# The Human Dimension of Fisheries Adjustment: An Overview of Key Issues and Policy Challenges

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## 1. Introduction: Fisheries, Adjustment and Human Considerations

Fisheries adjustment can be envisioned in a variety of ways. It is often portrayed simply as a matter of reducing fishing capacity, in terms of some combination of capital and labour in the fishery. However, fisheries adjustment should be seen more broadly than this, as a mechanism for restructuring the fishery to better meet the range of objectives being pursued, economic performance goals and to bring the magnitude of the fishery in line with resource productivity levels (i.e. to match the fleets to the fish).in terms of it should be supporting and the range of options that can be utilized. But however depicted, there is no doubt that fisheries adjustment has a human dimension – both with respect to how adjustment measures impact on people and their communities, and with respect to the underlying objectives pursued. This theme is the focus of the present paper.

The paper comprises eight sections. In this section is found an overview of some major elements underlying fisheries adjustment – the dynamic evolution of fisheries and fishing communities, the breadth of the fishery system and the world beyond it, fishery labour markets, and sustainable development considerations. Section 2 examines the objectives of fisheries adjustment, as well as links to societal and fishery objectives, the specific focus on dealing with over-capacity through adjustment, and the balancing of labour and capital in the fishery. Section 3 discusses the range of 'ingredients' of adjustment, such as (a) where to aim in terms of the future of the fishery, (b) short-term versus long-term aspects, (c) types of adjustment and restructuring, notably capital and labour reduction mechanisms, and (d) the interaction of adjustment with components of the fishery system. Section 4 presents several policy approaches to fisheries adjustment, focusing on capacity reduction and livelihood diversification. Section 5 reviews a wide range of challenges facing fisheries adjustment initiatives, from a lack of labour mobility to a lack of policy coherence, from barriers to exiting the fishery to a shortage of economic alternatives. Section 6 turns to a discussion of human impacts resulting from fisheries adjustment, ranging from those at

the individual or community level, to those of a wider scope, to those arising as a result of policy measures. Section 7 discusses some potential social and community-oriented mechanisms for fisheries adjustment. Finally, Section 8 presents a number of conclusions to the paper.

### 1.1 The Changing Nature of Fisheries and Fishing Communities

By its nature, fisheries adjustment involves changes over time. But such changes do not take place in a vacuum – they interact with a range of dynamic processes already occurring in those fishery systems, and in coastal economies, to produce varying impacts on the components of the fishery system. It is important, therefore, to understand not only the nature of deliberate adjustment processes, but also the underlying dynamic changes with which adjustment activities interact. For example, Hamilton and Duncan (2000: p.95) note that fisheries dependent regions of the northern Atlantic:

> "…have experienced rapid social changes in recent decades, driven partly by globalisation and other large socio-economic forces and partly also by shifts in ocean ecology. Among the most notable social changes has been a widespread substitution of technology for labour, so that fisheries related work tends to support fewer people. …the population of many small fishing communities has declined and grown older. Many fishing communities have also become less fisheries dependent and developed more diverse economies, commonly based on expansion of tourism, service and public-sector jobs. Families connected to fishing communities have diversified too, in their fishing and non-fishing activities."

Indeed, these authors (Hamilton and Duncan 2000: p.104) note that in addition to specific fishery-related causes, "The demographic changes also represent a more general modernisation that includes declining fertility, closer ties with global markets and trends, and increased educational attainment among fishing community residents." As part of this trend, they suggest (p.105) that "Elements of small community fisheries have become less traditional, more professional and, at the same time, more technologically capable of rapidly affecting resources. Small communities now contain both an older, more traditional inshore group and the newer, more professional fishermen…" These two groups are "competing both with each other and with the larger corporate fleets". Thus there can be a complex mix of driving forces and of outcomes relating to the dynamic change affecting fisheries.

Whether due to 'natural' processes or fisheries adjustment measures, a reduced fishing fleet can have major implications on fishing communities. Indeed, Hersoug (2006) suggests that such reductions could even mean that "former fishing villages over time may become redundant". He notes that "Some manage to take up new occupations, such as aquaculture or tourism. Other coastal communities experience a long drawn-out death rattle, gradually losing the public and private service institutions (the school and the local shop), ending up as a retiree dwelling place or a community of vacationers, taking over existing houses or constructing new cabins." Clearly, it is crucial to keep track of what form of dynamic change is taking place, and how this is influenced by policy-driven fisheries adjustment.

## 1.2 The Fishery and Beyond the Fishery

There is a strong tendency in fishery management, as well as in fishery analysis, to focus on the 'core' aspects of fish and fleets, to the virtual exclusion of other components of the fishery system – such as aquatic ecosystems, fishing households, fishing communities, processing and marketing, ancillary services, and the overall socioeconomic environment of the fishery. Symes (2000, p.214) comments: "For far too long the fishing industry has been viewed as a separate, almost unique entity and studied more for its intrinsic interest rather than as part of the wider economic system in which it is situated."

At a policy level, there is a need for greater attention, both conceptually and in practice, to how the fishery links into broader societal concerns, relating to such matters as regional development, employment and labour markets. Certainly, such considerations are noted in various studies, and the role of the fishery in supporting regional economies and in providing employment is well known, but within governmental structures, the implications of this strong inter-relationship often fail to be integrated into the decision making processes within fisheries ministries or elsewhere in government.

