

Financial Support to Fisheries

IMPLICATIONS FOR
SUSTAINABLE DEVELOPMENT



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Chapter 7

Social Impacts of Government Financial Support of Fisheries ¹

This chapter seeks to identify the key policy and analytical issues in assessing the social effects of providing subsidies, within a sustainable development framework. A range of frameworks that can help the social analysis are identified but none are found to be ideally suited to the fisheries sector. The most relevant one of these frameworks, the fishery systems approach, is used to discuss the impacts of subsidies on the various components of the human system in the fishery, including fishers, the post-harvesting sector, fishing communities, and the broader socioeconomic environment within which the fishery is located.

This chapter has been prepared as a scoping paper for the OECD's work on the sustainable development effects of the provision of government financial support to the fishing sector. The terms of reference require a report which:

- identifies the key issues involved in assessing the social effects of fishery subsidies, within a sustainable development framework;
- identifies the broad analytical directions that may be most useful to pursue in undertaking the study;
- assesses the extent to which the broader analytical framework mentioned above is amenable to the analysis of the social effects of subsidies and of the human dimensions of sustainable development issues with respect to subsidies; and
- advises on the kinds of information that may be useful in underpinning any ensuing analysis (as part of the project we will be asking OECD countries to complete a questionnaire providing data/information on key social aspects of their fisheries).

Producing an examination of the social aspects of fishery subsidies 'from a sustainable development perspective' is a challenging task for two major reasons. First,

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the important task of addressing the social aspects of subsidies has received little attention previously. Most analyses of subsidies in fisheries (and other sectors for that matter) have been carried out from a classical economic perspective, although an increasing proportion takes an environmental viewpoint. Rarely, if ever, have studies of subsidies adopted a ‘social’ or ‘socioeconomic’ focus. Indeed, there is no universally accepted sense of what is meant by a social effect or social impact of subsidies.

Second, there is some ‘fuzziness’ to the idea of placing an analysis within a sustainable development framework. This is a laudable goal, but what exactly is involved in conducting a fishery analysis within a sustainable development framework? Clearly, such a framework must look at what is meant by a ‘sustainable fishery’. Historically, the focus in this regard lay on maintaining a *sustainable yield*, perhaps through a mechanism such as setting a Total Allowable Catch (TAC). Certainly, it is crucial to ensure that catch levels lie within the renewability bounds of the resource, but it has become apparent that while the balancing of present and future catches is important, there is more to a healthy future than simply controlling catches. Concerns about sustainability arise in all aspects of the fishery, from the ecosystem, to the social and economic structure, to the fishing communities and management institutions, as well as the fish stocks themselves. For example, in some fisheries in the past, too much attention was paid to measuring biomass and catch levels, and too little to the integrity of the marine ecosystem and the ocean bottom. Pursuit of sustainable fisheries needs to consider not only the state of the fish stocks but also the *processes* underlying the fishery, including the health of the aquatic ecosystem, the integrity of ecological interactions, and the well-being of the ‘human dimension’.

The latter – the state of the human system – is central to the *sustainable development* approach (World Commission on Environment and Development, WCED, 1987). Given that sustainable development requires policy “that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987), and that the needs of both the present and the future include ecological, economic, social and institutional aspects, all of these factors must be incorporated in a sustainable development framework. Thus an *integrated* perspective is needed, and accordingly such a view is taken in this report, which focuses on impacts of subsidies on sustainability of the fishery system as a whole, incorporating social, economic, institutional and ecological realities.

This integrated view of a sustainable development framework is not incompatible with the specific approach of the OECD’s project “Fisheries Subsidies and Sustainable Development: Broadening the Agenda”, which seeks to synthesize the present work with comparable reports written from the perspectives of two other ‘pillars of sustainable development’ – the environmental and the economic – so as to produce a synthesis report which will “identify key issues, tradeoffs and obstacles to reform of subsidy policies” and “assess the extent to which other policy instruments may alter the effects of subsidy provision.” In the spirit of synthesis, this report attempts to go further, avoiding a focus solely on social aspects but rather taking a broad multi-disciplinary and multi-dimensional perspective throughout.

The Nature of Fishery Subsidies

There exists a wide variety of definitions and understandings of subsidies, but this report builds on the OECD concept of a subsidy as “the monetary value of government interventions associated with fisheries policies” (OECD 2000: p.129), which typically

appears in the form of a government financial transfer (payment) to the fishery sector. Hannesson (2003) puts this in a broader economic context:

“A subsidy is an undertaking by the government which increases the profitability of the production of a commodity or service over and above what it would be in unregulated market transactions, or if the government applied its ordinary rules to the industry or firm involved. Usually this means a transfer of money; a government makes payments that in some way are conditional on the activity one seeks to support.”

While this definition notes that, as in the OECD view, subsidies usually involve ‘a transfer of money’, the first part of the above definition – and those provided by some other authors (e.g., Schrank and Keithly, 1999; Westlund, 2003) – includes as subsidies any actions by government that are specific to the fishery sector and that increase fishery profitability differentially relative to other economic sectors. This would presumably include, for example, any government-led conservation measure that, as a by-product, improves net benefits for fishery participants. Since governments typically have responsibilities for marine and fish stock conservation, and thus they are not solely ‘managing’ an industry, it seems important to differentiate between government interventions targeting on profitability and those with other aims (which nevertheless may also increase the profitability of the fishery). Related to this is the point made by Westlund (1999):

“...in a country where public services are provided so to say free of user charge – because they are financed through the tax system – it would be considered normal that also the fisheries industry benefits from certain services without them being defined as subsidies.”

It is worth noting that despite the frequency with which commentators discuss subsidies in a negative light, it is generally accepted that in reality, subsidies are neither intrinsically ‘good’ or ‘bad’. Instead, the challenge is one of weighing the positive and negative impacts of a given subsidy in a given situation, and how those impacts are distributed. For example, Munro and Sumaila (2002: p.234) summarize Schrank (2001):

“...individual subsidies are not to be judged on an a priori basis. While some subsidies may produce socially undesirable results, others may be neutral in their effect, while yet others may produce highly desirable results.”

Similarly, Myers and Kent (2001: p.9-10) write:

“Despite their distortional effects, there is nothing necessarily bad about subsidies. Sometimes we need a bit of positive distortion... Without subsidies, we might never get as much as we want of, for example, nonpolluting and renewable sources of energy, with their manifold benefits – economic, environmental, political, security, social and ethical benefits.”

This chapter explores social impacts of fishery subsidies, adopting the perspective that the balance of positive and negative impacts will depend on the particular form of subsidy, the particular context in which it is applied, and the manner by which it is put in place. In particular, a key aspect relating to the context of the subsidy is the particular fishery programme within which the subsidy is implemented. Some major fishery programme categories (OECD, 2000; Hannesson, 2003) include:

- Management, research, enforcement and enhancement
- Fisheries infrastructure (wharves, ice plants, etc.)
- Investment in and modernization of vessels and gear
- Tax exemptions for fishermen and vessel owners
- Decommissioning of vessels and license retirement
- Expenditures to obtain access to other countries
- Income support and unemployment insurance
- Labour retirement
- Subsidies of variable costs, such as fuel subsidies
- Income support and unemployment insurance
- Fish price subsidies
- Subsidies to fish processing and marketing

Whatever fishery programme a subsidy is applied within, we can envision the subsidy as fitting within one of four types identified by the OECD (Steenblik and Munro 1999, p. 257):

- Revenue-enhancing transfers in the form of market price support (i.e. financed by consumers) and marketing support;
- Revenue-enhancing transfers in the form of direct payments (from government budgets); these could include payments based on the level of production or sales, per-vessel payments, income-based direct payments, or other direct payments.
- Cost-reducing transfers, whether related to productive capital or to intermediate inputs, or of some other form.
- General services (measured as the net costs incurred by governments) for fisheries management, conservation initiatives, research or other general services.

In assessing the impacts of fishery subsidies, it is useful to understand (see, *e.g.*, Westlund 2003) the extent to which the subsidy is:

- 1) short-term or long-term, particularly in terms of the time frame of impacts on profitability,
- 2) 'normal' (production-increasing) or conservation-oriented,
- 3) positive or negative in its effect on profitability,
- 4) 'cost reducing' or 'income increasing',
- 5) one-time (*e.g.*, in response to a particular fishery crisis such as a stock collapse) or ongoing.

These factors will be relevant to the analysis in this paper. Another important aspect to examine in classifying any given subsidy, one that does not seem to have been presented in the literature, and yet is perhaps of greatest relevance to an analysis carried out within a sustainable development framework, is the differential impacts of the subsidy on environmental, economic, social and institutional sustainability. In particular, one might categorise each subsidy on the basis of where its greatest impact lies – whether in the environmental, economic, social or institutional realm.

Also relevant to the assessing the impact of a subsidy is the spatial scale on which it applies. Fishery systems are of varying spatial scales, from a coastal community, together

with its local fishery resources and the corresponding small-scale management system, to fishery systems at state, provincial and national levels, to regional multinational fishery organizations. The impact of a subsidy program in a particular fishery will depend on the extent to which the spatial scale of the subsidy matches that of the fishery management system and that of the ‘natural’ scale of fishery operations. For example, the evolution toward decentralization, to resolve the mis-match between the scale of fishery management and the ‘natural’ system, may better allow for specific local conditions in the ecosystem and human system. Indeed, if local conditions vary significantly, there may be merit in adjustments that create a local component in the management system. Given this, a subsidy might reinforce this goal of matching the natural spatial scale of a fishery and the scale at which management occurs.

Finally, a major focus of this report lies in highlighting the distributional implications of subsidies – essentially who receives the subsidy, and who does not, and over what time frame. Financial support may be provided to the fishery sector as a whole, and this might presumably reflect a specific policy direction of government, given that it is using a certain portion of its scarce revenues in this way. Financial support may, on the other hand, be targeted on a particular component of the fishery, reflecting a policy to support that fishery component over other fishery sectors. For example, the government could support ‘industrialization’ and ‘modernization’ of the fishery by providing economic support to larger, more capital-intensive parts of the fishery, or alternatively, it may support small-scale fishers through measures that encourage community-based and/or labour-intensive approaches. Thus there may well be distributional implications of fishery policy measures, and in particular of subsidy programs.

Outline

The analysis begins with a review of a range of analytical frameworks for assessing the social impacts of subsidies, including:

- a framework presented in OECD’s trade liberalisation study;
- a framework for examining components of sustainability and concepts of resilience;
- a ‘fishery systems’ framework that focuses on interconnections throughout the fishery;
- a sociologically-oriented analytic framework for understanding a range of fishery issues;
- an analytical approach focusing on distributional aspects of subsidies;
- a ‘checklist’ approach for analysing the social impacts of fishery subsidies.

