Commission Catch Reporting Information System, *CRV2 – Situation by Stock.*

Figure 28 Total MS proportion of catch over quota; secondary axis total quota (2003-08)

MS highlighted in Table 41 indicate those which are considered to have shown significant trends through 2003-2008 these are Belgium, Netherlands and Sweden. This analysis also indicates that each significant trend identified is one that is decreasing.

Table 41 Rate of utilisation per MS. Note: MS with significant trends are in bold italics. Pearson's correlation coefficient (r) is also shown.

Country	2003	2004	2005	2006	2007	2008	r value
BEL	***0.785***	***0.739***	***0.664***	***0.499***	***0.541***	***0.533***	***-0.902***
BGR	-	-	-	-		82.078	-
CYP	-	-	-	-	0.004	0.435	-
DEU	0.851	0.807	0.973	0.836	0.775	0.817	-0.313
DNK	0.567	0.575	0.549	0.710	0.623	0.589	0.381
ESP	0.695	0.562	0.540	0.800	0.738	0.834	0.653
EST		0.890	0.800	0.734	0.869	0.905	-
FIN	0.584	0.837	0.615	0.581	0.615	0.640	-0.232
FRA	0.660	0.618	0.561	0.634	0.589	0.620	-0.335
GBR	0.834	0.802	1.043	0.780	0.812	0.806	-0.203
GRC	0.677	0.592	0.748	0.469	0.588	0.506	-0.590
IRL	0.875	0.840	0.963	0.813	0.841	0.781	-0.524
ITA	0.952	0.954	0.998	0.989	1.076	0.537	-0.479
LTU	-	0.665	0.408	0.660	0.697	0.531	-
LVA	-	0.606	0.606	0.571	0.621	0.629	-
MLT	-	-	-	-	0.938	0.810	-
NLD	***1.020***	***0.924***	***1.005***	***0.680***	***0.700***	***0.678***	***-0.871***
POL	-	0.638	0.603	0.581	0.616	0.389	-
PRT	0.540	0.578	0.494	0.602	0.622	0.623	0.687
SVN	-	-	-	-	-	-	-
SWE	***1.085***	***1.022***	***0.943***	***0.786***	***0.758***	***0.754***	***-0.960***

Figure 29 further demonstrates the trends which are considered to be significant. Those that fall outside the shaded area have an r value outside 0.811. This figure also illustrated that while they're not all significant a majority of the trends (10/13) are decreasing.

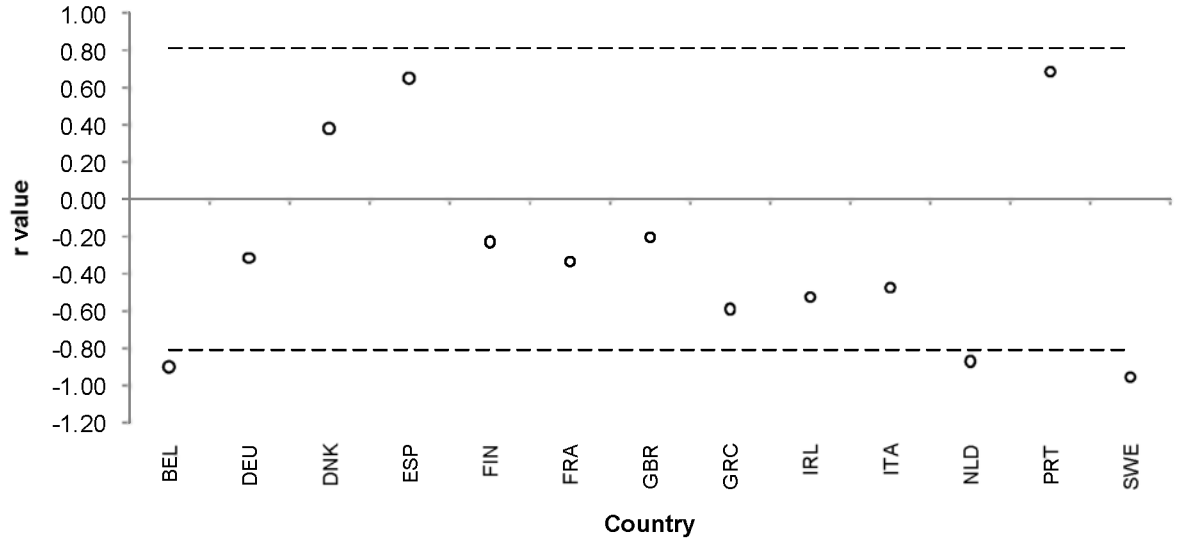


Figure 29 MS with significant trends in rate of utilisation. Significant r values fall above and below the upper and lower dashed lines respectively.

To identify the cause of these declining trends, analysis on rates of catch per species was conducted. Table 42 indicates all significant trends for catch rates by species for 2003-2008. Species that are highlighted (bold italics) are ones identified in Andersen et al (2009) in the top fifteen highest exchanged species in 2004. The potential impact of these declining catch rates on the rate of quota exchange will be discussed in section 4.

Table 42 Significant trends in rate of utilisation by species (2003-2008). Pearson's correlation coefficient (r) is also shown.

Species	2003	2004	2005	2006	2007	2008	r
ANF	***0.9256***	***0.9740***	***0.8773***	***0.7859***	***0.8001***	***0.7801***	***-0.8819***
BET	0.4571	0.5473	0.2962	0.1772	0.1615	0.0409	-0.9333
GHL	0.7845	0.9172	0.9315	0.8986	1.0278	1.0057	0.8661
HKE	***0.8411***	***0.7974***	***0.7650***	***0.7474***	***0.5806***	***0.6824***	***-0.8444***
JAX	***0.8583***	***0.9417***	***0.8784***	***0.8572***	***0.7417***	***0.6819***	***-0.8375***
LEZ	0.7253	0.6583	0.6202	0.5577	0.5377	0.5705	-0.9015
NEP	0.8968	0.9028	0.8982	0.7764	0.7738	0.7521	-0.9056
PEN	0.8833	0.8238	0.7292	0.5523	0.5750	0.3642	-0.9709
POK	***0.2839***	***0.2619***	***0.4107***	***0.6515***	***0.5592***	***0.5827***	***0.8569***
USK	0.7781	0.7005	0.8901	1.0027	0.9700	1.0512	0.8959
WHB	***1.1938***	***0.7351***	***0.6789***	***0.1066***	***0.1006***	***0.1512***	***-0.9170***

2.4.6 Indicator 23 Transfer of Quotas

Index definition

This index is defined as the percentage of initial quota that is exchanged by MS under the flexible quota management system as specified in Council Regulation no 847/96.

Data sources and methodology

The Commission's quota swap database was made available for use. The database has three types of data, initial quota, revised quota (quota with inter-annual MS revisions) and adapted quota. In each case the quota is a sum of two columns, quota + margin. Swaps were expressed as provider country swaps, i.e. losses of quota by a MS for a particular species and area between revised quota and adapted quota. Additional data, for the period 2001-2002, were available from Andersen et al (2009[72]). Analysis was restricted to the following MS: BEL, DEU, DNK, ESP, EST, FIN, FRA, GBR ,GRC, IRL, LTU, LVA, NLD, POL, PRT, SWE, and the correction for salmon suggested by Andresen et al (2009) (salmon TAC is in numbers, which were assumed to be 5kg per fish) was applied.

Results

The percentage of the TACs that have been exchanged has increased from 2003 to 2005 and then levelled off. This rise in 2005/2006 is attributed by Andresen et al (2009) to MS becoming aware of the possibilities of swapping (Figure 30). The provider countries engaging in most swaps are Spain, Denmark and Germany, whereas those swapping the highest proportion of their revised quota are Belgium, Greece, Germany, Spain and Lithuania (Annex A).

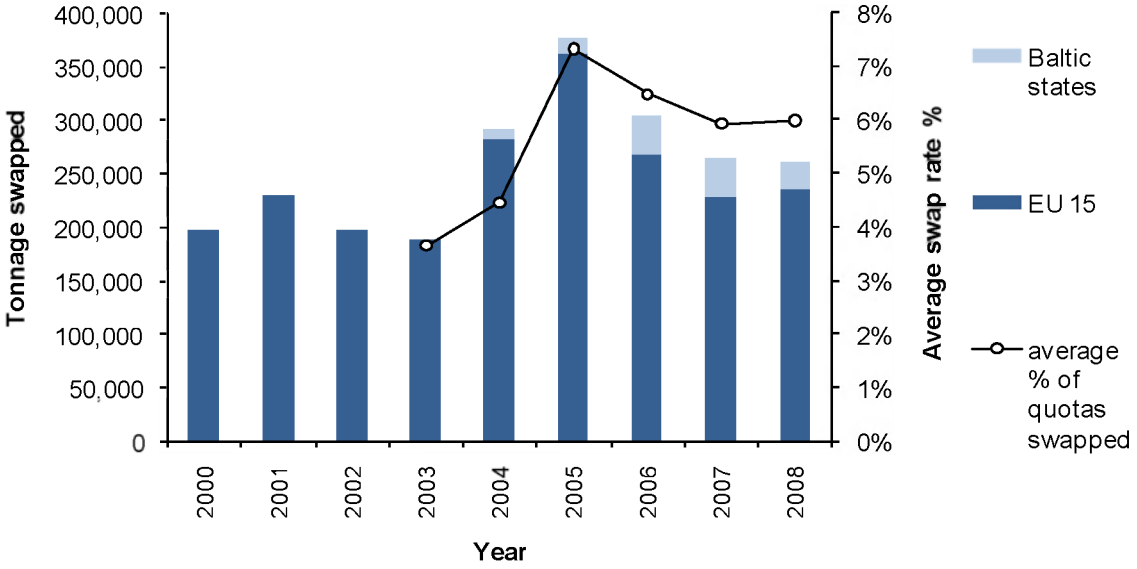


Figure 30 Tonnage of fish swapped by the EU 15 and EU 2007 (2003-2008). Note that data for 2000-2002 were available only from Andersen (2009).

The species showing highest swap volume are pelagics - herring, blue whiting, jack mackerel, mackerel, sprat, anchovy, sand eel – and, for demersals redfish, cod and hake. The only one of these showing a significant trend is sprat, for which swaps have been decreasing over the last 6 years.

[72] Anderson, J. L., Nielsen, M., Lindebo, E. (2008) *Economic gains of liberalising access to fishing quotas within the European Union*. Marine Policy 33, 2009 pp497-503.

Table 43 Percentage of quota swapped by species.

Species	2003	2004	2005	2006	2007	2008	Total Volume (t) 2003-2008	Correlation coefficient r
HER	3%	5%	11%	5%	6%	7%	400,215	0.3815
WHB	11%	5%	4%	10%	10%	13%	296,882	0.4879
JAX	13%	16%	21%	21%	16%	16%	257,769	0.2481
MAC	3%	2%	22%	3%	3%	4%	135,096	-0.0881
RED	24%	35%	37%	28%	23%	33%	98,085	0.0487
SPR	3%	3%	2%	2%	3%	2%	97,727	-0.8436
COD	3%	3%	10%	7%	7%	6%	54,315	0.5468
SAN	-	1%	-	8%	0%	1%	34,029	-0.1011
ANE	27%	24%	25%	5%	13%	-	33,620	-0.7905
HKE	7%	12%	10%	11%	4%	7%	29,623	-0.4235

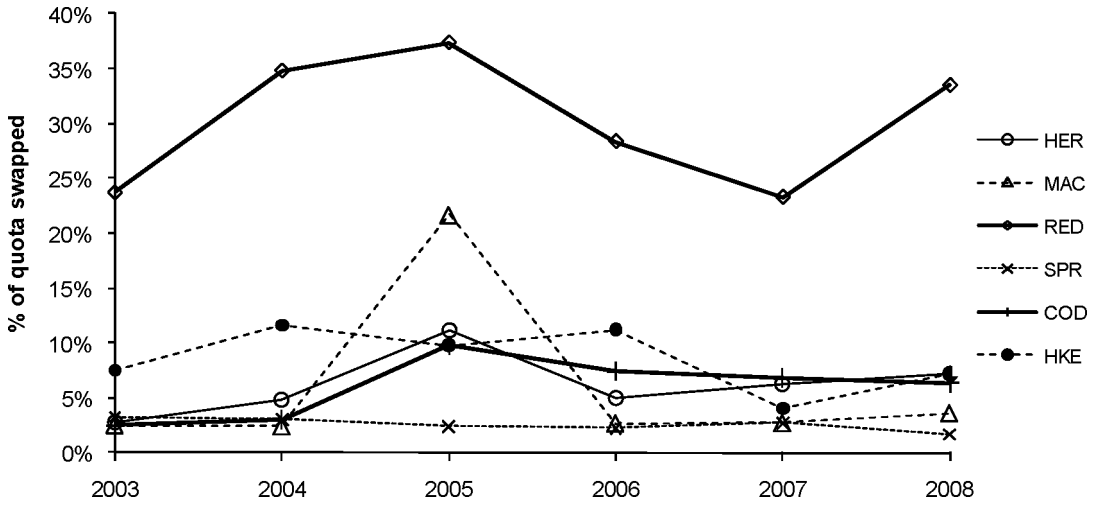


Figure 31 Highest percentage quota swapped by species (2003-2008). The species with highest percentage swap is redfish.

2.4.7 Indicator 29 Time Taken to Reach a Decision

Index definition

Indicator 29 is the time taken between the Commission making a proposal and the Council adopting it as a regulation.

Data sources and methodology

Using data on proposals from the Commission for Council Regulations/decisions from 2004 to 2009, the number of proposals made each year, as well as the time taken for Commission proposals to be adopted as Council legislation, were calculated. The data were sourced from a list of Commission communications, proposals and decisions published from 2004 to 2009, from the Commission's Agenda Planning database. Initially the data were screened to identify all the Commission proposals for Council regulations/decisions, removing all non-legislative documents, such as Commission communications, reports, etc. Commission decisions were also omitted from the analysis as these were only present for years 2007,

2008 and 2009, and the legislative procedure is different (for commission decisions DG MARE prepare the proposal text, and it is adopted by the college after inter-service consultation), thereby making a comparison between them and Council decisions invalid. Additionally, for each of the Commission proposals obtained a search was performed on the European Parliament Legislative Observatory (OEIL) in order to determine what stage of the legislative procedure the proposal had reached. For the proposals which had completed the legislative procedure, the date of the final legislative act was recorded. By subtracting the date of the initial legislative document (the proposal) from the date on which the final legislative document was adopted, it was possible to obtain the number of days taken for the legislative procedure to be completed.

Results

Below is the frequency of time taken for the legislative procedure to be completed (see Figure 32).

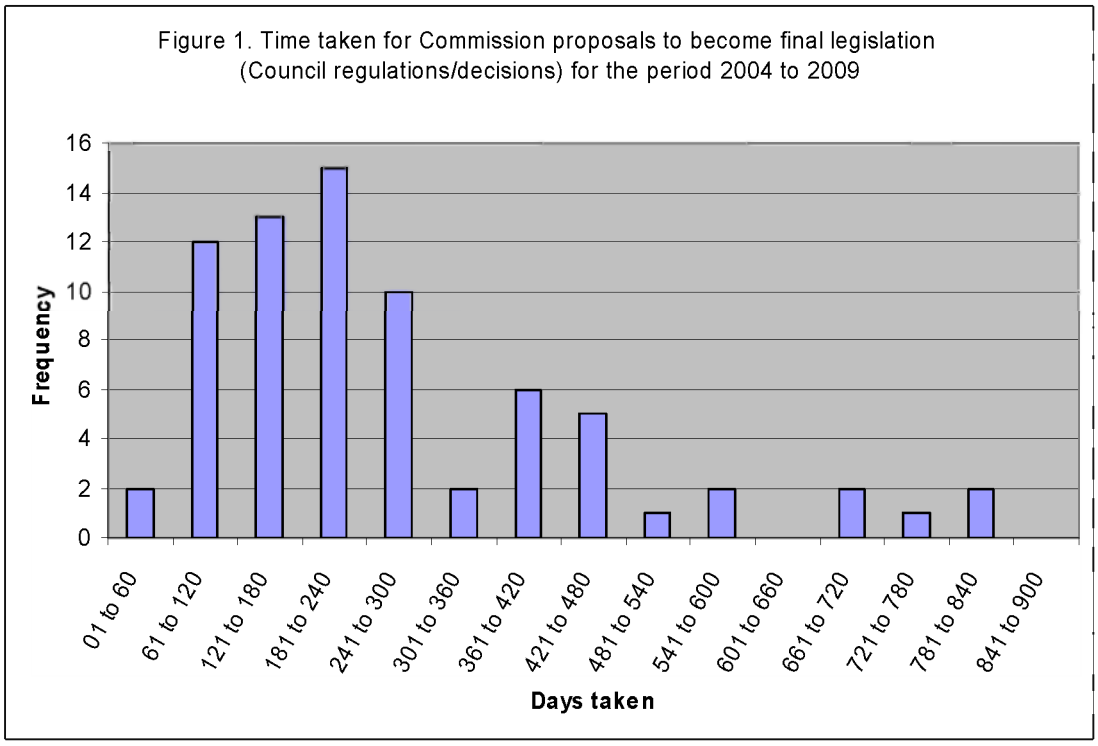


Figure 32: Time taken for Commission proposals to become final legislation (2004 – 2009).

The majority of proposals tend to be adopted as legislation within a year, with the most frequent number of days being 181 to 240 (approximately within 6 to 8 months) (Figure 32). It is also common to find that proposals are adopted within 61 to 120 days (~ 2-4 months), 121 to 180 days (4 – 6 months) and 241 to 300 days (8 – 10 months).

2.4.8 Indicator 24 Level of Coherence with WTO/ EC Policy

The impact assessment considers the coherence of Commission policies with with Treaty objectives, such as respect for Fundamental Rights, high level objectives such as the Lisbon or Sustainable Development strategies, the international obligations of the EU under the WTO Agreement as well as the EU's development policy.

The following section provides a summary of coherence with WTO and other relevant EU policy, although Annex A provides greater detail.

Trade

While the EU is a major actor in the global trade in fish and fish products, such activities are regulated primarily pursuant to the EU's external trade policy rather than by the CFP itself. A primary focus of the EU's external trade policy is the World Trade Organization (WTO) and the multilateral trading system that it supports. There are currently no obvious issues of incoherence between the CFP and the EU's obligations under WTO. However, within the ongoing Doha round of trade negotiations EU priorities include subsidy reductions for the agricultural sector, including fisheries subsidies. The outcome of these negotiations could have significant impacts on the current fisheries subsidies regime under the CFP.

Negotiations on fisheries subsides are being undertaken within the WTO Negotiating Group on Rules in the framework of the Agreement on Subsidies and Countervailing Mechanisms (ASCM). The group is mandated *inter alia* to prohibit certain forms of subsidies that contribute to overcapacity and over fishing. A draft text produced by the Chairman of the Negotiating Group, proposed the prohibition of a range of subsidies including subsidies relating to fishing vessels (in terms of repair, modernization), the transfer of vessels to third countries, operating costs (including fuel costs), fishing port infrastructure and price support mechanisms. Adopted in this form, the draft text would have rendered three of the four 'Priority Axes' for the operational programmes drawn up by the Member States for co-financing under the EFF incompatible with the ASCM. Progress, however, has been slow, positions on some issues are far apart (particularly as regards the scope of exceptions for less developed countries), and while the group continues to meet every two months, the Chairman's draft text has now been withdrawn and replaced with a roadmap for future discussions.

Any agreement on fisheries subsidies following this ongoing process would likely not enter into effect before 2013 and would in any even have a two-three year transition period. Nevertheless it is not inconceivable that agreement will be reached and that this in turn will have a major impact in terms of the compatibility of existing subsidies arrangements under the CFP with WTO rules and in particular the scope of the EFF. It is quite possible that the permitted fisheries subsidies under the EFF may be limited to those under Axis 4 ('sustainable development of fisheries area'), an area that may also be supported under the regional programs of European Regional Development Fund (ERDF). Moreover, it may be difficult to justify the increase in the *de minimis* provisions for aid to the fisheries sector, currently set at €30,000 per three-year period and per beneficiary, on condition that the total amount of such aid granted to undertakings is below 2.5% of the national annual production of the sector.[73]

Aid/development

The EU's concept of Policy Coherence for Development (PCD) builds on work undertaken by the OECD and seeks to strengthen synergies between EU policies in areas other than aid and development objectives. In May 2005 the EU undertook commitments towards PCD in twelve areas including fisheries. Moreover, Article 23 (d) of the Cotonou Agreement, which creates the current legal framework for relations between the EU and ACP countries, stresses the need for compatibility between fishing agreements and development.

[73] Commission Regulation (EC) 875/2007.

In terms PCD and the CFP, however, an issue arises in connection with the relationship between EPAs and Fisheries Partnership Agreements (FPAs). In outline FPAs seek to make an active contribution to partner countries to promote sustainable fisheries management and development: although a financial payment is still made by the EU to the relevant coastal State, a portion is used for support to the implementation of a sustainable fisheries policy.

A first progress report on PCD was issued in September 2007, while the most recent report was issued in September 2009.[74] The report notes that FPAs represent a more 'development friendly' policy and that the steps taken at EU level to combat IUU fishing are important steps to avoid resources diminishing and a situation where developing countries lose potential catches and revenues. The report, however, goes on to note that 'concerns remain with regard to the sustainability and the social consequences of the agreements'. At the same time a fundamental question of coherence remains in the linkage between access and development assistance in the fisheries sector. Although the conclusion of an FPA is not formally a requirement for development assistance from the EU in the fisheries sector, in practice FPAs are currently the main fisheries development assistance mechanism in the sector. The question arises as to whether the CFP, through the use of FPAs, with their inherent access conditionality, is really an appropriate mechanism for the delivery development assistance.

Environment

Notwithstanding the 2002 reforms of the CFP, with explicit references to sustainability, the precautionary principle and the progressive introduction of an eco-system based approach to fisheries management, there is at a fundamental level an incoherence between an instrument that seeks to promote the exploitation of fisheries resources and an EU Environmental Policy that aims at a high level of protection and which calls *inter alia* for environmental damage to be rectified at source.

This basic incoherence derives from the historical development of both policies and in particular the CFP which has developed from an agricultural model. It is manifested in a number of practical examples the most long-running of which is the issue of competence over the establishment of marine protected areas.

In the context of marine protected areas commercial fisheries activities will very often be the main threat to habitats: the conservation objectives of an SAC may require a different management for a fishery that lies fully or partly within an SAC, or even the closure of that fishery. Under the CFP, however, the competence to close fisheries and to declare 'no-take' zones very clearly lies with the Community.

The recently adopted Marine Strategy Framework Directive has some elements of complementarity with the CFP.[75] Intended to "constitute the environmental pillar" of the EU's maritime policy, the directive requires the Member States to "take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest".[76] The definition of "good environmental status" is based on a list of generic qualitative descriptors contained in an Annex to the Directive, stipulating, for example that populations of all commercially exploited fish and shellfish in that Region are

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[74] Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions EU 2009 Report On Policy Coherence For Development, SEC(2009) 1137 final.

[75] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy OJ L 164 25.6.2008. p 19.

[76] Art. 1 (1)

within safe biological limits (No. 3), or that sea floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected (No.6). The former is consistent with the CFP objectives as expressed in Council Regulation 2371/2002. The latter is not currently expressed as a CFP objective except in very general terms regarding application of the ecosystem approach.

2.4.9 Indicator 25 Administration Burden

Index definition

In 2007, the Council agreed that administrative burdens arising from EU legislation, including national measures implementing or transposing this legislation, should be reduced by 25% in 2012. This indicator describes the level of impact (administration) burden for the private sector based on simplification (see Indicator 26).

Data sources and methodology

Information for this indicator were drawn from the control impact assessment and the DG Entr report (2009[77]).

Results

Table 44 Administrative costs to the fishing sector under old and new control regulation

Types of obligations	Target group	Admin costs assoc regulation	Admin costs under new regulation	% reduction
Submission information (sending it to designation recipients)	Logbook and landing declaration by all vessels above 10m	56,801,250	17,671,500	69%
Inspections (Inspecting and checking including assistance to inspection by public authorities)	Inspection of all registered vessels	3,161,304	2,680,236	15%
Submitting the information (sending it to the recipient)	Submission of sale notes; registered buyers	11,760,000	11,760,000	0%
Submitting the information to the designated recipients	Geographical position, landing information, transport document etc.	6,300,000	6,300,000	0%
Total costs		**78,022,554**	**38,411,736**	**0.51**

The fisheries control system has been chosen for the mapping and the measurement of costs arising from reporting obligations, using the EU Standard Cost Model (SCM).

[77] Final report (2009). Measurement data and analysis, as specified contract on Modules 3&4 for the Priority Area Fisheries of the Framework contract No. ENTR/06/061, EU Project on Baseline Measurement and Reduction of Administrative Costs.

Reporting obligations resulting from the current fisheries control system resulted in a cost for business of just under 57 million Euro, most of which as a consequence of filling and handling of logbooks, landing declarations and sale notes. The new control system, which will be based on an extended use of information and communication technologies and efficient use of databases, will lead to a reduction of administrative burdens for the fishing industry of up to 51% of the current costs. The lower number of regular reports that Member States would have to submit to the Commission has the potential to reduce administrative work by 34%.

Beyond the initiatives listed in the *Action Programme on reducing administrative burdens in the EU*,[78] cost reductions in the fisheries sector have been achieved through other measures, e.g. the exemption for vessels of less than 12 metres fishing for periods of less than 24 hours, from the record-keeping requirement and the related inspection obligation under the HACCP (Hazard Analysis and Critical Control Point) scheme. The resulting savings are estimated to be around 14 million Euro. In the near future, a computerised management of requests and issues of fishing authorisations for vessels will also result in a significant reduction of costs for businesses.

2.4.10 Indicator 26 Implementation of Simplification Process

Index definition

This indicator describes the level of implementation of the simplification process by EU and Member States.

Data sources and methodology

Information on the level of implementation of the simplification process was drawn from a number of EU communications, reports and national reports which are listed in the biography. A description of two Member States' approaches to simplification is also provided.

Results

The Commission adopted in December 2005, the 2006-2008 Action Plan for simplifying and improving the CFP[79]. The actions listed therein have been supplemented by those inserted in the annual Commission's Simplification Rolling Programme (SRP).[80] The Commission's Communication on the implementation of the Action Plan for simplifying and improving the CFP set out what has been achieved to date, with a view to considering new initiatives and addressing possible shortcomings.[81] The aim of the actions undertaken was fourfold: achieving clearer legal texts; reducing administrative costs; enhancing the quality of the new initiatives; streamlining data transfer. The main legislative initiatives inserted in the Action Plan and in the Commission's SRP concern: the rational exploitation of fisheries resources; collection of data relating to fishing activities; monitoring of fishing activities; and, granting of public aid.

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[78] COM(2007) 23 final.
[79] (COM(2005) 647 final.
[80] The actions related to the Action Plan are set out in Annex I. An overview of measures resulting from the SRP is available at: http://ec.europa.eu/governance/better_regulation/documents/screening_2009/mare.pdf
[81] COM(2009) 261 final.

With regard to the simplification measures in the field of the *rational exploitation of fisheries resources*, the most noteworthy initiative concerns the introduction of a new working method for preparing the annual Council Regulations on fishing opportunities since 2003. This approach aims to make those texts clearer, especially by resisting the practice of making them catch-all acts. The Commission now presents a Communication containing a Policy Statement on the fishing opportunities for the following year.

The existing Community framework on *the collection of data* relating to fishing activities has been reviewed[82] as it was essential to streamline the collection of relevant data and avoid duplication. The implementing rules were designed in a way that allows for the reduction of bureaucratic workload while encouraging the extended use of electronic means.[83] Specific and detailed communication means have been elaborated, such the Electronic Reporting System (ERS) and the Fishing Authorisation Permits (FAP). These IT tools will complement those designed to manage the handling of data relating to fleet, fishing vessel activities and marketing of fish products.

In the context of *monitoring of fishing activities*, a thorough revision of the control regime has been conducted (see also indicator on reduction of admin burden). The simplification of the CFP was at the heart of this process. The outcome is a single piece of legislation containing general rules governing all aspects of control[84] and a general system designed to curb illegal fishing irrespective of where such activity is carried out[85]. The proposed legislation also constitutes a bold move towards a paperless environment for recording and reporting data relating to fishing activities[86] and a uniform, simplified and user-friendly system for obtaining authorisation to fishing activities outside Community waters.[87] The specific implications in relation to the reduction of administrative burden are considered in Indicator 26.

In order to make legislation clearer in the field of *public aid*, the number of legal acts has been reduced through the adoption of a single regulation on the financial instrument for fisheries[88] (EFF) and it's implementing rules.[89] Furthermore, financial contribution from MS to operations co-financed by the EFF and part of an operational programme benefits from the *de* minimis rule concerning state aids, which has also been extended to aid granted by MS in the context of the specific action in support of enterprises affected by the economic crisis induced by the high level of oil prices in 2008.[90] As regards financial support to businesses active in the fisheries and aquaculture sectors, charged against the national budget, two other initiatives resulted in a simplification of procedures. In accordance with the *de minimis* aid regulation, the grant of an amount raised at a maximum of 30.00 Euro per business, over a three year period, is not to be notified to the Commission.[91] Moreover, certain types of aid to businesses operating in the production, processing and marketing of fisheries products are exempted under specific conditions, from the requirement of prior notification to the Commission.[92]

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[82] Council Regulation (EC) No 199/2008
[83] Commission Regulation (EC) No 665/2008.
[84] COM2008 (721).
[85] Council Regulation (EC) No 1005/2008.
[86] Council Regulation (EC) No 1966/2006.
[87] Council Regulation No (EC) 1006/2008.
[88] Council Regulation (EC) No 1198/2006.
[89] Commission Regulation (EC) No 498/2007.
[90] Council Regulation (EC) No 744/2008.
[91] Commission Regulation (EC) No 875/2007.
[92] Commission Regulation (EC) No 736/2008.

An element of simplification is the reduction in the number of legislative acts. The number of acts listed in the fisheries Chapter of the 'Directory of Community legislation in force' has consistently increased and listed 795 acts as of 1st March 2009. This is due to the imprecise classification headings whereby some acts are listed under different sections of the fisheries The extensive legislation currently produced by Regional Fisheries Organisations (RFO) entails the transposition of their recommendations into Community law through a significant number of specific legal acts. Some acts are obsolete, i.e. without having any legal effect though formally still in force. So far, 49 legal instruments have been repealed[93] and the proposed control regulation would add to the simplification of the present legislation by reducing the number of applicable regulations by up to 36%.[94]

UK

Certain MS, such as the UK, have completed administrative burdens measurements. During 2008, the UK adopted a simplification Plan "Better Regulation, Better Business" which describes the administrative burden reduction programme for Defra (Department for Environment, Food and Rural Affairs). This programme revealed that because of security issues, Cefas and Defra maintain and run separate networks resulting in synchronisation issues between the fisheries data input by the MFA through Defranet and data collected by Cefas from Scotland and Northern Ireland. It was agreed to resolve these issues which would also benefit inspection recording systems over the internet and to near real time satellite monitoring data for fishing vessels.