Smith (1983, p.2) advocates an integrated approach that "permits the search for solutions to the problems of low standards of living in fishing communities to expand beyond those areas which are fishery-specific", highlighting that "The need for a holistic approach to fishing community development is obvious. What is implied is the necessity for viewing the fish production sector on the one hand as vertically integrated with factor input markets and with product markets and on the other hand as horizontally integrated with other non-fishery sectors…" This approach is echoed by Ben-Yami and Anderson (1985: p.9): "most problems affecting fishing communities are unlikely to be seriously tackled unless equal attention is also given to non-fishery needs in the community". They suggest that "Non-fishery options include development which will diversify the social services and communal activities in the community, thereby improving the quality of life and creating employment and income".

## 1.3 Fishery Labour Markets

A key realm of interaction between individual participants in the fishery and the overall socioeconomic environment is through labour markets, in which people choose their form of employment from among the options available to them. In assessing the labour markets relevant to fisheries, it is important to understand both (a) internal aspects of the markets, such as the system of remuneration used by vessel owners to pay crew members (e.g., wages or a share system), and (b) external labour-oriented interactions between the fishery and other economic sectors in the local, regional, national and/or international economy. Heen (1988) has highlighted the importance of examining both income and non-income variables as determinants of labour market behaviour, and fisher decision making.

Various authors have emphasised the importance of examining 'labour dynamics' in the fishery, i.e. how fishers and others decide on their choice of livelihood, and how the supply and demand of labour evolve over time. For example, Terkla *et al.* (1985) argue that "understanding labour adjustment processes is likely to be crucial for implementing efficient and equitable management policy" throughout the fishing industry. Labour dynamics describe how fishers, fishery workers,

and others in the labour force, inside or outside the fishery, shift over time (1) between occupations (reflecting *occupational mobility*), and (2) between locations (involving *geographical mobility*), in response to a wide range of factors from wage levels to social and cultural considerations. Smith (1981) noted the important relationship between labour mobility and the economic state of fisheries, and Munro (1990) has emphasized that fishery management must anticipate the impacts of changes in the employment options available to fishers by looking *beyond* the fishery, at the nature and dynamics of the larger economic system. Given all these considerations with respect to labour dynamics, Hersoug (1985, 2006) highlights a key point to be kept in mind in fisheries adjustment programs, namely that "…the migration of the fishers may therefore be as complicated as that of the fish."

It is crucial as well to note that what goes on outside the fishery *per se*, but within the broader socioeconomic environment, can operate in complex ways through the labour market to influence the fishery system. For example, consider how wage rates or crew shares on fishing vessels depend on the balance of the labour supply and demand process. In a region of high unemployment, with relatively low bargaining power among workers, average wage rates throughout the economy may be relatively low. This in turn may lead to a situation in the fishery where resource rents go primarily to boat owners (rather than labour) as above-normal profits. These profits may in turn lead to greater investment in vessels, resulting in excess catching power and possibly excessive fishing effort, thus threatening the sustainability of the resource base – largely as a result of regional labour markets, beyond the fishery as such.

### 1.4 Sustainable Development Considerations

In recent years, a 'sustainable development' framework has emerged within which to address fisheries management – and indeed the management of other natural resources. Such a framework is based on a balanced treatment of all aspects of sustainable development – e.g., ecological, social, economic, community and institutional components (Charles 2001).

Notably, a sustainable development framework has been used by OECD (2006) in its publication entitled "Financial Support to Fisheries: Implications for Sustainable Development". This compilation provides a multi-faceted examination of financial transfers (i.e. subsidies) in the fisheries of the world. Within that document, particular chapters of note in relation to the present paper include "A sustainable development framework for assessing the effects of government financial transfers" (chapter 2), "Social impacts of government financial support of fisheries" (chapter 7 – referenced herein as Charles (2006) and also appearing in an earlier form as Charles (2004a)) and "Social capital and fisheries subsidy reform" (chapter 8).

The key message from sustainable development thinking of relevance to assessing the impacts of fisheries adjustment lies in the multi-dimensional nature of the sustainable development concept. This tells us that any policy action, such as fisheries adjustment, should not be undertaken without first ensuring that the outcomes anticipated for each sustainability component – i.e. ecological, social, economic, community and institutional aspects – are acceptable, i.e. positive or at least not overly detrimental. Since, as shall be discussed, fisheries adjustment measures are often motivated largely by economic arguments, connected in some manner to ecological ones, it is important to ensure that social and community components of sustainable development are not

neglected. This holds both for assessing the adjustment measures, if they are under consideration, or for ameliorating their impact, if the measures are being implemented.

## 2. Fisheries Objectives and Fisheries Adjustment

### 2.1 Fishery and Societal Objectives

The effectiveness of fisheries management can be measured by the extent to which it achieves societal objectives through the use of appropriate policy and regulatory instruments. The societal objectives for a fishery are those that are *strategic* in nature – e.g., what do we want the fishery system to provide for society? This contrasts with lower-level objectives that are more at an *operational* level (Charles 2001). A major challenge lies in the fact that fisheries are very much multi-objective in nature, serving a variety of social, cultural, political, economic and ecological goals (even if these are *de facto* rather than explicitly declared). In any given situation, the particular set of objectives to be pursued, and the priorities amongst them, will depend on societal policy decisions. In turn, the choice of fishery objectives helps determine a *desired fishery configuration* (fleet composition, preferred gears, etc.), the desired level at which fishing should take place (e.g., optimal harvest rate or TAC), and the desirable regulatory framework, including the choice of fishery institutions and management approaches.

