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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE
EUROPEAN PARLIAMENT**

on improving fishing capacity and effort indicators under the common fisheries policy

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1. OBJECTIVE OF THIS COMMUNICATION

The adjustment of the capacity of the fleets to their available fishing opportunities and the limitation of fishing effort where it is required for the conservation of fish stocks are key management instruments of the Common Fisheries Policy.

The aim of this Communication is to open a debate on the most appropriate way to quantify fishing capacity and fishing effort in the framework of the Common Fisheries Policy.

2. DEFINITION OF FISHING CAPACITY AND FISHING EFFORT

2.1. Fishing capacity

Fishing capacity is defined as the ability of a vessel or group of vessels to catch fish¹. There are two approaches to the quantification of capacity.

The economic approach equates the capacity of a vessel or group of vessels to the maximum *output*, or maximum amount of fish than can potentially be caught over a certain period of time, provided that the vessels are fully utilised and the stocks remain in a healthy condition.

The other approach, generally adopted for fisheries management, bases the quantification of fishing capacity on the ‘potential’ for fleets to constitute an *input* to the fishery in terms of generation of fishing mortality. This quantification of the maximum potential input may be based on vessel or fishing gear characteristics. These vessel or gear characteristics may also be referred to as fishing capacity parameters.

In the framework of the Common Fisheries Policy, fishing capacity has so far been quantified on the basis of vessel characteristics. This approach dates back to the first multiannual guidance programmes adopted in the early 1980’s. The fishing capacity indicators chosen at the time were vessel tonnage and engine power, and these have been included in the basic regulation of the Common Fisheries Policy², which also provides for the possibility to define fishing capacity in terms of the amount and/or the size of fishing gear.

2.2. Fishing effort

Community law defines fishing effort for a vessel as the product of its capacity and its activity. For a group of vessels, the fishing effort is defined as the sum of the fishing effort of each vessel.

Fishing effort may be thought of as an energy input, where capacity represents the power and activity represents the time during which the power is used. This is particularly straightforward when capacity is defined as vessel power (see 3.1.2).

¹ Gréboval D. (ed.) Managing fishing capacity: selected papers on underlying concepts and issues. FAO Fisheries Technical Paper. No. 386. Rome, FAO. 1999.

² Article 3 of Council Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.

3. QUANTIFICATION OF FISHING CAPACITY

3.1. Fishing capacity indicators based on vessel characteristics

It is common practice to quantify capacity on the basis of vessel characteristics. This approach is simple and relatively easy to enforce, at least in respect of tonnage. Tonnage and power are the two most commonly used indicators, although there are alternatives.

3.1.1. Tonnage of a fishing vessel

The tonnage of vessel is a function of all or part of its enclosed volume. There are various systems to calculate the tonnage of a vessel and they differ essentially in respect of the volumes taken into account for the calculation.

In the early days of the CFP, Member States applied different standards to measure tonnage. Only vessels over 24 m in length that made international trips were measured by means of a common system across the Community, since they were subject to the London Convention³.

In 1994, the Council adopted the current tonnage definition that applies to all Community fishing vessels⁴. For vessels of 15 m or more in overall length, tonnage is calculated as a function of the total enclosed volume as defined by the London Convention, while for vessels of less than 15 m the total enclosed volume is replaced by an estimate of the hull's volume (a function of length, breadth and depth).

Since the end of 2003, all Community fishing vessels have been measured in accordance with a common definition of tonnage. This is an important achievement for the CFP. However, from time to time fishermen request that certain spaces within the vessel should be exempted from the calculation of tonnage or even from the entry-exit regime⁵. In the Commission's view, this would represent a backwards step that would undermine the current capacity management measures. In the past, tonnage was measured in different ways in the Member States, but common to all of them was the fact that certain spaces were not taken into account in the calculation. This made the system complicated and encouraged the mis-declaration of the use of spaces in order to be able to replace an old vessel by a bigger one.

Experience shows that the current definition of tonnage is satisfactory and there are no plans to fundamentally change it.