The establishment of two new regulatory bodies was also considered: (i) The Marine Bill makes provision for the establishment of a new Non Departmental Government Body, the Marine Management Organisation (MMO). The Bill is included in the draft legislative programme for the next Parliamentary session. The new MMO will deliver many existing and new marine functions. It will bring together, within a single independent body, the delivery of a new strategic marine planning system, streamlined marine licensing, improved marine fisheries management and enforcement and marine nature conservation enforcement. The Marine and Fisheries Agency will be subsumed within the MMO.[95]

Netherlands

Analogous measurements have also been conducted in the Netherlands[96]. The administrative burdens were estimated at 1.8 million Euro of which 56% resulted from European legislation, 31% of EU legislation with national implementation and 13% resulted from purely national legislation. It was estimated that the simplification plans at EU level which consisted in particular in adapting the timeframes for reporting and the introduction of an electronic logbook could result in a reduction of 90,000 Euro (5%) of costs. Since the proposals in the field of control and enforcement concern a better division of tasks between the government and the sector a reduction of costs of a few percentages was deemed feasible. Also with respect to the rules emanating purely from the national legislator, a few possibilities for reducing the administrative costs were identified, e.g., changes to the national days at sea regime, the abolition of the licensing requirements (cost reduction 1 % or 20000 Euro). Changes to IT systems and the introduction of electronic logbooks were expected to result in a reduction of up to 10%.

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[93] Council Regulation (EC) No 492/2009.
[94] COM(2008) 721.
[95] Defra (2008) *Better regulation, better business, Defra Simplication Plan.* Available at: http://www.berr.gov.uk/files/file49354.pdf
[96] Dutch Ministry of Agriculture, Nature and Food Quality

2.4.11 Indicator 27 External Waters Governance

Index definition

According to the UN Convention on the Law of the Sea (UNCLOS), in order to conserve and manage straddling fish stocks and highly migratory fish stocks, coastal States and States fishing on the high seas shall cooperate to adopt measures to ensure long-term sustainability of the targeted stocks. The main mechanism for cooperation is the implementation of a Regional Fisheries Management Organisation (RFMO) which can adopt management and conservation measures binding for all the parties. RFMOs constitute an improved model of governance on high sea fisheries.

As concerns access of foreign fishing vessels in the EEZ of a coastal State (fishing agreements), the UNCLOS indicates the coastal State, in the event it does not have the capacity to harvest the entire allowable catch, may give other States an access to the surplus of the total of the allowable catch, under terms and conditions established in the laws and regulations of the coastal State. An improved model of governance for fishing agreements is when the coastal State and the flag State, who is ultimately responsible for the activities of its flagged vessels, negotiate the framework governing activities of the access fishing fleet.

By virtue of its exclusive rights on the conservation and management of aquatic living resources, the EC must ensure that the activities of the Community fleet outside EC waters are properly managed according to the dispositions of the UNCLOS and related subsidiary agreements. MS do not have the power to negotiate on their own.

The analysis of the activities of the EC external fleet indicates that Community fishing vessels can exploit fisheries located in international waters, in coastal States EEZ or straddling both. The external waters governance indicator discussed in this section seeks to assess qualitatively the governance framework under which the fishing vessels of the EC external fleet operate for all major types of fisheries exploited.

Fisheries in international waters are those targeting highly migratory species (tuna and tuna related species) or various demersal or pelagic species in high sea areas. According to the UNCLOS, a proper management framework for these fisheries includes the existence of a RFMO having the capacity to adopt binding management and conservation measures to which the EC is a contracting party. When it is the case, the governance framework is assessed as positive independently of the performance of the RFMO (some RFMO may be more successful than other in adopting conservation and management measures aiming at preserving stock sustainability and minimising impacts of fishing on the environment).

Regarding fishing agreements, the governance indicator is assessed as 'positive' when the EC could negotiate on behalf of its MS a bilateral agreement setting terms and conditions to ensure that the activities of the EC fishing vessels in the EEZ of the partner coastal State are not detrimental to coastal stock conservation and to preservation of the maritime environment. By contrast, the governance indicator is considered as 'negative' when owners of EC fishing vessels have negotiated private agreements with coastal States. In this case, it cannot be ascertained that the Authorities responsible for the activities of the EC fishing vessels have taken due consideration of the potential of the stock (the surplus available) and enforced measures to limit the impact of fishing on the environment. Like for RFMOs, the assessment of the indicator is done independently of the management performances of the coastal State. For example, it can be assumed than the terms and conditions applying to foreign fishing vessels in the EEZ of Namibia, and enforcement thereof, are more adequate for conservation purpose than the same applying to foreign fishing vessels in the EEZ of Nigeria.

Data sources and methodology

The main source of information used to build this external waters governance indicator is a study on the EC external fleet publicly available on DG MARE web site[97] published in 2008. Other studies used include ex-post / ex-ante evaluations of EC fishing agreements (not publicly available) carried out systematically since 2004 before the agreements expire, as well as a study on the external dimension of the CFP published in 2008 as well. Additionally, the construction of the indicator used the results of a study on the Analysis of the economic and social importance of Community fishing fleet using bottom gears in the high seas[98] published in 2008 (publicly available).

The information included in these studies is useful to identify activities of EC fishing vessels in external waters and to assess the associated governance indicator. Since the number of EC fishing vessels operating in external waters is low compared to the EC domestic fleet and probably highly variable from one year in another, the indicator is built fishery wise, rather than vessel wise. Most of this information relates to the 2006-2007 period.

The methodology used separates fishing activities in the International waters and in the EEZ of Coastal States as the legal issues associated with fishing in both types of fishing ground are fairly different. Similarly, it is necessary to identify the indicator separately for fisheries targeting highly migratory species (as identified in Annex 1 of UNCLOS) and for other fisheries targeting demersal or pelagic species (not included in Annex 1 of UNCLOS) as they may have also specific legal status.

The scoring methodology is as follows:

- For International waters, the indicator screens if the fishery is covered by one or several adequate governance instrument (a RFMO with management mandate). A score of 1 is given in the positive indicator column for each relevant RFMO. When there is no RFMO, a score of 1 is given for each fishery with no proper governance framework in the negative indicator column.
- For EEZ of Coastal States, a score of 1 is given in the positive indicator column for each EEZ of coastal State with whom the EC has negotiated a fishing agreement assumed to represent an adequate governance framework. Similarly, a score of 1 is given in the negative indicator column for whenever it could be identified that some EC vessels have concluded private access with the coastal State Authority (assumed to be an inadequate governance framework)
- When for a given region or a given fishery, there are no EC fishing vessels identified as exploiting fisheries, a score of 0 is given.

Results

Given the wide range of EC fishing activities outside EC waters, it is necessary to identify the indicator separately for fisheries targeting highly migratory species (as identified in annex I of UNCLOS) and for other fisheries targeting demersal or pelagic species (not included in Annex 1 of UNCLOS).

Fisheries for highly migratory species

[97] Available at URL http://ec.europa.eu/fisheries/publications/studies/external_fleet_2008_fr.pdf
[98] MRAG Ltd. for the European Commission (2008) *Analysis of the economic and social importance of Community fishing fleet using bottom gears in the high seas.*

The EC fleet targeting highly migratory species include the purse seine fleet (56 units), the surface longline fleet (269 units) and pole and liners (13 units) (numbers as of end 2007).

- The Atlantic fleet included 17 purse seiners (the number has grown up since to approx. 25 due to the piracy issue in the Indian Ocean), about 150 surface longliners and 13 pole and liners (number has decreased since after the expiration of the EC agreement with Senegal). In the absence of EC fishing agreement, this fleet has negotiated access in EEZ of West Africa countries (all segments) and with coastal States of Southern Africa and South America (longliners only). The EC purse seine fleet targeting bluefin in the Mediterranean has negotiated a private access in the EEZ of Libya.
- The Indian Ocean fleet included in 2007 about 40 purse seiners and 64 longliners (with 33 based in La Reunion). The number of purse seiners has decreased dramatically since then to redeploy in the Atlantic. This fleet utilises the EC fishing agreement with four of the IOC MS and has negotiated private access in the EEZ of Kenya, Tanzania and Mauritius after expiration end 2007 of the protocol attached to the EC bilateral agreement with this coastal State.
- In the Pacific Ocean, the EC fleet includes 4 purse seiners that exploit tuna stocks on both sides of the Pacific. This fleet has negotiated private access to certain EEZ in addition to access to some key EEZ obtained through EC bilateral agreements.

The indicator indicates complete coverage of the activities of the EC in the high seas. The scoring for EEZ of coastal States indicates that the EC tuna fishing fleets can access 14 EEZ of coastal States under EC fishing agreement, and virtually as many EEZ of coastal States under private agreements (Table 45).

Table 45 Number of vessels flagged to EU Member States fishing under (positive) and not under good governance systems, on high seas and in the waters of third party Coastal States.

	High Seas		Coastal States	
Fishing region	EC negotiated access conditions	EC non-negotiated access conditions	EC negotiated access conditions	EC non-negotiated access conditions
Atlantic Ocean	**1** (ICCAT)		Morocco, Mauritania, Cape Verde, (Guinea*), Guinea Bissau, Côte d'Ivoire, Sao Tome **7 (6)**	Liberia, Angola, Brasil, Uruguay, Namibia, Lybia **6**
Indian Ocean	**1** (IOTC)		Madagascar, Mozambique, Seychelles, Comoros **4**	Mauritius, Kenya, Tanzania **3**
Pacific Ocean	**2** (IATTC, WCPFC)		Kiribati, Solomon Isl., FSM **3**	Ecuador, Colombia, Tuvalu, Nauru **4**
Indicator	4	0	14	13

** the Commission proposal for an agreement with Guinea is about to be withdrawn. At this very moment, EC vessels can still operate under interim provisions.*

The indicator indicates complete coverage of the activities of the EC in the high seas. The scoring for EEZ of coastal States indicates that the EC tuna fishing fleets can access 14 EEZ of coastal States under EC fishing agreement, and virtually as many EEZ of coastal States under private agreements.

Fisheries for other types of species (including fish, cephalopods or crustaceans)

The EC fishing fleet targeting species not included in annex 1 of UNCLOS includes:

- North East and North West Atlantic. The number of these vessels cannot be estimated precisely as a large number of vessels operate both inside and outside Community waters (ICES zone IVa includes EC waters and Norwegian waters). However, the long distance fleet specialised in the exploitation of fish stocks located under the highest latitudes was estimated to include 90 vessels, mostly trawlers.
- South West Atlantic, about 25 trawlers were identified as exploiting this area. The fishing grounds include mostly portions of the Patagonian shelf outside the limits of the EEZ of Argentina and inside the Falkland EEZ. This later area being an OCT, it is not considered as a third country. The fishing fleet operating in the South West Atlantic includes some vessels operating in the NAFO regulatory area.
- South East Atlantic: The EC vessels present in this area are mostly shrimp trawlers (about 16 units) that were active under the EC fishing agreement with Angola until it expired in 2004. These vessels were identified in the EEZ of Coastal States of the region under private agreements. In addition a couple of EC vessels were identified as active in Namibia waters under charter agreement for exploitation of the hake fishery.
- Eastern Central Atlantic: The EC fleet operating in this area include a fleet of approximately 165 demersal fishing vessels operating mostly in the Mauritania EEZ and in the Guinea Bissau EEZ under a fishing agreement. A part of this fleet has negotiated private arrangement to access the EEZ of Sierra Leone and Liberia (number unknown). In addition, the EC fleet present of this area includes freezer trawlers specialising on small pelagics (approx. 10 units plus other on a part time basis). This fleet operates in the EEZ of Morocco and Mauritania under EC fishing agreements and is not known to operate in other West African EEZ.
- Western Central Atlantic: no significant, if any, fishing activity developed by EC fishing vessels has been identified in the area
- South East Pacific: up to 5 small pelagic trawlers were identified fishing for small pelagics in the high seas off Chile. This EC fleet does not operate in the EEZ of coastal States in the Region. This number may have grown since.
- Antarctic Ocean: in 2007, four EC vessels were identified as operating in the Antarctic area. Three target toothfish while another one catches krill. In addition to the EC flagged vessels, other vessels flying the flag of an EC MS operate, but they are registered in specific OCT registers (e.g., France Kerguelen) and not legally considered as part of the Community fleet.

	High Seas		**Coastal States**	
Fishing region	EC negotiated access conditions	EC non-negotiated access conditions	EC negotiated access conditions	EC non-negotiated access conditions
ATLANTIC OCEAN				
North East Atl.	**2** (NEAFC, GCMF))	**0**	Greenland, Norway, Iceland, Feroes **4**	**0**
North West Atlantic	**1** (NAFO)		Greenland **1**	**0**
South West Atlantic		**1** (no RFMO)	**0**	**0**
South East	**1** (SEAFO)	**0**	**0**	Angola, Namibia, Congo

	High Seas		Coastal States	
Fishing region	EC negotiated access conditions	EC non-negotiated access conditions	EC negotiated access conditions	EC non-negotiated access conditions
Atlantic				Nigeria **4**
Eastern Central Atlantic	**0**	**0**	Morocco, Mauritania, Guinea Bissau **3**	Liberia, Sierra Leone **2**
Western Central Atlantic	**0**	**0**	**0**	**0**
PACIFIC OCEAN				
South East Pacific	**1** (SPRFMO)	**0**	**0**	**0**
INDIAN OCEAN				
Whole Indian oc.	**0**	**0**	**0**	**0**
ANTARCTIC OCEAN				
Antarctic	**1** (CCMALR)	**0**	**0**	**0**
Indicator	6	1	8	6

As concerns fishing in the high seas (Table 45), only the fisheries on the Patagonian shelf is not covered up to the expectations of the UNCLOS, although Spain as a MS assures that it closely monitors its fishing vessels and the fishery. As concerns fisheries in the EEZ of coastal States, fishing activities of EC vessels are covered by eight EC fishing agreements. It could be identified that a portion of the EC fleet is operating in EEZ of West African States and Southern African States (six EEZ in total).

2.4.12 Indicator 28 Safety at Sea

Indicator definition

Indicator 28 describes trends in safety within the catching sector (at sea), in terms of fatal and non-fatal accidents reported by each MS and within the EU as a whole.

Data sources and methodology

Although it is known that fishing is the economic sector with the highest number of occupational accidents, it is not possible to obtain reliable statistical data on the accidents involving fishermen, notably because of a lack of uniform methods. However, some data do exist, although for certain MS this is incomplete.

Data on the number of reported accidents occurring during fishing activity for each MS were sourced from the International Labour Office (ILO) statistical database on occupational injuries[99]. This database provides information on work-related accidents for a large number of economic sectors, not only fisheries, and provides resolution on the type of accident (fatal and temporary or permanent incapacity) and the gender of the casualty. The database cites insurance and administrative reports, and labour inspectorate records as the source information.

[99] Laborsta Internet. Available at: http://laborsta.ilo.org

The accident rate is considered only for those MS which have data for both FTE and non-fatal accident rate, and is calculated by dividing the number of accidents by the total number of employees (FTE) within the fisheries sector[100].

Results

A report produced by the ILO[101] in 1999 made clear the high fatality rate within the fishing industry. In the United Kingdom fishing industry fatalities were 15 times the national average; in Sweden they were 22 times the national average; in Spain, 8 times; and in Denmark, 25 times the national average. Figure 33 shows the downward trend in non-fatal accidents over the period 2003-2007. However Table 46 provides no evidence of a corresponding decline in the rate of fatal accidents.

Table 46 Comparison between fatal and non-fatal accident rates expressed as accidents per FTE (Source: LaborSta and AER 2009).

	2003	2004	2005	2006	2007
Non-fatal rate	6.51%	8.55%	5.68%	5.11%	4.80%
Fatal rate	0.03%	0.07%	0.03%	0.04%	0.03%

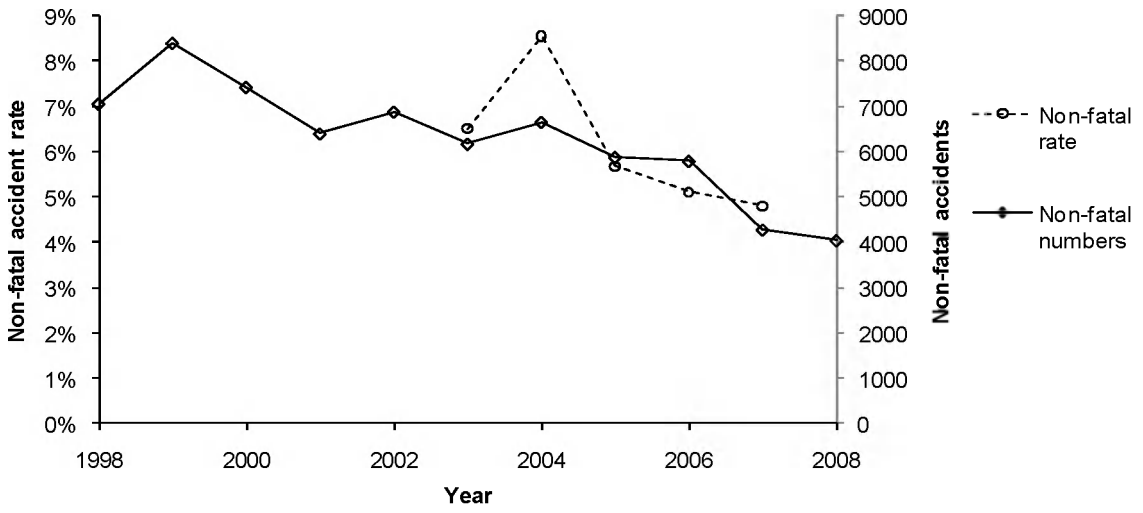

Figure 33 Number and rate of non-fatal accidents during fishing operations as reported by EU MS.

Most accidents occur as a result of poor judgement exercised during fishing operations, brought about by the pressure to increase profits (or simply to remain financially viable), and through use of poorly maintained equipment[102]. In a situation of overcapacity and overfishing, the competition to catch limited resources is intense, causing fishers to take risks. It has been proposed that effective management regimes have the potential to improve safety, and the observed reduction in accident rate in Denmark may provide evidence for this. Here, after the introduction of transferability of VTQs in the demersal sector, active fleet capacity was reduced by 30%, good stewardship was promoted and economic profitability of

[100] As specified in the AER 2009.
[101] ILO 1999. Safety and Health in the Fishing Industry. Report for discussion at the Tripartite Meeting on Safety and Health in the Fishing Industry. Geneva, 13-17 December.
[102] ILO opp cit.

the fleet as a whole increased from 9% to around 16%, consequently reducing some of the drivers associated with accidents at sea.

2.4.13 Indicator 30 Aquaculture

Indicator Definition

This indicator measures the ratio of total aquaculture production (numerator) to total (capture + aquaculture) production (denominator).

Data sources and methodology

For the calculation of the indicators the "FishStat Plus - Universal software for fishery statistical time series" was used as well as the FishStatPlus datasets from the FAO internet site[103].

From these data quantities of capture fisheries and aquaculture production were calculated analysed in excel to produce the ratio.

Value of production was also obtained from the FishStatPlus data. The conversion from US$ to Euros was calculated using the InforEuro monthly accounting rate of the Euro (average value for each year)[104].

Results

The data revealed the following figures for the period 2000-2008:

Table 47: Aquaculture and capture fisheries production figures 2000 - 2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU27 Aquaculture production ('000 tons)	1,398.5	1,385.5	1,272.4	1,343.3	1,311.2	1,260.6	1,283.5	1,302.6	1,277.8
EU27 Capture production ('000 tons)	6,831.4	6,978.2	6,401.9	5,970.7	5,950.1	5,755.1	5,670.0	5,231.3	5,178.5
Ratio (capture: aquaculture)	4.88	5.04	5.03	4.44	4.54	4.57	4.42	4.02	4.05
Proportion of EU aquaculture compared to total EU production (Aquaculture + Fisheries)	16.99%	16.57%	16.58%	18.37%	18.06%	17.97%	18.46%	19.94%	19.79%
TOTAL EU27 production ('000 tons)	**8,229.9**	**8,363.7**	**7,674.3**	**7,314.0**	**7,261.3**	**7,015.7**	**6,953.5**	**6,534.0**	**6,456.3**
EU27 value aquaculture (in 000 Euros	2,984.88	3,157.43	2,901.84	2,765.36	2,587.76	2,821.35	3,056.48	3,249.20	3,202.76

[103] http://www.fao.org/fishery/statistics/software/fishstat/en
[104] http://ec.europa.eu/budget/inforeuro/index.cfm?fuseaction=currency_historique&currency=201&Language=en

Total EU production (fisheries and aquaculture) decreased by 1.7 million tons in the period 2000-2008. Although aquaculture production has fluctuated slightly from 2000-2008 (but shows an overall reduction from 1.4 million tons in 2000 to 1.27 million tons in 2008) (see Table 47), the increase in proportion of total production due to aquaculture is mainly due to the steeper decline in capture fisheries production.

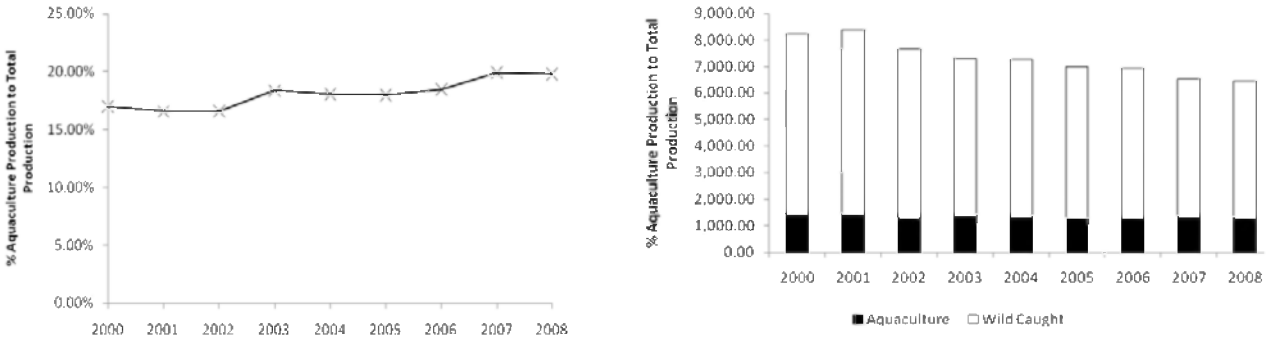

Figure 34: Ratio of aquaculture production to total production 2000-2008, and production totals.

3 POLICY OPTIONS

3.1 Recent policy decisions

In this section we look at recent policy decisions, or decisions that will result in new policy being implemented before 2012. These, together with the policies already implemented including under the CFP 2002 revision (Council Regulation 2371/2002), would set the policy framework for the development of European fisheries in the absence of any further revision to the CFP in 2012. In other words, these policies, together with external drivers (such as the overall productivity of fish stocks, the global fish and fuel market), will determine the status quo scenario for this impact assessment.

3.1.1 IUU Fishing Policy

Description of the new regulation

It is now widely acknowledged that IUU fishing is a major problem with highly negative environmental, social and economic consequences[105]. After the adoption by FAO in 2001 of a non-binding international plan of action to deter, combat and eradicate IUU fishing, the EC unveiled its own strategy in 2002 (document COM (2002) 180). It sets out which are the current challenges that the Community needs to address to improve the efficiency of its action (*inter alia* prevent the importation into the Community of fisheries products stemming from IUU fishing; discourage fishing operators and MS from supporting or engaging in IUU fishing, notably via the use of "Flags of non-compliance"; improve compliance with the rules of the CFP within Community waters). Until 2006, this Community action plan has been implemented by a number of initiatives, mostly at the international level within the framework of RFMOs and EC fisheries agreements, and through improvements of Reg. 2847/93 establishing a control system applicable to the CFP. The results of this strategy have been disappointing. In a special report published in 2007, the Court of Auditors established that the current control system in the EU is ineffective in maintaining catches at the levels agreed by Council. In addition, conservation and management measures adopted by RFMOs generally fall short of expectations.

Consequently, the EC undertook to adopt a revised strategy based on three regulatory pillars: 1) a proposal to reform and modernise the control system applicable to the CFP to address the shortcoming of Reg. 2847/93 and improve compliance in waters under EC jurisdiction (proposal reportedly adopted in October 2009); 2) Reg. 1006/2008 offering a tighter control of the Commission on fishing authorisations granted to 3rd country vessels in Community waters and to EC vessels in external waters and; 3) Reg. 1005/2008 establishing a Community system to prevent, deter and eliminate IUU fishing. One of the major measures of this later regulation is the implementation as from 1st January 2010 of a catch certification scheme for importation and exportation of fishery products meaning that all such products will be able to enter the Community market only if they are accompanied by a document validated by the Flag State authorities of the vessel at the origin of the catch (the catch certificate) certifying that they have been legally caught. The adoption of this measure is motivated by the fact that the EC covers as much as 60% of its domestic demand by imports from third countries. Taking account of all modes of transport, it is being assessed that approximately 500,000 tonnes worth 1.1 billion Euro fisheries products caught

[105] Agnew DJ, Pearce J, Pramod G, Peatman T, Watson R, Beddington JR, Pitcher T, 2009 Estimating the Worldwide Extent of Illegal Fishing. PLoS ONE 4(2): e4570. doi:10.1371/journal.pone.0004570 [http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0004570]

illegally by foreign-flagged fishing vessels end up on the Community market every year. This represents as much of 10% of the total value of imports of maritime fisheries into the Community (10.7 billion Euro in 2005).

Results of the Impact Assessment

Before adoption of Reg 1005/2008, a detailed impact study waswas realised (document SEC (2007) 1336). The followingtext summarises the main impacts of the catch certification scheme on Community stakeholders.

Governance

The IUU regulation will improve international governance: it will deter the use of open registry Flag States that will not be in a position to validate the catch certificates submitted by operators under their flags, and provide an incentive to register under responsible Flag States having implemented a framework to monitor their fleets.

Environmental

Reduction of fishing pressure on migratory and coastal stocks worldwide (not quantified) will result. In addition to stocks managed by the Council, the stocks impacted positively will include those stocks targeted by the EC external fleet placed under RFMO management (e.g. tuna stocks worldwide, groundfish stocks in NEAFC and NAFO areas) and those stocks within the EEZ of Coastal States.

A reduction of impacts on coastal environment caused by the use of unwanted gears can also be expected.

Economic

It is expected that a decrease in quantities will result in first sale price increases. Assuming that 10% of imports of fisheries products are no longer authorised, the demand on legal products, either from EC waters or from external waters, will increase with higher prices offered as a consequence. Depending on species group, prices are expected to rise from 7% (tuna) to as much as 63% (lobsters). Although not directly estimated in the impact assessment, an increase of 10% may be taken as a proxy for average price of all species. This increase will benefit in particular to EC operators working in external waters that are in competition with foreign operators, some of them operating under an IUU configuration (flag of convenience), improving their profitability.

The measure will impact the EU processing/commercialisation sector. Although the measure is not expected to impact the economy of larger companies that are able to secure their sources of supply, it can impact smaller companies that have an opportunistic buying strategy. The IUU measure may therefore favour a concentration of the EC processing/ commercialisation sector.

Social

By improving profitability of EC fishing vessels (elimination of unfair competition, higher first sales prices), the IUU regulation will have the effect of increasing wages and improving the attractiveness of the sector

In the processing/commercialisation sector, some employment losses could be felt mostly in small trading companies. However, the impact assessment qualifies these losses as likely to be small.

3.1.2 Discards policy

Description of the new regulation

The need for a discard reduction policy was identified in the Commission's 2007 paper on *"A policy to reduce unwanted catches and eliminate discards in European fisheries"*[106], based on the requirements of Council Regulation 2371/2002 Article 2 (1), which aims to *"minimise the impact of fishing activities …[and] ..aim at a progressive implementation of an ecosystem-based approach …[and] … contribute to efficient fishing activities"*.

The Commission conducted an Impact Assessment of its proposals in 2007[107]. The European Parliament[108] endorsed the idea of highgrading bans but proposed that a general discard ban should be implemented in a fishery only after actions to meet discard targets had failed. The Commission brought forward a document in 2008 which proposed Maximum Allowable Bycatch Limits for individual fisheries. This was subject to consultation[109] and an internal Commission assessment of available options.

These initiatives have led to some fishery-specific regulations dealing with discarding in different fisheries. Examples of these are the highgrading ban in the North Sea[110] which will be extended to all EU fisheries in 2010, and the provisions allowing increased effort for vessels able to demonstrate a reduction in cod discard mortality in Article 13 of the 2008 Cod Recovery Plan (Council Regulation 1342/2008). However, there is as yet no regulation implementing MABLs or a general discard ban.

Available studies indicate that the highest discard rates occur in beam trawl fisheries, next high in Nephrops fisheries, moderate in demersal trawl fisheries and lower in pelagic fisheries[111]. Attempts to estimate discard rates for the EU fleet as a whole are hampered by low sampling rates, with observer sampling of most fleet segments being less than 1% of hauls[112]. As a result STECF has been unable to make statistically rigorous estimates of discard rates in beam trawl and Nephrops trawl fisheries, for which the 2008 consultation document suggested baseline discard rates were 70% and 50% by weight respectively[113,114].

Two options were considered in the first impact assessment apart from the *status quo* option (Option 1): the first (Option 2) was to take supplementary actions to reduce discards, such as real time closures and selective fishing gears which would reduce unwanted bycatch; and the second (Option 3) was to implement a discard ban, either on its own or combined with

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[106] COM(2007) 0136 final

[107] Brussels, 28.3.2007 SEC(2007) 380. Accompanying document to the Communication on a policy to reduce unwanted by-catches and eliminate discards in European fisheries IMPACT ASSESSMENT {COM(2007) 136 final} {SEC(2007) 381}

[108] European Parliament resolution of 31 January 2008 on a policy to reduce unwanted by-catches and eliminate discards in European fisheries (2007/2112(INI))(2009/C 68 E/05)

[109] COMMISSION NON-PAPER On the implementation of the policy to reduce unwanted by-catch and eliminate discards in European fisheries.
http://ec.europa.eu/fisheries/cfp/governance/consultations/consultation_250408_en.pdf. The consultation comments are available at:
http://ec.europa.eu/fisheries/cfp/governance/consultations/consultation_250408_overview_en.pdf

[110] COUNCIL REGULATION (EC) No 43/2009 (TACs and quotas regulation); Annex III, paragraph 5b (1).