In broad terms, strategic objectives are often seen as falling into three principal categories (e.g., Food and Agriculture Organisation 1983): (a) Biological and conservation-related; (b) Social and equity-related; and (c) Economic. (In practice, objectives in the first of these groups, biological and conservation-oriented, may well be treated not as an objective, but as a requirement to be met, and thus a *constraint* on the pursuit of other goals.) Among fishery-specific social and economic objectives, some that are frequently referenced include:

- production of fish for food, livelihood (income) or profit
- economic efficiency, economic viability and rent generation
- employment
- export promotion and generation of foreign exchange.

Other social and economic objectives may be pursued as well, including those at the ‘macro’ policy level, applying more broadly than just to the fishery, such as:

- industry diversification
- social cohesion
- socio-political stability
- decreasing rural-urban drift
- maintaining a regional balance of development.

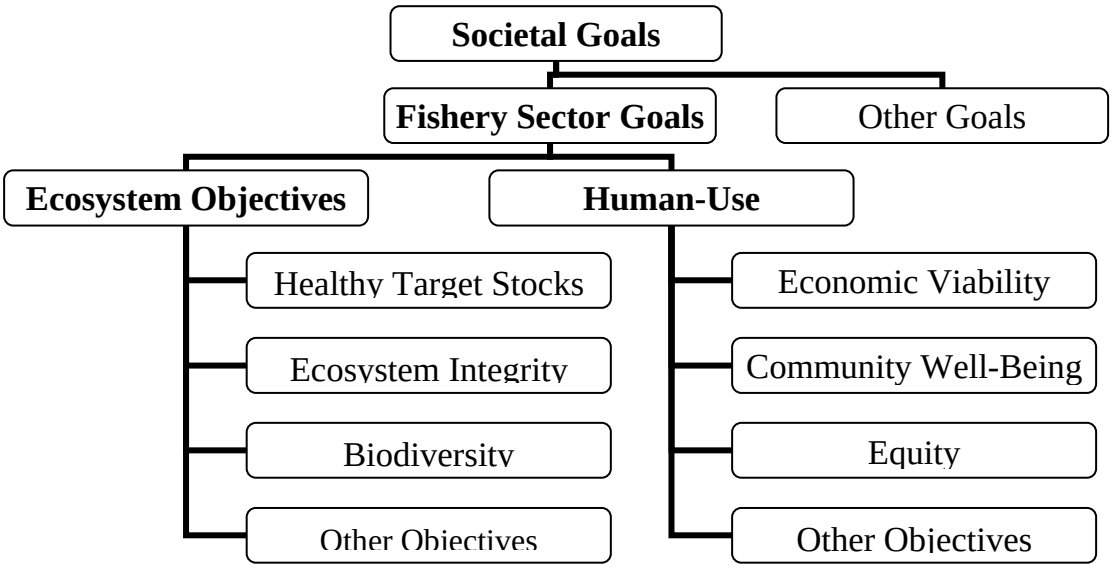
Fisheries adjustment is structural change that is undertaken to enable the fishery sector to better achieve the agreed-upon set of societal objectives. Indeed, before embarking on adjustment measures, it is important to ensure that they are indeed necessary to meet societal objectives, since most forms of adjustment in fisheries (or elsewhere in society, for that matter) involve a certain degree of dislocation, social stress and potential distributional impacts. However, it can be difficult to achieve this assurance of the necessity of adjustment, given the reality that (1)

such goals are often not fully delineated, and (2) as noted above, typically there is a multiplicity of objectives, and a lack of analysis undertaken to ascertain the impact of restructuring on each of these objectives. For example, it may be that adjustment is envisioned to improve fishery performance in meeting certain economic ends, but an understanding of the impacts that could result on the full range of fishery objectives may be lacking.

The necessity of a broad perspective that encompasses the full range of objectives is inherent in the concept of 'objectives-based' decision making in policy and management (not only in fisheries but across many sectors). Objectives-based approaches focus on linking the actions taken to the objectives being pursued, typically within a hierarchy of objectives (see Figure 1). While this is in a sense simply a logical decision-making arrangement, and reflects a standard approach utilized in planning and operations management, its new-found popularity is useful in reminding us of the importance of having policy and management decisions responsive to societal objectives.

This point is especially crucial for fisheries adjustment measures, which imply deliberate actions being taken to change certain key attributes of the fishery – such as its fleet size or capacity, its labour force, or its composition in terms of fleet sectors, gear types, etc. Any such actions are likely to have consequences of a social and economic, as well as potentially an environmental, nature. Thus, whether an action with dislocation and cost implications, such as fleet capacity reduction, is desirable or not is a matter of assessing the full range of consequences of that action, relative to societal objectives for the fishery. Such actions may be unhelpful (and indeed counter-productive, if net benefits are negative) unless they serve to move forward the aggregate set of societal objectives not only for the fishery sector but also for the broader social and economic systems. This idea is at the heart of the 'objectives-based' approach.

