REVIEW ON CURRENT PERSPECTIVES ON FUEL SUBSIDIES IN THE FISHERIES SECTOR

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Research in progress

BACKGROUND

Food production in general, and fish production in particular, is subsidised on a massive scale worldwide.

This report concentrates on perceived and actual benefits from fuel subsidies in the fisheries sector. The report is still work in progress.

There are different definitions of a subsidy and at times it may be difficult to determine whether a government financial contribution actually represents a subsidy. FAO offers the following definition: "Fisheries subsidies are government actions or inactions outside of normal practices that modify, by increasing or decreasing, the potential profits by the fisheries industry in the short, medium or long-term" (FAO, 2004, pp. 7-8).

A subsidy on fuel will reduce the effective price paid by fishermen below normal market price. This will reduce their variable costs and thus impact profits.

Governments may provide subsidies for a number of reasons including:

i. Increase fishermen's incomes.
ii. Increase employment in the fishing sector.
iii. Enhance food supply.
iv. Improve the competitiveness of the sector.

In addition to these objectives, we can also consider the impact of a fuel subsidy on stock sustainability.

Governments can use different instruments to reach the objectives outlined above. It is beyond the scope of this paper to discuss their effectiveness.Thus, in the following, only the consequences of a fuel subsidy will be analysed.

WORLD FISH PRODUCTION AND SUBSIDIES

Some statistics:

World fish harvest:	87 mt (2010)
“First sale value”	$ 95 billion
Potential resource rent:	$ 50 billion/year
Current resource rent:	0
Fisheries subsidies/year:	$ 27.2 billion(2003)
Fuel subsidies/year:	$ 6.4 billion (2003)

If anything, subsidies have increased since 2003.

- Resources are currently yielding no resource rent, due to overexploited fish stocks and excessive use of fishing effort (labour and capital) .
- Many fishing vessels are in operation only because of subsidies.
- Fuel costs are typically among the largest variable costs of fishing, usually second only to crew costs.
- The commodity fuel price index roughly doubled from 2000 – 2005, and then again almost doubled from 2005 – 2011.
- There is every reason to believe that fisheries subsidies, including fuel subsidies have contributed to resource overexploitation.

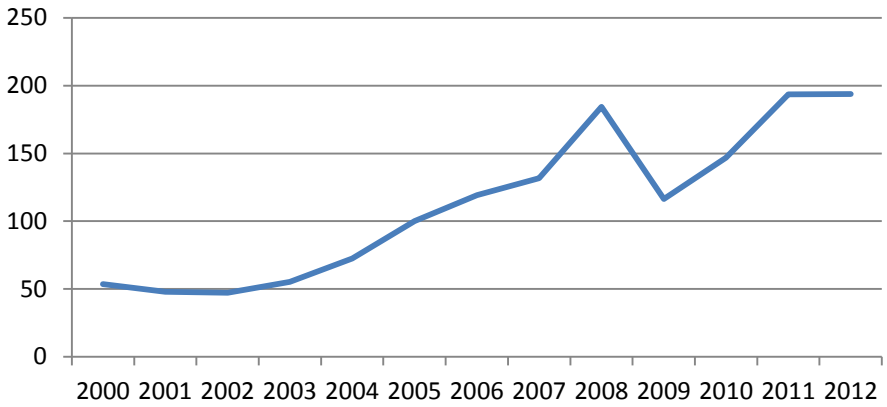

Figure 1. Commodity Fuel Index - Includes Crude Oil (Petroleum), Natural Gas, And Coal Price Indices for The World 2000-2012. 2005 = 100.

Figure 1 makes clear the resource consequences of Pure Open Access. It is not just a matter of overallocation of labour and (produced) capital to the fishery. There will be overexploitation – excessive disinvestment of natural capital – as well.

Since $X_{BE} < X_{MEY}$, open access leads to unequivocal resource overexploitation.