[111] Borges, *et al*. (2005) Fisheries Research 76, 1–13; Enver *et al*., 2007, Fisheries Research 86, 143–152; Enver *et al*., 2009, Fisheries Research 95, 40–46.

[112] Analysis of other observer programmes has suggested that coverage rates approaching 20% appropriate to deliver acceptable resolution in discard estimates; Lawson, 2001, Methods for analysing bycatches with observer data, SCTB14 Working Paper SWG-10

[113] All discard rates are given in weight in this report, i.e. weight of discards divided by weight of total catch

[114] Commission staff working document. Reduction of discarding practices (WGMOS-08-01) of STECF, Plenary meeting of 7-11 July, Helsinki.

supplementary measures. The proposal under Option 3 would have involved moving from a prohibition to have undersized or over-quota fish on board, to a prohibition to proceed with fishing when such unwanted fish were being caught, and an obligation to land all fish whether legal or not, and to deduct landings of undersized fish from quota.

The 2008 consultation paper[115] proposed direct means to achieve discard reductions (i.e. without requiring a discard ban): *"The overall objective of reducing unwanted by-catch and gradually eliminating discards should be achieved fishery by fishery, by using discard bans and supplementary measures to reduce by-catch."* The central methodology was to set specific bycatch reduction targets by fishery (Maximum allowable by-catch limit, MABL), from 50% to 10% over 5 years for Nephrops bottom trawls in Area VII, and from 70% to 15% over six years for beam trawls in Area IV and VIId; to consider a discard ban on certain sensitive species; to require 15% observer coverage to monitor discards, reducing to 10% in year three; and a quota/effort reduction scheme for MS not complying with the discard reduction targets. STECF further suggested that the discard rate targets should be supported by total discard quantity limits.

An internal impact assessment of this proposal was conducted by DG-MARE, and in addition the proposal itself contained some brief impact assessment.

Results of the Impact Assessment

The policy that is currently being implemented can best be described as a mixture of Option 2 and Option 3 – some supplementary measures, such as discard reduction schemes, which may in the future (as proposed by the 2008 proposal, but not yet implemented) be supported by the adoption of targets for discard rates in certain fisheries, and a ban on highgrading. The conclusions below follow from a combined reading of all current impact assessments for discard policy.

Environmental

The 2007 Impact Assessment concluded that there may be some reductions in discarding with Option 2 and that any reduction in discards is a welcome environmental outcome. The 2008 proposal cited significant environmental gains in terms of target species mortality and the reduction in discards, including more avoidance of unwanted catch. However, the 2007 impact assessment concluded that without a fundamental change to incentives (i.e. without a change to the prohibition to have on board under-sized or no quota fish) there would be little gain simply from Option 2.

Spatial management measures such as *closed areas* may reduce by-catches and hence discards by reducing fisheries in areas with high abundance of juvenile or non-target fish. A number of boxes have been introduced with that aim, including the plaice box and the Shetland box in the North Sea. Evaluations of the effect these boxes have however, has not demonstrated that their intended benefits were achieved.

The experience with recent experimental schemes has largely confirmed the impact assessment. Option 2 strategies may be able to reduce discards to a certain extent, but without a change in incentive – replacing landing limits with catch limits, linked to effective catch monitoring using cameras, is proposed by some MS[116] - significant reduction in

[115] Commission non-paper *On the implementation of the Policy to reduce unwanted by-catch and eliminate discards in European fisheries.*
[116] The Scottish Government *Action on fish discards.* Available at: http://www.scotland.gov.uk/News/Releases/2009/10/08161207

discards is unlikely. For instance the Scottish real time closures, which are an integral part of the conservation credits scheme, have been in place for two years. Although there is increased monitoring through VMS and observer coverage, the latter is still very low (< 2% of fishing days) and has not yet allowed an estimation of discarding rates with statistical accuracy although preliminary analysis suggests they may have been reduced[117]; and the high grading ban, while it may be effective in reducing high grading when vessels have sufficient quota for the sizes of fish being caught, will not stop discarding when vessels reach their quota or when undersized fish are caught, as this is not included in the definition of high grading.

The conclusion of all impact assessments is that without increased monitoring, by observers and other means, the effectiveness of high grading bans and other discard reduction programmes including discard bans and limits for certain species or fisheries is likely to be undermined by poor compliance.

Economic and social

Some economic impacts are expected to be negative – for instance, associated with the additional costs from moving away from closed areas – whereas some could be positive – the reduction in time spent fishing undersized fish, for instance, would increase the time spent fishing for legal sized fish. STECF has analysed the 2008 proposals and concluded that additional approaches are necessary in order to mitigate the negative economic consequences of a by-catch reduction programme, for instance the additional costs of landing unwanted by-catch or of avoiding area/season closures.

From a medium-term economic perspective, however, any reduction in discards in a fishery without quota for those discards should lead to an increase in revenue to the fisheries actually targeting those species. For instance, for stocks where TACs are currently calculated taking allowance for discards (e.g., North Sea cod) this additional catch could eventually (once the stock has recovered) be realised as landed catch.

Administrative

A move to results-based management, as proposed in the 2008 consultation document, would have the least impact on administrative costs. However, even here, a requirement to increase observer coverage to 15% would add additional administrative cost – or would be costly for industry, if that model for cost recovery was adopted. Discard bans, requiring 100% observer coverage, would clearly be more costly, although they would be the most effective in delivering environmental and, ultimately, economic results.

Qualitative impact under status quo on indicators and variables

Predicting the impact of this range of discard avoidance measures in a *status quo* scenario is difficult. We anticipate that the current discard reduction programmes, including voluntary avoidance of high discard areas without significantly increased monitoring, and high grading bans which impact on a minority of discard situations and fleets, are unlikely to reduce discarding by more than 5-10%. They will involve the industry in additional costs, associated with increased steaming time to avoid high bycatch areas and the requirement to retain previously high graded fish.

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[117] Holmes S. J. *et al.* (2009) *Using VMS and Fishery Data in a Real Time Closure Scheme as a Contribution to Reducing Cod Mortality and Discards.* ICES CM 2009/M:13

A second possibility is that the discard reduction programmes with their concomitant monitoring requirements will be introduced. If this were to happen, discarding in the target fisheries (currently only Nephrops fisheries in VII and Beam trawl fisheries in IV and VIId) would decline by 80% over a six year implementation period. Given that the majority of discarding is attributable to these two gear types, discarding over the whole of the EU fleet might drop in this circumstance by 50% or more.

Our *status quo* assumption includes only a 5% reduction in discards consistent with current programmes. In an optimistic scenario this might rise to 10-15%.

3.1.3 Control Regulation (COUNCIL REGULATION (EC) No 1224/2009)

Description of the new regulation

The Control Regulation (Adopted 20 October 2009[118]) introduced a number of key new control measures:

Introducing a new, common approach to control and inspection:

- Ability to carry out standardised, coordinated inspection actions and procedures at all stages of the chain, including harmonised requirements for monitoring of catches, effort, prior notification of landing of species under multiannual plans, fleet capacity, and traceability systems;
- Ability to use modern technologies, including VMS, AIS and VDS; and carry out effective and systematic cross checking of all relevant data and;
- Ability to use information identifying risks and rationalising control.

Developing a culture of compliance and effective application of CFP rules:

- Simplification and rationalisation of the legal framework;
- Ability to introduce deterrent and harmonised sanctions at the vessel and MS level, in particular a new penalty points system, harmonised minimum sanctions for serious infringements a mechanism for the Commission to close fisheries where a MS is not respecting its obligations to implement multiannual plans effective, and a payback system for overfished quotas and provisions to allow for the suspension of Community assistance in the event of non-compliance by MS with the agreed control provisions;
- Ensure improved cooperation between MS and with the Commission;
- (including the adaption of the mandate of the CFCA) and;
- Develop greater interaction with the sector and the stakeholders.

Although the proposal had been for recreational catches to be counted against TAC, for now this has not been accepted.

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[118] COUNCIL REGULATION (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006

Results of the Impact Assessment

The Impact Assessment was supported by a specific bio-economic study[119] which examined the situation in which compliance in the EU was improved through the greater use of control functions. The study found that in the short term inspection cost would rise and fishers would lose income, as catches were restricted to the TAC; but in the long term the stock situation, catches, GVA, and employment would increase, and inspection costs would decline as more of the inspection burden was transferred to land based operations and away from sea-based operations.

The Commission's full impact assessment[120] concluded the following impacts for Option 3 (regulatory instrument).

Environment

Overall, a increase of 51% of the biomass. The growth in size of fish populations as they recover would be accompanied by increases in the age distribution of fish both in the population and in the catch, associated with lower fishing pressure. Such benefits would have consequences for the ecosystem as a whole. As the Commission would have the ability to react faster and better to shortcomings, in particular with respect to overutilization of fishing quotas, the environment would be less likely to be affected by irresponsible fishing behaviour.

Economic

Sum of total net profits in the regulatory option of 8.9 billion Euro across all the stocks for the time span 2010 – 2019. Substantial restructuring of the current Community fleet contributes to reduce the current overcapacity (cg Blue fin Tuna case study). The initial loss is most likely to be suffered by fishermen who have gained additional income from the catch of illegal fish. By definition, such activities are not worthy of protection. The utilisation of new technologies will substantially reduce running costs of control authorities by allowing them to concentrate scarce control resources on fishing activities that have been identified by way of risk analysis.

Social

Net employment gain of almost 4000 jobs.

A better confidence of the public in the CFP would in turn affect consumer behaviour and confidence as he would be convinced of buying a sustainable product, and possibly allow to yield a higher price for the product.

Apart from greater quantities to be fished, the individual fish would be bigger and yield a better price for the same quantities. There would be higher returns to fishing effort and a greater cost efficiency for the fishing sector.

Administrative burden

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[119] MRAG Ltd., Oceanic Développement, Poseidon Aquatic Resource Management Ltd, Lamans s.a., Institute of European studies and IFM (2008). '*Impact Assessment of a Proposal to Reform and Modernise the Control System applicable to the Common Fisheries Policy*' (MRAG)

[120] Brussels, SEC (2008) 2760. COMMISSION STAFF WORKING DOCUMENT *accompanying the* Proposal for a COUNCIL REGULATION establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy *IMPACT ASSESSMENT* {COM(2008) 721 final}{SEC(2008) 2761}

Anticipated reduction in total administrative cost for fishermen from 78 million Euro to 38 million Euro, arising from increased use of electronic reporting, including electronic logbooks, leading to reductions of vessel administration by 70%, and the introduction of electronic sales notices.

A more organised inspection system, and a single coherent control legislation, combined with the increased use of electronic data gathering and cross-checking which will make planning and executing inspections more efficient, should significantly reduce MS administrative burdens.

3.1.4 Data collection framework

Description of the new regulation

The DCF is an instrument which sets out the broad requirements relating to the collection of data, repealing EC Regulation 1543/2000 as of 1 January 2009. The new DCF relates broadly to the:

- collection, management and use of data in the framework of multi-national programmes;
- the data management process;
- use of data collected in the framework of the Common Fisheries Policy;
- support for scientific advice.

Under the Regulation, MS are required to compile a wide range of biological and economic data as specified by the EC[121], under approved annual work programmes for which the EC provide 50% Community financing.

The data collected, which includes biological information on landings, data on catches (mainly to provide discard information) based on onboard observer schemes, support to surveys with research vessels collecting information on the abundance and biology of fish stocks and data on prices, costs and employment in the sector, will facilitate an evaluation of the activities of fishing fleets, in terms of landings and discards and of the economic performance. Other important sources of data not included under the DCR, but which will augment data collected within the DCR, are landings and sales reports and information on the activities of fishing fleets from VMS.

The new DCR is widely regarded as a major improvement over the earlier, repealed Regulation since it puts data in the public domain, which will enable public transparency for the basis for advice, and thus the policy, and will help the scientific advisory bodies to improve the quality of the advice. The new DCR also makes a better linkage to other data sources; VMS data will for instance be available (without vessel ID information) for fisheries scientists.

3.1.5 Mediterranean Regulation

In the Mediterranean, the 2006 regulation (Council Regulation (EC) No 1967/2006) will have the significant effect of requiring an increase in mesh size from 28mm to 40mm square mesh (50mm diamond mesh). Although in the original regulation this change was required by 2008, in practice several derogations have meant that implementation of the regulation will

[121] Commission Decision 2008/949/EC of 6 November 2008

be in 2010. To date, the uptake of the new mesh sizes has not been good, even though prices of small shrimp are much lower than prices of large shrimp. However, the end of the derogation, and the coming into force of the control regulation, is likely to mean a significant change for the Mediterranean fleet is unavoidable.

3.1.6 Long term management plans

For the purpose of this analysis, the regulations and plans for several different species were examined: Northern Hake, Cod, Southern Hake, West of Scotland herring, and Atlantic Horse Mackerel. This section summarises the associated plans and results of impact assessments that have been published on their implementation.

Results of impact assessments

Environmental impacts

For all fisheries the IAs note that long-term trends in productivity are difficult to predict due to unknown factors such as oceanic climate and recruitment however, keeping fisheries impacts at levels no higher than those needed to take high yields improves the stability of the stock and improves the robustness of the fishery to adverse environmental effects. Therefore, in the long-term, improvements in the conservation of stocks will result in sustainable stocks.

In the northern hake fishery, the IA predicts gradual positive impacts on the stock biomass are anticipated in the short-term due to reduced fishing mortality. For cod, the revised plan should, by improving the conservation of stocks and inducing stock recovery, decrease catches of juveniles and reduce discards. For southern hake because the regulation will result in a decrease of fishing pressure of the fleets operating in the designated areas, a positive effect for the target species should be seen, as well as for other commercial and non-commercial species which are caught with the recovery species. Furthermore, given that some of the fishing operations, in particular in Nephrops fishing, are realised with heavy towed gear which produces large alterations in the bottom communities and habitats, it is expected that these alterations will be substantially reduced, especially in where fishing for Nephrops will be restricted or forbidden; this should aid biodiversity restoration. In the short-term, the environmental impact of the plan for Atlantic horse mackerel will be a progressive improvement in stock management, thereby reducing the risk of overexploitation. The plan will also enable improvements in stock assessment, leading to better management of stocks and resulting in less negative impact of fishing on biodiversity.

Economic impacts

For all fisheries IAs predict that LTMPs will result in small decreases in catches and landings resulting in reductions in the profits in the short-term. The long-term will see positive impacts resulting from long-term stock stability and improved profitability of the industry and gains for all fleets. For example in the cod fleet when the TAC increases from the current *status quo* scenario of 21,000 tonnes to 150,000/250,000 tonnes as is assumed under the revised plan and; in the northern hake fishery where the Commission estimates that landings will increase around 48%, and if the exploitation pattern of the fisheries involved is improved the long-term benefits are even higher, up to 60%. In the long-term proposed legislation should bring a lasting recovery of the stocks concerned which would mean improved and stable catches for the fleet catching these stocks, either as target or by-catch species, and stability in the markets.

The majority of West Scotland herring catches are taken by vessels engaging in the exploitation of a variety of stocks. Therefore their dependence on this relatively small stock is

very limited. Consequently the IA anticipates that the direct impact of improved long-term management of this stock will cover only a small part of the economic activity of these vessels. The herring market depends more on supply from the larger Norwegian Spring Spawn and North Sea stocks, therefore it is difficult to predict the market effects of the recovery plan.

In the short-term the IA for the western horse mackerel foresees a possible small increase or decrease in catches, which would result in small changes in the sector's profitability. The plan will have a positive impact on the profitability of the industry due to achieving long-term stock stability based on better scientific assessment. In addition, adoption of a long-term plan with clear sustainability criteria may allow the fishery to qualify for certification under independent "eco-label" criteria. This could be helpful in product marketing terms, and in improving the perception of the sector as a responsible industry.

Evidence in the southern hake instance suggests that the short-term reduction in the value of the landings should be compensated for when considering the cumulative value of these catches over the mid-term (5-10 years), because the benefit of sparing younger age classes of S. hake will be rapidly obvious. It will in particular allow for a rapid increase in the proportion of the catch made of larger individual fish thus for an increase in the average value of the catch.

Social impacts

All of the IAs state that after a transitional phase and the recovery of stock, the industry could move to a situation of higher revenues with more possibilities for investment in safer vessels, shorter working hours, better pay and a lesser need to work in poor weather conditions. However, an overall reduction in fishing capacity and hence in employment may be needed in the short-term and if this leads to fishermen leaving the industry additional compensation maybe required. In the medium to long-term a substantial positive impact will result due to stock recovery leading to maintained employment in the sector.

The cod impact assessment also highlights other positive social impacts, including better regionalisation of management rules, better integration with stakeholders, and a bottom-up approach. In the long-term the Atlantic horse mackerel IA foresees that improved scientific assessment of the stock will lead to better management of resources, a stable stock and maintained employment in the sector.

The cod IA states that employment at sea is low in overfished situations, and low net revenues can result in limited resources available for vessel maintenance and investment in safety, as well as pressure to work long working hours in potentially unsafe weather conditions. The northern hake IA foresees a small negative impact on employment in the short-term whereas the IA for Atlantic horse mackerel does not foresee any negative impact on employment.

To comply with the regulation the IA points out that southern hake fishing vessels will have to reduce the number of fishing days they can catch southern hake and Nephrops in the designated areas, and their catches thereof. This implies that they will have to either stop fishing altogether for a number of days, move to fishing grounds outside the designated areas and/or switch to fishing gear which would generate no by-catches of southern hake and Nephrops. In addition, for control purposes, fishermen will have to store separately their catches from recovery stocks which will generate some additional work, and practical difficulties on-board vessels with insufficient storage facilities (especially smaller-scale fishing vessels). Reducing the number of fishing days for recovery species may mean preventing a number of vessels dependent on these and on a number of associated species from operating during certain key periods when they cannot switch to any alternative fishery.

Without a scheme to compensate for their temporary cessation of activity, such vessels would be forced out of fishing.

Table 48 Matrix of LTMP policy impact by species

Indicator / Policy			LTMP				
			Northern Hake	Cod	Southern Hake	Herring	Horse Mackerel
Environmental	1	Stock situation in terms of fishing mortality in relation to MSY	↑	↑	↑	↑	↑
	2	% of stocks and/or catches covered by LTMP	- Remain the same	- Remain the same	- Remain the same	- Remain the same	- Remain the same
	3	Average size (length and weight) of fish	↑	↑	↑	↑	↑
	4	Fleet evolution	-	Dependent on recovery levels	- Remain unaffected	- Remain unaffected	Dependent on recovery levels
	5	Evolution of fishing mortality/ Fleet size	Stabilise over time	Expected to continue to change dependent on state of stock	-	Will change depending on annual TAC	Expected to continue to change dependent on state of stock
	6	Area covered by protection regimes	-	Difficult to predict	↑	Not applicable	Difficult to predict
Economic	7	Gross valued added	↑	↑	↑	↑	↑
	8	Economic sustainability	↑	Stabilise	-	Stabilise	Stabilise
	9	Net profit margin		↑	Stabilise	Stabilise	↑
	10	Economic performance: ROI	↑	Stabilise	Stabilise	-	Stabilise
	11	Fish prices, market orientation	↑ (likely)	Remain stable	-	Cannot be predicted due to the nature of the fishery but impact should be positive	Remain stable

Indicator / Policy			LTMP				
			Northern Hake	Cod	Southern Hake	Herring	Horse Mackerel
	12	Level of subsidies / value of landings	Yes, to keep fleet in line with available resources	Difficult to predict	Will not be affected	-	-
Social	13	Employment	Likely to remain stable after initial phase of restructuring	↑	Should stabilise	Should stabilise	↑
	14	Status of fisheries dependent communities	↑	Remain stable	-	↑	Remain stable
	15	Value added dependency levels	-	-	Remain stable	↑	-
	16	Social sustainability: GVA per employee	Remain stable	To continue over time as stocks stabilise	↑	Remain stable	To continue over time as stocks stabilise
	17	Attractiveness of the sector	↑	↑	Expected to stabilise	-	↑
Governance	18	Departure from quotas	↓	↓ (Difficult to predict)	Difficult to predict	↓	↓ (Difficult to predict)
	19	Management costs for the sector	↑ (with need for reporting)	↑	↑ (initially due to increased monitoring & control requirements)	↑ (initially to improve compliance)	↑ (initially due to implementation of control regulations)
	20	Regions and MS having adopting RBM system	-	-	-	Not applicable	-
	21	Data provided by MS	↑	↑	-	↑	↑
	22	Rate of utilization of allocations (quotas)	Constant	Stabilise	Stabilise	Unpredictable	Stabilise
	23	Level of quotas exchanges	-	Difficult to predict	Unaffected	Not applicable	Difficult to predict
	24	Level of coherence with WTO & other EC policy	-	-	Not applicable	Not applicable	Not applicable
	25	Impact for the private sector	↑ (Initially, then stabilise)	Should stabilise	Not expected to increase	↑ (Initially, then stabilise)	-
	26	Level of implementation of simplification process by MS & industry	-	-	Not applicable	Not applicable	-

3.2 Status quo Option

In this Phase I report, only one option is assessed, the *status quo* option. Several sensitivity sub-options are explored in the model.

The current status of the EU fisheries sector has been described above. In envisaging a likely *status quo* situation over the period 2012 – 2022 several steps must be undertaken.

As a first step the impact of current and recently agreed policy must be taken into account. The likely influence of such policy on the indicators described above is presented in Table 50. Secondly, the likely direction of externalities must be explored – such as fuel price and markets. Finally, since we will seek to explore the impacts of s*tatus quo* policy on the various indicators of performance presented in Section 2 as far as possible through the use of an analytical model, we must interpret the s*tatus quo* scenario as key inputs into the bio-economic model.

Other continuing policy, and externalities, may also be expected to influence the *status quo*.

1. The EFF capacity reduction targets, the introduction of significant decommissioning by some MS, and the industry-led decommissioning that has arisen in some cases where RBM systems have been introduced by MS will continue to lead to a decline in the size of most fleet sectors.
2. Product prices are subject to a wide range of competing influences. Conditions that may tend to increase prices are:

- Restriction of internal supply in the initial stages of the implementation of the IUU and control regulations;
- Restriction of imports flowing from the IUU regulation;
- Increasing demand for fish products in the EU;
- The increasing average size of fish as stocks recover;
- Consumer responses to an industry that conducts its fishing in ecologically sustainable ways, with fewer discards and greater compliance.

And those that may tend to decrease prices are:

- The general economic outlook for the production sector in Europe, which has led to a narrowing of the gap between imported and domestically caught fish;
- Increasing supply of, and importation of, fish from outside the EU and increases in EU production
- Increasing substitution of wild caught fish by aquaculture, including the importation of aquaculture (e.g., *Pangasius*) fish not restricted by the IUU regulation.

Given the difficulty of anticipating which direction the pressure of the external and internal factors will go, we assume that the s*tatus quo* scenario fish prices remain steady in real terms.

2. The assumption for fuel prices is that they will increase by 50% and that this will be translated to a 45% increase in fuel costs to vessels (accounting for changes in behaviour) in 2012 over the baseline period (2005-07) (see section 2.2.6)

3. Although there is anecdotal evidence for the replacement of domestic workers with foreign workers on many fishing fleets, there is no systematic evidence (Indicator 17) that crew share rates are changing significantly. We therefore assume that they also remain the same as in the reference years for the model.

4. In the Status Quo model it is assumed that the control regulation will only be partially effective, such that it will reduce the level of unreported catches, in any fishery in which they are currently estimated, by 65% of their current level. Similarly, in the Mediterranean model HDA-BIRDMOD, we assume that the move to a 40mm mesh size will take place in 2013, even though it was required by 2008, i.e. about 2.5 years after the implementation of the Control Regulation.

5. In the Status Quo model it is assumed that long term management plans will be introduced for all species that the Commission currently has plans for. In addition to the current LTMPs (listed in Annex A, Table A 6) we assumed that the following additional plans were implemented, using Fmsy as their targets, in the period 2010 – 2017. For the stocks that were explicitly modelled, we give below the date on which we assumed that LTMP would come into effect.

Table 49 Assumed year of implementation of LTMP for modelled stocks with planned LTMPs.

Stock	Year of Implementation
Herring Baltic Sea	2010
Sprat Baltic Sea	2010
Western Horse Mackerel	2011

Table 50 Comparison of likely impact of current CFP policy on the evolution of indicators under the Status Quo scenario

Indicator \ Policy			IUU	Discards	Control	LTMP	DCF	Overall summary
Environmental	1	Stock situation in terms of fishing mortality in relation to MSY	⇡ Strong increase in respect of distant water stocks, EU domestic stocks probably affected in a minor way.	↑ Stock status will improve gradually as discards are reduced, but discarding will only be reduced by a small amount – 5%.	Not directly affected, except for management plans where catch has been in excess of TAC at Fmsy.	↑ Some 5 years after implementation.	⇡ Responding to better scientific advice arising from better quality data	Increasing stock status resulting from decreasing discards & LTMP using Fmsy..
	2	% of stocks and/or catches covered by LTMP	-	-	-	-	-	External driver - not affected.
	3	Average size (length and weight) of fish	⇡ Affected only because of 1	↑ Small increase as a result of small reduction in juvenile discards.	⇡ Affected only because of 1	⇡ In response to index 1	-	Small direct impact from reduction in juvenile discards
	4	Fleet evolution	↓ As the fleet is forced to operate without unreported catches, economic considerations should lead to a reduction in fleet size	-	NB: activity of the fleet will increase with increasing stock size.	Dependent, or Remain unaffected	-	None of the policies will directly affect fleet evolution
	5	Evolution of fishing mortality/ Fleet size	-	-	⇣	Different for each species[122]	-	Should decline as a secondary impact but dependent on the rates of decline of fishing mortality & fleet size
	6	Area covered by protection regimes	-	-	-	Different for each species	-	Not directly affected.

[122] Where impact of the regulation is dependent on the species please refer to Table 2 for LTMP impacts by species.

	Indicator	Policy	IUU	Discards	Control	LTMP	DCF	Overall summary
Economic	7	Gross valued added	↑	↑ Overall economics will be affected by increased operating costs, though these impacts will be relatively minor. On the plus side, and in the medium term, increasing catches should lead to increased revenue.	↓↑ In the short term a decline in GVA as catches are reduced to legal levels. In the medium term as the stock recovers increasing catches and stock size lead to increasing GVA & profitability.	↑	-	Initial reduction in GVA resulting from increased control with medium term increase in GVA resulting from increased stock size and catches plus increasing value of fish resulting from IUU and discard policies.
	8	Economic sustainability	↑	↑	↑	↑ or, Stabilise	-	Follows (7).
	9	Net profit margin	↑	- Overall economics will be affected by increased operating costs, though these impacts will be relatively minor. On the plus side, and in the medium term, increasing catches should lead to increased revenue.	↑ Net profits up by €8.9bn over 10 years.	↑ or, Stabilise.	-	Follows (7) but with lower level of increase resulting from costs of discard avoidance strategies.
	10	Economic performance: ROI	↑	↑	↑	↑ or, Stabilise.	-	Follows (9).
	11	Fish prices, market orientation	↓↑ Restricting imports may increase prices but this will be offset by other imports	↑ Because of the increasing quality & consumer confidence.	↑ Because of the increasing quality and size of fish.	Different for most species.	-	Probably no significant increase in prices
	12	Level of subsidies / value of landings	Not directly affected.	Not directly affected.	Not directly affected.	Not directly affected.	-	Decreasing subsidies per value of landings will decrease as value of landings increases.

Indicator / Policy			IUU	Discards	Control	LTMP	DCF	Overall summary
Social	13	Employment	↓↑ Increasing stocks in distant waters may lead to increased employment; decreased import volumes could reduce employment in small quantities (amount unquantified).	-	↑ Employment increases as stocks recover in both fleet and processing sectors.	↑ Employment increases as stocks recover in both fleet and processing sectors.	-	Potential increase in fleet employment as stocks recover. Potential neutral affect on processing employment through increase of domestic supply and decrease of import supply.
	14	Status of fisheries dependent communities	-	↑ As the overall quality of the fish improves.	↑	↑ or, Stabilise.	-	Medium term increase in employment in regions with catching sectors dependent on stocks effectively managed by LTMP. Short term decline in employment in regions dependent on stocks that are currently significantly overfished or subject to significant discard or unreported fishing. Possible negative impact on employment in regions dependent primarily on region dependent on processing of imported fish.
	15	Value added dependency levels	↑	↑	↑	Different for most species.	-	All dependent on economic performance.
	16	Social sustainability: GVA per employee	↑	↑	↑	↑ or, Stabilise.	-	All dependent on economic performance.
	17	Attractiveness of the sector	↑	↑	↑	↑ or, Stabilise.	-	All dependent on economic performance.
Governance	18	Departure from quotas	-	-	↓ Improving stocks should reduce the pressure from industry to set quotas higher than scientific advice.	↓ There is evidence that TACs are set more in line with scientific advice when the advice is based on an agreed harvest control rule.	-	Decreasing pressure to depart from scientific advice particularly when the scientific advice follows pre-agreed decision rules.

Indicator / Policy			IUU	Discards	Control	LTMP	DCF	Overall summary
	19	Management costs for the sector	↑ Importers, distributors and processors will see the biggest impact, increasing costs	↑ Significant increase in coverage by observers and/or technical alternatives such as onboard cameras.	↑↓ Initial increase in inspection costs followed by a reduction in costs as a culture of compliance develops and savings are made as a result of increased use of electronic data recording and checking.	↑ Initially	↑ Due to increasing costs of data collection	Management costs increase in the short term but as stocks recover and technologies improve this should reduce.
	20	Regions and MS having adopting RBM system	-	-	-	-	-	Unaffected by current policy.
	21	Data provided by MS	↑ Increased traceability.	↑ Improved observer data.	↑ A culture of compliance and increasing control such as the use of designated port schemes will improve the quality of catch reporting.	↑ Increasing control required by LTMPs (see also control reg.).	↑ Improved data.	Increased control and monitoring will improve data quality.
	22	Rate of utilization of allocations (quotas)	↓ Catches will be reduced to compliance with quotas.	↓ Catches will be reduced to compliance with quotas.	↓ Catches will be reduced to compliance with quotas.	-	↓ Catches will be reduced to compliance with quotas.	Over utilisation of quotas should be eliminated.
	23	Level of quotas exchanges	-	-	-	Different for most species.	-	-
	24	Level of coherence with WTO & other EC policy	↑ IUU regulation is WTO compliant.	-	-	-	-	IUU regulation is WTO compliant.