**Figure 1.**



In an objectives-based policy framework, it is important to avoid situations in which a lower-level objective is pursued single-mindedly to the extent that policy makers lose sight of the original societal objectives from which that low-level goal was derived. It is important as well to be clear in differentiating between the means and the ends, i.e., between objectives and methods/tools. There is a risk of mis-representing an action (such as fishing capacity reduction) as being an objective of fishery policy, whereas in reality it is more accurately expressed as one of a set of tools for potential use in meeting real objectives (such as those discussed earlier in this section and depicted in the above figure).

Two realities must be noted in relation to the pursuit of multiple objectives in the fishery. First, with multiple objectives, there will always be some degree of trade-off among them. As Hersoug (2006) notes "…there are obvious contradictions between the goals, and goal attainment can only be measured as some form of compromise. Greater attention to profitability will for example lead to less employment and most probably to legitimacy problems."

Second, in pursuing a multiple set of objectives through fisheries adjustment, there is a need for *efficiency* in policy implementation. To this end, a broad view of efficiency is required, i.e., seeking to obtain the greatest benefits (in terms of meeting objectives, within a long-term perspective) at the least cost. Such a perspective can be used to determine the preferred fishery configuration – i.e., what the fishery should look like in terms of a desired 'mix' among multiple user groups (such as commercial, recreational, and subsistence fishers), scales of operation (notably small-scale versus large-scale, or artisanal versus industrial), and gear types. Also, within any single user group or gear type in the fishery, there is a need to decide on the balance among a variety of inputs that combine to produce fishing effort (labour, capital, technology, management and enforcement activity, etc.). These decisions all depend on the blend of societal objectives pursued, and the capability of the various fishery players to meet those objectives.

### 2.2 Links to Fisheries Adjustment

Fisheries adjustment, as noted earlier, involves structural approaches to help achieve the various objectives specified in the fishery. This may involve reducing fishing fleets (e.g., through fleet buy-back and decommissioning schemes) – certainly a common preoccupation today, in keeping with the reality of the world's fisheries as having little room for increasing global catches – but it could involve an *upward* adjustment in fishery capacity under certain circumstances. Whatever the overall direction of adjustment, the achievement of societal goals may also involve adjustment in terms of re-allocation of fishery access and/or shifts in fleet composition. This may be done so that those fleet sectors (e.g., large-scale or small-scale, labour-intensive or capital-intensive) or fishery types (e.g., commercial, recreational, subsistence, etc.) most able to meet societal objectives are given preference in terms of fishery access. A framework for envisioning the range of fisheries adjustment options is shown in Figure 2.

The idea of fisheries adjustment can be related to that of 'fishery development'. While the latter could be seen as having an expansionary connotation, in fact a key aspect of fishery development is to increase the overall level of benefits from the fishery without necessarily increasing the catch (or indeed, in some situations, to *maintain* the level of benefits even while *decreasing* the

catch). This can be through a range of measures to (1) improve the flow of sustainable benefits from the fishery, including market development, quality control, and improvements to distribution processes, and (2) improve the physical infrastructure, technological capabilities, institutions and/or human productivity in the fishery system. Many of these interact with structural decisions in the fishery, and thus with possibilities for fisheries adjustment.

Finally, it should be noted that in fishery-dependent regions, where few alternative employment possibilities are available, maintenance of sustainable livelihoods, in the form of stable employment at reasonable incomes, is often a priority among society's fishery-oriented objectives. This may be seen as both a matter of employment and of maintaining the 'engine' of the coastal economy, given the flow of benefits from the fishery into coastal communities.

### 2.3 Over-Capacity

Adjustment measures are often advocated as a means to manage fishing capacity – the *catching power* of the fishery, which can be assessed in terms of potential harvests or potential fishing effort (the latter reflected in some mix of factor inputs, including fishers, vessels and gear). The focus is often expressed as being on over-capacity, which arises when there is a mis-match between the capacity *needed* to take the available harvest, and the *actual* capacity – i.e. when there is greater catching power than is needed to catch the available fish. This comes about as the result of a dynamic process, involving entry of fishers, expansion of fishing effort, investment in vessel construction, depreciation, and so on.

Why is over-capacity of concern? It has been claimed (Pascoe and Greboval 2005) that overcapacity will "lead to lower production levels than might be achieved, and also a reduction, if not total dissipation, of the economic benefits that may be generated from a fishery". Indeed, the development of over-capacity can involve a waste of physical capital, with more used in the fishing fleet than necessary to catch the available fish. Furthermore, if there is a positive opportunity cost of labour – i.e. if other productive activities are available for fishers elsewhere in the economy, and the fishers are mobile enough to accept those opportunities – then maintaining a greater number of fishers than needed to catch the fish can be seen as wasteful economically.

These concerns must be modified, however, in cases where the capital invested, while excessive, is 'sunk' in the sense of being already in place within the fleets of the fishery. In such cases, the economic 'damage' of over-investment is already done. Whether it is worthwhile to worry about, and pay for, removal of that excess capacity, as opposed to focusing on controlling the fishing effort exerted by existing vessels, is not at all clear-cut. Similarly, if fishers are in place in the fishery, and have low or zero opportunity costs, then the value of diverting limited funds and attention away from effective fishery management and into labour adjustment, in order to remove those fishers from the fishery, is also not clear-cut. In such instances, it is possible that the benefits of removing excess capacity could be outweighed by the costs of doing so.