The following section on some of the approaches described in the framework section to provide a set of preliminary assessments of potential social impacts arising from a variety of fishery subsidies discussed in the literature. This draws from a subsidies list compiled by Westlund (2003), and focuses specifically on their distributional implications. Where possible, the subsidies are also placed within three major groupings:

- Type 1: those that benefit all in the fishery, as well as some in other sectors of society,
- Type 2: those that benefit all in the fishery, but no one outside that sector,
- Type 3: those that benefit one or more specific components of the fishery.

The subsequent section takes a different perspective, drawing on a fishery systems approach to discuss the impact of subsidies in general on the various components of the human system in the fishery:

- the harvesters (fishermen)
- the post-harvest sector (from processing through to consumers)
- the fishing communities (and households)
- the broader socioeconomic environment within which the fishery is located.

Thereafter, the next section turns to the level of fishery policy, presenting a preliminary assessment of how subsidies might interact with each of a range of fishery management and policy directions that have potentially positive sustainability and resilience implications – the idea being that subsidies shifting the fishery in these directions are more likely to fit well within a context of sustainable development than those that move the fishery in opposite directions.

Finally, the report concludes with comments on next steps in utilizing available approaches to assessing social effects of fishery subsidies.

Toward an Analytical Framework for Assessing Social Impacts of Subsidies

As noted at the outset, there is no generally-accepted framework for assessing the impacts of subsidies in the context of sustainable development, or of assessing social impacts of subsidies specifically. Furthermore, there does not appear to exist any suitably-comprehensive framework that could be adapted to properly explore the various impacts of subsidies. Accordingly, this section seeks to consolidate useful elements from a range of sources that together may provide a suitable analytical framework for assessing the impacts of subsidies. Ideas and approaches here are drawn from the following:

- a framework presented in OECD's trade liberalization study, focusing on the relation between impacts of subsidies, and the particular fishery management regime in place;
- a sustainable development framework to address fishery issues, as well as management and policy measures, in terms of impacts on sustainability and resilience;
- a 'fishery systems' framework highlighting the natural, human and management sub-systems, and that focuses the analysis on interconnections throughout the fishery;
- a social science oriented framework for addressing impacts of interventions in relation to the range of human elements and social issues in the fishery;
- an analytical approach focusing on distributional impacts of subsidies, a key element of a social analysis of fishery impacts;
- a 'checklist' approach to provide a simple mechanism for monitoring and evaluating the various social impacts of fisheries subsidies or other policy interventions.

The Analytical Framework from the Trade Liberalization Study

A framework that has been suggested for analysing fishery subsidies (Hannesson 2001) focuses on how the various types of subsidies interact with the various fishery management regimes in determining the resulting impacts of the subsidies. In other words, this framework emphasizes the role of the management regime in determining the actual impacts of a subsidy. As Hannesson (2003, p.7) puts it:

“The effect of subsidies on fish stocks and catches depends critically on the fisheries management regime in place. If a subsidy is introduced it will initially augment the profits of fishing enterprises. The reaction of the industry will depend on the fishery management regime, that is, whether there are any controls at all, whether the catch is being controlled, whether the effort is being controlled, and whether there is a property rights structure accompanying those controls.”

One of the objectives defined by OECD for the present report is to examine how suitable this framework is to assessing subsidies within a broader sustainable development framework, and in examining the social dimension of subsidy impacts in particular. Certainly, the fishery management regime would seem to play a significant role in affecting how subsidies impact on the fishery, from a social perspective. For example, suppose that a certain jurisdiction introduces a rights-based management measure, such as individual quotas (or ITQs). Not infrequently, this has been done by dividing fishery participants arbitrarily into two groups – say, license holders with large catch histories, on the one hand, and crew members and small-scale license holders, on the other hand – then distributing use rights free of charge to the first group, while excluding the second. This practice clearly constitutes a subsidy favouring a specific group of fishery participants, and thus one with major distributional implications. Whether or not this subsidy leads to economic or environmental benefits is unclear, but the degree of inequity inherent in such a practice suggests that it will have significant social impacts on individuals and communities. This is an example of a subsidy that was likely designed from an economic perspective without adequate attention to social impacts – in other words, without due attention to all the ‘pillars’ of sustainable development. This example also illustrates how, in analysing a subsidy, care must be taken to examine all ‘angles’ of the fishery impacts.

There seems no doubt, therefore, that the impact of a given subsidy can vary depending on the fishery management regime in place, but that the classical economic analysis applied in previous work will be insufficient to properly assess the manner by which fishery management regimes affect the social impacts of a subsidy. In particular, since social considerations may either ameliorate or aggravate the subsidy’s impact, economic analysis alone may not arrive at a correct understanding of the situation, so a broader analysis is required.

Furthermore, there is no reason to believe that focusing on just one dimension in fishery systems – such as the fishery management regime – will be enough to effectively understand the nuances of how subsidies affect the fisheries. Therefore, in examining the impacts of subsidies, differences in fishery management regime should be seen as but one factor influencing the nature of the impacts, among a range of other structural or socially-oriented factors. For example, the developmental state of the coastal economy, labour market factors, and the socio-cultural reality affecting the fishery may all have considerable influence on how a subsidy impacts the fishery.

To move beyond a focus on how subsidies interact with the fishery management regime, we need to explore a number of other analytical frameworks within which impacts of subsidies can be examined. This is the subject of the remainder of the section.

A Sustainable Development Framework

As noted earlier, the sustainable development of fishery systems involves pursuing the simultaneous achievement of certain key components of sustainability. In this report, we focus on the three ‘pillars’ of ecological, social and economic sustainability, and add a fourth (equally important) pillar – institutional sustainability (cf. Charles 1994). These are described below:

- *Ecological Sustainability* incorporates goals that relate to individual species, to the broader resource, and to the overall ecosystem:
 1. ensuring that harvests are sustainable, in the sense of avoiding depletion of the fish stocks,
 2. maintaining the resource base and related species to avoid foreclosing future options,
 3. maintaining or enhancing the overall health of the ecosystem.
- *Social and Economic Sustainability* focus on maintaining or enhancing overall long-term socioeconomic welfare, including measures of individual well-being and the well-being of human communities reliant on the fishery, incorporating the goals of:
 1. generating significant sustainable net benefits (including resource rents),
 2. reasonably distributing those benefits amongst the fishery participants,
 3. maintaining or enhancing the system’s overall viability within local and global economies,
 4. maintaining or enhancing *community sustainability* – the welfare of human communities in the fishery system, including their economic and socio-cultural well-being, overall cohesiveness, and long-term health.
- Institutional Sustainability involves maintaining suitable financial, administrative and organizational capability over the long-term, as a prerequisite for the above three components of sustainability. Institutional sustainability refers in particular to the sets of management rules by which the fishery is governed, and the organizations that implement those rules - the bodies and agencies that manage the fishery, whether at the governmental, fisher or community level. A key requirement in the pursuit of institutional sustainability is likely to be the manageability and enforceability of resource use regulations.

Recognising the multi-faceted nature of sustainable development, it must be understood that overall sustainability of the fishery system requires the simultaneous achievement of all the above components. Thus a proposed fishing activity or fishery management measure should be considered unacceptable if it produces an overly negative impact on any one component. In other words, overall system sustainability would decline through a policy that increases one element at the expense of excessive reductions in any other.

The sustainable development framework requires a further extension. Increasingly it is becoming recognized that the concept of sustainability must be looked at in parallel with that of *resilience* – which reflects the ability of a fishery, and its ecological, social, economic and institutional components, to absorb and ‘bounce back’ from perturbations caused by natural or human actions, without collapsing, self-destructing or otherwise entering an undesirable state (Berkes and Folke 1998). The idea of resilience was first introduced by ecologist C.S. Holling, who wrote (Holling 1973: p.17):

“Resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables and parameters, and still persist. In this definition resilience is the property of the system and persistence or probability of extinction is the result.”

Resilience is relevant throughout the fishery – implying that the relevant ecosystems, and the human and management systems, are able to absorb perturbations, such that the system as a whole remains able to sustain (on average) a reasonable flow of benefits over time. Specifically, for components of the human system, such as fishing communities, it implies a capability to persist in a ‘healthy’ state over time, and for the management system, designing with resilience in mind seeks adequate management performance if and when something unexpected happens. A desired state of the fishery would be one characterised by resilient management institutions, resilient fishing communities, a resilient economic structure and a resilient ecosystem in which the fish live.

Unfortunately, resilience is not an entity that is simple to measure. In fact, there are no agreed upon measures of resilience, but there is an expanding body of study developing an understanding of what management and policy measures are compatible with maintaining or enhancing the resilience of the fishery: this is discussed later in the report.

Thus a sustainable development framework requires mechanisms to evaluate the nature and extent of sustainability and resilience in a fishery – an integrated, interdisciplinary, multi-dimensional ‘sustainability assessment’. This can build on analogous approaches to evaluating the impact of human activities contained in environmental impact assessment and social impact assessment. The sustainability assessment approach (*e.g.*, Charles 1995c, 1997b,c) involves determining a set of quantitative *indicators* that captures key elements within each component of sustainability, and allows comparisons between these. When indicators have been determined for a given fishery, some insight can be obtained into where sustainability and resilience seem to be present or absent. The checklist below suggests some examples of relevant sustainability-related questions that might be posed, from which appropriate indicators can be deduced.

Box 7.1. A 'Sustainable Development' Checklist

Ecological Sustainability

1. Are exploitation levels (catches) on directly impacted species such that ecosystem resilience is maintained (or at least not reduced excessively)?
2. Are indirect biological impacts reasonably understood to the extent required for sustainability?
3. Are impacts on the ecosystem as a whole reasonably understood to the extent required to maintain overall resilience?
4. Are alternative systems of management and/or utilisation available so that pressures from any increased demands placed on the system do not increase beyond management capabilities?
5. Are imposed stresses and rates of change likely to be within the bounds of ecosystem resilience?

