

## SURVEY OF ECONOMIC ASSISTANCE TO THE FISHING SECTOR

*(Paper submitted by the Spanish authorities)*

### **Types of measures**

Several methods have been proposed for assessing economic assistance to the fishing sector, amongst them the following:

- effective rate of assistance (ERA);
- producer subsidy equivalent (PSE);
- array type method;
- budgetary method;
- trade distortion equivalent (TDE);
- trade equivalent output subsidy (TEOS).

The methods we shall refer to from those given above are the TEOS and the PSE, since these were the only ones discussed at the meeting of the ad hoc Group of Experts held in February 1992 at the OECD Headquarters in Paris.

### ***Producer subsidy equivalent (PSE)***

The PSE method has been used in the agricultural sector after being discussed at the OECD.

The PSE (Producer Subsidy Equivalent) is defined as the amount that should be paid to a group of producers to compensate for the loss of income resulting from the termination of a public aid programme to such producers. The PSE can also be considered an indicator of the value of the transfers from the domestic consumers, or from the taxpayers to the producers as a result of public aid programmes.

In calculating the PSE, four groups of measures are taken into account:

- measures providing market price support, which cause changes in the market price and/or in the prices received by the producers;
- measures providing direct income support, which are those that increase the income actually received by the producer;

- measures providing indirect support to income, which decrease producer's costs;
- other support measures that obtain a long-term effect by reducing the costs of the sector in general.

It is important to point out that GATT has considered the possibility of applying the PSE for measuring the level of economic assistance in the agricultural sector. The following paragraph, taken from a document drawn up by the GATT Secretariat, explains this:

“Since the PSE attempts to measure the overall support or assistance granted to the producers of a specific product, all transfers, whatever their source, should in principle be taken into account. The fact that the transfer or the explicit or implicit subsidy results from a programme of compensatory payments, from measures applied at the frontier, from tax allowances or from services supplied by public authorities at a lower price than cost price is of no importance from the economic point of view when calculating the PSE. In this way, a transfer of income of one dollar in the form of a subsidy to export is tantamount to a transfer of income of one dollar resulting from a research programme financed by public authorities.” (GATT, Spec. (87)37.8 of September 1987).

In document prepared by the EC, three questions are posed in relation to the PSE: need, validity and cost of its quantification. The following comments can be made on these three issues:

- The PSE is unnecessary, since in the fishing sector there appears to be no problem of surplus stock as in the case of agriculture. However, it should be remembered that, although no generalised surplus exists in the fishing industry, a surplus does exist in some specific OECD countries, such as Canada, Norway and Iceland.
- The PSE is not valid because it takes into account neither the distortion in consumption nor the market failure in the fishing sector, nor the restriction on access of foreign vessels to waters belonging to the exclusive economic zone.
- The PSE is very costly because often the companies that process the fish are the very ones that caught it, rendering it difficult to make reliable estimates of domestic and reference prices. The heterogeneity of fish products also hinders and makes it more costly to draw up measures of assistance.

The points will be discussed and examined under Parts II and III.

### ***Trade equivalent output subsidy (TEOS)***

This measure was proposed by the EC Commission. According to the EC Commission, the TEOS is "the subsidy to the fishing industry which, assuming that the fishery is efficiently managed, would be needed in the absence of any other government intervention for the net export of fish products to be identical to the current net export".

As a benchmark to calculate the TEOS, a situation is considered where the fishing grounds are managed according to a system of ITQs (Individual Transferable Quotas).

To assess the TEOS, apart from a reference point with ITQ (or, alternatively, with corrective taxes), a partial equilibrium model -- a thesis supported in the document -- or a general equilibrium model needs to be constructed. If both requirements are taken into consideration -- ITQ and model -- the application of this methodology can hardly be considered operative.

In summarising, it can be established that the PSE is inadequate in its present form for direct application to the fishing sector as, apart from the difficulties inherent in its calculation, it fails to address the specific problems of the sector. On the other hand, and as we have already indicated, the TEOS proposed by the EC Commission does not appear to be operative.

In view of this situation, there remains the alternative of considering a modified PSE adaptable to the fishing sector. Naturally, in creating the modified PSE the specific problems of this sector will have to be taken into account and, to be more specific the economic assessment of the restrictions on access to fishing grounds, as these restrictions are an extremely important element in the economic assistance to the sector. Under Part III the measures involving a PSE applicable to the fishing sector are defined, which we shall call a modified PSE from now on.