This being said, small improvements in the application of the Community tonnage measurement standard could still be made, such as defining the precision required in calculating GT or the way to calculate volume in particular circumstances, as in the case of catamaran vessels of less than 15 m in length.

³ International Convention on Tonnage Measurement of Ships signed in London in 1969.

⁴ Council Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels. Council Regulation (EC) No 3259/94 of 22 December 1994 amending Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels. Commission Decision of 20 March 1995 concerning the implementation of the Annex to Council Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels.

⁵ In accordance with the entry-exit regime established by Article 13 of Council Regulation (EC) No 2371/2002, any entry of capacity into a the fleet of a Member State has to be compensated by the exit of at least the same capacity expressed both in terms of tonnage and power.

The current provisions are set up in three legal texts: Council Regulation (EEC) No 2930/86, Council Regulation (EEC) No 3259/94 amending the former, and the implementing Commission Decision 95/84/EC. In order to simplify Community law, the Commission will propose a new consolidated Council regulation defining the characteristics of fishing vessels to replace the current texts.

3.1.2. Power of a fishing vessel

The power of a fishing vessel is defined in Community law⁶ as the total of the maximum continuous power obtained at the flywheel of each engine and which can be applied to vessel propulsion. Therefore, under Community law, the power of a fishing vessel means its propulsive power.

Vessels also make use of what is generally referred to as ‘auxiliary power’. Auxiliary power may be defined as the total power installed on board not included in the definition of propulsive power. Auxiliary power covers the following needs: equipment associated with propulsion (pumps, rudder, etc), equipment for fishing operations, equipment for fish processing and conservation, accommodation (lighting, heating, cooking) and electronic equipment for fishing or navigation.

The share of auxiliary power in the total power of a fishing vessel has become significant, especially for big trawlers. Increased auxiliary power has allowed the use of bigger nets and has made it possible to fish at great depths. For these reasons, the Commission will propose to Member States that auxiliary power be included in the definition of fishing capacity.

The current system of measurement and certification of engine power has serious shortcomings. An engine can be certified with a power much lower than its maximum continuous power. The lower power rating (de-rating) is generally achieved by means of adjustments to the fuel injection settings when the engine is certified. These adjustments are easily reversible and, as a result, the real power output once the engine is installed on board is almost impossible to monitor or verify.

The Commission is working on finding a new system to certify engine power so the certified power should correspond to the real maximum continuous power; as a result, similar engines should be given similar ratings.

This issue is technically complex and cannot be resolved without the cooperation of engine manufacturers, classification societies and the administrations responsible for certification procedures in the Member States.

Implementation of a new power certification system will require new legal provisions replacing Article 5 of Council Regulation (EEC) No 2930/86. The new provisions should also include the definition of auxiliary power as part of the capacity definition. The Commission has conceived to base the certification of engine power on the existing certificate of emission of nitrogen oxides issued under the provisions of Annex IV to the MARPOL Convention⁷, but this solution needs further technical assessment.

⁶ Article 5 of Council Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels.

⁷ International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)

3.1.3. Other fishing capacity indicators based on vessel characteristics

Other capacity indicators based on vessel characteristics may be used, although they do not appear to add much value compared to tonnage and power:

The volume of fish holds is sometimes used as an indicator of a fishing vessel's carrying capacity. For demersal fisheries this indicator seems to be largely irrelevant, since fish holds are rarely filled up. Conversely pelagic trawlers and purse seiners often have the duration of their fishing trips cut short by the size of their fish holds. However, this indicator is strongly correlated with vessel volume (i.e. GT tonnage), and is difficult to monitor.

Freezing capacity may also be considered as a suitable indicator of capacity. Freezing capacity is the mass of fish that can be frozen per unit of time and it is a limiting factor in certain fisheries. However, freezing capacity would be very difficult to certify and monitor. Auxiliary power could be used as a proxy for freezing capacity, because freezing and refrigerating processes require a large amount of energy; this would be another argument in favour of including auxiliary power in the calculation of vessel capacity.