Social and Economic Sustainability

1. Will the activity increase the aggregate long-term rate of employment?
2. Will the project enhance economic viability in the local and regional systems?
3. Are possible impacts on input and output prices understood?
4. Is resource depreciation, and changes in natural capital more generally, incorporated into national accounting practices?
5. Are the current and projected levels of distributional equity in the system sufficient?
6. Will long-term food security and livelihood security be maintained or increased, as measured in both average and minimal terms?
7. Is the project likely to maintain or increase the long-term stability of affected communities?
8. Does the local population have access to the resource base?
9. Is the local population integrated into resource management and development practices, with traditional management approaches utilized to the extent possible?
10. Are traditional value systems of importance to the community maintained?
11. Are local socio-cultural factors (tradition, community decision-making, etc.) incorporated?
12. Are traditional resource and environmental management methods utilized to the extent possible?
13. Are there adverse impacts in any component of the system, that unduly affect particular components of the community (e.g. by age, gender, religion)?

Institutional Sustainability

1. Will the long-term capabilities of corresponding institutions be increased?
2. Is financial viability likely in the long term, or does the intrinsic importance of the system justify ongoing support from society regardless?

A Fishery Systems Framework

It was noted earlier that a sustainable development framework is inherently ‘integrated’ in looking simultaneously at ecological, social, economic and institutional sustainability. Such a framework must also look at the entirety of a fishery system – while it is important to understand the impact of subsidies on the ecological, social, economic and institutional sustainability of one particular gear type, or one particular fishing community, we must also look at broader impacts on the fishery as a whole, and indeed beyond the fishery.

An interesting illustration of this – drawn from one of the relatively rare analyses of fishery subsidies that have taken a broad perspective – relates to fishery subsidies in Ireland. Wiium (1999) notes that these subsidies “...are used increasingly for the purpose of employment creation in disadvantaged regions, rather than to increase capacity” and that “The fundamental objective is to prevent out-migration of people from peripheral regions of the State.”(p.157) Correspondingly, the conclusion of the study is that while “Abolishing fisheries subsidies in Ireland is therefore not likely to have huge effects on the fishing fleet...the effects on rural communities could be grave.” (p.164) Wiium makes the important observation, of relevance in a climate of subsidy removal, that “if subsidies are to be removed, it is of utmost importance to understand what underlying motives brought them about in the first place. Only then can policies be recommended that can replace the subsidies, if their removal is deemed desirable.” (p.159) What this example tells us is that to understand the impact of subsidies, we need to go beyond single-discipline analysis, and beyond a focus solely on the harvesting sector of the fishery.

There is no standard methodology involved in carrying out a ‘fishery systems’ analysis. Instead, in a manner analogous to that of applying a ‘sustainable development framework’, the key characteristic lies in the approach itself. Just as the field of ecology focuses on the structure, dynamics and overall nature of ecosystems, the broader idea of a ‘systems approach’ seeks to understand the structure and interactions within a fishery system (or an aquaculture system, etc.) from a holistic perspective. In particular, in examining the impacts of subsidies, it is relevant to take into account any impacts on each of the fishery system components:

The Natural System:

- The Fish
- The Ecosystem
- The Biophysical Environment

The Human System:

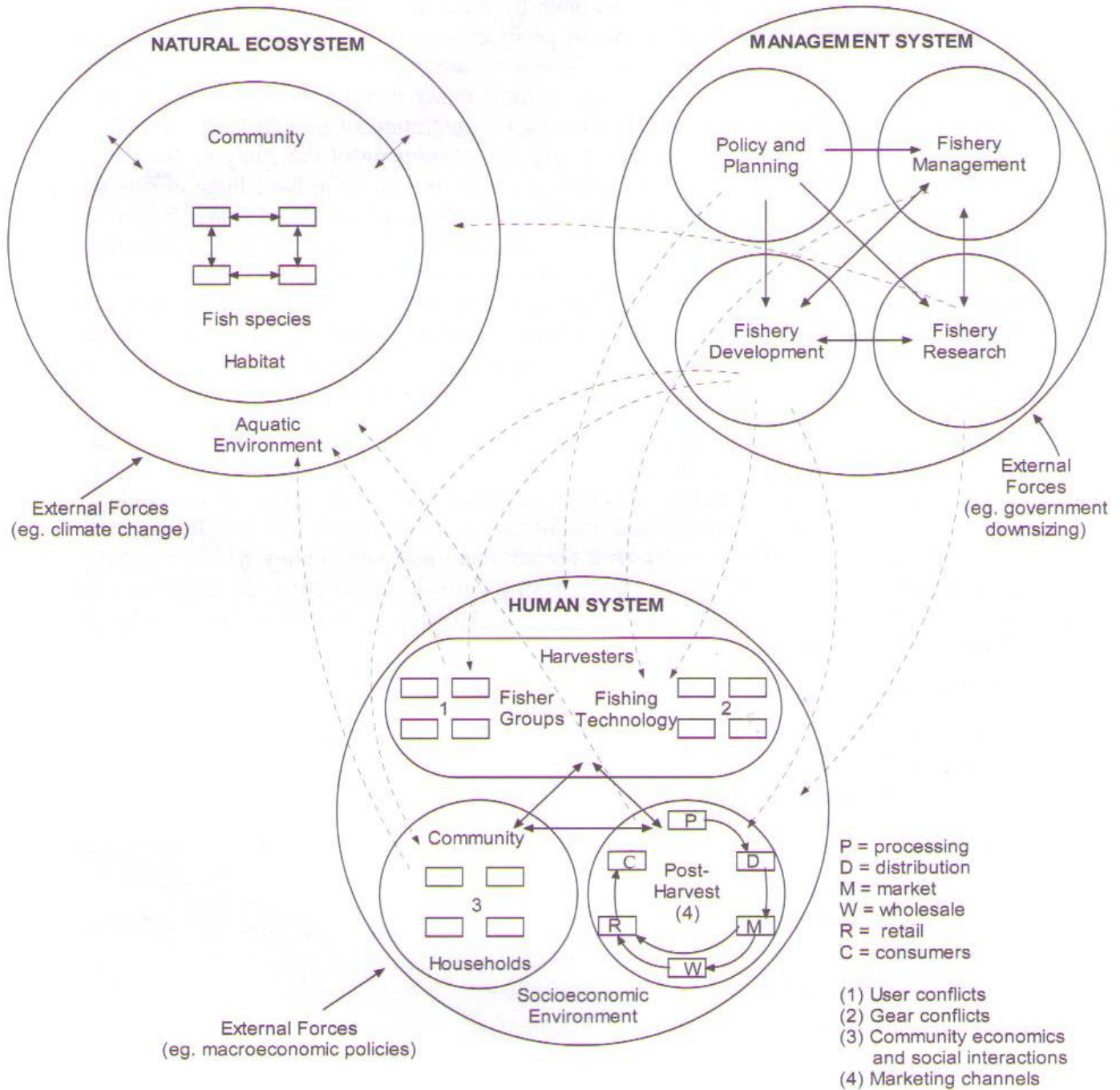
- The Fish Harvesters (Fishers)
- The Post-Harvest Sector and Consumers
- Fishing Households and Communities
- The Social/Economic/Cultural Environment

The Fishery Management System:

- Fishery Policy and Planning
- Fishery Management
- Fishery Development
- Fishery Research

The Figure below indicates these various components, some of the interactions among them, and representatives of the many external impacts on the fishery. Note that the lower circle depicts the human sub-system with emphasis on the internal structure within fisher, technology, community and post-harvest elements, and the interactions between the various elements.

Figure 7.1. The Fishery System



Social Analysis of Subsidies in Fisheries

As this author is not in a position to develop a sociological analysis of fishery subsidies, or other policy interventions, this paper draws on the work of Townsley (1998) who provides a survey of social issues in fisheries, developing an analytical framework for examining social considerations. In particular, Townsley provides two ingredients:

First, Townsley describes how social impacts may be classified demographically and organizationally. At the demographic level, he focuses on two key aspects: gender and age. The idea is that policy interventions – in this case a fishery subsidy – need to be considered through the dual lenses of age and gender. Thus one would explore how the subsidy affects different age groups in the fishery, and how it affects women and men differently. Townsley also highlights the need to examine the impacts of policy interventions on the different organizational levels in the fishery, notably:

- Community
- Household
- Production-unit

Second, Townsley provides a grouping of social issues arising in fisheries within seven major categories:

1. Stakeholder communities
2. Economic factors
3. Access and ownership
4. Labour
5. Institutions and decision making
6. History and change
7. Beliefs, knowledge and skills

Several elements in this set match closely with the categories used by Charles (1988) in reviewing the state of knowledge on fishery socioeconomics:

1. objectives, such as employment, distributional concerns and rent generation
2. income distribution
3. fishery management; property rights, co-operatives, community rights
4. social and opportunity costs for labour
5. fishery labour markets, labour supply, labour mobility
6. fishermen and fishing community decision processes, behavioural dynamics

While there are similarities, clearly there are also some differences between the above two sets. For example, Townsley's last two elements deal with more conceptual and philosophical considerations, while the two elements in the above paper that deal with fishery labour reflect a greater socioeconomic focus. In any case, a union of the sets would provide a fuller framework for analysis. Indeed, there may also be some aspects missing from the sets above – for example, the range of cultural considerations is not so clearly incorporated.

Distributional Analysis

A particularly important element above is that of the distributional impacts of subsidies. Who is affected more and who less by the subsidy? Who wins and who loses from having the subsidy in place? The matter of distributional impacts is always present –

after all, subsidies are often directed, intentionally or not, at certain components of the fishery sector, so distributional impacts arise naturally – but rarely dealt with comprehensively. Because distributional impacts cannot be easily analysed with the standard microeconomic tools, many analysts do not even acknowledge them. Munro and Sumaila (2002: p.235), on the other hand, consider distributional matters as one of two major categories of impacts: “...subsidies are to be judged in terms of their impacts. We can divide such impacts into two broad categories: (A) distributional impacts; and (B) impacts upon resource management and sustainability”. Those authors then proceed to focus on the latter group of impacts – in keeping with the approach of most economic analyses, where distributional considerations are not addressed – but the emphasis they place on the relevance of such matters motivates the focus of the present report.

The need for greater attention to distributional aspects is perhaps illustrated by the fact that many definitions of subsidies or statements of the nature of subsidies do not recognise the key point of Munro and Sumaila above – that affecting distribution of fishery benefits may well be a major objective and/or impact of a subsidy. For example, Hannesson (2003: p.1) writes that the purpose of a subsidy “is to raise the incomes of those who work in the industry or firm in question or to increase the volume of production.” This may well be *one* objective, but another may be to shift benefits or costs among “those who work in the industry or firm in question”.