Indicator / Policy			IUU	Discards	Control	LTMP	DCF	Overall summary
Administrative burden	25	Impact for the private sector	↑ Increased burden linked to verification of catch certificates. Increased governance due to increased monitoring.	↑ Requires active avoidance of high discard situations, implementation of new rules on high grading.	↓ Decreased administrative burden in the long term as a result of increased use of electronic data recording and checking.	Different for most species.	↑ Increased burden linked to requirements for better data	General increased impact at least in the short term, but reduced burden in the medium term
Simplification	26	Level of implementation simplification process by MS & industry	↑ Centralised regulation as opposed to various RFMO IUU initiatives.	↓ A stock by stock approach to discards regulation significantly increases complexity.	↑ Harmonisation of rules for all MS and fisheries.	-	-	The policies which include harmonization and centralization (IUU and control) will increase simplification but the current discard policy will tend to increase complexity.

3.2.1 Alternative Status Quo assumptions

Several alternative assumptions were considered in the modelling. Their likely impact on the indicators and model results are shown in Table 51.

Table 51 Likely impact of alternative *status quo* assumptions on the indicators

Indicator group	Environment	Economic	Social	Governance/ other
Alternative Assumption				
Ecosystem interactions	x	x	x	
Partially effective Control Regulation	x	x	x	x
Fish prices decrease		x	x	
Fish prices increase		x	x	
Fuel price increase		x	x	
Shortfall in EFF funding	x	x		

Ecosystem Interactions

The biological stock modelling that was undertaken for the *status quo* scenario was based on the methods of single species projection used by ICES. There are some key multispecies interactions that should be taken into account in sensitivity scenarios. While a full multispecies model is beyond the scope of this IA, the possible impact of some general interactions can be explored. Two interactions explored here are the cod-nephrops interaction (North Sea, Western Scotland and III a, b, c and d) and the cod-sprat interaction in the Baltic.

Nephrops populations have shown declines in the south of the EU zone and strong increases in the north. In the north, these increases have taken place at the same time as the declines in a major predator of Nephrops, cod. Although Nephrops is of relatively low nutritional value for cod, a recent report[123] concludes "Given that largely through overfishing, cod stocks have declined substantially over the past 2–3 decades almost throughout their range from the English Channel northward, a positive effect through significant release of predation mortality on the *Nephrops* populations of the area is likely to have occurred" which essentially follows the conclusions of Brander & Bennett (1989[124]). We therefore explored a decline in Nephrops stocks from 2012 at the same rate as the increase that has been experienced over the last 10 years to be coincident with a recovery of cod in the North Sea and western waters.

A similar interaction is suggested between cod and sprat in the Baltic, with the current very high sprat abundance being linked to reductions in the cod stock. To explore this issue the multispecies results of WKMAMPEL (ICES, 2009), were used in to adjust stock trajectories for sprat and cod.

Effectiveness of the Control Regulation

[123] George H. Engelhard, John K. Pinnegar, 2008. RECLAIM REsolving CLimAtic IMpacts on fish stocks. 1.6 Report of WP1 Chapter 25 – Nephrops. Available at http://www.climateandfish.eu/default.asp?ZNT=S0T1O-1P199

[124] Brander, K. M. and D. B. Bennett (1989). 'Norway lobsters in the Irish Sea: modelling one component of a multispecies resource: pp 183-204'. In: Caddy, J. F: (ed). *Marine Invertebrate Fisheries* Wiley-Interscience.

The assumption of the Control Regulation IA, and of the status quo analysis in this report, is that the Control Regulation (and, to a certain extent, the IUU Regulation) will be relatively effective in increasing compliance within the EU and reducing the level of unreported fishing in those species that have historic levels of unreported fishing. We implemented this in the model (See Annex B) through a reduction in the level of unreported catches in those stocks to 65% of their present levels over a 5 year period following the effective implementation of the Control Regulation (2011). In the EIAA model this was the following stocks: North Sea cod, Southern hake, NE Arctic cod, Atlantic mackerel and North Sea autumn spawning herring.

However there is uncertainty in what reduction of unreported catches will result from the implementation of the control regulation. It is noteworthy, for instance, that the longest-running JDP (in the North Sea) has managed to achieve an increase in compliance of only 33% over a 3 year period (see indicator 21). The sensitivity of the model output to this uncertainty is examined through the introduction of two alternative scenarios where, for the stocks named above, the level of unreported catches is reduced to 50% and 95 % of its current levels in the 5 year time frame noted.

Reduced implementation of long-term management plans

The assumption of the status quo analysis in this report is that long-term management plans will be in place for all stocks for which a LTMP has: already been adopted; is currently being developed; or, is planned to be developed (see above). However it is not currently clear whether the European Commission will have the capacity to effectively implement this assumed number of LTMPs. An alternative scenario was developed in which the number of LTMPs grows to 23 by 2017, remaining constant thereafter.

Stocks, for which LTMPs are currently under development but are considered unlikely to be adopted, are assumed to be managed under the stocks' current management for this sensitivity run. These stocks are: Bay of Biscay anchovy, Western horse mackerel, Celtic Sea cod and the Celtic Sea mixed fishery. However western horse mackerel is the only one of these stocks for which stock projections were made under the status quo option, and is consequently the only stock affected by this sensitivity run.

Prices

As discussed above, considerable uncertainty surrounds assumption of the future price of fresh fish in Europe. To explore their consequences we increased or decreased fish prices for TAC species effective in the reference period by 10% in real terms, responding to differences in the influence of external and internal factors described above. These prices were then subject to the normal EIAA price flexibility calculations. Non-TAC species prices were not adjusted.

Fuel price

The *status quo* assumption is for fuel prices to increase by 45% in 2012. However, in the recent past significant changes in fuel price have been experienced across the EU. We explored the consequences of an alternative scenario, in which fuel prices increased by an additional 45% of 2012 levels by 2017 (see section 2.2.6).

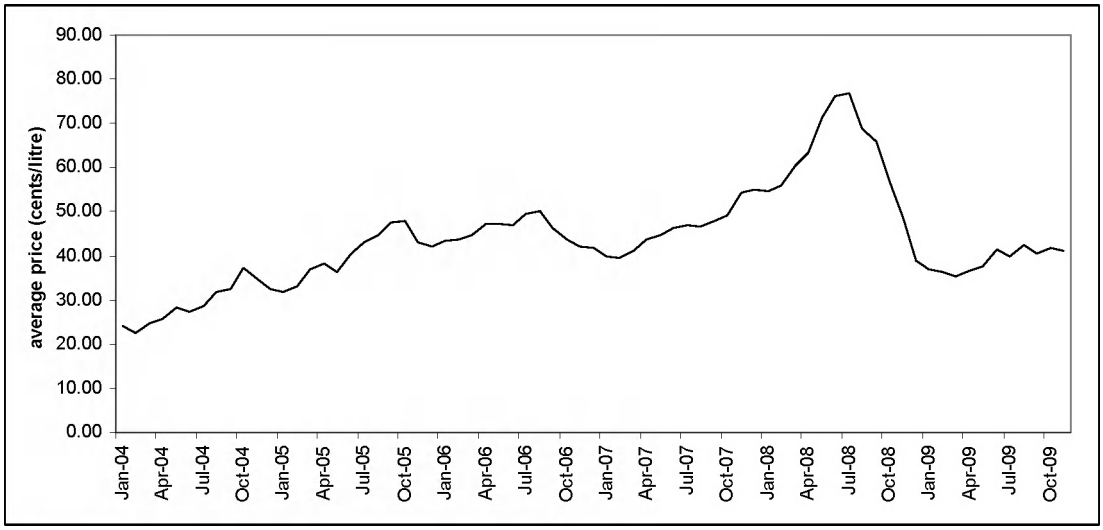

Figure 35 Trends in EU Gasoil and Brent crude price, average for 4 MS

Subsidy shortfall

It was noted in section 2.2.6 that uptake of EFF funding has been low so far. Although some slow increase in uptake should be expected, as the programme starts and as the legacy funding from FIFG 2000-2006 is reduced, this shortfall is reported to be partially due to MS having problems, in the current recession, in finding the matched funding required to access EFF funds (MS contributions should be 40% of total expenditure).

We examined the possibility that this situation would continue over the next 2 years, resulting in an overall shortfall of 50% in EFF funding drawdown.

3.2.2 Model Assumptions

Model assumptions, following the s*tatus quo* descriptions above, are presented in detail in Annex B.

4 IMPACT ASSESSMENT

The impact assessment described here is that for the status quo option. Three years for monitoring the situation are taken; 2012, at the start of the new 10-year CFP cycle; in 2017, mid-way through the cycle, and 5 years after the implementation of new policy under the 2012 revision of the CFP; and 10 years after such revision.

Our methodology for assessing the impacts of a continuation of current policy within the CFP on any indicator requires that an understanding of the **ideal state** for all indicators against which the status quo can be compared. Such consideration should derive from a general understanding of the objectives of the CFP. Since there are no agreed over-arching objectives for the CFP, we develop indicator ideal states by reference to the 2002 regulation (2371/2002).

4.1 Environmental Impact Assessment

4.1.1 Indicator 1 Stock Status with respect to F_{MSY}

The management objective for all stocks has been, since 2006, to be fished at F_{MSY}. The **ideal state** of this indicator therefore should be to have all stocks at F_{MSY}.

Under *status quo* conditions stock size should increase, but only for stocks covered by LTMPs

The development of LTMPs is likely to have two impacts on stock size. The first is that, in common with the more recently agreed LTMPs, future LTMPs are expected to have as their fishing mortality target a close approximation to F_{MSY}, which has been a stated policy objective since 2006[125]. F_{MSY} is not estimated routinely by ICES, although it is calculated for some stocks. Instead, LTMPs recently agreed (for instance Eastern Baltic cod) have set their fishing mortality target reference points close to F_{max} or between $F_{0.1}$ and F_{max} (Table 52). However, it should be noted that the latter is generally an upper limit for an expected value of F_{MSY}[126]. Furthermore, even application of F_{MSY}, particularly on lower tropic level species, has been shown to be likely to lead to negative impacts on top predators within an ecosystem[127], and recent modelling suggests that complex interactions between cod, haddock and whiting in the North Sea, and between cod, sprat and herring in the Baltic, mean that it will not be possible to simultaneously achieve yields corresponding to the MSYs predicted from single species assessments[128].

[125] Communication from the Commission to the Council and the European Parliament. Implementing sustainability in EU fisheries through maximum sustainable yield {SEC(2006) 868}Brussels, 4.7.2006, COM(2006) 360 final, and the Accompanying Staff Working Document (technical annex)
[126] Froese & Proels, in press. *Rebuilding fish stocks no later than 2015: will Europe meet the deadline?*
[127] Walters, C.J., Christensen V., Martell, S.J., Kitchell, J.F. (2005) *Possible ecosystem impacts of applying MSY policies from single-species assessment* ICES J. Mar. Sci. 62(3):558-568.
[128] Mackinson S., Deas B., Beveridge D., Casey J. (2009) Mixed-fishery or ecosystem conundrum? Multi-species considerations inform thinking on long-term management of North Sea demersal stocks. ICES J. Mar. Sci. in press.; and ICES Workshop on Reference Points in the Baltic Sea (WKREFBAS), 12-14 February 2008.

Table 52 Targets against reference points. Fishing mortality lower than Fmsy is indicated in bold.

Species	Area	LTMP	Fmax or Fpa	F0.1	Fmsy	Ftarget (LTMP)	Fproj (2012)	Fproj (2017)	Fproj (2022)
Blue Whiting	IIa,IV	Blue Whiting	-	0.18	0.18	0.18	0.31	**0.18**	**0.13**
Cod	IIIbcd (EC zone) 25-32	Cod eastern Baltic	0.25	0.15	0.22	0.30	0.30	0.33	0.30
Cod	IIa,IV IIIbcd (EC zone)	Cod IV North Sea	0.25	0.16	0.20	0.40	0.38	0.37	0.59
Cod	22-24	Cod western Baltic	0.27	0.16	0.22	0.60	0.86	0.56	0.59
Cod	I,IIb	International	0.25	0.13	0.22	0.40	0.31	0.48	0.49
Haddock	IIa,IV (EU zone)	Haddock North Sea	-	-	0.30	0.30	0.35	**0.21**	**0.30**
Hake	all northern	Hake northern	0.18	0.10	0.14	0.25	0.25	0.26	0.25
Hake	VIIIc,IX,X, CECAF	Hake southern	0.18	0.10	0.23	0.27	0.55	0.41	0.27
Herring	IIIbcd, Management Unit 3	Gulf of Riga proposed	0.00	0.26	0.26	0.26	**0.25**	**0.26**	**0.26**
Herring	IIa,IV	Herring North Sea	0.47	0.13	0.19	0.25	**0.18**	**0.11**	**0.11**
Herring	IIIbcd (EC zone)	Proposed	0.25	0.22	0.24	0.22	**0.20**	**0.22**	**0.22**
Horse Mackerel	IIa(EU),IV(EU)	International	-	-	0.15	-	-	-	-
Mackerel	all	International	-	0.17	0.20	0.21	0.29	0.23	0.23
Plaice	IIa,IV (EU zone)	Plaice North Sea	0.17	0.12	0.15	0.30	0.29	0.30	0.30
Saithe	IIa,IIIabcd,IV	Saithe North Sea	0.32	0.14	0.23	0.30	0.42	**0.23**	0.28
Sole	VIIa	Proposed	-	0.15	0.25	0.15	0.44	0.39	0.31
Sole	VIId	Proposed	0.27	0.10	0.19	0.27	0.47	0.39	0.30
Sole	VIIIab	Sole Biscay	0.24	0.10	0.19	-	0.38	0.40	0.42
Sole	II,IV	Sole North Sea	0.59	0.11	0.28	0.20	0.29	**0.23**	**0.21**
Sole	VIIfg	Sole western channel	0.25	0.12	0.19	0.25	0.31	0.26	0.26
Sprat	IIIbcd (EC zone)	proposed	0.40	0.00	0.40	0.40	0.56	**0.40**	**0.40**

The second impact of LTMPs is on the governance of a stock. For LTMPs, Council is more constrained on the quota that it can set, and there is evidence that deviation from scientific advice is lower within LTMPs. The closer adherence to scientific advice, enhanced by increasing control of fisheries (a reduction in un-reported catches) should contribute to a more rapid recovery of key stocks covered by LTMPs. However, the lack of progress to reduce discarding and the continuation of levels of unreported catch will continue to hinder recovery, and to impact on the TAC that can be taken from these stocks.

Thus the performance target is not met, even for LTMP stocks.

Our model results suggest that the number of stocks managed sustainably (with fishing mortality equal to F_{MSY}) will continue to increase very slowly, and will remain low primarily due to the fact that the target fishing mortality in the HCR is above any candidate for F_{MSY}. The proportion of our modelled stocks at F_{MSY} at 2012 is 14%, which increases to 33% in 2017. Furthermore, this increase is limited to northern stocks.

In some cases the LTMP does not bring fishing mortality into line with that specified as the target level (Table 52).There are two principle reasons for this. First, overcatch of the resource, so that actual fishing mortality exceeds that associated with the TAC set by the HCR, will prevent the target F being reached. This is the case for most of the cod species and also mackerel. Second, with a two year lag in implementation of a reduced TAC, reductions in fishing mortality to the F target level will be slowed. Thus there are cases where the LTMP may eventually achieve the target F, but not in the timeframe considered (e.g., Sole VIIa and VIId). There are also instances in which F under the LTMP ends up at a

level below F target. One notable case is for Herring in subareas IIa and IV. Here the HCR is defined by two F target values, and is dominated by a specification that the mean F on ages 0 to 1 is low. This also leads to a low mean F for ages 2 to 6 – the age range referred to by the second F target value. This second F target is the one given in Table 52.

The results for stock and catch are shown in Table 53. There is an increasing trend in stock size and catch for the analytically assessed stocks, which include all the LTMP stocks. The increase in stock size is 48% over the period 2012-2022, and the corresponding increase of catches is 17% over the same time period. In the *status quo* projection we assume no trends in the trend analysis stocks. We do, however, assume some medium term decline in biomass and increase in catch in non-modelled stocks, as a result of diversion of fishing effort from LTMP stocks in the early stages of a LTMP. Detailed results are shown in Annex B.

Table 53 Stock size and catches for modelled and non-modelled stocks from the EIAA model.

	SSB (t)				Catch (t)			
Stock	**2007**	**2012**	**2017**	**2022**	**2007**	**2012**	**2017**	**2022**
Herring IIIbcd (EC zone)	783,951	1,069,564	1,178,906	1,176,665	170,662	176,392	199,939	203,591
Herring IIIbcd, Management Unit 3	534,571	508,120	494,785	474,540	129,100	103,893	93,011	88,748
Herring IIa,IVab	1,233,800	1,272,303	2,613,725	3,293,189	315,351	83,135	126,050	171,877
Herring IVc,VIId	-	-	-	-	50,023	13,187	19,995	27,264
Cod I,IIb	621,033	1,662,358	1,326,018	836,773	20,337	28,611	32,260	26,974
Cod IIIbcd (EC zone)	83,292	394,714	398,590	391,731	71,477	130,467	136,679	138,658
Cod IIa,IV	34,475	104,596	227,075	137,449	19,260	28,097	57,459	50,902
Haddock IIa,IV (EU zone)	298,800	190,758	350,582	414,141	44,546	32,258	39,494	41,370
Hake IIIa,IIIbcd	129,800	146,149	128,337	130,789	1,323	1,613	1,408	1,430
Hake IIa,IV (EU zone)	-	-	-	-	1,541	1,879	1,641	1,666
Hake Vb,VI,VII,XII,XIV	-	-	-	-	24,617	30,009	26,206	26,613
Hake VIIIabde	-	-	-	-	16,419	20,015	17,479	17,750
Hake VIIIc,IX,,X,CECAF	16,109	21,368	19,579	30,767	6,661	6,210	6,412	7,891
Blue Whiting IIa,IV	7,129,418	4,208,594	7,555,832	9,282,547	106,313	41,384	54,250	62,119
Blue Whiting Vb,VI,VII	-	-	-	-	222,109	86,460	113,339	129,779
Blue Whiting VIIIabd	-	-	-	-	30,283	11,788	15,453	17,694
Blue Whiting VIIIc,IX,,X,CECAF	-	-	-	-	62,852	24,466	32,073	36,725
Plaice IIa,IV (EU zone)	247,639	512,247	548,303	539,413	55,820	84,165	84,684	82,451
Saithe IIa,IIIabcd,IV	276,982	157,622	253,255	297,212	59,160	34,061	37,427	39,452
Saithe Vb,VI,XII,XIV	-	-	-	-	12,787	7,362	8,090	8,527
Mackerel IIa (EU),IIIabcd,IV	2,476,318	2,776,600	2,895,262	3,011,895	17,621	21,326	22,155	23,293
Mackerel IIa,Vb,VI,VII, VIIIabde,XII,XIV	-	-	-	-	227,320	275,003	285,700	300,371
Mackerel VIIIc,IX,,X,CECAF	-	-	-	-	26,176	31,679	32,911	34,601
Sole II,IV	25,778	38,357	51,410	56,081	17,470	13,765	14,699	15,060
Sole VIIa	1,741	1,804	1,945	2,389	960	743	679	662
Sole VIId	9,679	8,411	10,837	13,274	5,720	4,459	4,330	4,423
Sole VIIfg	2,964	3,084	3,550	3,888	950	1,035	1,001	1,043
Sole VIIIab	12,485	14,964	14,490	13,735	4,060	4,642	4,732	4,693
Sprat IIIbcd (EC zone)	1,475,840	783,917	1,014,950	1,012,290	440,908	205,553	241,000	247,839
Horse Mackerel IIa(EU),IV(EU)	3,500,287	2,019,921	2,165,698	2,431,781	40,957	51,181	51,248	50,841

	SSB (t)				Catch (t)			
Stock	**2007**	**2012**	**2017**	**2022**	**2007**	**2012**	**2017**	**2022**
Horse Mackerel VI,VII, VIIIabde, XII,XIV,Vb(EU)	-	-	-	-	135,257	169,022	169,240	167,896
Horse Mackerel VIIIc,IX	-	-	-	-	55,000	68,730	68,819	68,272
Total	**18894962**	**15895451**	**21253129**	**23550549**	**2393043**	**1792590**	**1999864**	**2100474**

Sorted by categories cf. with EIAA model

4.1.2 Indicator 2 LTMPs

The management objective stated in Regulation 2371/2002 was to manage by LTMP. The **ideal state** of this indicator would therefore be to have all stocks subject to LTMPs.

The scope for LTMPs to be implemented on EU stocks is limited by the number of stocks that can be analytically assessed. Despite the improvement in data from the DCF, it is likely that the majority of stocks will remain without analytical assessments throughout the life of the 2012 CFP reform. Our assessment is that by 2017 LTMPs will exist for about 32 stocks, compared to the 22 at present and slightly more than the number of analytically assessed stocks (about 30). Because the Lisbon Treaty will likely come into force in 2010, we anticipate that there will be a hiatus in the generation of agreements on LTMPs, such that the number agreed by 2012 may be no more than 26 (the present number plus 3 Baltic herring stocks and 1 Baltic sprat). Thus although the number of LTMPs will increase this percentage increase may be only about 33% in number.

Although this may represent an increase in catches under LTMPs, there will remain a need to bring several remaining key stocks under LTMPs, such as anglerfish, whiting and megrim. Advances in methods of assessing and managing data poor fisheries, including approaches such as those outlined in the Commission's communication of June 2009, may contribute to the generation of LTMPs in the period 2017 to 2022 for some of the stocks lacking analytical assessments. However, to date there are no LTMPs, and to our knowledge no plans for LTMPs, in the Mediterranean beyond the current ICCAT-compliant recovery plan for bluefin tuna.

Thus the performance target is not met.

4.1.3 Indicator 3 Average size (length and weight) of fish

Large fish were arbitrarily defined as those fish greater than or equal to 25% of the maximum weight at age. This criterion defined a minimum age for large fish, so that the proportionate biomass of large fish could be estimated as the proportion of the total biomass in this age class and above.

Because all fish stocks grow differently there is no natural ideal state with respect to this indicator or with reference to the stated objectives in Regulation 2371/2002.

Stock	**Increase of large fish (%) over 2012**	
	2017	**2022**
Herring west & central IIIbcd	0	0
Herring IIIbcd MU 3	0	0
Herring north sea	0	0
Cod NE Arctic	5	1
Cod 24-32	10	8
Cod North Sea	16	20

Stock	Increase of large fish (%) over 2012	
	2017	2022
Haddock North Sea	-4	0
Hake northern	1	1
Hake southern	7	12
Blue whiting	4	12
Place IV	11	11
Saithe NS	0	6
Mackerel NE Atlantic	-1	0
Sole NS	1	6
Sole VIIa	-1	2
Sole VIId	-1	3
Sole VIIfg	0	-1
Sole VIIab	4	12
Baltic sprat	4	12
Horse mackerel WS	-36	-29

A general result from our models is that as stocks recover the mean size of fish will increase. Our results do not produce universal increases in the proportion of large fish; in cases where the stock size is currently higher than the target, we see initial decreases in the proportion of large fish.

Thus the target is met for LTMP stocks but not for others.

4.1.4 Indicator 4 Fleet size

The ideal state of this indicator would be that **fleet capacity matches fishing opportunities**. There is no EU target for capacity matching opportunities but it is generally acknowledged that fleet reductions of at least 30% are required over the reference levels[129]. Thus an ideal state would be a 30% reduction from 2007 levels in the short term (by 2017 at the latest). We would expect a further reduction to be required after 2017, with the ideal state seeing fleet size reduced by 40% in 2022, to compensate for some technological improvement (see below).

Fleet size will continue to decline in the *status quo* scenario, at an average rate of 2% per year. Some fleets will decline faster than this in the first instance. There is evidence, from Denmark and also from countries outside the EU that transferable rights based systems such as ITQ result in significant fleet rationalisation. Although the use of these systems in the EU is growing, our assumption is that only Denmark, Netherlands, Sweden, Poland and Estonia will have ITQ systems in place that result in significant (30%) reductions in before 2017. Other fleets will experience more gradual declines, but again to about 30% of 2007 values.

Technological improvements will almost certainly deliver some increased efficiencies by 2022 and the level of ITQ management in the EU will continue to be relatively small. Some

[129] This is implied by the targets included in the 2008 regulation on Fleet Adaptation Schemes, Council Regulation 744/2008.

early analyses[130] suggest that technological improvements will increase fishing power (capacity) faster than our assumed 2% per year reduction in fleet size (i.e. at about 3-6% per year). More recent studies of EU fleets suggest that the rate of technological improvement in fishing power is variable from segment to segment, depends on the current level of technology and incentives, and may be less than 2% per year[131]. This would mean that fleet capacity would no longer have been reduced sufficiently to meet available opportunities, even when increasing stock sizes are taken into account.

A further consideration for capacity reduction is the alternative scenario, described in section 4.5, in which Member States cannot find sufficient matched funding in the current economic climate to make full use of Axis 1 EFF funds. Please see that section for a discussion.

Table 54 Anticipated numbers of vessels by country for modelled segments only, assuming that recent declines continue, or, if they have been great, will lead to small continuing reductions in fleet size.

MS	2007	2012	2017	2022	2017 decline (%)	2022 decline (%)
BEL	94	80	73	66	9%	18%
DEU	351	317	286	259	10%	18%
DNK	400	400	400	362	0%	10%
EST	885	800	722	653	10%	18%
ESP	12,057	10,895	10,302	9,312	5%	15%
FIN	1,382	1,224	1,105	999	10%	18%
FRA	2,821	2,382	2,299	2,079	3%	13%
GBR	3,155	2,954	2,840	2,567	4%	13%
IRL	1,518	1,372	1,240	1,121	10%	18%
LTU	21	19	17	16	10%	18%
LVA	815	737	666	602	10%	18%
NLD	325	279	241	217	14%	22%
POL	726	637	563	509	12%	20%
PRT	2,389	2,247	2,115	1,912	6%	15%
SWE	931	793	680	615	14%	22%
Total	**27,870**	**25,136**	**23,549**	**21,287**	**6%**	**15%**

4.1.5 Indicator 6 Area covered by protection regimes

An **ideal state** would be an increase in protected areas to a maximum of 30% of fishable area, which is a target in line with calls from environmental NGO132.

The proportion of continental fishable areas (<1500m) receiving protection under fisheries management regulations, which primarily restrict bottom trawling only, is about 16%. This is due to rise to 23% by 2012 when all marine Natura 2000 areas are implemented. These are likely to afford much greater protection from all fishing than the fishery management regulations, and on their own are about 7% of fishable areas.

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[130] FAO J. Fitzpatrick, 'Technology and Fisheries Legislation', in *Precautionary approach to fisheries Part 2: Scientific papers* (Rome: FAO, 1996), FAO Fisheries Technical Paper 350/2, pp. 191-199. Available at http://www.fao.org/docrep/003/w1238E/W1238E09.htm

[131] R. Banks (RBL), S. Cunningham (IDDRA), W.P. Davidse (LEI), E. Lindebo (SJFI), A. Reed (RBL), E. Sourisseau (IDDRA), J.W. de Wilde. The impact of technological progress on fishing effort. The Hague, LEI, 2002, Report PR.02.01; ISBN

[132] Roberts, C. M. & L. C. Mason, 2008. Return to Abundance: a case for marine reserves in the North Sea. WWF-UK publication.

Discerning general trends within these data is difficult, because the implementation of restricted areas appears to have been episodic in the past, but outside of these episodic periods the increase in percentage appears to have been 0.5% per year. Thus we might suggest that the 23% protected in 2012 would rise to 28% by 2022, a proportion close to that suggested by NGOs.

4.1.6 Environmental Indicators in the Mediterranean

With regards to the Mediterranean Sea, the comparison of likely impact of current CFP policy on the status quo reveals that current fishing practices may not be sustainable. The majority of Mediterranean commercial fish stocks are over-exploited (see section 2.1 and GCFM[133]). IUU fishing and harvesting have resulted in the decline of many Mediterranean target species and non-target species. In some areas destructive fishing practices such as drift-netting persist[134]. Several species, including 60% of Mediterranean cetacean and 40% of shark and ray species are threatened with extinction (Nilufer Oral et al., 2009[135]).

Without positive action, this situation would be unlikely to lead to an improvement in environmental performance (and increase in the environmental indicators) over the future course of the CFP. However, along with the rest of the EU Mediterranean states are decreasing their fleet sizes; furthermore, as noted above the Mediterranean Regulation (1967/2006) there will be over the next few years an increasing use (from the Regulation and by improved control) of 40 and 50 mm mesh sizes.

Projections of fishing mortality for the most important demersal species in GSA 16 are reported in Table 55. Under status quo conditions, fishing mortality decreases as a consequence of the reduction in the number of vessels. Indeed, the Italian Operational Programme foresees a decommissioning plan for demersal fleet in two steps. In the periods 2008-2010 and 2011-2013, demersal trawlers and other fleets involved in demersal fisheries in GSA 16 should decrease by 25% and 5% respectively. As fishing mortality by species is the sum of fishing mortality determined by different fleet segments, the species predominantly by demersal trawlers, like European hake and deepwater rose shrimp, will see a stronger reduction in F. A further reduction in fleet size by a 2% per year is assumed from 2018 for all fleet segments. This is reflected in the decrease in F from 2017 to 2022.

Another factor affecting the fishing mortality of demersal species is represented by the introduction of the 40mm mesh size required under regulation 1967/2006. Even though the new mesh size should be in force in 2010, a intermediate period needed for its application seems to be likely. The effects of this management measure have been introduced in the model from 2013 for European hake and deepwater rose shrimp by reducing F of 28% and 9.6% respectively.

Despite the fact that these developments will have a positive impact on the GSA-16 stocks modelled in BIRDMOD/HDA, in all cases fishing mortality remains above the proxy for Fmsy (i.e. above F0.1). In other words, the CFP targets are not met.

Table 55 Projections of fishing mortality for demersal species in GSA 16

Species	Area	F 0.1	F current (2008)	F proj (2012)	F proj (2017)	F proj (2022)
European hake	GSA 16	0.16	0.84	0.80	0.55	0.51
Norway lobster	GSA 16	0.1	0.14	0.14	0.12	0.11

[133] http://www.gfcm.org/gfcm/topic/17104
[134] http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/412
[135] http://ec.europa.eu/maritimeaffairs/pdf/mediterranean_expert_group_report_en.pdf

Species	Area	F 0.1	F current (2008)	F proj (2012)	F proj (2017)	F proj (2022)
Striped mullet	GSA 16	0.37	0.34	0.32	0.29	0.27
Deepwater rose shrimp	GSA 16	0.83	3.44	3.28	2.67	2.47
Giant red shrimp	GSA 16	0.35	0.73	0.71	0.63	0.58
Red mullet	GSA 16	0.37	1.12	1.08	0.96	0.88

The evolution of the fleet size from 2008 to 2022 is mainly based on the Italian Operational Programme. As reported above, this Programme foresees a decommissioning plan for all Italian fleet segments. In the three GSAs where Sicilian fleet is located (GSA 10, 16 and 19) a reduction of 25% for demersal trawlers and 5% for other fleets involved in demersal fisheries is planned in the periods 2008-2010 and 2011-2013. As for purse seiners, a plan to reduce 30% of the number of Italian vessels involved in tuna fishery is foreseen. The effects of this reduction on Sicilian purse seiners has been estimated in the percentage reported in Section 2. A reduction in fleet size by a further 2% per year is assumed from 2018 for all fleet segments.