As Pascoe and Greboval (2005) note, various authors have "identified overcapacity as the single key problem afflicting marine capture fisheries resources". Indeed, a tendency to blame overcapacity for fishery problems is so pervasive as to become 'accepted wisdom' that is rarely critically evaluated. In reality, problems with overcapacity described in the literature are often

those in which, for example, effort has not been managed well, leading to a shortening of the fishing season or the like, and a resulting dissipation of benefits. In such situations of ineffective management, it may be true, as Pascoe and Greboval (2005) note, that "unless capacity is effectively controlled, there exists the potential for unsustainable levels of fishing effort to be developed and exerted". However, the idea that overcapacity is "the single key problem" even in fisheries where either total catch or total effort is effectively controlled does not seem well-supported. This highlights the importance of understanding cause-and-effect relationships, e.g. in this case, whether the various problems one might observe in the fishery actually arise as a result of overcapacity or due to some other cause.

Indeed, as has been shown previously (Charles and Munro 1985), in some circumstances it may well be optimal to have capacity greater than needed to catch the available harvest (apparent 'over-capacity'). This can occur, for example, when capacity had been 'optimally' built up previously, to catch relatively abundant stocks and in the knowledge that the capacity, being nonmalleable (i.e. with a low re-sale value and/or no alternative uses) would thereafter remain in the fishery. Of course, the optimality of such a situation depends on the capability of management to prevent that level of capacity from excessively harvesting the stock.

In addition to the above-noted economic concerns about overcapacity, there are also possible conservation impacts. It is often said that over-capacity is among the greatest threats to sustainability in fisheries. However, Pascoe and Greboval (2005) note that "the existence of overcapacity does not necessarily result in unsustainability". This is an important point in that a fishery with over-capacity may have abundant fishers, boats and gear, and thus a *potential* to over-fish, yet a powerful fleet does no damage to the stocks if the boats are merely tied to the dock. Thus, it is not over-capacity *per se* that poses a threat to conservation, but rather its presence in combination with ineffective fishery management that is unable to control the fishing effort of the fleet and thus the killing of fish. In this sense, the effect of over-capacity on conservation is indirect, through problems of manageability, since (a) a large number of boats is presumably more difficult to manage than a smaller number, and (b) over-capacity often reflects high investment levels, and correspondingly high debt among fishers, this can increase the pressure to increase harvests so as to pay debts.

Overall, then, a realistic approach to overcapacity would recognize that (1) truly excess capacity implies a waste of physical capital, and possibly of labour resources, if there are positive opportunity costs, but (2) some overcapacity can be a good thing in a fishery, allowing for responses to fluctuating resources in the face of nonmalleable capital, and (3) overcapacity by itself is often not the issue, but rather its presence *in conjunction with* poor or limited fishery management, notably an inability to control effort and to resist political pressure. There can also be a concern over an inability to keep excess capacity from shifting into other fisheries, such as those on the high seas. As noted earlier, capacity reduction is not a societal objective, nor a fishery objective (just as 'mesh size increase' or 'limited entry' are not fishery objectives *per se*). Instead, all of these are rightly management and policy tools that can be considered for inclusion in a suitable portfolio, or package, of tools for use in meeting a range of objectives.

### 2.4 The Balance of Labour and Capital

As noted earlier, despite the frequent equating of fisheries adjustment to capacity reduction, in reality the idea of adjustment is more multi-faceted – including aspects relating to changes in the composition of factor inputs in the fishery. For example, past efforts at 'modernization' often sought to make fisheries more capital intensive, at the expense of employment, in the belief that such shifts would better meet certain fisheries goals, such as profitability and safety at sea.

On the other hand, shifts toward more labour-intensive fisheries have advantages in terms of employment and community well-being, fleet flexibility and fuel economy. The relative use of labour in the fishery relates to the *social opportunity cost of labour* – the true cost to society of having a fisher working in the fishery, rather than doing something else in the economy. When fishers actually have no livelihood alternatives to fishing, then there is no social cost to keeping those individuals in the fishery. Indeed, the removal of fishers from the fishery may lead, through a multiplier effect, to an economic *loss* to the regional economy. In addition, social costs may rise, due for example to increased crime and/or decreased health and welfare levels. In such circumstances, the reduction of labour in the fishery would be a social 'bad'.

In any case, the key point is that adjustment measures have the potential to be designed to alter the mix of factor inputs, in order to better meet societal objectives. For example, an adjustment measure aimed primarily at reducing capacity in the fishery overall (perhaps for economic and environmental reasons) might be implemented through a judicious targeting of fleet reduction to minimize social harm to regional employment and community well-being (e.g., perhaps using capacity reduction to shift toward a more labour intensive fishery).

## 3. What Does Fisheries Adjustment Involve?

### 3.1 Choices about the Future Shape of the Fishery

Fisheries adjustment involves certain actions – such as vessel decommissioning schemes, licence retirement schemes, and changes to fleet composition – but any such alterations to the structure of the fishery sector imply the need for choices to be made concerning the desired future shape of the fishery – and such choices, as emphasized earlier, depend on the societal objectives being pursued. Potential changes, such as reducing certain fleets, or shifting from a more labour- or capital-intensive fishery, impact on the achievement of such societal objectives. John (1994: p.7) has expressed one aspect of this question as follows: "Within any single user group or gear type in the fishery, a variety of inputs combine to produce fishing effort, including labor, capital, technology, management and enforcement. To what extent should each of these exit from the fishery?"