A focus on distribution is crucial to an analysis of subsidies, and an analytical framework clearly needs explicit incorporation of such considerations. (The framework developed in the trade liberalisation study needs further elaboration in order to do so.) Clearly, Myers and Kent (2001: p.9) note the importance of focusing on who receives the benefits of subsidies and who does not:

“If everybody receives a subsidy, nobody does. By their very nature, then, subsidies have a marked distributional effect. This means in turn that subsidies carry all manner of equity implications... It is these equity concerns that make subsidies a politically contentious issue. Whom should governments try to assist through subsidies...? The list can be long.”

There are various dimensions in looking at distributional issues. One of these is the power structure in the fishery and society – the above authors proceed to state that “experience shows that in virtually all societies, it is often the powerful who obtain subsidies by causing weaker groups to shoulder some of the costs of their activities...”. Another dimension is that of scale: for example, since subsidies in the fishery sector can have a range of impacts on society beyond the fishery – *e.g.*, coastal communities, ancillary industries, etc. – it is crucial to look at larger-scale distributional implications. This is supported by the conclusion in FAO (2003: paragraph 15) that “...it may not be sufficient to note the effect on the recipient [of the subsidy] only. In order to get a grasp of the total outcomes of a policy it is necessary to look also at the economic effects on the industry and on society as a whole.”

Subsidy Impact Checklists

It is undoubtedly a complex task to develop an integrated analysis of fisheries subsidies, one that (a) takes into account the various social, economic and environmental perspectives, (b) consolidates the analytical frameworks described in the present section, and (c) assesses both the positive and negative aspects of a given subsidy. A simple mechanism to attempt to capture the range of relevant considerations is through a

checklist. Often, checklists are presence/absence in nature, with a ‘check-mark’ indicating a satisfactory outcome with regard to the particular item being considered. However, this can be expanded into a more open-ended set of key questions to be addressed in any given situation.

With respect to social impacts of subsidies, there is a need for ‘social impact assessment’ processes to examine subsidies in the same manner as such an assessment is carried out for major project proposals. If this were applied through a checklist to evaluate social impacts, it could be used in parallel with similar checklists of environmental and economic impacts. In particular, an approach of this sort could function analogously to a recent checklist approach for delineating specific elements of subsidies that produce environmentally harmful effects (cf. Cox, 2002).

Box 7.2. Some Components of a Checklist for Social Impacts of Fisheries Subsidies

[adapted from the analytical framework of Townsley (1998)]

1. What are the gender-related impacts of subsidies (e.g., gender roles, reproductive labour)?
2. What are the age-related impacts of subsidies (e.g., aspects of vulnerability, dependency)?
3. What impacts do subsidies have on the various communities involved in the fishery?
4. What impacts do subsidies have on the various households involved in the fishery?
5. What impacts do subsidies have on the various production units involved in the fishery?
6. How does the subsidy affect the interaction among stakeholder communities (relative ‘stakes’, historical involvement, tenurial rights, cohesion)?
7. How does the subsidy affect economic factors, such as interactions in the local economy, interdependence, diversification, indebtedness?
8. How does the subsidy affect access and ownership (women’s patterns of resource use, multiple use, access vs. ownership)?
9. How does the subsidy affect aspects of labour in the fishery and in coastal communities (migration, household survival strategies)?
10. How does the subsidy interact with institutions and decision making structures (devolution, conflict management, local power and equity)?
11. How does the subsidy relate to history and change (temporary population movements, seasonal variations and long-term processes)?
12. How does the subsidy relate to beliefs, knowledge and skills (cultural significance, attitudes, levels of education, TEK)?

Synthesis

In the absence of a generally-accepted ‘analytical framework’ for assessing the impacts of subsidies in the context of sustainable development, there seems to be a need to ‘build’ such a framework by integrating a number of relevant approaches – as presented in this section – that might be useful in assessing the impacts of fishery subsidies. While each approach has its role to play, none seems sufficient on their own – what is needed, then, is a ‘blend’ of these approaches.

The framework presented in OECD’s trade liberalization study provides a useful first step in linking the impacts of subsidies, on the one hand, and the specific fishery

management regime in place, on the other. Starting the ‘building process’, a *fishery systems* framework, as discussed in the section above, adds on the recognition that it is not only the management system that affects the impacts of subsidies, indeed so do many elements of the fishery system. The systems framework therefore provides a systematic way to analyse interconnections throughout the fishery, within and among the natural, human and management sub-systems.

The next step, after broadening the ‘trade liberalization study’ framework into a fishery systems framework, lies in integrating the latter with a sustainable development framework, as discussed above. This enables a proper examination of the impacts of subsidies, and indeed other management and policy measures, in the dual context of the fishery system and of the goals of sustainability and resilience.

These steps should produce a broad framework to analyse fishery subsidies (and other interventions) from ecological, social, economic and institutional perspectives. However, for the analysis of social impacts, the framework needs to incorporate aspects of a sociological analysis. As described in the section on impacts of fisheries subsidies on the human components, Townsley (1998) provides a suitable approach to accomplishing this, involving classification of social impacts demographically (in terms of gender and age) and organizationally (in terms of community, household and production-unit), and grouping of social issues within seven major categories: (a) stakeholder communities, (b) economic factors, (c) access and ownership, (d) labour, (e) institutions and decision making, (f) history and change, and (g) beliefs, knowledge and skills. This analysis is complemented by a focus on distributional impacts of subsidies as shown below, a key element of a social analysis of impacts.

The above amalgamation of approaches may lead to a consolidated analytical framework that deals with impacts within a ‘sustainable development oriented’ systems approach, and that also maintains some focus on interactions with management systems. A ‘checklist’ approach to assessing the various impacts (drawing on a social analysis – see the section on conclusions) may then provide a simple mechanism for monitoring and evaluating the various social impacts of fisheries subsidies, and indeed other policy interventions, in the spirit of a ‘rapid appraisal’ approach – one that is not as in-depth as a full analysis but which focuses attention on key components of the fishery system and on key issues of relevance to the analysis of subsidies.

Assessment of Social Impacts for Specific Fisheries Subsidies

In this section, we provide a preliminary attempt to analyse the social impacts of specific fisheries subsidies, focusing on distributional aspects (reflecting the focus in this report on social impacts in terms of the distribution of benefits, costs and overall impacts). This explores (a) who are the recipients of the subsidies, and (b) how widespread these recipients are in the fishery and in society. In addition to a general discussion of distributional considerations for each form of subsidy, we also attempt to classify subsidies into the following three groups:

- Type 1: those that benefit all in the fishery, as well as some in other sectors of society;
- Type 2: those that benefit all in the fishery, but no one outside that sector;
- Type 3: those that benefit one or more specific components of the fishery.

Type 2 subsidies are easiest to analyse, since they reflect a clear case of government financial support to the fishery sector, that is not provided to others. Subsidies of Type 1 range from those, at one extreme, that apply to all economic sectors and thus really are not fishery subsidies at all, to those at the other extreme that are ‘almost’ Type 2 subsidies in that they apply to all in the fishery plus a very small group outside the fishery.

Subsidies of Type 3 are most in need of a distributional analysis, as they are likely to affect the division of fishery benefits and costs amongst the fishery participants. Such subsidies may well reflect implicit or explicit government policy directions. For example, financial support may be provided for fleet ‘modernization’ – encouraging more capital-intensive vessels, and thereby favouring participants with access to capital or lending institutions. On the other hand, subsidies may be provided as income support to small-scale fishers, as a means to maintain the integrity of a labour-intensive fishery, and the coastal communities that rely on it. Many more examples may be considered: subsidies to particular gear sectors, particular vessel categories, particular geographical locations, particular fishing areas, and so on. In this report, considerable attention will be paid to exploring the implications of Type 3 subsidies.

It should be noted as well that there is a fourth type of government intervention, one that is made available to all in the society (not just in the fishery); such public services (public goods) do not usually constitute a subsidy. For example, provision of water and sewage facilities would fit this description, as essential services provided by government. Other ‘public services’ could be considered as fisheries subsidies if those services are *de facto* oriented to the fishery sector. For example, a wharf paid for by government, and nominally accessible to the public, but for which usage is, say, 95% on the part of fishery participants, might be considered as a subsidy to the fishery sector. Similarly, a marine protected area may be instituted as a public good, but impacts may be differentially important to those in the fishery (particularly if there is a closing of certain areas to fishing, or a restriction of fishing within certain areas). However, they may also have significant distributional impacts, with some fishers suffering short-term negative impacts while others enjoying long-term positive impacts.

The above distribution-focused classification of subsidies is utilized in this section to examine the social impacts of specific subsidies listed by Westlund (1999). That author’s list of financial transfers is organised into two groupings. First, *direct financial transfers* include investment grants, grants for equipment, and price support, as well as negative subsidies (taxes and fees, import/export duties). Second, *services and indirect financial transfers* include (a) non-tariff border measures, export promotion, etc., (b) tax and duty exemptions, fuel tax exemptions, etc., (c) differentially-beneficial government services (e.g., loan guarantees), and (d) government services to fishermen for which the full cost is not recovered. A selection of the financial transfers listed by Westlund is shown below – and a sub-set is examined in this section. Also omitted here are two groupings that Westlund includes in the list of subsidies, but which do not fit the definition of ‘financial transfers’: (a) ‘interventions with different short and long-term effects’, notably measures with a short-term cost (subsidized) but long-term benefits, such as environmental protection, gear regulations for species conservation, and protected areas (see above), and (b) ‘lack of intervention’ (such as not charging for access to fishing grounds, not implementing management measures or enforcement programs, etc.).

Box 7.3. Fisheries Subsidies in the form of Financial Transfers (drawn from Westlund, 2003)**Direct financial transfers:**

Bad weather unemployment compensation, Disaster relief payments
 Modernization/investment in vessels
 Income support, UI and income guarantee
 Vessel decommissioning, License and quota buyouts
 Compensation for closed or reduced seasons
 Price support
 Direct aid to participants in specific fisheries
 Grants to establish joint ventures
 Support to improve economic efficiency
 Grants for safety equipment
 Direct export incentives
 Retraining fishers for other industries
 Taxes
 Import/export duties
 Transport subsidies

Services and indirect financial transfers:

Support to community based management, regional development
 Fishers' insurance programs
 Payments to foreign governments for fishery access
 Fishery-specific infrastructure e.g. fish markets, landing sites
 Bait services
 Gear development
 Fuel tax exemptions, Sales tax exemptions
 Special income tax deductions for fishers
 Investment tax credits, Loan guarantees
 Market promotion programs
 Input or output regulations
 Inspection and certification services
 Training and extensions services
 Research and development
 Sales to fishers at below-market prices
 Information collection, analysis and dissemination
 Promotion and development of fisheries
 Exploratory fishing
 Fisheries enhancement
 International fisheries co-operation
 Import quotas
 Promotion of fish consumption
 Market research

Direct Financial Transfers***Bad weather unemployment compensation / Disaster relief payments***

A subsidy made available only under certain conditions of Nature, e.g. natural disasters and bad weather, to compensate those disadvantaged by the specific conditions,

reduces the risk element that might be present in the recipient's analysis for investment and operational decisions, but is in keeping with the nature of many societies to provide care for those harmed by acts of Nature, whether droughts, hurricanes, or other such phenomena. Accordingly, this fits as a Type 3 subsidy (not provided to everyone); distributional conflicts may arise but are not likely large.