### **Specific problems in the fishing sector**

There are two facts that distinguish the fishing sector from agriculture, and which affect the PSE calculation. In the first place, in agriculture, and restricting ourselves to the scope of the OECD countries, there is a general problem of surpluses as opposed to the fishing sector, where the most characteristic feature is the great imbalance between producing and consuming countries. This consideration, together with the special rules of the producing countries -- such as the restrictions on access placed on foreign fleets -- means that the world supply is totally lacking in transparency. In the second place, and related to the first point, the incentives and support measures in agriculture tend to exacerbate the problem of surpluses, while in the fishing industry such measures can lead to over-exploitation of resources and, consequently, to a decrease in supply, should free access to such resources be allowed.

For the reasons given above, Public Administrations should adopt suitable measures for obtaining rational exploitation of fishing grounds. When establishing total allowable catch (TAC) or the maximum limits for the fishing effort, the aim should be to obtain the catch level corresponding to the maximum sustainable yield (MSY). Once such measures are established, the fishing possibilities may be distributed.

Since it is obvious that Public Administrations should act to avoid depletion of fish resources, it is consequential to consider how the quotas or licences should be distributed without their being a form of assistance. If the quotas or licences are distributed by Public Administrations amongst fishermen without taking into consideration their origin, by auction or by any other procedure that will guarantee equal opportunities of access to all fishermen, it would then be concluded that this form of resource assignment does not give rise to any economic assistance.

Should any Government restrict or forbid access of foreign fleets to its waters, and distribute the licences or quotas, at no cost or otherwise, amongst its own national fishermen for fishing in the corresponding exclusive economic zone; economic assistance is being granted to the fishermen of such a country. We shall refer to this as quota or licence subsidy (QLS). This type of measure is unquestionably a transfer from Government to fishermen -- implicitly paid for by the taxpayers -- as otherwise the Government could obtain income by auctioning the quotas or licences to the fishing fleets, whether national or foreign, thereby assuring an effective assignment of resources.

The income that a Government fails to receive when it does not apply a system of public auctions, or some other one with similar effects (such as a hypothetical rate system) is equivalent to the difference between the maximum sustainable yield (MSY) and the total cost (TC) of the most efficient fleet for that point. These non received income amounts in practice to a subsidy to national fleets. The final destination of such subsidies will be a compensation for the inefficiency of the national fleet and/or an increase in its benefits. Under Part III the assessment of the QLS is developed.

Among the economic assistance measures contained in the PSE calculation, the granting of quotas or licences could be classified under c) (measures providing indirect support to income), as they reduce the producer's cost.

There remains an important question to be discussed, of course; namely, the assessment of quotas or licences when they are neither auctioned nor transferable, in which case, in theory, the price should be set according to the free interaction of supply and demand.

However, all the foregoing is distorted by reality, as few countries control the supply, and consequently it is not possible to make comparisons. Moreover, it so happens that the most efficient fleets are not those with more fishing rights. This assessment of quotas or licences, in any case, should be made under the assumption that the fishery is efficiently managed and the effort level or the total allowable catches (TAC) in the area of exclusive competence is established at the level corresponding to maximum sustainable yield (MSY). If this were not the case, the discrepancy between the effort level or the TAC and the MSY should be eliminated before establishing any measure.

### **Producer subsidy equivalent in the fishing sector**

Taking into account the quota or licence subsidy (QLS) discussed under the previous heading, and other specific aspects of the fishing sector, the modified PSE could involve the following measures.

#### ***Measures providing market price support***

This kind of measures affect both producer and consumer prices:

- Tariffs on raw fish and fish products.
- Subsidies to export.
- Restrictions on import.
- Price control systems, e.g. minimum landing prices for national fleets catches.
- Ban on landings from foreign vessels. In order to assess the economic assistance embodied in this type of ban, account should be taken not only of transport costs from the nearest foreign harbour to the harbour of the country establishing the ban, but also other costs such as the possible damage and devaluation undergone by fish because of its double transshipment.

### ***Measures providing direct income support***

These are measures through which money sums are directly transferred to national fishermen without affecting consumer prices:

- direct aid in the case of natural catastrophes;
- social protection measures, such as unemployment compensation, compensation for vessel lay-up in case of rough weather, and labour re-deployment programmes.

### ***Measures providing indirect income support***

These measures include all those sparing or reducing costs for national fleets, as well as those that increase costs for foreign fleets.

- Quota or licence subsidy (QLS) to national fleets for operating in EEZs. This type of economic assistance measures will be considered below in greater length, given its special importance to the fishing industry. Suffice it to say for the moment that this type of measures spare costs to national fleets as compared to a situation in which the market for fishing services is free and the relevant Government auctions fishing licences to the highest bidder, either national or foreign.
- Obligations imposed on foreign fishermen in exchange for fishing rights. Should these measures discriminate against foreign fishermen, they must be quantified for their consideration as an economic assistance device to national fleets.
- Fuel subsidies.
- Capital formation subsidies.
- Subsidies for the use of production inputs.
- Port facilities; e.g. the exemption from payment for certain port services, accorded to national fleets.
- Insurance plans.
- Streamlining and development measures; e.g. soft loans and/or incentive premiums to motivate transformation of the fleets.