### 3.2 Short-term and Long-term Measures

Fisheries adjustment can involve either or both of short term policies and long term policies. On the one hand, short-term measures may be focused on buybacks, dealing with redundant fishers through compensation programs and the like. Longer-term measures could include the development of 'broader policy frameworks' that provide coherence in fisheries policy relative to that of community economic development, regional development, etc.

### 3.3 Forms of Adjustment

Dolan et al. (2005) view adjustment, or 'restructuring', with a focus on human-induced changes in certain key variables. They differentiate between five forms of restructuring:

- physical restructuring: human-induced change in physical structure or the levels and/or distribution of 'elements or compounds'
- biological restructuring: human-induced change in species attributes such as population size, spatial structure, and/or in biodiversity measures
- social restructuring: socioeconomic processes such as urbanization, demographic change, generational dynamics, etc.
- industrial restructuring: change in industry or employment structure
- institutional restructuring: change in government policies and programs.

These authors (p.197) also refer to *interactive restructuring* – "the multidimensional processes that are reshaping biophysical, social, institutional, and industrial structures", including the interactions among these and the "potential consequences for health at all levels".

Of these five types of restructuring, the first three reflect change in the various components of the fishery ecosystem and human system that could result from either internal or external drivers. The latter two types are those put in place as deliberate adjustment through management and policy measures within the fishery (or beyond). With respect to "institutional restructuring", it is important to recognize that fisheries adjustment may imply changes to fishery management itself, to improve the 'fit' with broad societal policies – e.g., to ensure that actions within the fishery are coherent with broader policy, whether that be in employment maintenance, regional development, etc. With respect to "industrial restructuring", this section briefly introduces two major forms of fisheries adjustment, namely (a) buy-back and decommissioning schemes, and (b) labour market adjustments (including licensing aspects).

#### *Buy-back and Decommissioning Schemes*

As noted earlier, reductions in fleet size and other aspects of physical capital are common components of fisheries adjustment. In the short term, these most often take place through buy-back programs and vessel decommissioning.

Holland et al. (1999: p.62) note that such programs often are targeted on certain groups in the fishery, i.e. "to direct the buyback resources toward specific groups of fishermen. This has been done with eligibility requirements, bid ranking systems and direct allocation of funds among groups." These authors have described the wide variety of targets to be found within such capacity reduction programs:

> "Some programs have been limited to only those fishermen most dependent on the fishery… Other programs have at least indirectly targeted underutilized or inactive permits… Several programs have targeted the opposite group, the most active fishers… Other programs have targeted potential rather than demonstrated capacity… There are also examples of programs that have specifically targeted groups of fishermen on the basis of demographic characteristics. Some programs have allocated funds among gear groups, vessel classes and areas…"

From a social perspective, a range of impacts can be anticipated as resulting from buy-backs and vessel decommissioning. These are discussed later in this paper.

***Labour Market Adjustments***

Labour adjustment measures are often delineated into two categories:

- **Active labour market policies**… Measures accompanying adjustment actions, focusing either (a) at an individual fisher scale, locating alternative employment or livelihood options for displaced fishers, and/or (b) at a community or regional level, involving introduction of new employment opportunities as alternatives for the fishing sector (or generally available to all, thereby implicitly increasing the opportunity cost of fishing and inducing exit from the fishery).

- **Passive labour market policies**… sets of policy measures and incentive structures that provide the policy environment in which individuals and communities are induced to make decisions in keeping with the reality of the labour market, e.g., with shifting of labour away from the fishery in cases in which that sector cannot support the previous level of labour involvement.

### 3.4 Interaction of Adjustment with Various Aspects of the Fishery

This section discusses some interactions that may exist between fisheries adjustment on the one hand, and a range of fishery components or considerations on the other – the post-harvest sector of the fishery, fishing households, fishing communities, the fishery's socioeconomic environment, gender and the role of women in the fishery, and technological change. For each of these, the interactions may occur through the particular component being impacted by fisheries adjustment, or through its effect on adjustment processes.

***Post-Harvest***

Fisheries adjustment can include changes in the processing sector, the social impact of which will vary according to the type of processing involved and in particular whether it is capital-intensive or labour-intensive (e.g., ranging from capital-intensive factory freezer trawlers and fish meal production, to relatively labour-intensive processing carried out by fishers and their families). It is important to understand who is working in fish processing: in particular, these individuals may well be relatives of fishers and/or residents of the same communities in which the fishers live. Particularly notable is the major role of women in on-shore fish plant work.

In considering fisheries adjustment options – changes to the structure of the fishery and its constituent components (fleet types) – it is also important to take into account emerging trends in fish markets. Specifically, emerging certification and eco-labelling approaches will lead to changes in consumer preferences, which need to be considered in fisheries adjustment decision making. For example, if this trend leads to certain modes of fishing becoming identified as environmentally- or socially-destructive, it will be important to be aware of this, since restructuring decisions that are, or turn out to be, contrary to such consumer preferences, may in fact have very negative impacts.

### *Fishing Households*

In some fisheries and some fishing communities, multiple household members may be involved in harvesting and/or related fishery activities, or there may be broader 'kin relationships' involved. If household and kin participation are major aspects of the labour market, two results can be foreseen. First, fisheries adjustment can have major social (and economic) impacts on certain family units. Second, the family connections mean that labour market processes may not work in the manner that may be expected according to theory.