Income support, UI and income guarantee

This has the potential to fall into Type 2, i.e., subsidies that benefit all those in the fishery, but can have distributional impacts, depending on whether income support is at the same level for all participants, or varies, e.g. based on a percentage of income.

Vessel decommissioning

This Type 3 subsidy involves payments to boat owners but unlikely any compensation to crew members or ancillary sectors, and therefore there can be significant distributional implications. In addition, crew members of decommissioned vessels may re-enter other sectors of the fishery, causing possible social problems.

License and quota buyouts

As with vessel decommissioning, this Type 3 subsidy typically involves payments to boat and/or quota owners, but does not likely include any compensation to crew members or ancillary sectors. Crew members may re-enter other fishery sectors, potentially leading to social problems. What happens to vessels is not specified, so vessels may be brought into other parts of the fishery, causing over-capacity, or alternatively, vessels may be used in non-fishery sectors (e.g., tourism) for economic development.

Retraining fishers for other industries

This Type 3 subsidy may directly benefit certain fishers – i.e., those who are motivated to undertake re-training, or those forced to do so – but may also serve the public interest, constituting an investment in human resources and in reducing pressure on fishery resources.

Transport subsidies

This form of subsidy could support isolated fishers and fishing communities in enabling them to market their catch; alternatively, it could reduce food supplies in such isolated areas if, as a result, more fish were to be 'exported' out of the area. Depending on how such subsidies are implemented, specifically whether they are available to benefit everyone in the fishery or are targeted on particular locations or groups (e.g., processors), they may fit as Type 2 or Type 3.

Services and Indirect Financial Transfers

Support to community management, regional development, producer organisations

To the extent that these measures support local resource management and development, they may serve to enhance stability in isolated areas. They may well be Type 1 subsidies in that their impact includes not only those in the fishery, but also the

broader coastal society and economy. Support for producer organizations will generally be Type 3, in that typically not all those in the fishery benefit equally from such support.

Fishery-specific infrastructure e.g. fish markets, landing sites

These constitute ‘public goods’ within the fishery... the value and necessity of such subsidies depends on whether collective action could produce such infrastructure, and/or whether private sector investment can produce the infrastructure. They are Type 2 if use is restricted to fishery participants, or Type 1 if there is broader accessibility and use of the facilities.

Special income tax deductions for fishers

This would seem to be a classic Type 2 subsidy, benefiting all those in the fishery sector. However, depending on how the system is implemented, the subsidy may favour high income fishers over others (if the deduction is proportional to earnings) or may be a more egalitarian arrangement (if for example, there is a ‘cap’ on the level of the deduction). Social impacts may thus occur within the fishery, and may as well include the possibility of social tension in coastal communities, where some are receiving preferential tax treatment over others (non-fishers).

Investment tax credits

This subsidy may be portrayed as one of potential benefit to all fishers (Type 2) but in reality, unless the credit nears 100%, it can be taken up only by those in a position to make investments (*i.e.*, with access to capital and able to take risks with one’s assets), making it of Type 3. It thus may favour wealthier fishers and/or corporate participants. On the positive side, an investment tax credit system could be envisioned that would apply only to relatively ‘under-capitalised’ participants, enabling them to ‘catch up’, and thereby improving the distribution of access to resources. This subsidy has the potential to be among the most environmentally damaging and economically wasteful, if it leads to over-capitalisation in the fishery.

Loan guarantees

These have similar features to investment tax credits, but quite likely will have a somewhat better distributional impact, in that loan guarantees may enable development by those not in a position to take substantial risks. There have been some positive social results, for example, from revolving lines of credit on a small-scale community-level of operation. Often, loan guarantees are aimed at specific fishery sectors, making them Type 3 subsidies.

Grants to establish joint ventures, Payments to foreign governments for fishery access

These subsidies are of Type 3: they may be implemented with the stated aims of fishery development – assisting fishers to access new species and/or new fishing grounds, and securing new sources of fish – but there are significant distributional implications: the benefits of such subsidies will go to those able to undertake large-scale ventures and those capable of fishing in distant waters respectively.

Inspection and certification services

Government provision of inspection and certification services is a direct support to the fishery sector, or at least that part of the sector involved in selling fish. Of course, such provision also benefits the consuming public; therefore, whether this is seen as a public good or as a (Type 2) subsidy to the fishery sector is a matter of policy.

Sales to fishers at below-market prices

Here there is a different impact depending on whether we are considering capital or operating (variable) inputs. If a certain variable input (such as fuel) is subsidized, this differentially benefits those who consume most of that input on an ongoing basis. Specifically, a fuel subsidy may encourage fleet modernization (enabling some who would otherwise retain labour-intensive vessels to switch to fuel-intensive ones), but would most directly benefit those who already invested in fuel-intensive (and capital-intensive) vessels. In other words, it is a windfall benefit to those who already made an investment in such vessels. On the other hand, subsidizing capital purchases provides a similar incentive to that of investment tax credits; the benefit goes to those in a position to take advantage of the subsidy, and not to those who already made the relevant capital expenditures, or those without the financial resources to make those expenditures in any case. For example, subsidies on electronic equipment may increase the catching efficiency of vessels that benefit from the subsidy; this would increase the overall catching power of the fleet as a whole, but distributionally, it would (a) ‘even the playing field’ somewhat by providing the opportunity for investment to who had not yet made those expenditures due to lack of capability to do so, but (b) be of most benefit to those who can afford to pay the (albeit-subsidized) costs for new equipment. Overall, then, these financial transfers may be portrayed as Type 2 (those available to all in the fishery) but in reality, they are *de facto* available (or of most use) to those with a certain financial/investment history (Type 3).

Research and development

It is particularly difficult to assess, or even categorise, financial support provided for research and development. For example, if it is oceanographic research, this may be of benefit to fisheries, but also to shipping, offshore mineral development, underwater cable communications, and indeed to society at large through improved knowledge of a nation’s (and the world’s) seas. If it is development of more environmentally-appropriate fishing gears, this may be of no benefit to the fishery sector, but of great societal benefit – or it may be seen as a low-cost alternative to costly retro-fitting of existing gear or vessels, or indeed of a prohibition against certain forms of fishing. There is also a distributional issue: *e.g.*, development of a new bottom trawl gear may benefit trawlers directly (perhaps avoiding prohibition of the gear type, or stringent regulations). There may be indirect benefits to others through improved habitat quality and potentially improved fish stocks, but the greatest benefit would go to one component of the fishery.

Information collection, analysis and dissemination

Like research and development payments, this is a difficult area to address. Three questions need to be posed: What information is being collected and analysed? For what purpose? Who has access to the information and resulting analyses? Consider for example the case of a government initiative to map the seafloor off its coast. If government funding enabled scientists to map the seafloor and provide publicly

accessible information, this will provide benefits to the fishery sector, but the rationale for such efforts lies in seeking a better understanding of the ocean – very much a societal benefit rather than a fishery subsidy. This would seem to be a Type 1 subsidy. On the other hand, suppose the government partners with a private company to map the seafloor, producing information on the benthic habitat, its suitability for aquatic resource production, and the current location of such resources – information that is not released to the public and others in the fishery. This is a case of the government subsidizing a particular company in obtaining that information, implying a Type 3 subsidy with significant distributional implications.

Promotion and development of fisheries / Promotion of fish consumption

A generic promotion of seafood from the fisheries of a particular jurisdiction may seem to be of equal benefit to all in the fishery (Type 2). However, it may well have greater benefits to some than others (Type 3). For example, fishers who sell their catch locally may not benefit much from more widespread promotional efforts. In a fishery with both commercial and recreational components, clearly there is little benefit to the latter from promoting seafood consumption.

Exploratory fishing

The impact of subsidies for exploratory and experimental fisheries can be complex. There may be a rationale for such subsidies in terms of governmental policy directions – whether food supply, export promotion, employment generation or regional development. However, there are distributional impacts in the sense that benefits will go directly to those with the means to become involved in such endeavours (and of course, the capability to incur risks) – implying a Type 3 rather than a Type 2 subsidy.

Market research

Efforts to understand fish markets, supply and demand relationships, market niches, etc., can be of benefit to the entire fishery sector (Type 2), but may be particularly helpful to processors and exporters (Type 3).

Synthesis

This section of the report has taken a structured approach to examining the social impacts, and particularly the distributional implications, of fishery subsidies. The approach has drawn on the discussion of distributional issues in the frameworks section, utilising a 3-prong typology of distributional impacts, and applying this to a set of subsidies drawn from the listing of Westlund (2003). On the other hand, apart from use of the above classification scheme, the analysis for each subsidy herein has been very much *ad hoc* based on the author's understanding of the general features of each situation. An important step for the future would be a more systematic and comprehensive analytical undertaking, to fully explore the social impacts of each form of subsidy.

Impacts of Fisheries Subsidies on the Human Components of the Fishery System

Fish Harvesters

A key aspect in assessing the social impacts of a particular fishery subsidy is the potential for differential impacts on the different types of fishers. Overall categories of

fishers can include subsistence, indigenous/aboriginal, recreational and commercial fishers. Within the commercial sector, it is important to differentiate between

- artisanal/small-scale fishers – those fishing commercially but at low levels, and “confined to a narrow strip of land and sea around their community, faced with a limited set of options, if any, and intrinsically dependent on the local resources” (Panayotou 1985: p.11), and
- industrial or large-scale fishers, i.e. those with “a broad spectrum of options both in terms of fishing grounds and non-fishing investment opportunities”, typically corporate fleets of capital intensive vessels.

Indeed, the difference between *small-scale* and *large-scale* can be applied to the fishery system as a whole, and the impact of subsidies in a fishery will depend very much on where the fishery lies on the spectrum between small-scale and large-scale. Fisheries need to be considered as small-scale or large-scale on a case-by-case basis, depending on an assessment of a range of organizational and structural characteristics, such as the size of the typical fisher’s operation (e.g., vessel size), the distance from shore the fishery operates, and aspects shown in the table below.