Table 56 Projections of number of vessels by fleet segment

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	573	501	413	373	-18%	-26%
Purse seiners	121	121	104	94	-14%	-22%
Small scale fishery	2,135	2,082	1,948	1,761	-6%	-15%
Polyvalent	49	48	45	40	-6%	-15%
Polyvalent passive	144	140	131	119	-6%	-15%
Longlines	174	170	159	144	-6%	-15%
Total	**3,196**	**3,062**	**2,800**	**2,531**	**-9%**	**-17%**

4.2 Economic Impact Assessment

Summary results from the EIAA model are presented below.

Table 57 Results from the EIAA model by MS. Note that total rows are the indicators calculated across the whole database not averages or sum of rows above in table. [136]

	2012					2017					2022				
	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment
Indicator		7	8	9	10		7	8	9	10		7	8	9	10
BEL	83	16	0.93	-13%	-17%	82	83	30	0.94	-17%	83	30	0.94	-11%	-18%
DEU	145	105	1.51	30%	172%	152	151	117	1.59	223%	151	117	1.59	34%	252%
DNK	300	179	1.30	4%	3%	310	313	202	1.35	4%	313	202	1.35	10%	7%
EST	26	7	1.22	12%	16%	26	26	10	1.33	26%	26	10	1.33	20%	35%
ESP	1415	445	1.02	-2%	-1%	1399	1414	535	1.05	0%	1414	535	1.05	1%	1%
FIN	14	2	0.92	-41%	-47%	14	13	3	0.98	-43%	13	3	0.98	-31%	-40%
FRA	948	472	1.18	6%	6%	946	947	521	1.23	8%	947	521	1.23	10%	11%
GBR	648	262	1.20	9%	4%	680	686	346	1.29	6%	686	346	1.29	16%	8%
IRL	215	112	1.31	16%	12%	216	217	125	1.39	16%	217	125	1.39	22%	20%
LTU	5	4	1.25	18%	42%	5	6	4	1.30	54%	6	4	1.30	22%	66%
LVA	12	5	1.36	25%	64%	13	13	6	1.55	91%	13	6	1.55	34%	113%
NLD	342	124	1.16	1%	1%	353	358	176	1.27	13%	358	176	1.27	11%	22%
POL	34	19	1.44	24%	12%	35	35	21	1.50	17%	35	21	1.50	29%	20%
PRT	250	138	1.33	16%	12%	251	247	144	1.31	12%	247	144	1.31	16%	13%
SWE	62	26	1.46	21%	11%	63	63	31	1.56	15%	63	31	1.56	28%	19%
TOTAL	**4499**	**1916**	**1.15**	**5%**	**3%**	**4545**	**4572**	**2270**	**1.20**	**5%**	**4572**	**2270**	**1.20**	**10%**	**7%**
Increase over 2012						1%	10%	2%	3%	2%	2%	19%	4%	5%	4%

Table 58 Results from the EIAA model by fleet size. Note that total rows are the indicators calculated across the whole database not averages or sum of rows above in table

	2012					2017					2022				
	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment	Income (mln)	GVA (mln)	Revenue/ Break Even Revenue	Net Profit Margin	Return On Investment
		7	8	9	10		7	8	9	10		7	8	9	10
0012	741	453	1.40	19%	13%	739	469	1.43	21%	15%	739	485	1.46	24%	19%
1224	1213	529	1.10	3%	2%	1227	585	1.12	5%	4%	1231	627	1.14	7%	6%
2440	1260	372	1.02	-4%	-2%	1265	426	1.04	-2%	-1%	1283	503	1.06	0%	0%
40XX	1285	561	1.25	9%	4%	1313	625	1.30	13%	6%	1318	656	1.33	16%	8%
TOTAL	**4499**	**1916**	**1.15**	**5%**	**3%**	**4545**	**2105**	**1.18**	**8%**	**5%**	**4572**	**2270**	**1.20**	**10%**	**7%**
Increase over 2012						1%	10%	2%	3%	2%	2%	19%	4%	5%	4%

[136] Note that the EIAA model uses profit calculated from the AER data, which is revenue minus costs. The calculations undertaken in Section 2 utilise the actual profit reported in AER data. For most fleets the discrepancy between the two is minor, but for some smaller vessels, particularly from the Mediterranean, it is significant. Furthermore, the indicators in Section 2 give results for the entire EU fleet by segment, including the Mediterranean fleets. The EIAA model did not include these fleets. See Annex A Table A.44 for details. Consequently, the results in this section are not directly comparable with the tables for indicators 8-9 in Section 2.

Table 59 Summary of the number of fleet segments within a category meeting the targets for three indicators, expressed as a % of the total number of fleet segments in each category. The three indicators are break-even revenue (indicator 8), net profit margin (9) and ROI (10).

	2012			2017			2022		
Fleet	**% profitable > 5%**	**% ROI > 15%**	**% Break Even Revenue > 1**	**% profitable > 5%**	**% ROI > 15%**	**% Break Even Revenue > 1**	**% profitable > 5%**	**% ROI > 15%**	**% Break Even Revenue > 1**
0012	60%	40%	93%	67%	60%	93%	73%	60%	93%
1224	40%	7%	87%	73%	13%	87%	73%	27%	93%
2440	38%	31%	56%	50%	31%	63%	56%	38%	63%
40XX	64%	27%	100%	82%	27%	100%	82%	45%	100%
TOTAL	**49%**	**26%**	**82%**	**67%**	**33%**	**84%**	**70%**	**42%**	**86%**
Increase over 2012				18%	7%	2%	21%	16%	4%

4.2.1 Indicator 7 Gross Value Added

The **ideal state** for gross value added (GVA) in the catching sector should be a gradual increase in both total GVA and GVA per vessel, and for this increase to be demonstrated in all major fleet categories (gear types and vessel lengths).

The trend over the last 5 years has been for static levels of total GVA for almost all gear types and vessel sizes, although given declining vessel numbers over the same period this implies slight increases in GVA per vessel.

The EIAA model suggests that

- For the EU as a whole, GVA for fleet segments included increased by 10% between 2012 to 2017, and by an additional 9% by 2022 (i.e., a total increase over the 10 year period of 19%). If one applies this increase to total GVA for the EU as a whole as reported in indicator 7 (3.74 billion Euro), the total increase in EU GVA would be negligible.

- On a MS-basis, percentage increases in GVA appear to be greater for Denmark, Belgium, UK, Germany, Ireland, Lithuania, Latvia, Netherlands, and Poland. This due to differing dependencies on stocks and their varying recovery.

- On a vessel size basis, the improvement in GVA over the period 2012-2022 is greatest for the 24-40m size of vessels (35% improvement over the period) and least for the smallest vessels (0-12m; 6.8% improvement). This reflects the lower dependency of these smaller vessels on the main recovery stocks, and a higher dependency of them on coastal stocks. For instance, the proportion of modelled quota stocks in the catch of 0-12m vessels, across the non-Mediterranean EU, was only 21% in 2007, compared with 41%, 37% and 56% for vessels in the size classes 12-24, 24-40 and 40+.

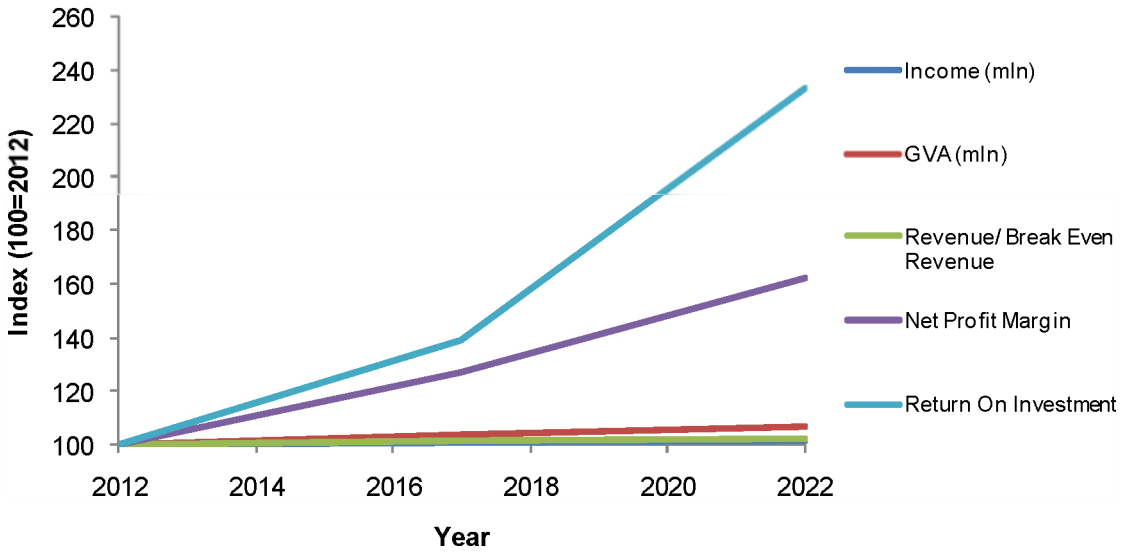

Figure 36 Relative change in economic indicators for 2012-2017-2022 (indexed so that 2012 = 100)

- Figure 36 shows that the EIAA model predicts a positive relative change in GVA over the period 2012-2022.

- Under the status quo option, the respective proportions of GVA for the modelled fleets contributed by the four different vessel size groupings (0-12, 12-24, 24-40 and 40+m) are 0.23, 0.28, 0.19 and 0.29 in 2012, 0.22, 0.28, 0.20 and 0.30 in 2017, and 0.21, 0.28, 0.22 and 0.29 in 2022.

In the processing sector, trends in GVA are not available – there appear to be significant discrepancies in data provided in the 2007 European Parliament report (data for 2005) and recent data made available by some MS to the STECF-SGECA (October 2009). 2007 data are only available for some MS, and different methodologies used in the two datasets almost certainly explain most of the differences between data for 2005 and 2007.

Consequently, we estimated the impact on GVA in the processing sector from an analysis of processing sector GVA multipliers. These were calculated as follows:

- Catching sector and processing sector GVA was taken for each MS from recent AER data where possible, and supplemented in the case of the processing sector by other available data where data for 2007 were not available;

- The value of landings in different MS was assessed, along with the value of imports to MS most likely to be processed in MS, and noting that not all imports are processed in the EU;

- Landings as a proportion of landings plus imports is used to determine processing value-added that is derived from landings in MS ports, as distinct from processing sector value-added derived from both landings and imports. This in turn enables a more accurate multiplier between landings and processing. This treatment of imports is considered important to ensure that changes in fleet GVA model outputs do not overestimate changes in GVA in the processing sector (i.e. multipliers between the catching and processing sectors are smaller when one considers imports)

Ancillary sector multipliers are not assumed to be dependent on imports and thus ancillary sector GVA are assumed to change in proportion to changes in catching sector GVA based on the backward multipliers for each MS.

Table 60 Income/value-added multipliers by Member State

Country	Capture fisheries value-added '000s (1)	Process industry value-added '000s (1)	2006 landings into MS ports (2)	2007 import of product for processing (3)	landings as % of landings + imports	processing GVA from landings '000s	downstream processing value-added multiplier	upstream ancillary value-added multiplier (4)
BEL	33,350	84,668	82,910,000	199,501,560	29%	24,857	0.75	0.40
CYP	6,480	2,100	5,463,000	18,771,960	23%	473	0.07	0.27
DEU	82,780	387,900	113,471,000	507,351,090	18%	70,899	0.86	0.19
DNK	221,200	222,550	445,754,000	853,129,530	34%	76,375	0.35	0.31
EST	555,890	1,611,276	2,122,000	25,712,370	8%	122,838	0.22	0.30
ESP	19,590	23,756	1,679,668,000	2,199,023,400	43%	10,288	0.53	0.04
FIN	10,500	28,700	9,296,000	91,909,810	9%	2,636	0.25	0.00
FRA	650,410	711,600	842,042,000	1,104,221,530	43%	307,870	0.47	0.23
GBR	351,040	607,737	679,924,000	585,009,710	54%	326,669	0.93	0.19
GRC	564,450	114,800	336,186,000	191,417,240	64%	73,150	0.13	0.52
IRL	83,860	90,000	314,810,000	33,716,590	90%	81,293	0.97	0.31
ITA	825,240	358,188	1,518,120,000	1,283,926,570	54%	194,063	0.24	0.22
LTU	1,450	27,546	13,000,000	67,896,640	16%	4,427	3.05	1.34
LVA	8,720	66,700	14,300,000	44,186,120	24%	16,308	1.87	0.49
MLT	2,600	1,400	5,612,000	16,198,190	26%	360	0.14	0.08
NLD	165,200	165,329	335,687,000	473,378,530	41%	68,596	0.42	0.31
POL	22,270	202,089	13,400,000	330,564,860	4%	7,873	0.35	0.08
PRT	151,800	171,205	213,021,000	660,261,590	24%	41,762	0.28	0.08
SVN	960	11,572	1,514,000	18,421,410	8%	879	0.92	2.73
SWE	66,460	114,861	116,577,000	847,775,690	12%	13,885	0.21	0.16
Total	**3,824,250**	**5,003,977**	**6,742,877,000**	**9,552,374,390**	**-**	**1,445,502**	**-**	**-**

(1) black text 2007 AER data for catching and processing sectors, red text 2005 EP study data

(2) data from CFP Facts and Figures

(3) Imports based on products likely to be processed in EU: whole fresh and frozen fish (0302 and 0303) and variety of cephalopods likely to be processed (030729, 030749, 030799). Source: COMEXT data

(4) value-added ancillary multiplier assumed same as employment ancillary multiplier due to data availability issues

The ideal state for GVA in the processing sector should be increases from the base year, and increased GVA multiplier effects between the catching and processing sectors (see Table 61 below).

Under the status quo, catching/processing sector multipliers are not expected to change, but total processing GVA will increase in proportion to increases in catching sector GVA as described above assuming that total imports available for processing do not change.

Table 61 Expected GVA multiplier effects from the EIAA model results

	2012		2017		2022	
	GVA Processing (million euro)	**GVA Ancillary (million euro)**	**GVA Processing (million euro)**	**GVA Ancillary (million euro)**	**GVA Processing (million euro)**	**GVA Ancillary (million euro)**
Indicator	7c	7d	7c	7d	7c	7d
BEL	18	8	17	7	17	7
DEU	81	14	85	13	84	11
DNK	59	50	61	50	62	45
EST	2	2	2	2	2	2
ESP	233	17	230	16	233	14
FIN	1	0	1	0	1	0
FRA	236	104	235	97	235	91
GBR	264	49	276	47	279	42
IRL	109	30	109	27	110	24
LTU	5	1	5	1	5	1
LVA	11	3	12	3	12	2
NLD	57	39	59	33	59	30
POL	5	1	6	1	6	1
PRT	39	11	39	10	39	9
SWE	5	3	5	3	5	2
TOTAL	1123	331	1142	309	1149	283
Increase over 2012			2%	-7%	2%	-15%

The aquaculture sector in the EU is estimated to generate 1.6 billion Euro of value added (2005) although data trends by year are not available. The increased production across many of the EU MS (see Annex C) suggest that under the status quo option GVA should increase slightly over 2012-2022 in both real and absolute terms, but quantitative estimates are not possible.

Value added in the EU from ancillary activities (e.g. inputs to the catching sector such as vessel construction, gear suppliers, engine repair and supply, etc) is estimated for 2005 at 0.8 billion Euro. The **ideal state** should be for ancillary activity GVA to increase proportionally with increases in GVA in the catching sector (percentage increases over and above increases in the catching sector might imply rising input costs for the catching sector and therefore have negative impacts on GVA for the fleet). The EIAA model suggests that under the status quo option catching sector GVA does indeed slowly rise, and there is no particular reason to suppose that backward multipliers to the ancillary sector will change or that GVA in the ancillary sector will not also therefore rise slightly.

4.2.2 Indicator 8 Revenue to Break-even Revenue

The **ideal state** for the ratio of revenue to break-even revenue in both the catching and processing sectors is for all fleet segments and vessel sizes, and all national processing sectors, to have ratios greater than 1, implying that cash flow is sufficient to cover costs (excluding depreciation and interest).

For the catching sector, historical trend analysis suggests that half of the fleet segments in the EU have ratios of greater than 1, and that the fleets that do tend to be the 0-12m and 12-24m segments, and those using passive gears (i.e., not the PTS and DTS segments). Furthermore trends over 2003 to 2007 in the ratio for the most important fleets in terms of EU GVA, and for the EU as a whole, show a static or very slight declining trend in the ability of revenues to cover costs.

The EIAA model suggests that under the status quo option:

- In 2012, 47 out of the 57 fleet segments included in the model have ratios of greater than 1, but that by 2017 the number with ratios of greater than 1 increase to 48, and again to 49 in 2022.

- In 2012 for all fleet segments included the ratio is 1.17, and that this ratio changes to 1.19 by 2017 and to 1.20 by 2022.

- With respect to the performance of different vessel sizes and gear types, under the status quo option, for the four different vessel size groupings (0-12, 12-24, 24-40 and 40+m[137]) 93%, 87%, 56% and 100% respectively of the fleets included have ratios greater than 1 in 2012, 93%, 87%, 63% and 100% of the fleets included have ratios greater than 1 in 2017 and these remain stable through to 2022 with the exception of VL1224 which will increase to 93%.

- There is virtually no relative change in revenue to break-even revenue over the period 2012-2017-2022 (see Figure 36).

For the processing sector, ratios only just greater than 1 for most countries suggest that the sector in most Member States is facing severe financial difficulties. Trend analysis is not possible due to data availability and this makes forward projections to the base year in 2012 and beyond problematic. Changes in the ratio are therefore not modelled using the EIAA model. Nevertheless under the status quo option it can be assumed that performance will gradually increase as stocks recover slowly and more fish becomes available for processing (assuming that costs don't increase faster than increases in revenues).

4.2.3 Indicator 9 Net Profit Margin

STECF and the AER report assume that fleet segments with a profitability of >5% are "profitable", those with profitability <5% and >-5% are "stable" and those with profitability <-5% are "unprofitable. An **ideal state** should therefore be that all fleet segments are profitable.

Trend analysis for the catching sector shows slightly improving performance over recent years for many fleet segments, but for many of the most important fleets in terms of overall

[137] Note that the smaller vessel sizes generally also correspond with the more passive gear types.

contributions to value-added, and for many of the larger vessel sizes using active gears, net profit margins remain poor.

The following 22 (49%) of the 57 modelled fleets are calculated from the AER data to be unprofitable (net profit margins < -5%) in the reference period (See Annex B). This proportion is higher for the small vessel sector (0-12m), in which 64% of the modelled sectors are unprofitable (9 out of 14).

The EIAA model suggests that under the status quo option:

- By 2012 the number of profitable segments has increased to 28, and by 2022 it is 40.
- Overall net profit margin improves from 5% in 2012 to 10% in 2022, with 70% of fleet segments profitable.
- On an MS-basis, the improvement in profitability over the 2012-2022 period appears to be greatest for Denmark, Spain, UK and the Netherlands, with no improvement shown Portugal. This reflects the distribution and share of significantly improved stocks in these difference Member States.
- Net profit margin shows a positive relative increase over the period 2012-2017-2022, as shown in Figure 36.

For the processing sector, net profit margins are only greater than 10% for one country in 2007 for which data are available, and this suggest that the sector in most Member States is facing severe financial difficulties. Trend analysis is not possible due to data availability and this makes forward projections to the base year in 2012 and beyond problematic. Changes in net profit margins are therefore not modelled using the EIAA model. Nevertheless under the status quo option it can be assumed that performance will gradually increase as stocks recover slowly and more fish becomes available for processing (assuming that costs don't increase faster than increases in revenues).

4.2.4 Indicator 10 Return on Investment

There is no firm basis for identifying a 'sufficient' return on investment (RoI) in both the catching and processing sectors that would represent an **ideal state**. However one might assume that a RoI of at least 15% could be deemed as being sufficient for the catching sector and at least 10% as sufficient for the processing sector, and that under an **ideal state** all fleets and processing sectors should achieve these respective targets. These percentage RoIs would provide for a sufficient RoI to cover the risk of investing in the sector over and above investing in low risk government long-term bonds.

Trend analysis for the catching sector shows flat performance over recent years for many fleet segments, but for many of the most important fleets in terms of overall contributions to value-added, and for many of the larger vessel sizes using active gears, RoI remain poor.

The EIAA model suggests that under the status quo option:

- In 2012, 15 of the 57 fleet segments included in the model have a RoI of more than 15%, but that by 2017 this number increases to 19, and to 24 by 2022.
- In 2012 for all fleet segments included in the model, the overall RoI is 3.0%, and this changes to 5% by 2017 and to 7% by 2022.

- On a MS-basis, changes appear to be greater for Denmark, Estonia, Spain, France UK, and the Netherlands.

- With respect to the performance of different vessel sizes and gear types, under the status quo option, for the four different vessel size groupings (0-12, 12-24, 24-40 and 40+m[138]) 40%, 7%, 31% and 27% respectively of the fleets included have an RoI greater than 15% in 2012, 60%, 13%, 31% and 27% of the fleets included have an RoI greater than 15% in 2017, and 60%, 27%, 38% and 45% of the fleets included have an RoI greater than 15% in 2022.

- Return on investment shows a positive relative increase over the period 2012-2017-2022, as shown in Figure 36.

For the processing sector, RoI is only greater than 10% for two countries in 2007 for which data are available, and this suggest that the sector in most Member States is facing severe financial difficulties. Trend analysis is not possible due to data availability and this makes forward projections to the base year in 2012 and beyond problematic. Changes in the RoI are therefore not modelled using the EIAA model. Nevertheless under the status quo option it can be assumed that performance will gradually increase as stocks recover slowly and more fish becomes available for processing (assuming that costs don't increase faster than increases in revenues).

4.2.5 Indicators 7-10 The Mediterranean case

Adriatic small pelagics (MEFISTO)

The impact assessment of the status quo option presented above deals with fleets operating in NE Atlantic waters. An impact assessment of the status quo for the Mediterranean using the EIAA model has not been completed because the Mediterranean management system is not based on TACs, but on effort control. To assess the impacts of the status quo option in the Mediterranean, it is therefore more appropriate to use a bio-economic model based on effort control. The status quo impact assessment in the Mediterranean is based on use of the MEFISTO bio-economic model.

An issue of concern with regards to the modelling is the lack of robust time series data. However we have adopted an approach whereby existing case study data for the Volanta fleet segment collected in the Northern Adriatic for 2004 has been corrected using AER trend data for a similar fleet in Italy (PTS1224). This has allowed for a reference period that is based not just on the year of data collection but on a series of years. In particular, AER trends with regards to vessel numbers, effort days, employment, fleet GT, and fuel costs have been used to project fleet performance forward from 2004 to the base year in 2012 based on AER data for 2002-2007 and similar assumptions post 2007 up to 2012 as used in the EIAA model.

Annex B presents more detailed discussion with regards to the data sources, methodology, analysis and findings. Key findings with regards to economic indicators 7-10 are shown below.

[138] Note that the smaller vessel sizes generally also correspond with the more passive gear types.

Table 62 Economic indicators for the Adriatic Volanta segment

Volanta	2012	2017	2022
GVA m	4 053 167	4 164 821	5 230 178
GVA pv	109 545	122 495	163 443
Revenue to break-even revenue	1.15	1.17	1.23
NPM	-7%	-5%	1%
RoI	8%	8%	11%

The results show that performance gradually increases as fleet size declines.

Sicilian multispecies fisheries (BIRDMOD)

The HDA model has been used to simulate the Status quo scenario for Sicilian multi-species fisheries under the following assumptions:

- Average days at sea by fleet segment are supposed to be constant and equal to the average value estimated in the period 2006-2008.
- Fuel price is expected to increase by 45% in 2012 on 2008 prices.
- A reduction in the number of vessels of 25% for demersal trawlers and 5% for other fleets involved in demersal fisheries are planned in the Italian Operational Programme for the periods 2008-2010 and 2011-2013 (reductions are equally divided in the two periods). In the model, the changes in number of vessels are implemented in 2010 and 2013 for both Sicilian and non-Sicilian fleets.
- A reduction in fleet size by a further 2% per year is assumed from 2018 for all fleet segments.
- Reductions in fishing mortality are assumed as a consequence of the Mediterranean regulation 1967/2006. Even though the new mesh size should be in force from 2010, an intermediate period needed for its application seems to be likely. The effects of this management measure have been introduced in the model from 2013 for European hake and deepwater rose shrimp in GSA 16 by reducing fishing mortality of 28% and 9.6% respectively (variations estimated on the hypothesis that the introduction of the new mesh size will avoid undersized catches).

Table 63 Projections of gross value added (mln €) by fleet segment for catching sector, and changes on 2012

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	47.25	48.76	46.28	45.38	-5%	-7%
Purse seiners	16.85	12.47	14.35	14.38	15%	15%
Small scale fishery	31.60	33.57	34.65	34.43	3%	3%
Polyvalent	0.53	0.21	0.25	0.31	20%	48%
Polyvalent passive	8.83	7.02	7.18	7.37	2%	5%
Longlines	21.62	15.54	16.47	17.15	6%	10%
Total	**126.68**	**117.57**	**119.19**	**119.01**	**1%**	**1%**

Table 64 Projections of ratio of revenues to break even revenue by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	1.18	1.15	1.18	1.20	3%	4%
Purse seiners	1.54	1.38	1.45	1.48	6%	8%
Small scale fishery	1.47	1.45	1.47	1.50	2%	3%
Polyvalent	1.17	0.97	1.00	1.04	3%	8%
Polyvalent passive	1.64	1.49	1.51	1.55	2%	4%

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Longlines	1.65	1.47	1.51	1.55	3%	6%
Total	**1.33**	**1.28**	**1.32**	**1.35**	**3%**	**5%**

Table 65 Projections of net profit margin by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	-12.6%	2.7%	6.3%	8.3%	3.6%	5.6%
Purse seiners	8.2%	4.0%	11.7%	14.3%	7.7%	10.3%
Small scale fishery	13.8%	30.9%	32.7%	34.4%	1.8%	3.4%
Polyvalent	-5.2%	-9.5%	-5.4%	0.3%	4.1%	9.8%
Polyvalent passive	14.1%	18.1%	20.5%	23.7%	2.4%	5.7%
Longlines	21.1%	18.7%	22.0%	25.6%	3.4%	6.9%
Total	**0.7%**	**10.4%**	**14.5%**	**16.8%**	**4.0%**	**6.3%**

Table 66 Projections of return on investment by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	14.7%	17.7%	20.6%	22.5%	3.0%	4.9%
Purse seiners	31.6%	22.3%	31.1%	34.9%	8.8%	12.6%
Small scale fishery	54.1%	59.3%	65.7%	72.5%	6.4%	13.3%
Polyvalent	20.4%	6.9%	9.5%	13.8%	2.6%	6.9%
Polyvalent passive	43.6%	35.1%	38.6%	44.1%	3.5%	9.0%
Longlines	62.9%	45.7%	52.1%	60.4%	6.4%	14.7%
Total	**28.2%**	**30.4%**	**36.1%**	**39.9%**	**5.6%**	**9.5%**

Projections on the economic indicators show a positive performance for the catching sector in Sicily. However, the improvement in the economic status of the fleet is not homogeneous among fleet segments. Compared with 2008 data, the model has predicted the best performance for demersal trawlers and small scale fishery, while the other fleet segments show stable or negative trends. These differences are mainly due to landing compositions. The reduction in fishing mortality, due to the decrease in fleet size and the introduction of a more selective mesh size, is expected to improve primarily the status of demersal stocks. Therefore, revenues of demersal trawlers and small scale fishery, which depend almost exclusively on these stocks, will be increasing significantly. The other fleet segments show a landings (and revenues) composition where large pelagic stocks, like bluefin tuna and swordfish, represent significant fractions of the total. In particular, bluefin tuna represents almost 20% of total revenues for purse seiners. Swordfish represents 20% of revenues for polyvalent, 40% for polyvalent passive and more than 65% for longliners. As a declining trend in Mediterranean landings for these species is expected in the next years, also revenues of the mentioned fleet segments will decline.

GVA, given by the difference between revenues and intermediate costs, is expected to increase for purse seiners and small scale fisheries also showing decreases in the other fleet segments. In particular, longliners will have nearly the worst performance given the strong dependency on tuna landings. However, as trawlers and small scale vessels represent most of the Sicilian fleet, an increase in GVA is expected for the entire Sicilian catching sector.

Under status quo assumptions, the ratios between revenues and BER remain greater than 1 for all Sicilian fleet segments through the simulation period. The indicator shows an increase for the demersal fleet and a stable trend for the other fleet segments. The results for the

Sicilian catching sector is positive with increases of 3% and 5% over 2012 registered in 2017 and 2022 respectively.

Net profit margin shows a stable trend for the entire Sicilian fleet. The indicators by fleet segment do not show significant variations compared with the 2008 value, with the exception of demersal trawlers. Given the improvement in the status of demersal stocks, the net profit margin for demersal trawlers should pass from an unprofitable condition registered in 2008 to a profitable status from 2012. Among the other fleet segments, polyvalent is the only fleet in an unprofitable condition, which is maintained also in the future. Once again, the poor performance of the longline fleet is due to the anticipated declines in tuna and swordfish quota.

The last economic indicator reported above, return on investment, should be higher than 15% for a fleet to be considered profitable. In 2008, demersal trawlers represented the only fleet segment showing a value close to the limit of 15%, while fishing activities were profitable for all the other fleet segments. Projections have shown that fishing activities will remain profitable for all fleet segments, and that significant increases should be registered for demersal trawlers and small scale fishery.

4.2.6 Indicator 11 Fish Prices and Market Orientation

A good market situation is when producers are paid at a fair price and consumers can afford buying fish products at competitive prices compared to meat substitute products. An ideal situation would be where prices increase in real terms.

Historical analysis of price series (see indicator 11) shows that fish prices are influenced by a large array of internal and external factors. Potential factors which, according to economic theory can determine the price of an individual fish species at the market level includes:

- Size and quality of the fish and catch method: for a same species, a large fish is paid at a higher price than the same amount of small fish.
- Supply: increasing supply of a species, but also of a related possible substitute species (ex. Pollock and Alaska Pollack), may cause price to fall
- Demand: Population and income growth increase demand and thereby prices. Under adverse economic condition, consumer may choose to decrease expenses on high value species and revert to lower value fish species or meat substitutes (poultry)
- Exchange rates: The EC is a net importer for a large number of species. When the EUR / USD exchange rate increases, third countries exporters negotiating in USD will be more competitive on the market compared to producers negotiating in EUR.