In the long term, the availability of household labour within the fishery may provide greater income security, since internalising labour costs allows the enterprise to better survive fishery downturns. Alternatively, income security in households could also be enhanced (1) when household members not involved in harvesting are involved on the post-harvest side, perhaps working in processing plants, or marketing and distributing the catch within the community and beyond, and (2) when household members hold jobs entirely outside the fishery system, which could stabilise family income and reduce the risk of major loss if a disaster in the fishery were to occur (such as an unexpected stock collapse). These various labour market complexities imply risk-spreading strategies that may make fishers less responsiveness to restructuring incentives than might otherwise be the case.

### *Fishing Communities*

Just as the past tendency of fishery management to focus exclusively on target fish stocks is broadening through an "ecosystem approach to fisheries" to incorporate the context of where the fish live (ecosystems), so too is it logical (and indeed crucial) to incorporate into fishery policy discussions not only fishers but also the coastal communities where the fishers live. This point certainly applies to aspects of fisheries adjustment. In that regard, it is important to understand (a) linkages between adjustment options and the realities of how communities operate – socially, economically and in terms of community institutions – and (2) impacts of adjustment processes on key objectives such as community well-being and community cohesion. In considering such impacts, a variety of factors within coastal fishing communities may be relevant, for example those indicated in the following table:

**Factors of Potential Relevance in Fishing Communities**

| | |
|---|---|
| **Demographic:**<br>• community population<br>• population trends<br>• levels of migration<br>• age and gender structure<br>• education levels<br><br>**Socio-cultural:**<br>• identified community objectives<br>• religious stratification<br>• gender roles | **Institutional:**<br>• pattern of community organisation<br>• pattern of local resource management<br>• pattern of resource ownership, tenure<br>• level of community infrastructure<br>• regulatory and enforcement methods<br>• traditional ecological knowledge<br>• involvement of women in institutions<br>• interaction with upper levels of government |

| | |
|---|---|
| • social stratification, power structure<br>• level of social cohesion<br>• local traditions and norms<br><br>**Economic:**<br>• income levels and distribution<br>• wealth levels and distribution<br>• degree of dependence on the fishery<br>• degree of fishing-related activity<br>• diversity in livelihood opportunities<br>• household economic structure<br>• types and location of markets | **Environmental:**<br>• availability/ condition of fish stocks<br>• quality of aquatic and coastal habitat<br>• oceanographic/environmental conditions |

### *The Fishery's Socioeconomic Environment*

The socioeconomic environment around a fishery incorporates human, social and institutional elements, at the community, regional, national and global levels. The links between the fishery and the socioeconomic environment, and consequently the possibilities for interaction with fishery adjustment initiatives, can include the following:

- Interactions of demographic aspects within the fishery, such as participation by age and gender, with external influences, such as national population and migration trends.
- The broad aspects of society, culture, history and tradition that impact on decision making in the fishery system.
- Interaction of the fishery economy with the economic structure and dynamics at the regional and/or national levels.
- Relationship of local fishery objectives to broader regional and national policy goals.
- Interaction of the local institutional structure with institutions, legal arrangements, legislation and policy frameworks at national and/or sub-national levels.

### *Gender Considerations and the Role of W omen*

An important consideration in fisheries adjustment is that of gender-related impacts, notably the differential effects of adjustment on women and men. In much of the world, women are either involved in fishing itself, or play a major role in on-shore components of the fishery (such as processing or marketing). Davis (1988: p.214) suggests that there are two major forms of participation by women: "The first mode is tangible and functional and entails women's fishery-related work roles. The second contributory mode is less tangible and involves the emotional, ideological, more rarified contributions women make to the fishing enterprises – in terms of their roles of wife, mother, and sister of fishermen and as carriers of the family tradition." On the latter point, Ruddle (1994) highlights the important role of women in the building up and holding of fishery and marine environmental knowledge within the community. These can be crucial roles in the functioning of the fishery, and thus gender issues need to be taken into account in implementing fisheries adjustment measures.

### *Technological change*

In assessing the need for fisheries adjustment measures, as important as the level of current fishing capacity is the phenomenon of technological change, since advancements in fishing technology have been the source of long-standing processes of change in the fishery. In addition to effects on catching power and catches themselves, technological change can have social impacts. For example, McCay (1979) found that the introduction of new long-liner technology in the fishery of Fogo Island, Newfoundland (Canada), affected the level of earnings, the sharing of revenues between owner and crew, returns to capital, and labour mobility. These impacts in turn produced changes in fishery participation levels, to the extent that difficulties arose in recruiting vessel crews, despite high unemployment levels in the region.

## 4. Policy Approaches to Fisheries Adjustment

### 4.1 Overall Approaches

There is no single avenue to approaching fisheries adjustment, but rather a range of policy mechanisms for potential use in achieving the ultimate objectives. Specifically, one might choose between three mechanisms to determine the final configuration of the fishery – market forces, planning approaches and/or community-based approaches - or indeed a suitable combination of these:

Market approaches. In a purely market-based approach (e.g., ITQs), the marketplace determines the eventual configuration of the fishery, e.g., through the trading of fishing rights. Capacity reduction occurs as choices are made by individual fishers or corporate fishing entities to either remain or to exit the fishery after selling off their rights to others.