Bollard pull has been proposed as a suitable indicator for trawlers. It is defined as the maximum force that may be exerted by a vessel when pulling against a fixed point. Bollard pull has always been a contractual value for tug vessels (and often for trawlers) and there are standard methods to measure it. However, measuring it is expensive and would suffer from the same problem of under-declaration that affects engine power; if the engine is de-rated, the pull measured would be also lower.

3.2. Fishing capacity indicators based on fishing gear

3.2.1. Fishing gear type and size. Efficiency and selectivity

The characteristics, and especially the size, of fishing gear can be taken as representing the potential of a vessel to generate fishing mortality. If the type and size of the fishing gear that fishermen are allowed to use in a certain fishery are well defined, fishing capacity may be easier to quantify on the basis of that information.

Efficiency and selectivity.

There is no clear separation between the characteristics of a fishing gear that affect its efficiency (general ability to fish) and those that affect its selectivity (ability to discriminate between species or sizes of fish). The Commission would propose that fishing gear type and size be considered to relate to efficiency, and therefore to potential to fish or fishing capacity, while some fishing gear characteristics, such as mesh size or separation devices, should be considered to influence selectivity. Although this approach is a simplification, it does serve to distinguish management measures aimed at limiting capacity from those aimed at improving selectivity.

The Commission will take this into account in the drafting of forthcoming legislative proposals in the fields of capacity management and technical conservation measures.

Type of fishing gear

When trying to quantify fishing capacity on the basis of the fishing gear it may be useful to classify fishing gears into two groups, according to whether they remain attached to the vessel

or not. When fishing gears remain attached to the vessel, their fishing time can be estimated on the basis of the vessel's time at sea. This is the case for trawls and seines, as well as some types of longlines. If the fishing gear is left on the fishing grounds while the vessel sets other gears or goes back to port, the measurement of fishing time or activity may become independent of the time spent at sea by the vessel and more difficult to measure. This would be the case for set gill-nets, trammel nets or pots.

3.2.2. Fishing capacity indicators for trawls

Trawling essentially consists of filtering water. Assuming an optimum trawling speed depending on the targeted species, the surface opening of the net measured in square metres (m²) gives a reasonable quantification of fishing capacity.

Demersal and pelagic trawling could both be characterized by the surface opening described above. Beam trawls may be characterized by the length of the beam, which determines the surface of the opening for this type of trawl.

3.2.3. Fishing capacity indicators for longlines

The fishing capacity of longlines may be quantified by the number of hooks or, if the distance between hooks is kept constant, by the length of the longline.

3.2.4. Fishing capacity indicators for seines

The capacity of purse seines may be characterised by the total length of the net, the depth of the net being characteristic of the target species. Attention should be paid to the use of fish aggregating devices (FAD), which may increase capacity to an extent difficult to quantify. Seines are always attached to the vessel.

3.2.5. Fishing capacity indicators for pots

The capacity in a pot fishery may be quantified by the number and size of pots. Other characteristics of pots, such as their shape, the size of the openings and certain specifications on the materials used, would very much depend on the particular fishery and could be defined as technical measures.

3.2.6. Fishing capacity indicators for gillnets and trammel nets

The fishing capacity of these nets is directly related to their size, so the number of nets, together with their length and depth, would be appropriate capacity indicators. Surface area per net could also be used instead. Mesh sizes and other characteristics are specified as technical measures.

3.2.7. Control and enforcement

It is commonly agreed that any system that manages capacity or effort in terms of fishing gear indicators would be more difficult to monitor and enforce than a system based on vessel characteristics. For such a system to be effective it has to rely on a strong commitment by the authorities and stakeholders to enforcement. This would only be possible in a well-delimited fishing zone and for a well-defined group of vessels, ideally having exclusive access to the fishery.

4. TECHNOLOGICAL PROGRESS

One of the main drawbacks for fishing capacity indicators based on vessel characteristics is that they cannot easily take into account the effect of technological progress.