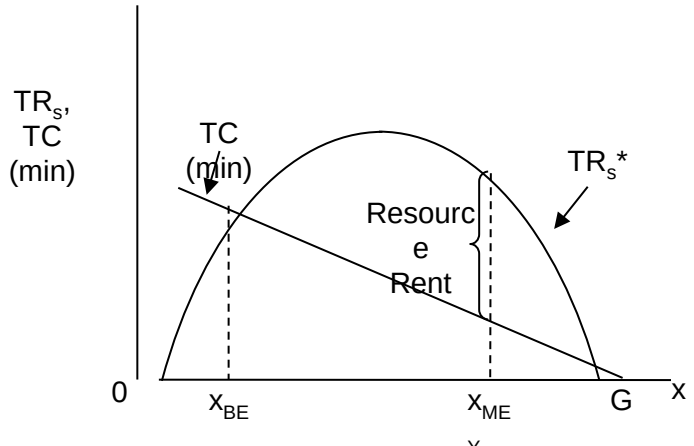

Figure 1. The Gordon-Schaefer Model. $TR_s = p$

Effects of a fuel subsidy

- Figure 1 can be used to illustrate the consequences of a fuel subsidy. In this case, fishermen are faced with the following effective price – B – per unit effort: B = b – s, where b is the unsubsidised price and s is the subsidy per unit of effort.
- The subsidy can take two forms. One is a direct handout from the government to suppliers/users of fuel, at the given rate. The other would be non-collection of taxes on fuel.

- To illustrate the effect, we assume that the effective price B is halved due to the subsidy.
- Other things being equal, this will cause the minimum costs of harvesting the sustainable yield, for any given level of X, to be reduced by 50 per cent. This is illustrated in figure 2. It can here be seen that X_{BE2} is half of X_{BE1}.
- Note that X_{MEY} remains unchanged. This is because the optimal stock level is determined by full market prices, not subsidised ones, in addition to the growth characteristics of the resource.

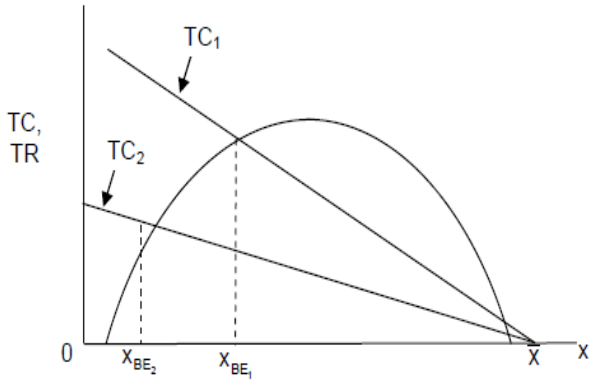

Figure 2. The Impact of a Fuel Subsidy.

THE CONSEQUENCES OF A FUEL SUBSIDY

These will be analysed for three management scenarios.

1 Open Access

Increase fishermen's incomes.

- In this simplistic model, fishing effort consists of fixed proportions of various inputs in the production process including labour. Moreover, the price per unit input is considered fixed. Thus, although a fuel subsidy will affect the effective price per unit effort, it will not affect the remuneration per unit labour, i.e., fishermen's incomes.
- This situation would be different if $w = w(L)$ with $w'(L) > 0$, where w is the wage rate and L – labour - the amount of labour used in the fishery. In this case, the wage rate depends on how much labour is used, with the wage rate increasing in the use of labour.
- It is essentially an empirical question whether this is so. Many fisheries are based in areas with higher than normal levels of unemployment and limited alternative opportunities. In such a situation, increased use of labour is likely to have no perceptible impact on the wage rate.

Increase employment in the fishing sector.

- In the model under consideration, the fuel subsidy will increase the use of effort so that employment will be boosted. From a social point of view, this simply means that there is even more overallocation of labour to the fishery.
- Moreover, this potentially happens at the expense of the potential future sustainability of the stock.

Enhance food supply.

- In the short run, introduction of a fuel subsidy will increase fish landings: as effort is expanded, a process of stock depletion is initiated, and in the period until the new stock equilibrium is achieved, fish landings will increase.
- Whether fish landings will increase in the long run, is a different question; the outcome is an empirical question which may vary from fishery to fishery. Having said that, between 80-90% of the world's fisheries are classified as either overexploited or fully exploited (FAO, 2012), implying that stocks are exploited at levels equal to or beyond X_{msy}.
- Thus, for the vast majority of fisheries, a fuel subsidy would under open access lead to reduced food supply in the long run

2 Optimal Management

- In this situation, we assume that the fishery is stabilised at stock level X_{MEY}. Moreover, let us assume that the fishery is managed with Individual Transferable Quotas (ITQs). From a social planner's perspective, the optimal stock level would not change due to the introduction of a fuel subsidy. The consequences will then be as follows:
  - Fishermen's incomes will increase with the value of the fuel subsidy – this will be a direct income transfer.
  - Employment in the sector will be unaffected, as effort will not change.
  - Food supply will not be affected.
  - The competitiveness of the sector will not be affected.
- It should, however, be recognised that profitability in the fishery may be high and that this will even increase as a consequence of introduction of a fuel subsidy. This may lead to a demand from fishermen for higher quotas. If successful, the consequences will depend on the initial level of the equilibrium stock size. Depending on the location of X_{MEY} to X_{MSY}, and how large the increase in quota is, the impact on long run fish supply is uncertain. There would, however, be some increase in employment. Importantly, there would be a reduction in stock size below what is socially desireable and a wasteful allocation of labour and capital to the fishery.