Table 7.1. Characteristics of Small and Largescale Fisheries

Social/Economic Factor	Small-scale Fisheries	Large-scale Fisheries
Nature of Objectives	multiple goals (social, cultural, economic, etc.)	tendency to focus on single goal (profit maximization)
Mode of production	subsistence fisheries as well as commercial ones, selling into appropriate markets	market-driven commercial fisheries, often with a focus on export
Ownership	typically individual/family; often small business in developed nations	typically corporate; often based on foreign fleets in developing nations
Mix of Inputs	labour intensive, relatively low technological level	capital intensive, emphasis on applying new technology
Rural-Urban Mix	predominantly rural; located typically outside mainstream social and economic centres	often urban or urban-tied; owners within mainstream social and economic centres
Community Connections	closely tied to communities where fishers live; integral part of those communities	relatively separate and independent of coastal communities

Subsidies relating to fishing methods, gear, etc., may affect the choices made by fish harvesters, in concert with a range of economic and social factors. These include (a) the relative importance of short-term *versus* long-term benefits in decision making, which will affect the level of concern for conserving fish and habitat (e.g. destructive methods can be very profitable in the short term); (b) the relative importance of private profit (market value of the catch less the cost of the fishing activity) *versus* a balance of multiple objectives (benefits of income and food production minus the time, energy and cost expended in fishing); and (c) the relevance of the selectivity of fishing gear – its

capability to catch only target species and sizes of fish – which can be important given concern about the by-catch issue, dumping of low-valued by-catches and the like.

Finally, there are a number of socioeconomic and cultural distinctions that may be important in examining impacts of subsidies and other policy interventions on fish harvesters:

- Within any given group of fishers, there are variations in many social and demographic aspects, such as age, education, social status and religion. Between fisher groups, there may be differences in internal social cohesion (how attached the fishers feel to their group) and in community connections (attachment to their local community).
- In commercial fisheries, there is also variation by occupational commitment (e.g., full-time versus part-time) and the level of occupational pluralism – with some fishers specialized entirely on a single species, some utilizing a range of resources, and others drawing income from outside the fishery as well as from fishing.
- Fishers vary in their motivation and behaviour; e.g., some may be profit-maximizers (acting as stereotypical ‘firms’) while others may be satisficers (fishing to obtain ‘enough’ income).
- Gender is an important element in many fisheries, given that in much of the world, women may be involved in one or more of (a) fishing itself, (b) on-shore components of the fishery system, such as processing, in industrial contexts, or marketing, in artisanal settings, (c) organizing the community to respond to threats to the livelihood of the local fishery, and (d) building up and holding fishery and marine environmental knowledge within the community (Ruddle 1994).

Post-Harvest Sector

Subsidies in the harvesting sector may also affect the post-harvest sector, or subsidies may be directly targeted on the latter. A *sustainable development* approach implies a focus on maximising the benefits to society provided by each fish that can be caught sustainably, so that the limited quantities of fish available are used as efficiently as possible to meet societal goals. This point has particular relevance to the post-harvest sector, implying the need for attention to: (a) reducing waste and post-harvest losses, (b) maximizing the *value-added* through appropriate processing, (c) developing and/or improving distribution and marketing systems, and (d) integrating the fishery into overall rural development efforts.

Marketing and Distribution. Clearly, successful marketing and distribution of fish can make the difference between a reasonable income for fishers and others, and an untenable one. Policies, and subsidies, affecting marketing and distribution must be based on a good understanding of the complexities of the coastal system to avoid creating unexpected ‘perverse’ problems from a social perspective - for example, by reducing the role played by women, or reducing the stability and cohesion of the fishing communities.

Processing. Subsidies for the processing sector will presumably aim to enhance the attributes of this component of the fishery: (a) creating additional employment in fishery-based regions, (b) providing *value added* to the fish landed by harvesters, (c) providing a means to transform fish into more manageable forms (e.g., processing into canned, salted

or frozen products to make distribution easier), or more marketable forms, or (d) providing better utilization of by-catch and development of new resources, leading to economic development. On the other hand, subsidies in the processing sector can have social impacts in terms of the distribution of benefits in the fishery. For example, given that some forms of processing (e.g., heading/gutting, freezing, smoking and salting) all tend to be relatively labour intensive, while others (canning and reduction) are capital intensive, the direction a subsidy favours may have dramatic effects on employment and community well-being. Finally, while most attention within the processing sector is typically paid to the material being processed, it is also important to look at those doing the work: do subsidies change the nature of who works in processing, e.g. the role of women in on-shore fish plant work?

Markets. Subsidies that support fish markets may have social implications. In particular it is useful to monitor issues of market power, intermediaries and financiers. Market power in a fishery will depend on internal social structure, such as the role played by producer organizations and co-operatives, on the fisher side, and by vertical integration and food wholesaling on the processor side. The role of middlemen can be not only as fish buyers but also as financiers, lending money to fishers, who agree to sell fish to the middlemen in return.

Consumers. Subsidies may affect the consumer sector of the fishery system, whether through consumer preferences or consumer demand. For example, a government seafood promotion campaign could affect preferences – the inherent desires that people have for seafood. Subsidies may focus on price support, affecting consumer demand. It is important to understand both consumer preferences and consumer demand in order to analyze the impacts of actions in other parts of the fishery system. For example, a subsidy designed to improve quality control in fish processing may lead to healthier fish products, but the resulting price may be higher; depending on the availability of substitutes in the marketplace, what appeared to be an obviously beneficial move to improve the desirability of a product could also lead to drastically reduced demand, and therefore lower incomes for fishers and processors. A subsidy that leads to a shift in market focus can have major social impacts: for example, the drive to maximize the value of the fish caught can lead to fish being diverted from local markets to export markets, and from use as food fish locally to use as fish meal in salmon and shrimp farms. Both of these impacts result in lower availability for local nutritional needs.

Fishing Communities

Households. Subsidies may have complex impacts on fishing households – those in which at least one member is involved in the fishery. Does the subsidy change the overall income to the household, and/or the distribution of that income across household members? Is there an impact on who in the household can join in the fishing activity? In many cases, household members not involved in harvesting may be involved on the post-harvest side, working in processing plants or marketing and distributing the catch – is this situation affected by the subsidy? Finally, the harvester and others in the household may hold jobs entirely outside the fishery system, which may have the effect of stabilizing family income and reducing the risk of major loss if a disaster in the fishery system were to occur. How is this affected by the subsidy?

Communities. In examining fishery subsidies, and indeed any fishery policy measure, it is important to broaden beyond the traditional focus on fish and fishing ‘firms’, to understand the broader context of where the fish and the fisher live – in the aquatic

ecosystem and in coastal communities respectively. There needs to be a focus on the linkages between what goes on in the fishery itself, and how fishing communities operate - socially, economically and in terms of the functioning of community institutions. The list below shows some features of communities that are relevant in general to an understanding of the fishery system, and relevant specifically in assessing the impact of subsidies (and other government interventions) on fishing communities.

Table 7.2. Impacts of Subsidies on Fishing Communities: Some Relevant Factors

Demographic:	<ul style="list-style-type: none"> • community population • population trends • levels of migration • age and gender structure • education levels
Socio-cultural:	<ul style="list-style-type: none"> • identified community objectives • religious stratification • gender roles • social stratification and power structure • level of social cohesion • local traditions and norms
Economic:	<ul style="list-style-type: none"> • income levels and distribution • wealth levels and distribution • degree of dependence on the fishery • degree of fishing-related activity • diversity in livelihood opportunities • household economic structure • types and location of markets
Infrastructure:	<ul style="list-style-type: none"> • landing sites (e.g., beaches, wharves, etc.) • marketing, processing, distribution facilities • fishery-related facilities (e.g., boat repair) • social and cultural facilities • schools, religious centres, meeting places • roads, electricity, water and sewers
Institutional:	<ul style="list-style-type: none"> • pattern of community organisation • pattern of local resource management • pattern of resource ownership and tenure • level of community infrastructure • local government and legal system • regulatory and enforcement approaches • interaction with upper levels of government • use of traditional ecological knowledge • involvement of women in local institutions
Environmental:	<ul style="list-style-type: none"> • availability and condition of fish stocks • quality of aquatic and coastal habitat • oceanographic/environmental conditions

The Socioeconomic Environment

As noted elsewhere, a fishery subsidy may have impacts well beyond the fishery itself, moving into the fishery's socioeconomic environment – human, social and

institutional elements, at the community, regional, national and global levels. To assess these impacts, it is necessary to examine the links between the fishery system and the socioeconomic environment. Some aspects of this are as follows:

- How do demographic aspects of the fishery system, such as participation by age and gender, interact with external influences, such as national population and migration trends?
- What are the broad aspects of society, culture, history and tradition that impact on decision making in the fishery system?
- How does the fishery economy interact with the economic structure and dynamics at the regional and/or national levels?
- How are the economic inputs in the fishery, notably labour and capital, affected by the broad economic environment?
- How do local fishery objectives relate to broader regional and national policy goals?
- How does the local institutional structure interact with institutions, legal arrangements, legislation and policy frameworks at national and/or sub-national levels?

Labour markets. In assessing the impacts of a fishery subsidy, an important socioeconomic consideration is how harvesters interact with their socioeconomic environment through labour markets. Wage rates or crew shares on fishing vessels will depend on the balance of labour supply and demand, and what goes on outside the fishery system *per se* - in the broader environment - can operate through the labour market to influence the fishery system. Furthermore, analysis of the social impacts of subsidies must take into account the nature of ‘private’ decisions made by individuals in the fishery, and the differences between these and broader community and societal objectives.

Suppose, for example, that maintaining sustainable livelihoods (stable employment at reasonable incomes) is a priority among society’s objectives, as may be the case in regions of isolated fishing communities, where little alternative employment is available. This may be not just a matter of jobs in the fishery, but also of maintaining the ‘engine’ of the coastal economy, given the economic impact of a fishery on coastal communities. In such a situation, the *private cost of labour* may be significant (i.e., in terms of fishery wages paid by private operators) while the *social cost of labour* (the cost from a societal perspective) of employing people in the fishery may be much lower. (Indeed, depending on multiplier effects, the social cost of labour may even be negative, with employment of fishers being a positive ‘good’, not a cost to be minimized!)