### ***Other support measures***

This group includes aids not directly received by fishermen, but that are able to reduce fishery costs in the long term, as well as other support measures not comprised in the previous groups.

- rationalisation measures;

- local and regional measures, e.g. infrastructure improvement measures, construction of artificial reefs, etc.

The above list of measures is, naturally, not exhaustive although it gives an idea of the outcome of the modified application of PSE to the fishing sector.

Consequently, the measures will have to be analysed in depth, one by one, in an endeavour to find solutions that will include all the aspects of this complex problem in order to be able to quantify the economic assistance to the fishing sector.

Obviously, one of the measures whose application will cause the greatest problems is the one we have called QLS.

In order to determine the QLS a theoretical approach will be first adopted, and then the problems implied by its empirical implementation will be examined.

In an efficiently managed fishery, the authorities will assign the fishing industry a total fishing effort that equals the effort level needed to obtain the maximum sustainable yield (MSY). In Figure 1, total income (TI) and total cost (TC) are plotted against an effort level (E), as usual in this type of models. The total income equation may be termed as follows:

$$TI = pH = p G (E)$$

where p is the market price, considered as given, and H measures catches caught, which can be termed as a function of effort for a given stock. The function usually employed is a second-degree parabola.

On the other hand, total costs are represented by a straight line going through the origin of co-ordinates, i.e.:

$$TC = cE$$

According to Figure 1, the maximum economic yield is obtained -- under the assumption of a TAC decided by the relevant authority -- at effort level E\*. At that level, fishery economic rent will be:

$$FR = TI^* - TC^* = pG (E^*) - cE^*$$

Figure 1

Taking the above equation as a reference scheme, let us see how the QLS could be obtained if no direct methods can be applied. We will make the additional assumptions that only one species of fish is considered and that effort applied to this fishery is evenly distributed among m licences, n of which are assigned to the national fleet and f to the foreign fleet.

$$m = n + f$$

In the first place, the value of a hypothetical licence would be determined, which would place the most efficient foreign fleet at a limit that would dissuade it from fishing in the waters to which the licence is applied, or, to put it another way, which would reduce to zero the economic rent of the said foreign fleet.

In our model, the theoretical value of a hypothetical licence would be  $FR/m$ . Let us see how that value can be estimated.

This estimate requires the previous estimation of both income and costs. The income resulting from a licence is easy to figure if market price is considered as given, in which case we shall simply multiply that price by the catch volume assigned in the licence, that is:  $p G (E^*)/m$ .

On the other hand, costs can be estimated according to the output that the most efficient fleet could obtain in the waters to which the licence applies. To this end, the cost structure should be determined from the examination of the accounting statements of a sample of the most efficient fleets. This examination should yield an estimate of cost per unit of effort and, consequently, of the total cost incurred to catch the quota. In total costs a normal return on capital invested in the fleet should be included, but not so any payment made for the fishing licence. Thus, the estimated cost for a licence will be:

$$cE^*/m$$

The difference between income and costs will provide an estimate of the aliquot part of the fishery economic rent that corresponds to any licence, to which we shall call hypothetical licence (HL):

$$HL = \frac{p G (E^*)}{m} - \frac{c E^*}{m}$$

Finally, the QLS per licence awarded to the national fleet, which we will term as QLS, is to be reckoned as the difference between the hypothetical licence value and the effective price paid by the national fleet for a licence (NL), i.e.:

$$Q L S = H L - N L$$

Since the Fisheries Administration has issued  $n$  licences to the national fleet, the total QLS for the fishery considered is:

$$Q L S \text{ Total} = n Q L S$$

In order to assess the relative importance of this economic assistance measure, it may be advisable to construct and evaluate an indicator such as the ratio:

$$\frac{Q L S \text{ Total}}{n p G (E^*)/m} \times 100$$

which measures the importance of this subsidy as compared to the income obtained by the national fleet from the fishery considered.

According to the methodology adopted, it is clear that, under the assumption made, the key to the valuation of QLS lies in a thorough knowledge of the cost structure pertaining to the most efficient fleets.

Calculations may grow complicated if the licence comprises more than a single species or if there is a price differential for quality grades. In any case, this methodology deserves being explored if we aim at an estimate of QLS, which is one of the most important measures -- if not the most important -- of economic assistance to the fishing industry.