According to an evaluation published in 2008, the Common Market Organisation (CMO, Reg (EC) 104/2000) is a relevant instrument to stabilise the market. For the next decade, the market policy should logically reinforce the role of the producers organisations and work on the objective of ensuring adequate supply for the Community market from third countries while contributing to the competitiveness of the EC products (quality, origin, eco-responsibility).

Overall, and given the high level of uncertainties for the future, the working assumption retained is that fish prices will remain constant in real terms over the next few years under a statu quo scenario, thus equating to a situation in which the performance target is not met. This working hypothesis assumes that the natural growth of demand linked to growth of the EC population and the restrictions made on imports from flags on non-compliance (IUU regulation) will be offset by greater offer from aquaculture species like panga, development

of processing capacities in 3rd countries and increased demand in other countries. The assumptions in relation to supply of the EC market are :

- EC fishing sector (20% of total EC supply): decrease with possibilities of small increase if stocks are rebuilt
- EC aquaculture sector (10% of total EC supply): stable with some possibilities of development
- Imports from fishing (60% of total C supply): sustained increase with tariff progressively dismantled
- Imports from aquaculture (10% of total EC supply): increase supported by investments and tariff dismantlement.

The EC market is anticipated to increase by 2 million tonnes over the next 10 year (0.5% increase per year) with large differences between Member States.

4.2.7 Indicator 12 Subsidies

The **ideal state** for subsidies should be one encompassing three main elements:

- subsidies as a percentage of landed values gradually decrease over time;
- subsidies are better targeted to maintain environmental, economic and social sustainability, without compromising any one of these three objectives, and especially so that economic and social support does not threaten stock status (as this stock status is the basis for long-term economic and social sustainability);
- better reporting of fisheries-specific subsidies in all their various forms

With respect to the first element, planned expenditure for EFF 2007-2013 suggests that funds to be allocated will be broadly similar in quantum to the funds used under FIFG 2000-2006. Under EFF the average level of planned subsidy as a proportion of 2006 landings values across the EU is 11%. In the absence of any information to the contrary it also seems likely that there will be an 'EFF II' post-2013, although planned expenditure is not known, and could be impacted considerably by ongoing WTO discussions especially with regards to some axes (see section 2.4.7).

Given the increased number of Member States during the EFF period compared with the early years of the FIFG 2000-2006 period, and the fact that many newer MS have planned allocations under EFF that represent very significant proportions of their landed values, for other MS subsidies as a percentage of their landed values will decline considerably when comparing the FIFG and EFF periods. However, for the EU as a whole as stocks recover under the status quo option and landed values increase, subsidies as a percentage of landed values can be expected to decline only slightly. An EFF II could also be expected to include smaller amounts of expenditure in the newer MS than under the current EFF.

All the above points suggest that overall subsidies as a percentage of landed values in the EU will decrease only slightly over the next 10 years, and will still remain significant in the short- to medium-term.

With respect to the second element and better/careful targeting of subsidies so that they promote long-term sustainability, 38% of FIFG 2000-2006 monies were allocated to axis 1 and a considerable proportion of this funding (17%) was used for modernisation which may have increased catching efficiency in fleet segments known to be targeting stocks that are

already over-exploited. Despite requirements for such funds only to be used provided that modernisation does not increase the ability of the vessel to catch fish, it is nevertheless probable that replacing GT/kW, or installing new engines and modernising vessels, resulted in a) increasing catching efficiencies of vessels in some fleets, and b) the switching of effort from some fleets to others also targeting over-exploited stocks, and did not therefore in all cases contribute to balancing fishing capacity with fishing opportunities.

Under EFF, 27% of total funds budgeted for are allocated to axis 1. It is not clear the extent to which such funds will be used to adjust fishing capacity to meet fishing opportunities, or the extent to which such funds might actually result in increased fishing efficiencies in the fleet. Available funds appear able to meet the needs of permanent cessation and capacity reduction either anticipated in our model or described in the operational plans of Member States (Table 85). However, we present later (section 4.5) an alternative scenario in which accessed EFF funding is not sufficient to reduce capacity.

Much will depend on the rigour with which MS allocate funds to fleets they consider to be fishing within biological limits, and rigorous evaluation of individual applications to ensure that investments do not increasing fishing efficiency on vulnerable stocks. However, under the status quo option, and given the inability of MS to use EFF to fund construction of new vessels, it is likely that some improvements in better use of funds will take place. It should also be noted that some improvements between FIFG and the EFF can be expected – while the EFF will renew most of the FIFG measures it will also propose new and innovative measures to account for the changing needs of the sector, and Member States will have more flexibility when implementing measures because eligibility rules have been limited to what is strictly necessary at Community level. Thus it will be easier to adapt measures to the needs of national sectors.

With respect to the third main element – better information – the assessment of subsidies presented in Section 2.1 has highlighted data deficiencies for fisheries-specific subsidies by MS. There is nothing under the status quo option to suggest that any better information on subsidies to the fishing sector will become available.

4.3 Social Impact Assessment

Table 67 Social results from the EIAA model by MS. Note that total rows are the indicators calculated across the whole database not averages or sum of rows above in table.

	2012					2017				
	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE
Indicator	a2	13	13a	16	17	a2	13	13a	16	17
BEL	82	459	6	35249	49302	73	398	5	61342	76580
DEU	317	721	2	146229	78821	286	653	2	178864	94136
DNK	400	1312	3	136588	83222	400	1239	3	156488	94951
EST	800	2475	3	2918	1039	723	2395	3	3545	1197
ESP	10974	26452	2	16815	15667	10377	25526	2	18165	16433
FIN	1224	1641	1	1443	2161	1105	1537	1	1880	2321
FRA	2564	8649	3	54518	37430	2404	8109	3	61229	41345
GBR	2954	5040	2	51995	30390	2840	4664	2	68657	39133
IRL	1372	2451	2	45540	24588	1240	2335	2	50586	26616
LTU	19	61	3	59638	42301	17	60	3	65421	45318
LVA	737	1229	2	4112	1419	666	1204	2	4900	1453
NLD	279	1479	5	84015	52549	241	1340	6	117834	68661
POL	637	1510	2	12332	5564	563	1478	3	13848	6180
PRT	2247	8485	4	16245	8885	2116	8091	4	17720	10052
SWE	793	1086	1	23955	6195	680	1029	2	27807	7254
TOTAL	**25398**	**63050**	**2**	**30387**	**20920**	**23731**	**60057**	**3**	**35053**	**23474**
Increase over 2012						-7%	-5%	2%	15%	12%

	2022				
	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE
Indicator	a2	13	13a	16	17
BEL	66	362	5	82451	98288
DEU	259	635	2	184045	96194
DNK	362	1200	3	168303	100324
EST	653	2278	3	4241	1379
ESP	9406	24088	3	22195	19362
FIN	999	1452	1	2306	2517
FRA	2252	7664	3	68010	45230
GBR	2567	4434	2	77988	43014
IRL	1121	2223	2	56412	29036
LTU	16	58	4	69585	47386
LVA	602	1151	2	5509	1473
NLD	217	1263	6	139002	78599
POL	509	1426	3	14893	6606
PRT	1916	7712	4	18674	11118
SWE	615	991	2	30830	8037
TOTAL	**21559**	**56935**	**3**	**39878**	**26328**
Increase over 2012	-15%	-10%	6%	31%	26%

Table 68 Social results from the EIAA model by vessel size. Note that total rows are the indicators calculated across the whole database not averages or sum of rows above in table.

	2012					2017				
	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE
Indicator	a2	13	13a	16	17	a2	13	13a	16	17
0012	19189	22718	1	19962	9862	17877	21562	1	21731	10619
1224	4437	16341	4	32368	27208	4189	15432	4	37912	30897
2440	1351	16929	13	21992	20595	1269	16243	13	26247	23287
40XX	421	7063	17	79461	42718	395	6820	17	91676	47772
TOTAL	**25398**	**63050**	**2**	**30387**	**20920**	**23731**	**60057**	**3**	**35053**	**23474**
Increase over 2012						-6%	-7%	-5%	2%	15%

	2022				
	Fleet size (no)	Employment (FTE)	Employment (FTE) per vessel	Value added per employee (€)	Crew wage (€) per FTE
Indicator	a2	13	13a	16	17
0012	16212	20490	1	23648	11403
1224	3830	14593	4	42960	34231
2440	1153	15177	13	33129	28685
40XX	364	6676	18	98296	49502
TOTAL	**21559**	**56935**	**3**	**39878**	**26328**
Increase over 2012	-15%	-10%	6%	31%	26%

4.3.1 Indicator 13 Employment

The **ideal state** for employment should be a reversal of declining trends for employment, to at least stabilise employment in the capture and processing sector. Employment is currently increasing in the aquaculture sector, and this trend is likely to continue.

The trend over the last 5 years has been for a reduction in employment in the catching sector. By contrast, employment in the processing sector appears to have been constant, although it is true that the trend data for the processing sector are not as high resolution as for the catching sector.

We used a similar method of calculation to that used for GVA (Table 60) to estimate employment multipliers taking into account imports to project the impact of our EIAA results on the processing and ancillary sectors (Table 70).

- Catching sector and processing sector employment was taken for each MS from recent AER data where possible, and supplemented in the case of the processing sector by other available data where data for 2007 were not available;

- The value of landings in different MS was assessed, along with the value of imports to MS most likely to be processed in MS, and noting that not all imports are processed in the EU;

- Landings as a percentage of landings plus imports is used to determine processing employment that is derived from landings in MS ports, as distinct from processing sector

employment derived from both landings and imports. This in turn enables a more accurate multiplier between landings and processing;

- Ancillary sector multipliers are not assumed to be dependent on imports and thus ancillary sector employment is assumed to change in proportion to changes in catching sector employment based on the backward multipliers for each MS.

Table 69 Expected employment multiplier effects of the EIAA model

	2012		2017		2022	
	Employment Processing	Employment Ancillary	Employment Processing	Employment Ancillary	Employment Processing	Employment Ancillary
Indicator	7c	7d	7c	7d	7c	7d
BEL	293	177	291	158	292	143
DEU	874	164	919	148	909	134
DNK	1297	475	1339	475	1353	430
EST	128	725	128	655	128	592
ESP	8210	1125	8120	1064	8209	965
FIN	68	0	64	0	62	0
FRA	7466	1930	7452	1809	7458	1695
GBR	5684	920	5957	885	6012	800
IRL	2249	721	2256	652	2274	589
LTU	186	153	191	139	194	125
LVA	1522	691	1590	625	1597	565
NLD	1099	469	1133	404	1149	365
POL	485	143	507	126	509	114
PRT	976	699	981	658	965	596
SWE	174	189	177	162	178	147
TOTAL	30711	8582	31106	7961	31289	7259
Increase over 2012			**1%**	**-7%**	**2%**	**-15%**

- For the EU as a whole, catching sector employment decreases by <1% from the reference period to 2012 in line with fleet decommissioning, and then decrease further only very marginally (i.e. a total change over the 10 year period of <1%).
- There are many contributors to these trends, but principle among them will be the reduction in unreported catches, which should lead to short term reductions in employment, followed by a recovery of many stocks as LTMPs are developed and become effective, which will lead to increasing catches.
- If the employment multipliers are included, total employment in the processing and ancillary sectors are likely to increase marginally from 38,293 in 2012 to 38,724 in 2022

Although the application of multipliers suggests similar trends in the processing sector to those seen in the capture sector, this is dependent upon the mix between processing of domestic capture fish and processing of imported fish (Table 70). Processing employment could further increase if imports increase with increasing demand within Europe, but could also decrease if there are significant improvements in processing technology (requiring less employment per tonne of fish processed) or if more processing is done in third countries such as China (although note that the controls introduced in the IUU Regulation may mitigate against this).

Table 70 Income/value-added multipliers by Member State

Country	Capture fisheries employment (2)	Process industry employment (2)	Ancillary employment (2)	2006 landings into MS ports (3)	2007 import of product for processing (1)	landings as % of landings + net imports	processing jobs from landings	downstream processing employment multiplier	upstream ancillary employment multiplier
BEL	501	993	200	82,910,000	199,501,560	29%	292	0.58	0.40
CYP	747	100	200	5,463,000	18,771,960	23%	23	0.03	0.27
DEU	1,617	6,925	300	113,471,000	507,351,090	18%	1,266	0.78	0.19
DNK	1,925	4,428	600	445,754,000	853,129,530	34%	1,520	0.79	0.31
EST	3,367	2,103	1000	2,122,000	25,712,370	8%	160	0.05	0.30
ESP	35,274	22,500	1500	1,679,668,000	2,199,023,400	43%	9,744	0.28	0.04
FIN	1,782	756		9,296,000	91,909,810	9%	69	0.04	0.00
FRA	12,480	23,240	2900	842,042,000	1,104,221,530	43%	10,055	0.81	0.23
GBR	8,096	16,041	1500	679,924,000	585,009,710	54%	8,622	1.07	0.19
GRC	24,745	3,700	12798	336,186,000	191,417,240	64%	2,358	0.10	0.52
IRL	3,838	3,500	1200	314,810,000	33,716,590	90%	3,161	0.82	0.31
ITA	25,426	15,500	5523	1,518,120,000	1,283,926,570	54%	8,398	0.33	0.22
LTU	744	4,632	1000	13,000,000	67,896,640	16%	744	1.00	1.34
LVA	1,632	7,400	800	14,300,000	44,186,120	24%	1,809	1.11	0.49
MLT	1300	-	100	5,612,000	16,198,190	26%	-	0.00	0.08
NLD	1,953	3,120	600	335,687,000	473,378,530	41%	1,295	0.66	0.31
POL	2,588	14,149	200	13,400,000	330,564,860	4%	551	0.21	0.08
PRT	14,445	6,301	1200	213,021,000	660,261,590	24%	1,537	0.11	0.08
SVN	110	200	300	1,514,000	18,421,410	8%	15	0.14	2.73
SWE	1,879	1,867	300	116,577,000	847,775,690	12%	226	0.12	0.16
Total	**144,449**	**137,455**	**32,221**	**7,731,512,000**	**9,552,374,390**	**-**	**51,844**	**-**	**-**

1/ Imports based on products likely to be processed in EU: whole fresh and frozen fish (0302 and 0303) and variety of cephalopods likely to be processed (030729, 030749, 030799). Shrimp not included although it is noted that some may be cooked in MS
Source: COMEXT data

2/ black text columns b:d 2007 AER data, red text 2006 AER data, blue text data for 2007 from Commission, green text EP study 2005 data

3/ data from CFP facts and figures

4.3.2 Indicator 14 Status of Fisheries Dependent Communities

The **ideal state** for this indicator should be a reversal of declining importance of fishing.

The four areas selected for the case studies include some of the areas of Europe with the highest levels of fisheries dependency. This can be seen in Table 71, summarising some of the key characteristics of the four areas. The current status of each the areas is discussed in turn below.

Table 71 Summary of case study boxes

Case study area	Key ports	Number of vessels (2008)	Total landings (2008)	Total value of landings, mEuro (2008)	Employment in catching (2005)	Employment in processing & ancilliary (2005)
Brittany	St Malo, Erquay, Le Guivinec and Concarneau	1,448	90,000	247	4,200	7,300
Galicia	Vigo, Coruña	4,855	173,569	451	17,500	11,500
Scotland	Fraserburgh, Peterhead,	2,205	372,000	390	5,900	6,800
Sicily	Mazara del Vallo, Sciacca, Trapani, Catania	3,196	43,301	287	8,900	1,500

AER data for individual fleet segments are reported on a national level only, and consequently the EIAA model outputs generate projections for the MS as a whole. Each case study draws conclusions from these outputs depending how well represented a particular segment is within the region. Small scale fisheries using vessels less than 12m in length were important in all the case study location with these segments well represented in all fleets. In all the case study areas the improvements in stock conditions under the status quo were expected to increase the profitability of fleet segments but there was also expected to be a reduction in fleet sizes due to capacity reduction schemes.

For further analysis on the fisheries dependent communities addressed in Table 71, please refer to the Status Quo Regional Case Studies document.

4.3.3 Indicator 15 Value Added Regional Dependency Levels

The **ideal state** of in areas of high regional dependency should be a reversal of the current trend to declining employment.

The most important NUTS-2 regions appear to have experienced significant decrease in the employment in the catching sector from 1996-98 to 2005 (tables below). In Galicia, Sicilia and Andalucía a total of 21,000 jobs in the catching sector were lost during that period, equal to 28% of the total decrease in employment in this activity. This trend is probably set to continue, following the likely reduction in employment in the catching sector up to 2017. In some particularly sensitive areas in Spain, Italy, and Greece local stocks are of particular importance and under the current CFP we foresee no significant increase in the state of these stocks.

In some areas in the North regional employment will increase as stock health recovers – for instance, our model predicts that capture fisheries employment in Latvia will increase by 36

persons between 2017 and 2022, resulting in an additional 121 non-capture fisheries jobs in processing and ancillary occupations. This will, however, have followed significant reductions in employment up to 2017.

For the case study locations (see Section 2) the overall picture is similar but with some local differences. In Scotland the pelagic sector is already profitable and improvements to herring stocks will likely further the trend towards fewer, larger and more profitable vessels and potentially slight increases in employment in the segment overall. The very slight improvements forecast for the southern hake stocks will affect fleets in Galicia, limiting the attractiveness of investment. Improvements in performance of the fleet segments in this fishery are likely to come from capacity reductions and the effect that these have on cost structures. Other sectors of the Galician fleet will improve performance and this is likely to have important benefits for coastal communities that are characterised by high dependence and a low degree of diversification. Similar benefits from improved stock status and capacity reductions are likely in other dependent areas such as the Highlands and Islands of Scotland.

The impacts of changes in fleet structure and landings are likely to vary. In Brittany further losses of employment are expected in the processing sub-sector although potential increases in landings of small □elagic (sardine mostly) could support further development high value-added canning. Similarly in Scotland, the processing sub-sector is expected to be part of an expected wider contraction in manufacturing. Forecast improvements to whitefish stocks should reduce costs and result in improved profitability in the sub-sector but are unlikely to result in growth. Coastal tourism has been identified as important in all the case study locations and positive benefits identified from local fishing activities that contribute both to the attractiveness of the coastal communities and the array of fish products in local markets and restaurants.

Table 72 Employment in the catching sector – top-10 NUTS-2 regions in the EU (1000 persons)

NUTS-2 region	1996-8	2005
ES11 Galicia	29.4	17.5
Itg1 Sicilia	13.9	8.9
ES61 Andalucía	11.8	6.9
GR12 Kentr. Makedonia	4.9	5.1
GR25 Peloponnisos	3.6	5.1
PT11 Norte	9.8	5.0
Itf4 Puglia	6.3	4.7
FR52 Bretagne	6.0	4.2
GR42 Notio Aigaio	4.8	4.0
pPT20 Açores	5.2	3.8

Table 73 Employment in fish processing – top-10 NUTS-2 regions in the EU (1000 persons)

NUTS-2 region	1996-8	2005
ES11 Galicia	14.0	10.9
LV00 Latvia	n/a	7.4
PL63 Pomorskie	n/a	6.8
FR52 Bretagne	3.9	6.2
DK00 Denmark	8.6	5.2

NUTS-2 region	1996-8	2005
Uke1 E. Riding, N. Linc.	3.9	4.4
LT00 Lithuania	3.4	4.4
PL42 Zachod. Pomorskie	n/a	4.2

4.3.4 Indicator 16 Social Sustainability

The **ideal state** would be an increase in GVA per employee.

Since the EIAA model projects increases in GVA, increases in GVA per employee will follow. Summary results are:

- For the EU as a whole, catching sector GVA per employee increases by 4% over 2012 to 2017, and by an additional 3% by 2022 (i.e. a total increase over the 10 year period of 7%).
- On a MS-basis, percentage increases in GVA per employee are greater for Belgium, Germany, Finland, UK, Latvia and Netherlands due to differing dependencies on stocks and their varying recovery.

4.3.5 Indicator 17 Attractiveness of the Sector

An **ideal state** for attractiveness of the sector should be that incomes are at least 100% of the national average income. This will attract young people into the industry.

Some sectors are experiencing significant reductions in attractiveness at the moment. All MS except Germany and Denmark have seen reductions in attractiveness over the last 6 years. However, the model appears to indicate

- For the EU as a whole, crew wages increase by 12% over 2012 to 2017, and by an additional 14% by 2022 (i.e. a total increase over the 10 year period of 26%).
- On a MS-basis, percentage increases in employment to be greater for Belgium, the United Kingdom and Netherlands than other MS, due to differing dependencies on stocks and their varying recovery
- By fleet segment, however, crew wages increase much less for the 0-12m sector than for the larger sectors.

Vessel length class	Increase in crew wage in 2017 (from 2012 levels)	Increase in crew wage in 2022 (from 2017 levels)
0012	7.67%	15.63%
1224	13.56%	25.81%
2440	13.07%	39.28%
40XX	11.83%	15.88%

To understand what this might mean in terms of attractiveness of the sector we calculated the inflation-adjusted rise in average national wage for those Member States represented in the EIAA model. Over the period 2004 – 2007 national wages have increased on average 3% above inflation (Annex A, Table A30). If this rise continues to 2022, the rise in national wage would be greater than the rise in crew wage (which the EIAA model suggests would

increase by 26%). However, this assumes no extrinsic influences on crew wage rates. We would expect that the recovery of stocks would at least maintain the competitiveness of capture sector wages in the status quo scenario.

4.3.6 The Mediterranean case study

Table 74 Projections of number of employees (FTE) by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	2,644	2,313	1,904	1,721	-18%	-26%
Purse seiners	550	550	474	428	-14%	-22%
Small scale fishery	2,531	2,468	2,310	2,088	-6%	-15%
Polyvalent	136	133	125	113	-6%	-15%
Polyvalent passive	470	459	429	388	-6%	-15%
Longlines	644	628	588	531	-6%	-15%
Total	**6,977**	**6,552**	**5,829**	**5,269**	**-11%**	**-20%**

Table 75 Projections of GVA per employee (000 €) by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	17.87	21.08	24.30	26.36	15%	25%
Purse seiners	30.62	22.67	30.30	33.58	34%	48%
Small scale fishery	12.48	13.60	15.00	16.49	10%	21%
Polyvalent	3.87	1.57	2.02	2.75	29%	75%
Polyvalent passive	18.76	15.30	16.74	18.99	9%	24%
Longlines	33.56	24.73	28.02	32.27	13%	30%
Total	**18.16**	**18.90**	**21.27**	**23.35**	**13%**	**24%**

Table 76 Projections of average crew wage per employee (000 €) by fleet segment for catching sector

Fleet segment	2008	2012	2017	2022	2017 var %	2022 var %
Demersal trawlers	9.58	11.09	12.61	13.58	14%	22%
Purse seiners	11.09	8.59	11.03	12.07	28%	40%
Small scale fishery	5.42	5.87	6.42	7.02	9%	20%
Polyvalent	1.32	0.65	0.78	1.00	20%	52%
Polyvalent passive	6.92	5.73	6.23	7.00	9%	22%
Longlines	9.82	7.42	8.30	9.45	12%	27%
Total	**7.87**	**8.16**	**9.04**	**9.83**	**11%**	**20%**

Employment under the status quo option is likely to follow trends in vessel numbers. In 2004, case study data show that 4.9 jobs were created by every vessel in the fleet[139]. Given predicted changes in vessel numbers from 37 in 2012, 36 in 2017 and 32 in 2022, employment in the fleet can be expected to decline from 181 in 2012, to 176 in 2017 and to 157 in 2022.

Projections on GVA (Table 75) have shown an increase for demersal trawlers and small scale fisheries, and a decrease for the other fleet segments. GVA per employee shows

[139] This shows quite strong correlation with FTE/vessel from AER PTS1224 data in Italy of 4.24 (average 2005 to 2007)

partly different results as this indicator is also affected by the reduction in the people employed. Significant increases are predicted for purse seine trawlers and polyvalent vessels. All other fleet segments are expected to also increase through to 2022 over the 2012 base period as a consequence of the further reduction in the number of vessels and hence in the number of people employed.

Given the predominance of the share contract in the Italian fishing sector, the average salary per person employed in the Sicilian fleet is linked to the difference between revenues and variable costs. As a consequence, this indicator (Table 76) shows results very similar to the GVA per employee reported above. Even though an increasing trend is expected especially for demersal trawlers and small scale fishery, average salaries in the catching sector remain lower than the average salary in Sicily, estimated at 18,270 Euros (2007 data).

4.4 Governance Impact Assessment

4.4.1 Indicator 18 Departure from Quotas

The rationale for this indicator is that scientific advice reflects environmental concerns more than fisheries management decisions. If the CFP is to deliver sustainable management the **ideal state** of this indicator should be that deviations from scientific advice decline to zero.

The las on control and LTMPs suggested that as stocks increased there should be less pressure to depart from scientific advice. There are three aspects to this: that scientific advice will support the harvest control rule in the LTMP; that the Commission will propose a TAC consistent with the HCR to the Council; and that Council (or other decision making body) will confirm the Commission's proposal. There is some evidence that coherence between Council decision and Commission proposal has improved with the introduction of LTMPs with pre-defined HCRs (Table 77), and that the proposals by the Commission have conformed to the HCR, but this does not seem to have translated into a greater coherence between TACs and scientific advice (Figure 22, Figure 23).

There is less evidence that the scientific advice will always be coincident with the HCR; in the early years of the cod recovery plan, and in the western channel sole plan, scientific advice has been at odds with the HCR and therefore with the TAC set (Figure 37). Other factors may influence this relationship as well, such as the state of the stock. The consistency between advice and TAC for northern hake was improved by both increasing stock size and the LTMP. One feature that may lead to a deviation between advice and TAC in LTMPs is the influence of the 15% inter-annual variation rule for the TAC, which we have noted before leads to the creation of lags in the system (see also Kell *et al.*, 2006[140]).

Outside LTMPs, there is currently little evidence for increasing agreement between quotas and advice. Given that we only expect LTMPs on 26 stocks by 2017, this indicator will be unlikely to reach its ideal level without additional policy measures being developed.

[140] Kell, L.T., Pilling, G.M., Kirkwood, G.P., Pastoors, M.A., Mesnil, B., Korsbrekke, K., Abaunza, P., Aps, R., Biseau, A., Kunzlik, P., Needle, C. L., Roel, B. A., and Ulrich, C. (2006) 'An evaluation of multi-annual management strategies for ICES roundfish stocks', *ICES J. Mar. Sci.*, Vol. 63, pp: 12-24.

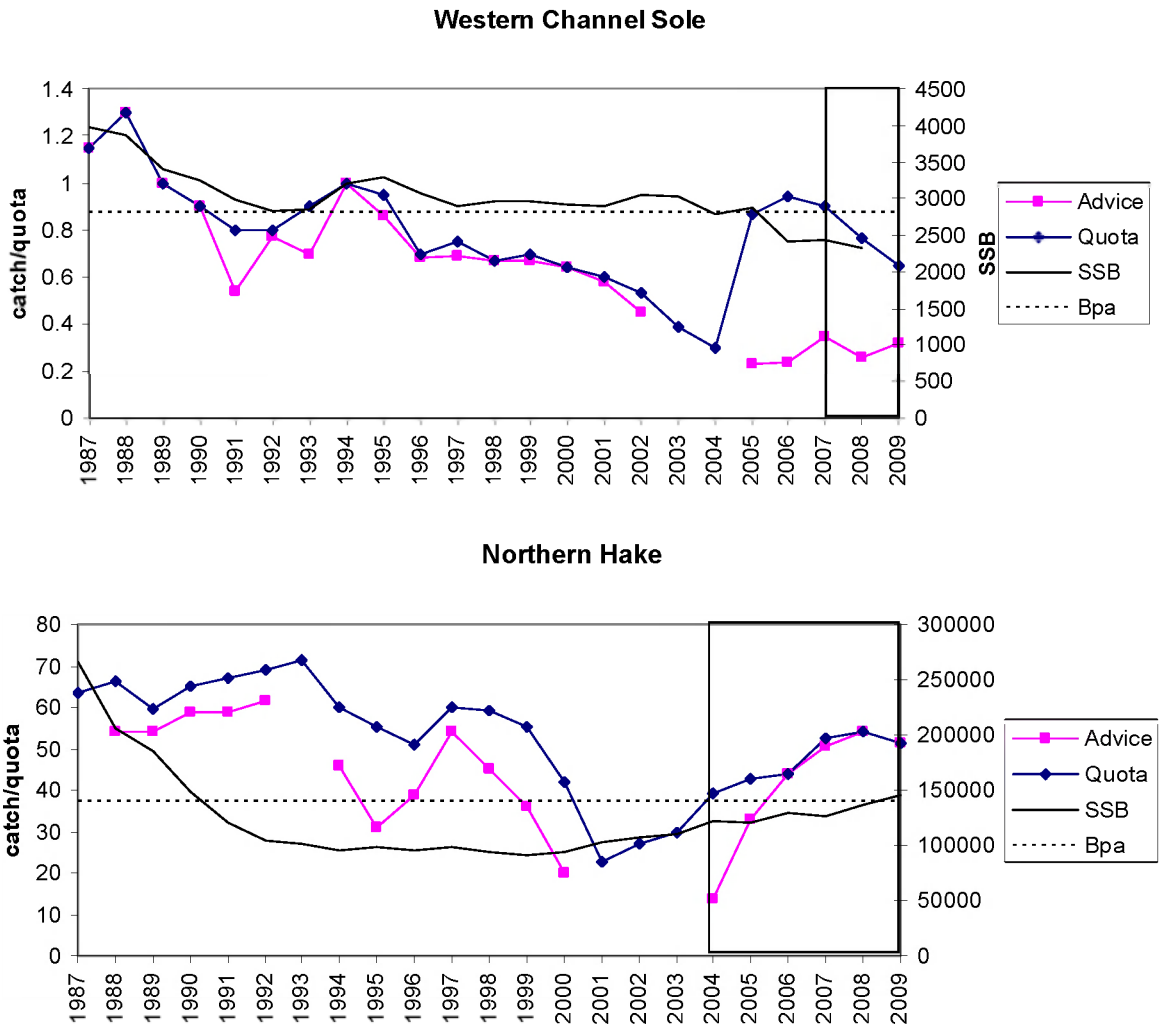

Figure 37 Development of scientific advice, TAC and biomass in two stocks subject to LTMPs. Note that the 2008 assessment for western channel sole is presented for comparative purposes only; ICES has expressed a low confidence in this assessment and did not repeat it in 2009. Shaded areas indicate LTMPs

Table 77 History of decision making in recovery plans. The table shows the difference between the final Council decision on the TAC and the Commission proposal. Figures in bold are when the recovery plan was in operation. Source: Compiled from Commission Proposals and Council Regulations. Other stock data is included in Annex B and associated Appendix.