This highlights the importance, in analysing subsidies, of recognizing the difference in impacts taken from societal and private perspectives. In the above scenario, if a specific subsidy leads to a reduction in employment levels, this may induce serious negative social impacts – the loss of fishers may lead, through a multiplier effect, to an economic *loss* to the regional economy and broader social costs may rise as well, for example, through increased crime or decreased levels of health and welfare. In such situations, it may be desirable (a) for capacity-reducing subsidies to target on capital-intensive rather than labour-intensive fishery components, and (b) for reductions in

employment, if needed, to be accompanied by subsidies that support resilience of fishing communities and a transition of people and communities to new economic activities.

Fishery Policy and Management, Sustainable Development and the Impacts of Subsidies

This section focuses on the manner by which fishery subsidies interact with particular policy and management approaches that would seem to have a potentially significant effect on sustainability and resilience of the fishery system (Charles, 2001). These include (a) robust management, (b) adaptive management, (c) the use of ‘diversified’ management portfolios, (d) support for self-regulating fishery management institutions, (e) participatory management, (f) full utilisation of the fishery knowledge base, (g) appropriate fishery efficiency objectives, (h) managing fishery capacity, and (i) livelihood diversification. These are discussed in turn below.

Robust Management. Given that fisheries must be managed for sustainability and resilience within an uncertain environment, and with limited capability to control fishing activity, policy interventions are needed to move fishery management in directions that will produce reasonable success even in such a world of imperfect knowledge and imperfect management. This is referred to as *robust* management – approaches that seek to achieve satisfactory results in meeting their objectives, *even if* our current understanding of the fishery and its environment turns out to be incorrect, and our capability to control the fishery is imperfect. In other words, a robust management system is one that functions reasonably successfully even given unexpected changes in nature’s course, or ignorance of nature’s inherent structure. Examples of resilience-enhancing robust management approaches (Folke and Berkes, 1998) include traditional ecological approaches to management such as: (a) embracing small-scale disturbances to avoid major catastrophes; (b) using reserves and habitat protection measures; and (c) avoiding reliance on a single species or fishery, by encouraging multiple occupations and sources of livelihood. Other mechanisms for moving to robust management are discussed below. In examining the impacts of subsidies, it needs to be kept in mind that those shifting the fishery in such policy directions may be more likely than others to have ecological, economic, social and institutional benefits through enhancement of fishery resilience and sustainability.

Adaptive Management. No matter how successful a management system is in lessening the overall sensitivity to uncertainty, such uncertainties will not disappear. Thus it remains important to institutionalize processes for (a) continuous learning about the fishery system, through suitable monitoring, and (b) maintaining the capability and willingness to make appropriate adjustments, over both short and long time scales, by adapting in a timely manner to unexpected circumstances, so that conservation (as well as socioeconomic) goals are not compromised. This is what is meant by *adaptive* management – a crucial means to build resilience in the fishery. An adaptive approach is needed both in fishery monitoring – as for the impacts of technology and the processes of technological change – and in fishery operating and management plans, which must be flexible enough to allow for the highly uncertain nature of the fish. New information must be integrated on a regular basis, with management actions reassessed accordingly. These points imply that the use of subsidies to support improved information management, monitoring and adaptation may have additional benefits from a perspective of fishery resilience and sustainability.

Management Portfolios. A wide array of management instruments is available in fishery systems, each with its advantages and disadvantages. An over-emphasis on any one of these is unlikely to provide the desired robustness, as there will always be some situation in which any such method will fail to ensure sustainability. Thus the risk of failure can be reduced if a portfolio of management tools is utilized in the fishery. The key goal here is for the portfolio to be ‘mutually-reinforcing’ in that the various tools each help to rectify the shortcomings of the others. A *portfolio* of appropriate *mutually-reinforcing* management tools should take into account society’s objectives, biological aspects of the resource, human aspects such as tradition and experience, the level of uncertainty and complexity in the fishery, and predicted consequences of the various instruments. Subsidies supporting the broadening of the set of management measures, reflecting an element of a shift to robust management, may well work in favour of greater fishery resilience and sustainability.

Self-Regulatory Management Institutions. Subsidies are often thought of primarily as financial transfers to *individuals* in the fishery (such as income support payments, boat-building subsidies, fuel cost subsidies, etc.) but financial transfers can also be made to support ‘collective’ actions and *institutions* in the fishery, such as co-operatives and local fishery management boards. This is an important distinction, since it is generally acknowledged that a key step toward greater resilience and robustness is the creation of suitable institutions for fishery management, in particular ones that can effectively ‘self-regulate’ the use of fishery resources. Such institutions help to ‘get the incentives right’ so that fishers and others have the incentive to operate in accordance with the regulations, and in particular to avoid anti-conservationist actions. Thus appropriate subsidies to support appropriate institutions can produce positive impacts. The idea is to make institutions both effective and resilient; the latter is a key characteristic of successful management institutions “so they are capable of responding to and managing processes, functions, dynamics and changes in a fashion that contributes to ecosystem resilience” (Folke and Berkes 1998, p.5). These authors further argue (Folke and Berkes 1995, p.132) that in promoting resilient institutions (such as through subsidies), “The task is to make institutional arrangements more diverse, not less so; to make natural system – social system interactions more responsive to feedbacks; and to make management systems more flexible and accommodating of environmental perturbations.”

Participatory Management. An important social consideration pertaining to subsidies is the effect they may have in supporting or detracting from the effective participation of fishery participants in management. For example, an appropriate subsidy that supports an effective community-based institution as described above may serve to increase the level of participation in management, thus creating social incentives for more responsible behaviour in fishing. Co-management – the development, implementation and enforcement of management measures by a suitable combination of government, fishers, communities and the public – is rapidly expanding and evolving in fishery systems. The key ingredient is to increase the role of resource users, which serves to lessen the conflict between fishers and managers that has tended to lead to failure in top-down management regimes. As a consequence, there is a clear need to involve fishers, their organizations and their communities in managing local resources, based on sharing decision-making power and the responsibility to ensure the fishery’s sustainability. In particular, development (or revitalization) of community-based management approaches can help make use of local resource knowledge and indigenous social- and culturally-based controls on resource use. This can enhance both sustainability and economic efficiency if local-level control provides more efficient and effective resource management.

Appropriate subsidies can support this trend, but others can be detrimental to participation in management (for example, this might be the case for a subsidy that targets its benefits on individuals at the expense of collective actions, fishermen's groups and institutions).

Utilising the Knowledge Base. Fishery research and data collection are in many ways 'public goods' in that understanding the sea and species therein is clearly useful to the fishing sector, but also to society as a whole. For this reason, subsidies supporting such efforts are likely to produce positive results (albeit with diminishing marginal returns). From a social perspective, it is important to note that a large base of information that already exists but has been under-utilized in fishery management is that which typically lies beyond the standard scientific apparatus, namely Traditional Ecological Knowledge (TEK). This knowledge base incorporates the accumulated information and wisdom that has been built up over time by fishers and coastal communities, through regular interaction with their environment and the natural resources therein. Berkes (1999, p23) defines TEK as "a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment." This includes knowledge about the natural world, but also about how to manage within that environment, what institutions work best. Such forms of knowledge clearly have the potential to improve the performance of fishery management, and at the same time to improve the interaction between fishers and communities on the one hand, and scientists and managers on the other. An examination of fishery subsidies must be cognizant of the impact such subsidies may have both in encouraging the collection and compilation of fishery knowledge, and in enhancing or detracting from the role of traditional/local knowledge.

Understanding Efficiency Objectives. In assessing the impacts of subsidies designed to affect the efficiency of the fishery, it is important to understand the concept of *efficiency*, which is a frequently mis-used but inherently simple one: to obtain the greatest benefits with the least cost. From this perspective, efficiency can be addressed at the level of a fishing vessel, a fleet, a fishery and society broadly. Unfortunately, it is often discussed only at the first of these levels, as 'harvesting efficiency' – seeking the maximum rate of harvest, or profit, obtained by a fisher (or vessel owner) at a given time. This view of efficiency – focused on the short term and on the individual – has its place, but it is not sufficient, since there is no reason to believe that what is efficient at such a level implies efficiency for the fishery system - or for communities and society. In contrast, efficiency seen from the fishery or societal perspective looks quite different. A broader and longer-term sustainable development perspective could view an 'efficient' fishery as one (a) that maximizes net benefits obtained *per fish caught*, with increases in efficiency requiring increased benefits without killing more fish, and (b) that seeks maximum net benefits measured from community or coastal economy perspectives, rather than that of the individual fisher. In such a case, efficiency is measured by incorporating all that is valued in society, e.g. a combination of profits and rents, employment, community well-being, ecological resiliency, and so on. Thus an 'efficient' subsidy might be one that moves the fishery in a direction that appropriately blends societal objectives, and provides a capability for the various fishery players to meet those objectives.

When efficiency is viewed from a wider 'fishery system' perspective, integrating the harvesting aspects of the fishery with on-shore activities and the coastal economy as a whole, the analysis of the impacts of a subsidy may shift. For example, a subsidy that shifts a fishery from being small-scale to a larger-scale might have been advocated on the basis of narrow 'harvesting efficiency' (i.e., more powerful vessels). However, a broader

view of efficiency may show that not only are local small-scale fleets efficient in terms of community economics, and net benefits to the system as a whole, they may also promote efficiency in fishery management, if enhanced use of local knowledge and the community's power of moral suasion lead to increased efficiency and effectiveness. Thus the subsidy in question may have negative efficiency impacts, measured from a broad perspective.

Managing Fishery Capacity. Fishery subsidies often impact in particular on fishery capacity, whether they are oriented toward increasing or decreasing that capacity. If fishery policy involves multiple objectives - that is, if society seeks to balance a range of social, economic and conservation goals - then subsidies that increase or decrease capacity must similarly be designed to consider impacts on a range of factors, such as conservation, ecological balance, rent generation and income distribution, fishing community welfare, and institutional stability. Thus a key matter to be resolved at the outset is how subsidies interact with capacity in terms of achieving the multiple objectives set by society. Fundamentally, subsidies should be part of a planning process that moves the fishery system toward a desired configuration. This implies the possibility that capacity-altering subsidies will need to be focused selectively on certain fishery sectors or certain inputs. For example, a desired capacity adjustment scheme may be one that reduces employment to create a more capital-intensive fishery, or one that reduces capital, promoting a shift to a more labour-intensive fishery. Unfortunately, implementation of capacity-altering subsidies rarely takes an objectives-based sustainable development perspective. The simplistic view of over-capacity - "too many fishermen, chasing too few fish" - places the focus of concern on the fishers rather than on over-capitalization, and can lead to mis-guided policy measures that reduce resilience in the fishery. (For example, 'use-it-or-lose-it' policies of government force fishers to fish regularly or risk losing their fishing rights, thereby rewarding those who place the most pressure on the resource, while perversely penalizing fishers who respond to low stock abundance by shifting temporarily to other work, reducing their impact on the fish.)