3 Regulated Open Access

- Fishermen's incomes: As in the open access fishery, due to the underlying assumptions of the model, fishermen's incomes will not be affected.
- Employment: If the intensity of the fishery increases, there may be an increase in nominal employment, however, it is not likely there will be much change in total employment measured as full time equivalents. This is because more fishermen harvest the same quantity of fish but in a shorter season.
- Food supply: Assuming the TAC remains binding, there will be no change in food supply.
- As in the case of optimal management, there is certainly the possibility that the fuel subsidy, temporarily improving profitability, may lead to a demand from fishermen for higher quotas.
- If demands for higher quotas are successful, the consequences will depend on the initial stock size as was the case for optimal management, and the impact on long run fish supply is uncertain. The expansion in quota is likely to lead to some increase in employment. Importantly, there would be a reduction in stock size below what is socially desireable and an even more wasteful allocation of labour and capital to the fishery.

FURTHER ANALYSIS

The concept of fishing effort

- The Gordon-Schaefer model employs the concept of fishing effort, combining fixed proportions of labour and capital inputs. An example could be the concept of "standardised fishing days".
- In reality, effort can be considered a composite input, consisting of factors such as labour (often of different types and skill sets), capital (vessel type and size), fishing gear (type and quantity) and numerous other inputs such as fuel, bait, provisions and more.
- While there is limited scope for substitution in the short run, in the long run, the vessel will need to be replaced, based on future relative prices of factors of production. This means that proportions of labour and capital cannot be considered positive in the long run.
- A fuel subsidy reduces the price of fuel relative to prices of other factors of production. If the subsidy persists also in the long run, this may lead to substitution among factors of production, in particular leading to more fuel intensive engines at the expense of other inputs.
- This substitution effect is likely to worsen the long run consequences of a fuel subsidy.
- <u>Improved competitiveness:</u> *analysis to be completed*

Subsidies in agriculture

- The problem referred to is in no sense unique to fisheries. It arises in a major way in agriculture, particularly within the developed world.
- Various subsidy programmes, designed to provide income support for farmers, have been seen to lead to the production of immense surplus crops, and to numerous distortions in international trade in agricultural products, often to the detriment of developing country exporters.
- An obvious example of such a subsidy progrmme is one established to ensure a minimum price for a given agricultural crop. This has led, in the field of agriculture, to much discussion of the concept of “decoupling”. What is to be “decoupled” is the support to farmers’ income from the farmers’ production plans.

Preliminary conclusions and recommendations

We set out four objectives that fishery subsidies are typically intended to achieve, namely:

- Increase fishermen's incomes.
- Increase employment in the fishing sector.
- Enhance food supply.
- Improve the competitiveness of the sector.

In addition, stock sustainability has been considered as an important variable.

- *Increase in fishermen's incomes* is in most instances an important objective. The present analysis suggests that a fuel subsidy will have little, if any, beneficial impact on fishermen's incomes.
- Under some scenarios – open access, less than perfect optimal management, regulated open access – there may be an increase in *employment*. However, it would be at the expense of even more socially wasteful allocation of labour and capital to the sector and (additional) stock depletion.
- While *food supply* in general will increase immediately following the introduction of a fuel subsidy, a situation that may persist until a new equilibrium is attained, in the long run sustainable food supply is in fact likely to decrease.
- *Competitiveness: subject to further analysis.*
- *Stock sustainability* will in general deteriorate due to fuel subsidies. In most situations, a fuel subsidy will lead to a reduction in equilibrium stock level. In the case of severe stock depletion, a fuel subsidy may even endanger the future viability of the stock.

Conclusions:

- Fuel subsidies are in general wasteful – no tangible positive impact can be identified.
- Other instruments than fuel subsidies must be found to achieve relevant government objectives.

Further points

- Comparison of subsidies across food sector, and specific impacts of fuel subsidies
- National strategies for fuel (and energy subsidies)
- Transition mechanisms – social and political dialogues, trade implications