Species (Common Name)	*Species (Latin Name)*	ICES Fishing Zone	Diff as % of actual (2009)	Diff as % of actual (2008)	Diff as % of actual (2007)	Diff as % of actual (2006)	Diff as % of actual (2005)	Diff as % of actual (2004)	Diff as % of actual (2003)
Herring	*Clupea harengus*	Vb, ViaN (EU waters), Vib	38.39	5.33	15	n/a	n/a	0	n/a
Cod	*Gadus morhua*	Skagerrak	**n/a**	**n/a**	**n/a**	**0**	**0**	0	n/a
Cod	*Gadus morhua*	Kattegat	**n/a**	**18.57**	**12.72**	**0**	**10**	0	38.36
Cod	*Gadus morhua*	Vb (EC), VI***	**n/a**	**8.46**	**6.12**	**0**	**0**	0	46.24
Cod	*Gadus morhua*	VIIa	**0**	**8.51**	**6.22**	**0**	**14.98**	0	38.46
Cod	*Gadus morhua*	VIId	**n/a**	**14***	**23.38***	**5.5***	**0***	38.28*	22.09*
Hake	*Merluccius merluccius*	IIIa, IIIbcd (EU waters)	**0**	**0**	**4.16**	**0**	**0**	28.1	n/a
Hake	*Merluccius merluccius*	Iia (EU waters), IV (EU waters)	**0**	**0**	**4.16**	**0**	**0**	28.1	n/a
Hake	*Merluccius merluccius*	Vb (EU waters), VI, VII, XII, XIV	**0**	**0**	**4.14**	**0**	**0**	28.1	41.67
Hake	*Merluccius merluccius*	VIIIc, IX, X, CECAF 34.1.1 (EU waters)	**0**	**0**	**2.17**	**0**	0	39.76	22.86
Norway lobster	*Nephrops norvegicus*	VIIIc	**0**	**0****	**0**	**0**	0	80	0
Norway lobster	*Nephrops norvegicus*	IX, X, CECAF 34.1.1 (EU waters)	**0**	**10.6**	**0**	**0**	0	69.83	33.33
Plaice	*Pleuronectes platessa*	Iia (EU waters), IV	**n/a**	**n/a**	n/a	n/a	0	30.59	n/a
Common sole	*Solea solea*	II, IV (EU waters)	**1.51**	**0**	0	n/a	10.75	20.59	n/a
Common sole	*Solea solea*	VIIe	**0**	**0**	0	0	0	34.33	33.25
Common sole	*Solea solea*	VIIIa, b	**0**	**0**	0	0	0	22.22	47.37
Bluefin tuna	*Thunnus thynnus*	Atlantic Ocean (east of longitude 45° W) and Mediterranean	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**0**	**n/a**

* *Stock has not been separated out for these years. It is included as part of VIIb-k, VIII, IX, and X*

** *Stock has not been separated out for these years. It is included as part of III b,c,d*

*** *Stock has not been separated out. It is included as part of Vb (EC), VI, XII, XIV*

Reg 1300_2008 West of Scotland herring (Via and Vb)
Reg 423_2004 Cod (IIIa, IV, Iia, VIId, VIIa, Via, Vb)
Reg 811_2004 Northern Hake (IIIa, IV, Vb, Via, VII, VIII a,b,d,e)
Reg 2166_2005 Southern Hake (VIIc, Ixa)
Reg 676_2007 Plaice & Sole (IV)
Reg 509_2007 Sole Western Channel (VIIe)
Reg 388_2006 Sole Bay of Biscay(VIII a,b)

4.4.2 Indicator 19 Management Costs for the Sector

The **ideal state** of this indicator is as a declining trend, as management costs are reduced and management becomes more efficient.

In the status quo scenario it is unlikely that management costs will be reduced in the short term. Management costs will increase in the short term for MS whose current enforcement effort is lower than that required to create the culture of compliance which is the aim of the Control Regulation, but the Control IA concluded that for the seven stocks investigated there would be a total gain in control costs for the period 2010 to 2019 in the magnitude of 389 million Euro resulting from a reduction in national enforcement budgets. Translated to the time scale of the CFP IA, this would equate to a reduction of the national enforcement budget so that by 2017 it was about 42% of the budget in 2012, reducing further to about 35% in 2022. Many of these reductions will come about with use of new technology (e-logbooks), which is expected to become effective as of 2014, as well as the improvement in the general level of compliance created by the harmonisation of sanctions.

4.4.3 Indicator 20 Rights Based Management Systems

The fleet as a whole should be able to operate in such a way as to naturally balance capacity against opportunities. If it is assumed that only ITQ fleets are able to continually rationalise their capacity against opportunities, it might be reasonable to say that an **ideal state** would be the majority (50%) of vessels are under ITQ management.

An increase in the use of RBM systems is likely to be the case, at least in Northern Europe, as more fleets adopt fully ITQ systems. There are already indications that Poland, Estonia, and Sweden will implement ITQs for their demersal fleets around 2012, which would increase the number of vessels in ITQ systems in the first period of the new CFP (2012-2017) by about 500. Our assumption in the EIAA model, however, is that these fleets will rapidly rationalise, losing about 30% of their size by 2017.

The model results are shown below. The proportion of ITQ vessels as a proportion of the fleet is higher than was calculated in section 2, primarily because of the sub-set of fleets used for the model was composed of the most important fleets of large (>12m) vessels across the northern EU, which comprise most of the fleets that have already, or will soon, enter ITQ. It can be seen that, as expected, removal of vessels from those segments operating under ITQ systems is faster than removal of non-ITQ vessels, which, if no more fleets entered ITQs, would tend to decrease the proportion of total EU vessels in RBM systems over time.

Table 78 Model results of the number of vessels operating under ITQ systems in the EU fishing fleet.

	2007	2012	2017	2022
ITQ fleet (>12 m)	836	1062	1059	978
Total fleet (>12m)	5753	5365	5081	4749
ITQ %	14.5	19.8	20.8	20.6

4.4.4 Indicator 21 Data Provided by MS

The **ideal state** for this indicator would be full compliance with reporting obligations. Under the status quo, it is expected that Member states reporting on their efforts to balance effort with opportunities is likely to improve, both in terms of timeliness and completeness. This would be supported by the 2008 Guidelines and use of the relevant indicators for estimating level of capacity in national fleets.

Given a constant effort, an **ideal state** for this indicator would be a reduction in the number of serious infringements. There is no evidence that the number of infringements has declined yet (see Figure 38). However, there are two issues to consider when analysing the current trends – the sampling effort and the levels of serious infringements being committed by fishermen. The indicator currently cannot distinguish between these, except that it is anticipated that inspection rates have been rising in recent years (see Table 79).

One set of data that we can look at to see whether an increase in control effort will have the impact on compliance that is anticipated in the Control Regulation IA is the JDP data. At the time that the Control Regulation IA was conducted these had been implemented for only a few months. Examining them now shows an encouraging and anticipated response to increases in control. In both the North Sea and Baltic the proportion of infringements detected has declined in 2009 although the confidence intervals (binomial) indicate that these declines are not yet statistically significant (Figure 38).

These results support our (model) assumption that the levels of unreported fishing will decline due to the Control Regulation and the conclusion that the reliability of reporting of catch data will improve. We would also expect number of infringements to decline as the control regulation takes effect. However, an initial increase, such as is seen in the recent data, may be expected.

Table 79 Summary of inspections and infringements by Region (2007-2009)

	2007				2008				2009			
	At Sea		On land		At sea		On land		At sea		On land	
	Inspection	Infringement	Inspection	Infringement	Inspection	Infringement	Inspection	Infringement	Inspection	Infringement	Inspection	Infringement
North Sea	242	29	297	18	410	33	670	43	234	17	727	32
Baltic	178	10	337	23	466	66	1727	108	269	13	1670	31
Western waters		-		-		-		-	72	2	100	0

**Ins. = Number of inspections; Inf. = Number of infringements*

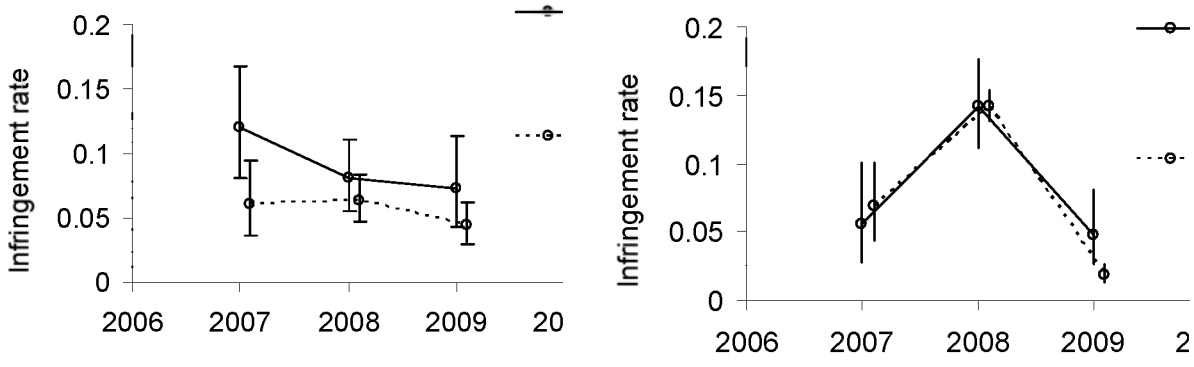

Figure 38 Infringement rate (infringements per inspection) in the three years of the North Sea and Baltic Sea JDPs for sea-based and land-based inspections. 95% binomial confidence intervals are shown.

4.4.5 Indicator 22 Rate of Utilisation and Allocations (quotas)

An ideal state for this indicator might be to have the rate of utilisation close to 100%, which would suggest that all available TAC opportunities are being satisfied. However, this would be at odds with the ideal state of indicator 18, in which we noted that TACs are set some 30% above scientific advice. An **alternative ideal state** would therefore be for utilisation to be at about 70% or lower.

Current trends on utilisation are downwards, and will likely continue downwards as stocks recover, beyond the 70% level, unless fleets increase their utilisation, particularly of pelagic stocks. If this does occur, this may be seen as a less than ideal situation from an economic point of view.

4.4.6 Indicator 23 Transfer of Quotas

Swapping quota under the current CFP, where relative stability determines MS quotas and quota swaps between MS take place at MS level rather than at individual vessel level, is administratively burdensome. Although it is possible to track this indicator, it is difficult to assess an ideal state for it. A reduction in swaps implies efficiency of the quota allocation system and decreasing administrative burden. An increase in swaps implies individual fleet specialisation and economic efficiency, and full utilisation of quota opportunities by the fleet. The **first** interpretation of an ideal state is used here in the context of the policy objectives examined in the Phase II report.

Transfers of quotas imply two things: increasing specialisation between fleets, which should be expected to deliver economic efficiency; and a constraint on fishing opportunities within MS allocations to those fleets wishing to specialise[141]. The history of swaps shows a maximum in 2005, when utilisation of quota was at a recent maximum and for some species and areas MS needed to swap quota to avoid going over quota. Swap volumes have declined since then, as has utilisation.

It may be that there is a general relationship between utilisation and swaps, such that decreasing utilisation results in decreasing swaps and vice versa. For a number of species identified in section 2.4.5 trends in utilisation appear to be matched by trends in swaps (Table 80). These findings are also consistent with suggestions raised in Anderson et al (2009) regarding the relationship between utilisation and swaps.

Table 80 Trend analysis of rate of utilisation and percentage of quota swapped

Species	Swap	Utilisation
Anglerfish	-0.8213	-0.8819
Greenland Halibut	0.448168	0.8661
Hake	-0.42349	-0.8444
Megrims nei	-0.87933	-0.9015
Nephrops	-0.46338	-0.9056
Pollack	0.945531	0.8569
Tusk	0.319755	0.8959
Blue whiting	0.487855	-0.9170

[141] J L Anderson, M Nielsen, Erik Lindebo (2008) *Economic gains of liberalising access to fishing quotas within the European Union*. Marine Policy 33, 2009 pp497-503.

Given the trend to increases in quota, stimulated by recovery of a number of stocks, it may be anticipated that the level of quota swaps will either remain constant or continue to gradually decline, over the status quo scenario period 2012-2022. Individual species trends (see Annex A) do not show strong trends in most cases, but in some (redfish and some □elagic) there is a suggestion that swaps are increasing.

4.4.7 Indicator 29 Time Taken to Reach a Decision

The **ideal state** of this indicator should be that the time taken is low, because the swifter decisions are taken the quicker they will be implemented, and the sooner one would expect to see their positive impacts.

Under the Status Quo, the implementation of co-decision making in 2010 under the Lisbon Treaty is predicted to increase the time taken to reach decisions (Figure 39).

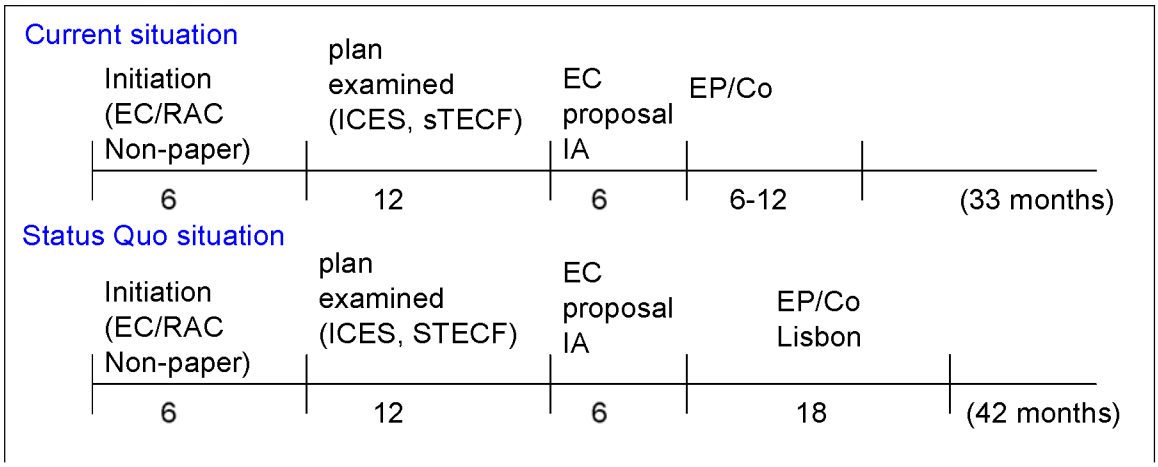

Figure 39: Schematic diagram of anticipated time to reach decisions under the Lisbon Treaty Status Quo situation

4.4.8 Indicator 24 Level of Coherence with WTO/ EC Policy

The **ideal state** for this indicator is that the CFP is fully coherent with the EU's WTO obligations as well as other EU policies.

Although it would likely not enter into effect before 2013 (and would in any event have a two-three year transition period), it is assumed that agreement on fisheries subsidies will be reached under WTO. Under the status quo scenario a substantial element of the existing CRP subsidy regime will be rendered non-compliant with the EU's WTO obligations.

While fundamental conceptual differences between the EU's environment policy and the CFP will remain it is expected that progress will be made on the development and implementation of practical mechanisms for improved coherence. Further experience of implementing FPAs will enable a better of evaluation of their coherence with development policy objectives.

4.4.9 Indicator 25 Impact for the private sector: Administrative Burden

An **ideal state** for administrative burden on the private sector would be a decrease..

The impact assessment for the control regulation highlights that whilst admin burden to the industry is likely to increase in the short term (implementing VMS etc, especially with the implementation of the new VMS requirements for under 10m vessels), a further decrease in the burden to the industry may happen in the long term, once the system is fully implemented. However, on balance, because the burden will increase in the short term, the ideal state for this indicator is only partially met.

4.4.10 Indicator 26 Implementation of Simplification Process

An **ideal state** for simplification would be an increase in simplification, as required, in line with the to the EU's Better Regulation Agenda. This process has already started (see Indicator 26) with the Commission Action Plan 2006-2008 simplifying and improving the Common Fisheries Policy (CFP).[142]

Under status quo, the impact of increased simplification of the CFP should be further reductions in the administrative burden to the industry and national administrations in the long term. For example, the control regulation contributed to the simplification of the present legislation by reducing the number of applicable regulations by up to 36%[143]. On the other hand, significant complexity will remain in the short term associated with the additional administrative burden of the control regulation, and the continuing complexity of the technical and other measures.

4.4.11 Governance indicators in the Mediterranean

The governance system is fragmented and although there is some cooperation between existing organisations (Mediterranean Action Plan (MAP), GFCM, EC, ACCOBAMS, ICCAT, as well as stakeholders and industry), in terms of attendance and participation in meetings, partnerships and technical agreements, cooperation should be extended to secure more effective collaboration. Most of the fishing activities in the Mediterranean occur within existing national jurisdictions and not on the high seas, and are carried out mostly by Mediterranean countries and not third party countries. The IUU and Control Regulations as well as discard avoidance are likely to improve compliance across the Mediterranean EU MS. The Data Collection Framework[144] (DCF) as well as the LTMPs[145] will also lead to an increase of the analytical assessments.

4.4.12 Indicator 27 External Waters Governance

Under an **ideal state**, 100% of the Coastal States EEZ and International waters in which EC vessels have obtained fishing possibilities have good governance frameworks.

Under status quo, activities of EC fishing vessels in the high seas should be covered adequately. The number of RFMOs set up to regulate external fisheries on certain species has been increasing over the last few years (SEAFO, SPRFMO, SIOFA). The last area to be covered (Patagonian shelf) will be particularly problematic based on the current political issues between Argentina and United Kingdom.

Concerning access to third country waters, the Commission will continue to negotiate access to 3rd countries waters on a case by case basis whenever there is an interest for both parties

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[142] COM(2005) 647 final.
[143] COM(2008) 721.
[144] Commission Regulation (EC) No. 665/2008
[145] Regulation No 1639/2001 as amended by Regulation No 1581/2004, and recalling Article 10 of the EC Treaty

(EC and third country). There will be still some EEZ not covered by bilateral agreements in which EC fishing vessels will work on the basis of private agreements. The governance framework will not be fully satisfactory. A possible solution considered by the Green Book would be to move away from bilateral fishing agreements to regional fishing agreements.

4.4.13 Indicator 28 Safety at Sea

Clearly an **ideal state** for safety would be to reduce the accident rate to zero.

There is a general expectation that with a move to regulate from "Olympic" style fisheries safety should improve, as fishers are not in a race to fish. The same trends should be evident as fisheries become more profitable, such that vessels can be maintained more frequently, improved and safer technology used etc.

There is already an indication that safety is improving within EU fisheries. It is interesting, but not necessarily conclusive, that the highest injury rates per FTE occurred when utilisation was also highest i.e. in 2004 and 2005. Under current policy we may expect to see continued improvement in safety as profitability improves, and particularly as the use of right based management becomes more widespread (note that this is not tied exclusively to profitability but it is related to exclusivity, so that all RBM systems that deliver exclusivity and ownership should deliver some safety benefits.

Current trends suggest that non fatal injury rate will drop in the *status quo* situation close to zero by 2022. There are currently no indications of a declining trend in the fatal accident rate.

4.4.14 Indicator 31 Aquaculture

There is **no ideal state** on this indicator. Current trends leading to 2007 were indicating that aquaculture production was increasing as a proportion of total production. This was a combination of slightly increasing aquaculture production and more rapidly decreasing capture. In 2008 production from both sources stabilised leading to a constant ratio.

As the CFP does not influence aquaculture production, it is difficult to predict how this will impact the ratio against fisheries capture. However, it can be assumed that the slightly increased level of stocks under LTMP will positively impact the level of fisheries capture. While there has been an increase in stocks under LTMP, it has been addressed in section 4.1.2 that this increase under status quo will not be satisfactory to reach the ideal state of stocks under LTMP. Therefore, we can assume that under status quo as aquaculture remains constant (as has occurred between 2007-2008) and fisheries capture increases with level of stocks under LTMP the ratio of fisheries capture to aquaculture production will increase.

Alternative status quo assumptions

The alternative status quo assumptions were

a) Multispecies: include potential multispecies effects, in the Baltic between cod and sprat and in the North Sea and Atlantic between cod and nephrops;

b) Unreported catches: the Control Regulation reduces the unreported catches by 95%

c) Unreported catches: the Control Regulation reduces the unreported catches by 50%

d) Reduced adoption of LTMPs: a reduction in the number of adopted LTMPs

e) Fish price decrease: externalities result in the base price for quota species decreasing by 10%;

f) Fish price increase: externalities result in the base price for quota species increasing by 10%;

g) Fuel: world fuel price increase by 50% causing a 45% increase in fuel costs to fishing segments.

Full results are shown in Annex B.

Alternatives a), b), c) and d) affect biological, economic and social indicators. The biological impacts are shown in Table 81 and Table 82. The economic impacts are shown in Table 83 and Table 84.

Multispecies

Impacts from assuming an interaction between cod and sprat are significant for countries dependent on Baltic sprat, as was shown in the Baltic Pelagic IA , and there are some impacts, as expected, from a reduction in Nephrops catches for those countries and sectors (See Annex B) catching significant proportions of Nephrops – in particular UK and Ireland. The fleets that would be most affected by changes in Nephrops are the UK DTS <12m and 12-24 m (with 45% and 60% of their income from Nephrops in 2007 respectively), Ireland 12-24 and 24-40m (46% and 34% respectively). Nevertheless, the impacts of these multispecies changes on overall profitability, employment and crew wage are (with the exception of Poland) relatively minor.

Unreported catches

The impacts of assuming a less efficient implementation of the Control Regulation are limited to those 5 stocks where significant unreported catches are currently reported. Although the performance of the LTMP for each of these stocks is reduced, the overall performance of indicator 1 is not affected because the only stock that currently shows MSY status in 2017 and 2022 (North Sea herring) still shows this status under the very small increases in unreported catch that are reported. The performance in 2012 of this stock, however, is affected. All the other stocks perform worse, but they did not meet the MSY condition in the status quo scenario itself.

Spain, Germany and the UK show significant losses of GVA, and crew wage under this alternative, arising from significant drops in legal (quota) catch for southern hake, mackerel

and cod. However, these fleets would continue to benefit from the sale of unreported (over-quota) fish, at a reduced price.

There would be negative impacts on some of the governance indicators from this alternative, notably the indicators on management costs (indicator 19), data quality (21), and administrative burden (25).

Reduced adoption of LTMPs

The impacts of assuming a reduction in the adoption of LTMPs are likely to be greater than the model output suggests. Our results are based on the omission of the proposed LTMP for western horse mackerel. This stock is currently underexploited with respect to its status under the proposed LTMP, which is unusual in that it uses a harvest control rule based on egg production estimates rather than a target fishing mortality. Therefore, using the LTMP harvest control rule generates a higher catch than is produced by the status quo fishing mortality along with a lower spawning stock biomass which is still within biological limits but for which we do not know its relation to MSY. However, without a LTMP the exploitation of the stock is still uncontrolled, so from a management and governance perspective a LTMP is the desired option irrespective of individual trends in stock and catch.

This situation may not be expected to hold for the majority of stocks to be potentially managed under LTMPs, because their current stock status is generally poor (below reference points) in contrast to the current situation for western horse mackerel whose status is good (ICES, 2009)[146]. In the normal situation, one would expect that stock biomass would increase under a LTMP, and for catches to initially decline and subsequently to rise again as the stock increases.

Overall, the impact of the loss of a LTMP is negative because of the lack of management and governance associated with the current systems versus the control delivered by a LTMP. Thus we conclude that under this alternative scenario the ability of the EU to manage its stocks under the CFP is reduced.

Fish price changes

Relatively minor impacts on key economic and social indicators are generated by a ±10% change in fish price.

Fuel price increase

World fuel prices may continue to increase at the rate that they are assumed to take between 2005-7 and 2012. This sensitivity therefore examined the impact that an additional 45% increase in fuel price in 2017 (maintained at this rate to 2022) would have on fleet performance.

[146] ICES (2009) Report of the ICES Advisory Committee, 2009. ICES Advice, 2009. Book 9. Available at: http://www.ices.dk/committe/acom/comwork/report/2009/2009/hom-west.pdf.

Table 81 Impacts of alternative assumption (b) and (c) on fishing mortality. No fishing mortality reference points were estimated for assumption (a).

Model run	Species	Area	LTMP	Fmsy	Fproj (2012)	Fproj (2017)	Fproj (2022)
Main	Cod	IIa,IV	Cod IV North Sea	0.2	0.38	0.37	0.59
	Hake	VIIIc,IX,X, CECAF	Hake southern	0.23	0.55	0.41	0.27
	Cod	I,IIb	International	0.22	0.31	0.48	0.49
	Mackerel	all	International	0.2	0.29	0.23	0.23
	Herring	IIa,IV	Herring North Sea	0.19	0.18	0.11	0.11
95 % reduction in unreported catches	Cod	IIa,IV	Cod IV North Sea	0.2	0.33	0.29	0.42
	Hake	VIIIc,IX,X, CECAF	Hake southern	0.23	0.35	0.26	0.27
	Cod	I,IIb	International	0.22	0.32	0.41	0.43
	Mackerel	all	International	0.2	0.26	0.22	0.22
	Herring	IIa,IV	Herring North Sea	0.19	0.11	0.11	0.11
50 % reduction in unreported catches	Cod	IIa,IV	Cod IV North Sea	0.2	0.39	0.42	0.59
	Hake	VIIIc,IX,X, CECAF	Hake southern	0.23	0.56	0.47	0.31
	Cod	I,IIb	International	0.22	0.31	0.52	0.53
	Mackerel	all	International	0.2	0.29	0.24	0.24
	Herring	IIa,IV	Herring North Sea	0.19	0.18	0.11	0.11

Table 82 Impacts of alternative assumptions (a) [top], (b) and (c) [middle] and (d) [bottom] on stock and catch status.

		SSB				TAC			
Model Run	**Stock**	**2007**	**2012**	**2017**	**2022**	**2007**	**2012**	**2017**	**2022**
Main	Cod IIIbcd (EC zone)	83292	394714	398590	391731	71477	130467	136679	138658
	Sprat IIIbcd (EC zone)	1475840	783917	1014950	1012290	440908	205553	241000	247839
	Sub-total	**1559132**	**1178631**	**1413540**	**1404021**	**512385**	**336020**	**377680**	**386498**
Multispecies	Cod IIIbcd (EC zone)	83292	390000	290000	300000	71477	92884	75000	80000
	Sprat IIIbcd (EC zone)	1475840	750000	900000	900000	440908	205553	210000	210000
	Sub-total	**1559132**	**1140000**	**1190000**	**1200000**	**512385**	**298437**	**285000**	**290000**

		SSB				TAC			
Model run	**Stock**	**2007**	**2012**	**2017**	**2022**	**2007**	**2012**	**2017**	**2022**
Main	Cod Iia,IV	34475	104596	227075	137449	19260	28097	57459	50902
	Hake VIIIc,IX,,X,CECAF	16109	21368	19579	30767	6661	6210	6412	7891
	Cod I,Iib	621033	1662358	1326018	836773	20337	28611	32260	26974
	Mackerel Iia, IV	2476318	2776600	2895262	3011895	17621	21326	22155	23293
	Mackerel Iia,Vb,VI,VII					227320	275003	285700	300371
	Mackerel VIIIc,IX...					26176	31679	32911	34601
	Herring Iia,Ivab	1233800	1272303	2613725	3293189	315351	83135	126050	171877
	Herring Ivc,VIId					50023	13187	19995	27264
	Sub-total	**4381735**	**5837225**	**7081659**	**7310074**	**682750**	**487248**	**582942**	**643172**
Unreported catches 95 %	Cod Iia,IV	34475	108020	269812	223510	19260	28432	62299	80892
	Hake VIIIc,IX,,X,CECAF	16109	26161	34918	40448	6661	5677	8841	13601
	Cod I,Iib	621033	1652007	1302372	1085948	20337	28611	32585	30246
	Mackerel Iia, IV	2476318	2771233	2954734	3142738	17621	21338	22629	24518
	Mackerel Iia,Vb,VI,VII					227320	275159	291815	316177
	Mackerel VIIIc,IX...					26176	31697	33616	36422
	Herring Iia,Ivab	1233800	1575662	2767516	3330201	315351	83135	140762	175123
	Herring Ivc,VIId					50023	13187	22329	27779
	Sub-total	**4381735**	**6133084**	**7329350**	**7822846**	**682750**	**487236**	**614876**	**704759**
Unreported catches 50 %	Cod Iia,IV	34475	102520	198646	114145	19260	27541	55073	45586
	Hake VIIIc,IX,,X,CECAF	16109	21135	17127	27690	6661	6130	5850	6984
	Cod I,Iib	621033	1659659	1206220	770965	20337	28611	30980	25880
	Mackerel Iia, IV	2476318	2765310	2826157	2906660	17621	21286	21273	22122
	Mackerel Iia,Vb,VI,VII					227320	274496	274331	285277
	Mackerel VIIIc,IX...					26176	31621	31602	32863
	Herring Iia,Ivab	1233800	1284430	2662799	3276954	315351	83135	127122	169769
	Herring Ivc,VIId					50023	13187	20165	26930
	Sub-total	**4381735**	**5833054**	**6910949**	**7096414**	**682750**	**486008**	**566395**	**615412**

Model run	Stock	SSB 2007	SSB 2012	SSB 2017	SSB 2022	TAC 2007	TAC 2012	TAC 2017	TAC 2022
Main run	Horse Mackerel IIa(EU),IV(EU)	3500287	2019921	2165698	2431781	40957	51181	51248	50841
	Horse Mackerel VI,VII, VIIIabde, XII,XIV,Vb(EU)					135257	169022	169240	167896
	Horse Mackerel VIIIc,IX					55000	68730	68819	68272
	Sub-total	**3500287**	**2019921**	**2165698**	**2431781**	**231214**	**288933**	**289307**	**287009**
Reduced LTMP adoption	Horse Mackerel IIa(EU),IV(EU)	3500287	2171339	2517310	2716357	40957	28836	36955	40120
	Horse Mackerel VI,VII, VIIIabde, XII,XIV,Vb(EU)					135257	95230	122041	132494
	Horse Mackerel VIIIc,IX					55000	38724	49626	53877
	Sub-total	**3500287**	**2171339**	**2517310**	**2716357**	**231214**	**162790**	**208623**	**226491**

Table 83 Summary results from the alternative assumptions for Status Quo: Total for economic and social indicators.