Livelihood Diversification. Subsidies that support livelihood (economic) diversification seem to have positive impacts that are particularly compatible with a sustainable development framework. Such diversification is often key to the success of programs for sustainable fisheries, especially in the context of heavily exploited fisheries. A broad 'fishery system' approach is particularly crucial - inherent linkages between fishery and non-fishery aspects reinforce the need to understand connections beyond the fishery system. Diversification efforts will thus typically be composed of within-fishery and non-fishery actions. First, within the fishery itself, policy measures can encourage multi-species fishing, in which fishers utilize a range of fish resources. By diversifying across sources of fish, individual fishers reduce risks, and at the same time, the collective pressure to over-exploit is also reduced. Second, encouraging 'occupational pluralism' - the practice of fishers holding other jobs during non-fishing times - helps those fishers avoid total reliance on fishing for their income, reducing the pressure they would otherwise face to obtain a livelihood entirely from the fishery, and thus also reducing pressure on fish stocks, and boosting the resilience of the fishery. Third, diversifying the fishery-dependent economy, by creating new, sustainable economic activity outside the fishery sector, enhances the range of available livelihood choices. This is likely to increase income levels outside the fishery, making it more attractive for so-inclined fishers to leave the fishery, and reducing incentives for others to enter (increasing the *opportunity cost* of remaining in the fishery). This leads to an overall reduction in fishing capacity,

and reduced pressure on the resources. Thus economic diversification, combined with conservation-oriented management restrictions within the fishery, can increase resilience.

Conclusions

This report has explored a range of policy and analytical issues involved in assessing the social effects of subsidies in fisheries, within a sustainable development framework. The first section introduced the rationale and objectives of the study, and discussed the nature and structure of fishery subsidies. The following section explored options for developing a suitable analytical framework for assessing the social impacts of subsidies. This enlarged on the ‘trade liberalization study’ framework by introducing: (1) a ‘sustainable development’ framework for examining aspects of sustainability and resilience; (2) a ‘fishery systems’ framework that focuses on interconnections throughout the fishery; (3) a sociologically-oriented analytic framework for understanding social issues in fisheries; (4) an analytical approach focusing on distributional aspects of subsidies; and (5) a ‘checklist’ approach for analysing the social impacts of fishery subsidies.

The next section elaborated on the distributional focus in providing preliminary assessments of potential social impacts arising from a variety of fishery subsidies. The following section drew on a fishery systems approach to discuss the impact of subsidies in general on the various components of the human system in the fishery, specifically the harvesters (fishermen), the post-harvest sector (from processing through to consumers), the fishing communities (and households), and the broader socioeconomic environment. The next Section turned to the level of fishery policy, and focused on sustainable development considerations, in presenting a preliminary assessment of how subsidies might interact with each of a range of fishery management and policy directions that have potentially positive sustainability and resilience implications.

In closing, it is useful to reiterate the key point, that there is no standard theory that can be applied to provide a clear path to addressing social impacts of fishery subsidies, or indeed to placing the discussion of fishery subsidies properly within a sustainable development framework. This report is but an introduction to an exploration of a topic that requires significantly greater attention. The key message of this report has been that a sustainable development framework for analysing fishery policy interventions, and subsidies in particular, requires three key ingredients: (a) an integrated view of fishery sustainability, incorporating environmental, economic, social and institutional components of sustainability, along with the related aspects of resilience, (b) a broad ‘systems perspective’ that looks at impacts of policy interventions throughout the fishery system, and (c) attention to social impacts arising from the distributional effects of subsidies. The present report provides a degree of integration of existing approaches, and some new ideas for exploring the above ingredients, but clearly this must be seen as just a start along the challenging road to exploring the social dimensions of fishery subsidies.

BIBLIOGRAPHY

- Berkes, F. (1999) *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Taylor and Francis, Philadelphia, U.S.A.
- Berkes, F., and Folke, C. (Eds) (1998) *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge University Press. Cambridge, U.K.
- Charles, A.T. (1988) "Fishery Socioeconomics: A survey", *Land Economics* 64:276-295.
- Charles, A.T. (1994) Towards sustainability: The fishery experience. *Ecological Economics*, 11, 201-11.
- Charles, A.T. (1995) Sustainability assessment and bio-socio-economic analysis: Tools for integrated coastal development. In: *Philippine Coastal Resources Under Stress* (Ed. by M.A. Juinio-Meñez and G. Newkirk), pp.115-25. Coastal Resources Research Network, Halifax, Canada, and Marine Science Institute, Quezon City, Philippines.
- Charles, A.T. (1997a) "Sustainability Indicators: An annotated bibliography with emphasis on fishery systems, coastal zones and watersheds". *Strategy for International Fisheries Research*, Ottawa, Canada.
- Charles, A.T. (1997b) "The path to sustainable fisheries". In: *Peace in the Oceans: Ocean Governance and the Agenda for Peace: The Proceedings of Pacem in Maribus XXIII, Costa Rica, 3-7 December 1995* (Ed. by E.M. Borgese), pp. 201-13. Intergovernmental Oceanographic Commission Technical Series 47. UNESCO. Paris, France.
- Charles, A.T. (2001). *Sustainable Fishery Systems*. Blackwell Science, Oxford UK, 384p.
- Cox, A. (2002). "OECD Work on Defining and Measuring Subsidies in Fisheries", Background Paper prepared for the OECD Workshop on Environmentally Harmful Subsidies, Paris 7-8 November 2002. OECD, Paris, France.
- Cox, A., and C. Schmidt (2002). "Subsidies in the OECD Fisheries Sector: A Review of Recent Analysis and Future Directions", Background Paper prepared for the FAO Expert Consultation in Identifying, Assessing and Reporting on Subsidies in the Fishing Industry, Rome, 3-6 December 2002. OECD, Paris, France.
- FAO (2003). Report of the Expert Consultation on Identifying, Assessing and Reporting on Subsidies in the Fishing Industry. Rome. 3-6 December 2002. FAO Fisheries Report No. 698, FAO, Rome.

- Folke, C. & Berkes, F. (1995), "Mechanisms that link property rights to ecological systems". In: *Property Rights and the Environment: Social and Ecological Issues*. (Ed. by S. Hanna & M. Munasinghe), pp.121-137. Beijer International Institute of Ecological Economics and the World Bank. Washington, U.S.A.
- Folke, C. & Berkes, F. (1998) *Understanding Dynamics of Ecosystem-Institution Linkages for Building Resilience*. Beijer Discussion Paper Series No.112. Beijer International Institute of Ecological Economics, The Royal Swedish Academy of Sciences. Stockholm, Sweden.
- Hannesson, R. (2001). "Effects of Liberalizing Trade in Fish, Fishing Vessels and Investment in Fishing Vessels", OECD Papers Offprint No.8. OECD, Paris, France.
- Hannesson, R. (2003). "The Economic Effects of Subsidies in Fisheries" Report commissioned by the OECD. OECD, Paris, France.
- Hatcher, A. and K. Robinson (Editors) (1999). *Overcapacity, Overcapitalisation and Subsidies in European Fisheries: Proceedings of the First Concerted Action Workshop on Economics and the Common Fisheries Policy*, Portsmouth U.K. 28-30 October 1998. CEMARE Misc. Publication No. 44, University of Portsmouth.
- Hollings, C.S. (1973). "Resilience and stability of ecological systems". *Annual Review of Ecology and Systematics*, Volume 4, pages 1-23.
- Munro, G.R. and U.R. Sumaila (2002). "The impact of subsidies upon fisheries management and sustainability: The case of the North Atlantic". *Fish and Fisheries* 3:233-250.
- Myers, N. and J. Kent (2001). *Perverse Subsidies: How Tax Dollars Can Undercut the Environment and the Economy*. Island Press. Washington USA.
- OECD (2000). *The Impact on Fisheries Resource Sustainability of Government Financial Transfers*. Organization for Economic Cooperation and Development, Paris.
- Panayotou, T. (Editor) (1985) *Small-Scale Fisheries in Asia: Socioeconomic Analysis and Policy*. International Development Research Centre, Ottawa, Canada.
- Ruddle, K. (1994) Local knowledge in the folk management of fisheries and coastal marine environments. In: *Folk Management in the World's Fisheries: Lessons for Modern Fisheries Management* (Ed. by C.L. Dyer & J.R. McGoodwin), pp. 161-206. University Press of Colorado. Niwot, U.S.A.
- Schrank, W.E. (2001). *Subsidies for Fisheries: A Review of Concepts*. p.11-40 in: *FAO Papers Presented at the Expert Consultation on Economic Incentives and Responsible Fisheries*. Rome, 28 November – 1 December 2000. FAO, Rome, Italy.
- Schrank, W.E. and W.B. Keithly (1999). "The concept of subsidies". *Marine Resource Economics* 14:151-164.
- Steenblik, R.P. and G.R. Munro (1999). "Current international work on subsidies in fisheries: a survey" in: Hatcher and Robinson (Editors), *Overcapacity, Overcapitalisation and Subsidies in European Fisheries: Proceedings of the First Concerted Action Workshop on Economics and the Common Fisheries Policy*, Portsmouth U.K. 28-30 October 1998. CEMARE Misc. Publication No. 44, University of Portsmouth.

- Townsley, P. (1998) Social issues in fisheries. *FAO Fisheries Technical Paper* No. 375. FAO, Rome, Italy. 93p.
- Westlund, L. (2003). Draft Guide for Identifying, Assessing and Reporting on Subsidies in the Fisheries Sector. Appendix E in: FAO Report of the Expert Consultation on Identifying, Assessing and Reporting on Subsidies in the Fishing Industry. Rome, 3-6 December 2002. FAO Fisheries Report. No. 698. Food and Agriculture Organization, Rome, Italy.
- Wium, V. (1999). "Subsidies in Irish fisheries: The saviour of rural Ireland?" in: *Overcapacity, Overcapitalisation and Subsidies in European Fisheries: Proceedings of the First Concerted Action Workshop on Economics and the Common Fisheries Policy, Portsmouth U.K. 28-30 October 1998. CEMARE Misc. Publication No. 44, University of Portsmouth.*
- World Commission on Environment and Development. 1987. *From One Earth to One World: An Overview*. Oxford, Oxford University Press.

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