It is generally accepted that, today, an average ‘state of the art’ vessel fishes considerably more quantity than a vessel of equivalent tonnage did 30 years ago. However, this phenomenon is difficult to quantify. Some studies indicate yearly increases in productivity due to technological advances of between 1 and 3 %⁸ or even higher figures for certain fisheries. Examples of technological improvements that have contributed to this increase in real fishing capacity are:

- The use of controllable pitch propellers or nozzles does not increase vessel power, as defined by Community law, but it does increase the efficiency with which this power is used. The same engine power output may produce a higher pull when trawling or a higher sailing speed.
- Electronics in the form of fish-finding equipment or equipment for the control of gear position are examples of improvements in vessel efficiency that cannot be represented by a measurable parameter. The same is true for electronic devices to control the position of the trawl that make its use much more efficient.
- The use of satellite data to determine the probable location of tuna stocks is another example. This technique allows the tuna vessels to reduce their search time to the benefit of fishing time, thus increasing catch per fishing trip.
- More powerful deck equipment allows a vessel to haul and pull the net more times per day, thus increasing effective catch, while the size of the boat, its propulsive power and the number of days spent fishing remain unchanged.
- The design of trawls has been improved in various ways in order to reduce the force that is required to pull them through the water. Stronger material allows thinner fibres and this makes the trawl offer less resistance when moving through the water. The hydrodynamic design of the doors and of the trawl shape has also been improved to reduce resistance, which allows a given boat to use a bigger trawl.

The effect of technological progress on fishing capacity is probably too complex an issue to be integrated explicitly into fisheries management measures. The management of fishing capacity on the basis of fishing gear type and size has the advantage to avoid part of the difficulty by establishing limitations at fishing gear level.

Standardisation and technological progress.

The quantification and limitation of fishing capacity and fishing effort on the basis of the fishing gear characteristics involves a certain degree of standardisation of gear types, sizes and other characteristics such as mesh size or hook shape. This standardisation may hamper technical progress and, consequently, gear efficiency.

⁸ Report on efficiency and productivity in fish capture operations ICES Working Group on Fish Technology and Fish Behaviour Report 2004.

5. FISHING ACTIVITY

5.1. Definition of fishing activity

Fishing activity is defined as the time during which the fishing capacity of a vessel is effectively operating. In Community law, fishing activity refers to the vessel's activity and is measured in days. However, it could be defined more precisely for some fisheries on the basis of the time during which the fishing gear is in operation.

Vessel's activity

This concept applies currently to the recovery plans for cod and hake and as well as to Annex II to the 2006 TAC and quota regulation, where the vessels' activity is managed as days present in the area and absent from port. It also applies to the computation of fishing effort in the Western waters regime⁹, where activity is defined as time spent in a well defined area. For vessels based near their fishing grounds, the two previous definitions are equivalent.

In addition to the previous definition, the rules on fishing activity need to establish clearly how to calculate the number of days. For example, it is necessary to establish whether days are taken as calendar days or as the number of hours divided by 24 and explain how fractions of a day are dealt with.

Fishing gear activity. Soak time.

A more accurate and, in theory, better indicator to measure activity would be the actual time spent fishing, i.e. the time during which the fishing gear is actively in the water, or "soak time". However, soak time of fixed gear is generally difficult or expensive to monitor properly since pots, nets and other fixed gear may be left in the water while the vessel goes elsewhere or returns to port. They can also be laid by one boat and recovered by another, and they can also be set permanently.

5.2. Recording and monitoring of activity; logbook

The logbook should in principle provide for the possibility of recording all the data necessary to calculate activity in different ways. The skippers should fill in the appropriate data depending on the fishing regime under which they fish. Two main sets of data are relevant in relation to activity:

- (a) Vessel data: geographical position at different times
- (b) Gear data: time spent in the water by fishing operation.

Monitoring of the vessel's activity has to be based on data from the logbook and from the VMS (Vessel Monitoring System). The future implementation of the electronic logbook would enhance the possibilities to monitor activity accurately and timely.