Indicator	Income (mln) 7	GVA (mln) 8	Revenue/ Break Even Revenue 9	Net Profit Margin 10	Fleet size (no) a2	Employment (FTE) 13	Value added per employee (€) 16	Crew wage (€) per FTE 17
Reference Year	4412	1918	1.15	3.4%	27870	69390	27645	19552
Main Run								
2012	4499	1916	1.15	5.3%	25398	63050	30387	20920
2017	4545	2105	1.18	7.8%	23731	60057	35053	23474
2022	4572	2270	1.20	10.1%	21559	56935	39878	26328
Unreported catches 50%								
2012	4497	1914	1.15	5.2%	25398	63049	30362	20902
2017	4524	2083	1.18	7.7%	23731	60119	34643	23199
2022	4542	2242	1.20	9.9%	21555	56931	39380	25998
Unreported catches 95%								
2012	4493	1919	1.15	5.3%	25398	62786	30561	21043
2017	4586	2156	1.18	8.0%	23730	59742	36093	24264
2022	4681	2379	1.21	10.5%	21563	56963	41768	27716
LTMP adoption								
2012	4465	1897	1.15	5.1%	25398	62349	30420	20976
2017	4523	2094	1.18	7.8%	23730	59609	35123	23538
2022	4556	2262	1.20	10.0%	21535	56613	39961	26387
Multispecies								
2012	4501	1921	1.15	5.3%	25398	62784	30593	21085
2017	4515	2076	1.18	7.5%	23731	59908	34656	23311
2022	4503	2201	1.20	9.5%	21560	56806	38749	25737
Price +10%								
2012	4949	2366	1.19	8.4%	25398	63050	37523	25237
2017	4999	2560	1.21	10.7%	23731	60057	42620	28034
2022	5029	2728	1.23	12.8%	21559	56935	47908	31168
Price -10%								
2012	4049	1466	1.12	1.4%	25398	63050	23252	16602
2017	4090	1651	1.14	4.3%	23731	60057	27485	18915
2022	4115	1813	1.17	6.8%	21559	56935	31849	21488

Indicator	Income (mln) 7	GVA (mln) 8	Revenue/ Break Even Revenue 9	Net Profit Margin 10	Fleet size (no) a2	Employment (FTE) 13	Value added per employee (€) 16	Crew wage (€) per FTE 17
Fuel								
2012	4499	1916	1.15	5.3%	25398	63050	30387	20920
2017	4545	1640	1.13	4.4%	23731	60057	27311	18323
2022	4572	1830	1.16	6.8%	21559	56935	32141	21192

Table 84 Summary results from the alternative assumptions for Status Quo. Comparisons of the 2022 results between the Main Run and the results for the alternative assumptions, for selected indicators.

	Effect on GVA 2022 (% change) [7]						
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
BEL	0%	0%	0%	0%	28%	-28%	-51%
DEU	-1%	4%	0%	-10%	13%	-13%	-5%
DNK	-1%	3%	0%	-10%	16%	-16%	-11%
EST	0%	0%	0%	0%	27%	-27%	-39%
ESP	-3%	13%	-1%	1%	26%	-26%	-31%
FIN	0%	0%	0%	-2%	39%	-39%	-49%
FRA	0%	0%	0%	-2%	18%	-18%	-16%
GBR	-2%	6%	0%	-5%	20%	-20%	-15%
IRL	-1%	1%	-1%	-5%	17%	-17%	-12%
LTU	0%	0%	0%	-34%	14%	-14%	-7%
LVA	0%	0%	0%	-1%	21%	-21%	-26%
NLD	0%	0%	-2%	0%	20%	-20%	-26%
POL	0%	1%	0%	-18%	17%	-17%	-18%
PRT	-1%	2%	0%	1%	17%	-17%	-14%
SWE	0%	-1%	0%	-14%	21%	-21%	-21%

	Effect on GVA 2022 (% change) [7]						
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
0012	0%	0%	0%	-2%	15%	-15%	-7%
1224	-1%	4%	0%	-8%	20%	-20%	-19%
2440	-3%	13%	0%	-3%	26%	-26%	-31%
40XX	-1%	3%	-1%	1%	20%	-20%	-20%

	Effect on net profit margin 2022 (absolute change in % profit) [9]						
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
BEL	0.0%	0.0%	0.0%	0.0%	0.7%	-0.9%	0.5%
DEU	-0.2%	0.9%	0.0%	-1.8%	1.6%	-2.0%	-1.7%
DNK	-0.2%	0.5%	0.0%	-1.5%	3.2%	-4.0%	-3.3%
EST	0.0%	0.0%	0.0%	0.0%	4.7%	-5.8%	-10.7%
ESP	-0.2%	0.7%	0.0%	0.0%	2.4%	-2.9%	-2.9%
FIN	0.0%	0.0%	0.0%	-0.2%	6.0%	-7.4%	-4.1%
FRA	0.0%	0.0%	0.0%	-0.3%	2.9%	-3.6%	-3.7%
GBR	-0.4%	0.9%	0.0%	-0.9%	3.3%	-4.0%	-3.8%
IRL	-0.2%	0.2%	-0.2%	-0.7%	3.0%	-3.6%	-3.7%
LTU	0.0%	0.0%	0.0%	-4.9%	1.7%	-2.0%	-2.0%
LVA	0.0%	0.0%	0.0%	-1.1%	5.6%	-6.9%	-14.8%
NLD	0.0%	0.0%	-0.3%	0.0%	3.6%	-4.3%	-6.4%
POL	0.0%	0.1%	0.0%	-2.9%	2.5%	-3.1%	-5.5%
PRT	-0.2%	0.4%	0.3%	0.3%	0.5%	-0.6%	3.7%
SWE	0.0%	-0.2%	0.0%	-3.6%	4.1%	-5.0%	-7.0%

Effect on net profit margin 2022 (absolute change in % profit) [9]							
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
0012	0.0%	0.0%	0.0%	-0.8%	2.8%	-3.5%	-2.8%
1224	-0.1%	0.5%	0.0%	-1.2%	2.5%	-3.0%	-3.1%
2440	-0.2%	1.0%	0.0%	-0.6%	2.0%	-2.4%	-1.6%
40XX	-0.3%	0.4%	-0.1%	0.0%	3.5%	-4.3%	-5.1%

Effect on employment 2022 (% increase) [13]							
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
BEL	0%	0%	0%	0%	0%	0%	0%
DEU	1%	-2%	0%	-2%	0%	0%	0%
DNK	0%	0%	0%	-2%	0%	0%	0%
EST	0%	0%	0%	0%	0%	0%	0%
ESP	0%	0%	-1%	0%	0%	0%	0%
FIN	0%	0%	0%	0%	0%	0%	0%
FRA	0%	0%	0%	0%	0%	0%	0%
GBR	0%	0%	0%	1%	0%	0%	0%
IRL	0%	0%	0%	0%	0%	0%	0%
LTU	0%	0%	0%	-31%	0%	0%	0%
LVA	0%	0%	0%	-1%	0%	0%	0%
NLD	0%	0%	-1%	0%	0%	0%	0%
POL	0%	-1%	0%	-6%	0%	0%	0%
PRT	0%	0%	-1%	0%	0%	0%	0%
SWE	0%	-1%	0%	-6%	0%	0%	0%

Effect on employment 2022 (% increase) [13]							
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
0012	0%	0%	0%	-1%	0%	0%	0%
1224	0%	0%	-2%	0%	0%	0%	0%
2440	0%	1%	0%	0%	0%	0%	0%
40XX	0%	-2%	0%	1%	0%	0%	0%

	Effect on crew wage 2022 (% increase) [17]						
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
BEL	0%	0%	0%	0%	24%	-24%	-44%
DEU	-2%	6%	0%	-5%	12%	-12%	-5%
DNK	-1%	4%	0%	-9%	14%	-14%	-10%
EST	0%	0%	0%	0%	23%	-23%	-31%
ESP	-3%	13%	1%	0%	22%	-22%	-26%
FIN	0%	0%	0%	-1%	23%	-23%	-30%
FRA	0%	0%	0%	-2%	16%	-16%	-14%
GBR	-2%	6%	0%	-6%	17%	-17%	-14%
IRL	-1%	1%	0%	-5%	15%	-15%	-11%
LTU	0%	0%	0%	1%	12%	-12%	-6%
LVA	0%	0%	0%	8%	3%	-3%	18%
NLD	0%	0%	0%	0%	18%	-18%	-23%
POL	0%	1%	0%	-12%	16%	-16%	-20%
PRT	-1%	2%	0%	0%	23%	-23%	-34%
SWE	0%	1%	0%	-2%	22%	-22%	-26%

	Effect on crew wage 2022 (% increase) [17]						
Country	**Unreported catches 50%**	**Unreported catches 95%**	**LTMP adoption**	**Multispecies**	**Price increase**	**Price decrease**	**Fuel increase**
0012	0%	0%	0%	-1%	14%	-14%	-6%
1224	-1%	3%	1%	-6%	17%	-17%	-16%
2440	-2%	11%	0%	-1%	23%	-23%	-31%
40XX	-2%	5%	0%	0%	18%	-18%	-18%

Subsidy (EFF funding) reduction

The effect of a reduction in EFF funding, which might arise if MS were unable to provide matched funding under the current economic situation, would clearly have an impact on the expenditure in all axes, but here we examine just the measures to adapt the EU fishing fleet. These include measures for scrapping and modernisation (specifically engine replacement, safety measures etc).

Clearly the impacts of a reduction in EFF funding would be felt across the board, from the fleet, to marine infrastructure, social programmes and aquaculture, according to the impact across different axes. As concerns the fleet, Axis 1 comprises 27% of the total budget for EFF and would be impacted in such a scenario.

In the FIFG programme, from 2003-2006, some 83% of equivalent Axis 1 funding went on scrapping (permanent removal). From data available[147] it is possible to calculate the cost of decommissioning a vessel, or a kW unit. These data were combined with anticipated fleet reductions under our status quo model scenario to estimate the total cost of scrapping by Member State. Making such calculations, it is possible to see that in a number of Member states a shortfall in funding may lead to a significant reduction in the funds available for

[147] www.fishsubsidy.org

scrapping. This would lead to a consequential reduction in the ability for the MS to meet its capacity reduction targets.

This alternative scenario would have impacts across the whole of our calculations of fleet profitability, reducing individual vessel GVA and crew wage. However, ITQ fleets would be expected to self-regulate capacity without needing EFF funds.

Table 85 Estimated cost of scrapping under the EFF programme, calculated using either the reduction in number of vessels or the reduction in Kw. The cost is compared with the available funds under the whole of Axis 1, and assuming a 50% uptake of those funds under this alternative scenario.

	Anticipated scrapping requirement 2007-2013		Funding				
	Vessels	kW	EFF subsidy required (meuro) based on vessel reduction	EFF subsidy required (meuro) based on GRT or KW reduction	EFF + MS Axis 1 funding (meuro) available		Potential subsidy amount (meuro, 50% or original)
BELGIUM*	14	**12442**	**10**	**13**	19	10	shortfall
CYPRUS^	88	4267	13	2	6	3	
DENMARK^	129	291098	29	362	102	51	
ESTONIA~	111	5584	14	9	39	19	
FINLAND~	381	22293	105	12	9	4	shortfall
FRANCE*	830	**145578**	**191**	**127**	151	76	shortfall
GERMANY~	222	18752	60		21	10	shortfall
GREECE^	1795	57436	67	54	196	98	
IRELAND*	**350**	23377	94		88	44	shortfall
ITALY^	1409	128195	**144**	**120**	409	205	
LATVIA~	101	6433	24	10	53	26	
LITHUANIA~	29	8008	7	18	35	17	
NETHERLANDS~	123	64742	97	32	43	21	shortfall
POLAND~	116	14228	25	20	429	214	
PORTUGAL~	750	26859	**148**	**28**	160	80	
SPAIN*	1267	**171115**	**238**	**221**	1023	512	
SWEDEN~	237	37711	**42**	**25**	35	17	shortfall
UNITED KINGDOM~	548	62108	223	60	101	50	shortfall

* Based on EFF Operational Programme information from the Member State
^ Based on MS specific EIAA modelled segments capacity reduction
~ Based on total EU EIAA modelled segments capacity reduction

The above calculations assume that all EFF Axis 1 funds are devoted to scrapping (permanent cessation) but this is not the whole objective of that Axis. In the FIFG 17% of funds were used for modernisation of vessels. However, as we have seen in section 2.2.6, the Axis 1 type subsidies only contributed some 3% of total income of vessels in the FIFG period, and modernisation subsidies therefore less than 1%. They do not appear in vessel accounts as “additional income”. The presumption is that these subsidies will lead to the more rapid uptake of improving technology, such as more efficient engines and gear, but evidence for them generating significant improvement in profitability or better fishing is mixed. Research by Seafish in the UK as part of a ‘fuel task force to address rising fuel

prices identified a number of measures the fleet could adopt to improve fuel efficiency. While replacement of the engine resulted in a 7% reduction in fuel costs for one vessel, the high capital costs meant that these costs would not be recovered over a 10 year time horizon (Seafish, 2006)[148] Only a small proportion of owners that were already looking to replace old engines may have done so quicker than planned to benefit from fuel saving earlier. The availability of a subsidy for engine replacement would change the level of capital investment required to make this option attractive to a larger proportion of owners, but this is simply accelerating fleet investment, which would occur at some point anyway.

In terms of gear technology, research in the Netherlands on adaptations to the conventional beam trawl has identified that lighter trawl gears do result in greatly reduced fuel consumption, which in the case of the electric pulse trawl was up to a 40% reduction (ICES 2006[149]), but other research highlights the costs in terms of comparative catch efficiencies from these new technologies (eg. the pulse trawl caught significantly less landings, i.e. 68% of the landings of a conventional beam trawler (IMARES, 2006)[150].

As the ICES Working Group on Fishing Technology reported, in a number of fisheries as in previous years, research into selective gears has been extensive but still with only limited uptake. The drivers for up-take are still clearly regulatory, i.e. as a means of attaining an increased quota entitlement or increased access; or economic through higher price paid for a responsibly caught product. (ICES, 2009)[151]

Even if we consider that a 50% reduction in EFF Axis 1 funding would lead to a reduction in this additional income from 1% of total income to 0.5% of total income the impact on fleet profitability across the EU would be less than 0.4%. This is less than can be accurately measured.

[148] Seafish, 2006 Options for increasing fuel efficiency in the UK fishing fleet. H., Curtis, K graham, T. Rossiter. October 2006.
[149] ICES, 2006 Report of the Ad-hoc Group on Pulse trawl evaluation. ICES, April 2006
[150] IMARES, 2006 Performance of pulse trawling compared to conventional beam trawling B. van Marlen, R. Grift, O. van Keeken, M.S. Ybema, R. van Hal. Project number 32.11.242.007
[151] ICES, 2009 Report of the ICES-FAO Working Group on Fish Technology and Fish Behaviour (WGFTFB), Ancona, Italy May 2009

5 CONCLUSIONS

The overall conclusions are summarised here and in Table 86.

Only 2 of the 27 indicators (22%) were assessed as being able to meet their performance target by 2022 under the status quo scenario (Table 86). The remainder (25 indicators; 92% of the total) were assessed as not meeting their performance target by 2022, although some of these showed improvement.

For environmental indicators, there is likely to be a slow improvement in all indicators, associated with the recovery of fish stocks, particularly those associated with LTMPs, and a continued improvement in the number of protected areas (both from the generation of fisheries-related measures and environmental protection measures such as Natura 2000). However in general targets are not met as a consequence of discarding, unassessed stocks and large numbers of non-RBM fleets in the future. The improvement in stocks will be hindered because LTMPs are currently setting targets slightly higher than F_{MSY}, and because of continued discarding. Fish stocks will experience more modest improvements if the control regulation is less effective at reducing unreported catches than is assumed in the status quo scenario. In the Mediterranean stocks will improve as fleet size, and effort, declines (in these effort managed fisheries) but these reductions will not be sufficient to achieve F_{MSY}.

For economic indicators of Gross Value Added, Revenue to Break-even revenue, Net Profit Margin and Return on Investment) there will be a gradual improvement, associated with the improvement in fish stock status and the reduction in fleet size. However significant numbers of poorly performing, over-capacity fleets prevent significant improvements in overall financial performance of the EU fleet. Some fleets will in the longer-term begin to increase in size as opportunities grow. However improvements in these indicators will be small over 2012-2022, and while some fleet segments will perform better than others, the financial/economic viability of others will remain under threat. Fish prices will remain constant in real terms and subsidies will remain a significant proportion of the value of landings. Increasing fuel prices and decreasing fish prices have the potential to adversely impact the performance of all fleet segments, along with the risk that future stock recoveries may not be as significant as those assumed in the status quo scenario. Conversely, future increases in effective fishing power would lead to improvements in economic performance through the reduction of effort-based costs.

For social indicators the situation is similarly mixed. While there may be some very small increases in catching sector employment, the model suggests that these are close to negligible. Increases in GVA from capture fisheries will lead to an increase in GVA per employee and crew wage, but this is likely to only keep pace with the general trend in national wages rather than outstrip it. On the other hand, without these changes the attractiveness of the sector would continue to decline. Some communities highly dependent upon the industry will continue to see a decline in the importance of fisheries, but others such as Scotland are likely to see an improvement in the status of fisheries. Safety (which, although it is indicator 28, should be grouped with social indicators) will improve gradually as fleets become smaller and more profitable. Effort creep would result in decreasing employment through decreased effort, though this would lead to improvements in social sustainability.

The above three sets of indicators confirm the close linkages between long-term environmental status of stocks, and long-term economic and social sustainability. They

suggest that without more marked improvements in stock status, economic and social sustainability will remain limited.

For governance indicators, the situation is also mixed. Unless there is a significant improvement in management of stocks outside LTMPs and stocks without analytical assessments, relatively high levels of departure from scientific advice is likely to continue. The continued inclusion of the 15% inter-annual TAC variation in LTMPs, which restricts the action that can be taken during recovery and may not be consistent with scientific advice (if that advice does not endorse the plan) may also lead to low consistency with scientific advice. There are likely to be improvements in management costs (reducing as a result of the use of new technology, etc) and data reporting (improving with increased compliance with regulations), and the number of fleets with RBM systems will continue to rise slowly.

For simplification and administration, there should be gradual improvements under the status quo option. The interaction between utilisation and swaps should lead to a reduction in swaps and a decrease in administrative burden. In addition, further rationalisation of the rules under one regulation such as done for the DCF and the control regulation is likely to lead to further reduction in administrative burden. A reduction in fleet size and increasing use of RBM and electronic monitoring should further improve these indicators.

The indicator on the external fleet may not show a very significant improvement under the status quo option, as some EC fleets will be still operating under poor governance regimes in the EEZ under jurisdiction of certain Coastal States.

Table 86 Impact Assessment Summary. The status quo results and the performance of each of the indicators is assessed in this table against its performance target (ideal state). Risks to achieving the assessed performance are presented in the final column.

Double Frown: performance targets not met, and/or a significant worsening of the situation
Frown: performance targets not met, and/or a worsening of the situation
Neutral: performance targets not met, and little change in the situation or only very small improvement
Smile: performance targets substantially met, and/or significant improvement of the situation
Double smile: performance targets met, and/or very significant improvements of the situation

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
1. Stock at MSY	All stocks at MSY	Only about 40% of the stocks modelled were fished sustainably by 2022, an increase from 20% in 2012. Total catches of modelled stocks increase by 21%. The major concerns remain – • LTMPs continue to set targets that are higher than MSY • Continued discarding • Unassessed stocks and Mediterranean stocks not at MSY. • Negative impact on non-LTMP stocks as effort is directed away from LTMP stocks	Performance target **not met** except for LTMP stocks • Undermined by setting targets higher than MSY, discarding and unassessed stocks ☹	There is a risk that the Control Regulation will not be as effective as assumed in the status quo calculations. This impacts the state of the stocks concerned but does not significantly impact the modelled proportion of stocks at MSY. There is a significant risk that the Commission will not have the resources, or that sufficient political will will not be generated, to agree all the proposed LTMPs. This will significantly impact the ability to meet MSY management.
2. LTMP	All stocks with LTMP	Some 75% of catch volume will come from stocks with LTMP. However, significant numbers of unassessed stocks (66%) will remain without LTMP.	Performance target **not met** • undermined by unassessed stocks 😐	There is a significant risk that the Commission will not have the resources, or that sufficient political will will not be generated, to agree all the proposed LTMPs. This will significantly impact this indicator and lead to a reduction in management and governance ability.

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
3. Fish size	Increase in mean size for all stocks	62% of modelled stocks show an increase in mean size under LTMPs, although there is no increase for some already-healthy stocks. Improvements in LTMP stocks are however overshadowed by continued discarding and lack of improvement in non-LTMP stocks.	Performance target is **met** for LTMP stocks, but **not met** for other stocks. • Level of improvement reduced by continued discarding 😐	The level of improvement is less than it should be for some stocks because of continued discarding. If stock size increases are not realised, through continued unreported catches or significant ecosystem impacts the mean size of fish in impacted stocks will not increase. There is a significant risk that the Commission will not have the resources, or that sufficient political will will not be generated, to agree all the proposed LTMPs. This will significantly impact this indicator for the stocks for which proposed LTMPs are not implemented.
4. Fleet size	Decrease in fleet size to balance stock size, of at least 30% of 2007 levels by 2017 and 40% by 2022	Decrease in fleets anticipated, but generally only at the existing rate reduction of 2% p.a. to 15% by 2017 and 23% by 2022. A balance with opportunities is only likely for RBM fleets.	Performance target **not met** although there is some improvement • Undermined by large number of non-RBM fleets 😐	Technological improvement at high rates will undermine the balancing of fleet size with catching opportunities except where RBM fleets are operating. The current financial situation may lead to MS being unable to provide sufficient matched funding under Axis 1 of the EFF reduce fleet size through decommissioning.
6. Protected areas	Increase in protected areas to a maximum of 30% of fishable area	Increase in protected areas close to 30% of fishable area within continental EU waters, but not with MPA status.	Performance target **not met** although there is likely to be small improvement. 😐	

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
7. GVA	Increase	GVA increases for most segments, with overall GVA increasing from 1.9 mln in 2012 to 2.3 mln in 2022.	Performance target **not met** although there is some improvement • Undermined by significant number of poorly performing fleets 😐	Vulnerability to prices of inputs (e.g. fuel) and outputs (e.g. fish prices) and success of recovery plans (themselves consequent on the performance of the Control Regulation)
8. Revenue to breakeven revenue	All fleets have a ratio of >1	Small increases due to stock increases and declines in vessel numbers, but some fleet segments continue to perform poorly. Only 86% of modelled segments have a ratio >1 in 2022, compared with 82% in 2012.	Performance target **not met** although there is some improvement • Undermined by significant number of poorly performing, over-capacity fleets 😐	Decreasing fish prices, lack of significant stock recovery, and increasing fuel price will reduce ratio.
9. Net profit margin	All fleets have NPM of >5%)	Small increases due to stock increases and declines in vessel numbers, but some fleet segments continue to perform poorly. Only 70% of the modelled segments have a ratio >5% in 2022, compared with 49% in 2012.	Performance target **not met** although there is some improvement • Undermined by significant number of poorly performing, over-capacity fleets 😐	Decreasing fish price, lack of significant stock recovery, and increasing fuel price will reduce NPM.

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
10. Return on investment	All catching segments have RoI >15%; and all processing sectors have RoI >10%	Small increases due to stock increases and declines in vessel numbers, but some fleet segments continue to perform poorly. Only 24 (42%) of the modelled catching segments are operating with RoI >15% in 2022, compared with 26% in 2012. Probably fewer than 50% of MS will have processing sectors with RoI >10%.	Performance target **not met** although there is some improvement • Undermined by significant number of poorly performing, over-capacity fleets 😐	Decreasing fish price, lack of significant stock recovery, and increasing fuel price will reduce return on investment.
11. Fish prices and market orientation	Fish prices increase in real terms	The best estimate under status quo is that fish prices will remain constant in real terms.	Performance target **not met** 😐	Fish prices might increase with increasing quality and size; increasing demand; decreasing supply of imported product. However, it is perhaps more likely that increasing supply of imported product eased by relaxation of trade rules and increased access to technology in third countries as well as competition with aquaculture will exert downwards pressure on prices.
30. Fuel Prices	N/A	As a proportion of vessel costs, fuel price does not change as a linear relationship to fuel price increases or decreases. That is with an average 33% increase in fuel prices between 2005-2008, there was only a 25% increase in fuel price/vessel costs.	N/A	Fuel prices may increase by greater than 33% requiring further changes to activity.
12. Subsidies	Reduced and more targeted 'good' subsidies	Subsidies remaining as a significant proportion of the value of landings, albeit declining slightly. Some improved targeting of subsidies	Performance target **not met** ☹	Role of WTO agreement could be critical in determining type of subsidies post 2013
13. Employment	Reversal of declining trends	Catching sector employment decreases with decreasing number of vessels from 2012 – 2022, with ancillary employment following this trend. Processing employment increases slightly with the increase in landings.	Performance targets **not met** ☹	Effort creep and the failure of the Control Regulation would erode the improvements in employment, with decreases in FTE required to catch fish. Increased employment of cheaper third country labour detrimental to employment of EC Nationals

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
14. Status of fisheries dependent communities	Reversal of declining importance of fishing	No major changes anticipated in some regions, but others where significant stock recoveries are anticipated (e.g. Scotland) will experience an increase in employment and income	Performance target **met** for some regions**, not met** for others 😐	Failure of the Control Regulation and non-recovery of stocks, increases in fuel prices, decreasing fish prices, could significantly impact highly fishery dependent regions
15. Regional dependency	Reversal of declining trends in employment	Following (14)	Performance target **met** for some regions**, not met** for others 😐	Following (14)
16. Social sustainability	Significant ncrease in GVA per employee	Small increases following increases in GVA per employee	Performance target not **met** although there are some small increases 😐	Vulnerability to decreasing prices of fish and success of recovery plans (themselves consequent on the performance of the Control Regulation). However, with effort creep the effort required to catch fish will decrease, and the resulting decline in employment will boost social sustainability

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
17. Attractiveness of the sector	Income at least 100% of national average	Unlikely to change significantly, because although there are increases in real terms these are likely to only keep pace with national income increases	Performance target **not met** • Undermined by likely trends in national average salary 😐	Vulnerability to decreasing prices of fish and success of recovery plans (themselves consequent on the performance of the Control Regulation). However, with effort creep the effort required to catch fish will decrease, and the resulting decline in employment will boost social sustainability
28. Safety[152]	The accident rate (accidents per FTE) should decrease to zero	The current trend would suggest that the non-fatal accident rate will reduce to near zero by 2022. This trend should be expected to be re-inforced as more safety regulations are introduced by the EU, more RBM systems are introduced, and as profitability and GVA/vessel increases. There is no indication that the fatal accident rate is declining.	Performance target **met** for non-fatal accidents, but **not met** for fatal accidents 😐	Safety at sea could be compromised by utilisation of old fishing vessels (low investment capacity of the industry, low availability of public support for modernisation)
18. Departure from scientific advice	Deviation from advice should decline to zero.	Deviation should decrease where catches are high (stocks have recovered) and LTMPs effective. However there are no indications of this reversing the current situation where quotas are set 40% higher than scientific advice. The number of stocks for which scientific advice is zero TAC where the Council sets a positive TAC has increased significantly since 2003.	Performance target **not met** • there are no indications that deviation of TACs from scientific advice is declining • increasing deviation from scientific advice for zero TAC ☹	If fleet capacity continues to be higher than opportunities, pressure for continued deviation may continue.

[152] Although safety is indicator 28, should be grouped with social indicators

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
19. Management costs	Management costs should decline	Management costs are unlikely to be reduced in the short term, but in the medium term national enforcement budgets are expected to be 42% and 35% of 2012 baseline in 2017 and 2022 respectively. Management costs will also slightly decrease with declining fleet sizes.	Performance target **met** ☺	If the Control Regulation is not effective, additional management costs may be incurred to control the problem.
20. Regions and MS having RBM systems	RBM systems uptake should increase to more than 50%	Adoption of additional RBM systems is likely, but will stay at a low level within the EU, about 20% of the modelled fleet.	Performance target **not met** although some improvement • Indications are that relatively few additional fleets are considering implementing RBMs ☹	
21. Data provided by MS	Full compliance by all MS with reporting obligations	Number of infringements expected to decline as the Control Regulation takes effect, and the DCF will significantly improve data reporting	Performance target **met** ☺	

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
22. Rate of utilisation of quotas	Optimum utilisation at 70%	Likely to continue to decline unless fleets as stocks increase	Performance target **not met** • Trends indicate continuing decline in utilisation ☹	
23. Level of quota swaps	Decrease in quota swaps[153]	Likely to remain stable, at about 6% overall, or to continue to decline for most species as stocks recover. A high level of swaps will continue for certain stocks, most particularly redfish, horse mackerel and blue whiting.	Performance target **not met** ☹	The development of highly specialised fleets, particularly for deepwater species, may increase the demand for swaps of those species.
29. Time to Taken to Reach a Decision	Time = low	Most frequent result in time taken (181 – 240 days (6 – 8 months)) is likely to increase significantly under the Lisbon Treaty, effective 2010.	Time taken to reach decisions will increase significantly under EU co-decision of Lisbon treaty ☹	
24. Coherence with WTO	All policies coherent with the EU's WTO obligations	Likely to remain coherent with current policy except on subsidies if agreement is reached at WTO	Performance target **will not be met** • Undermined if WTO decisions on subsidies include those being provided in the EU ☹	
25 Administrative burden	Administrative cost and burden should decrease	Slight decrease, linked to improvement in compliance	Performance target **partially met** 😐	Increasing control, in the Control Regulation

[153] Although it is possible to track this indicator, it is difficult to assess an ideal state for it. A reduction in swaps implies efficiency of the quota allocation system and decreasing administrative burden. An increase in swaps implies individual fleet specialisation and economic efficiency, and full utilisation of quota opportunities by the fleet. The first interpretation of an ideal state is used here in the context of the policy objectives examined in the Phase II report.

Indicator	Performance target (ideal state)	Status quo scenario results	Overall performance of the status quo scenario	Risks and threats to the status quo results
26 Simplification	Simplification of implementation should increase	Simplification likely to remain at present state, with improvement in electronic reporting balanced by continued complexity of technical regulations	Performance target **partially met** 😐	
27 External fleet	100% of the Coastal States EEZ and International waters in which EC vessels have obtained fishing possibilities have good Governance frameworks	Governance will continue to be satisfactory overall, but poor in some agreements. Currently 39% of EU vessels operating in distant waters are operating under poor governance systems.	Performance target **not met** • EC vessels to continue to make private agreements with poorly performing states ☹	
31. Aquaculture	NA	Until 2007, ratio of fisheries capture over aquaculture was decreasing due to both declining catches and increasing aquaculture production. Between 2007 and 2008 this ratio is stabilised.	NA	Aquaculture production may begin to increase and lack of stocks under LTMP may negatively impact fisheries capture.