⁹ Council Regulation (EC) No 1954/2003 of 4 November 2003 on the management of the fishing effort relating to certain Community fishing areas and resources and modifying Regulation (EC) No 2847/93 and repealing Regulations (EC) No 685/95 and (EC) No 2027/95

6. THE WAY FORWARD

In relation to the current capacity indicators, the Commission considers that the definition of a fishing vessel's tonnage is adequate and properly implemented, and therefore does not require any major changes. The certification of the power of fishing vessels, however, is not satisfactory. The Commission services will continue their discussions with Member States, engine manufacturers, classification societies and fishermen's representatives in order to improve the current certification system established by Council Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels.

With regard to the adoption of capacity and effort indicators based on fishing gear size and characteristics, no such moves have been made so far. The issue is highly technical and would require fine-tuned monitoring and control and hence, further consultation in order to properly assess this possibility.

Fisheries that are currently identified by fishing area, targeted species and type of fishing gear may be the best candidates for implementing limitations of capacity and effort based on fishing gear. For these fisheries, fishing authorisations could be envisaged in the form of a maximum amount of activity carried out with a well defined type and size of fishing gear (standardisation). However, there are a number of issues that would need to be addressed before implementing such an approach in Community law:

- Compatibility with current fishing effort limitations and the 'denomination' of fishing authorisations based on vessel characteristics, i.e. tonnage and power.
- Possibility to eliminate capacity limitations based on vessel characteristics, where a management regime based solely on fishing gear is applied. In other words, could a fishing authorization-based system be established independently from the power or tonnage of vessels?
- Finally, the embedding of such a system of effort management into the system of overall capacity limitations established by Community law (entry-exit regime) would need to be resolved.

While awaiting the outcome of this discussion, the Commission considers that the current situation of many European fisheries would in any case justify the adoption of measures to prevent further increases in fishing effort resulting from technological improvements and an increased size and number of fishing gears.

Action plan

In relation to engine power certification and tonnage measurement the following actions are envisaged:

- Proposal consolidating the tonnage measurement provisions now included in Council Regulation (EEC) No 2930/86 defining the characteristics of fishing vessels.
- Continued consultations with engine manufacturers and classification societies in order to determine the best technical solution for the certification of engine power, followed by exchanges with Member States' experts. On the basis of these

discussions the Commission would put forward a proposal for new legal provisions on engine power.

Regarding the use of fishing gear characteristics as fishing capacity and effort indicators, the Commission will take the following actions:

- **Case studies.** Member States have set numerous limits on fishing gear type and size at national, regional or local level. The experience gained from the application of these measures would constitute a valuable basis for discussion of the possibility of implementing such measures at Community level. As a first task, the Commission would, starting in 2007, collect information from Member States on the characteristics of such regimes. A study to analyse the results of one or more such management schemes would follow subsequently.
- **Consultation with Member States, stakeholders and scientists.** During 2007 the Commission intends to initiate a series of contacts and meetings with stakeholders and scientists in order to identify fisheries suitable for applying the new types of capacity or effort limitations mentioned in this Communication. The Scientific, Technical and Economic Committee for Fisheries (STECF) will be requested to provide advice on specific aspects of the assessment of fishing effort on the basis of fishing gear characteristics.
- **Pilot projects.** The Commission will then propose that, as a pilot exercise, some selected fisheries be managed on the basis of the effort and capacity indicators mentioned in this Communication. This may take place during 2008.

7. CONCLUSIONS

The Commission considers that the tonnage of fishing vessels is an appropriate measure of vessel size, and consequently a suitable indicator of fishing capacity. Tonnage should continue to be used to assess the overall capacity of the Member States' fishing fleets. The Commission intends to propose some small improvements to its definition, including a new legal text consolidating the current provisions.

The power of a fishing vessel is also an appropriate indicator of fishing capacity, but the effectiveness of current Community rules is not satisfactory. The procedure for the certification of engine power needs to be greatly improved. In relation to the use of fishing gear characteristics as fishing capacity indicators, the Commission will carry out the proposed action plan comprising an assessment of case studies, discussions with stakeholders and the implementation of pilot projects.

The Commission considers that the measures proposed in the action plan may provide a solid foundation on which to base future decisions on whether, when and how fishing gear characteristics should be more widely used as indicators for fishing capacity and thus as management tools within the Common Fisheries Policy.