Planning approaches. Targeted, selective approaches (such as targeted vessel buy-backs) aim to achieve a desired overall fishery configuration, which may take into account such factors as the differential capacity of the various gear types and fleet sectors in the fishery, and the conservation impacts of the harvesting technologies.

Community-based approaches. Local-level co-management approaches to capacity reduction are also planning mechanisms but ones fitting within a framework of devolved governance, aiming specifically to produce a fishery configuration that meets local objectives as well as societal ones. Such approaches aim to be efficient at the fishery level (e.g., reducing fishing costs by co-ordinating fishing effort among community participants) and the regulatory level (e.g., reducing conflict, increasing self-enforcement and decentralising management).

### 4.2 Capacity Reduction

If fishery policy were based on pursuing only a single objective, a suitable capacity reduction policy may be fairly obvious. For example, a single-minded pursuit of maximum harvesting efficiency might focus on eliminating fishers until one reached the minimum number capable of harvesting the available catch. But if fishery policy involves multiple objectives - that is, if society seeks a balance among a range of social, economic and conservation goals - then capacity reduction must similarly be designed to consider impacts on a range of factors, such as conservation, ecological balance, rent generation, income distribution, fishing community welfare, and institutional stability. Thus the matter of how capacity reduction can contribute to

achieving the multiple objectives set by society for the fishery is a key matter to be resolved at the outset.

This implies that capacity reduction needs to be part of a planning process that moves the fishery system toward a desired configuration. This has two key implications…

First, as noted earlier, capacity reduction may need to be focused selectively on certain fishery sectors or certain inputs, to best meet multiple objectives. For example, it may be desired that the capacity reduction scheme reduces employment to create a more capital-intensive fishery, or reduces capital so as to shift toward a more labour-intensive fishery. Either might be accomplished by changing allocations of catches, or through a 'buy-back' of targeted boats.

Second, in developing approaches to adjustment, it is important to properly assess policy options in terms of their capability to promote societal objectives, to guard against perverse policies. Consider, for example, fishery policies that pursue capacity reduction through (a) favouring specialist/full-time fishers at the expense of generalist/part-time fishers, or (b) adopt 'use-it-or-lose-it' policies that force fishers to fish regularly or risk losing their fishing rights. Both of these policies have the perverse effect of rewarding those who place the most pressure on the resource, while penalising fishers who respond to low stock abundance by reducing their impact on the stocks (perhaps by shifting temporarily to other work). Whether these policies have positive features that compensate for such negative aspects is something that can be explored within a suitably comprehensive planning process, based on objective examination of the fishery.

### 4.3 Livelihood and Economic Diversification

Fishery policies of restructuring and adjustment, to deal with over-exploitation and over-capacity, have been long critiqued for their failure to actively address the major problem of a lack of economic alternatives beyond the fishery. For example, fishery economist Ian Smith (1981: p.22) long ago pointed out that rationalization actions are likely to aggravate problems posed by a lack of livelihood (employment) alternatives since "Management programmes fail to deal adequately with fishermen who are displaced". Smith noted that fishery restructuring, in the absence of non-fishery economic alternatives, may fail either because it is (a) non-sustainable and politically infeasible, due to adverse impacts on those dependent on the fishery, or (b) practically infeasible, since fishers removed from a fishery, and without other options, will do what they feel necessary - including illegal fishing - to maintain their livelihood.

Solving the problem of a lack of alternatives to fishing is by no means simple, yet efforts in this direction seem critical in most cases to the success of programs for sustainable fishery systems – especially in the context of heavily exploited fisheries. Such efforts will typically be composed of within-fishery and non-fishery actions, including those targeted on individuals and households (livelihood diversification) and those targeted on fishing communities and regions (economic diversification):

#### *Multi-species Fishing*

Within the fishery, it can be useful to encourage multi-species fishing, in which individual fishers utilise a range of fish resources, in contrast to policies that lead to specialisation of fishers into

single-species fisheries. By diversifying across sources of fish, the individual fisher reduces risks, and at the same time, the pressure to seriously over-exploit particular species may be reduced.

***Multiple Sources of Livelihood for Fishers***

There can be value in reinforcing or renewing the traditional practice in many seasonal fisheries of 'occupational pluralism' - fishers holding jobs outside the fishery during non-fishing times. Through such practices, fishers avoid total reliance on fishing for their income, and this can lead to a reduction in the pressure they would otherwise face to obtain a livelihood entirely from the fishery, and thus may also reduce pressure on the fish stocks. It has been suggested, on the other hand, that the opposite outcome could occur: namely, that when fishers have other, non-fishing income sources, they may be less responsive to economic signals within the fishery, and thus less willing to exit. However, it would not be expected that fishers would operate their fishing activities at a loss – unless there are regulatory reasons to do so, or if there are multiple objectives being met in such circumstances, such as if the fishery is a significant source of food for households, or if it is viewed as a social or recreational activity more than an income source. Overall, it would seem that in most cases, encouraging livelihood diversification, and by implication, discouraging excessive specialisation of fishers, will boost the resilience of the fishery.

***Diversification of the Economy***

Third, a frequently advocated policy approach to fisheries adjustment lies in diversifying coastal economies by creating new, sustainable economic activity outside the fishery sector. From the perspective of the individual, this enhances the range of available livelihood choices, both for current fishers and for young people looking for a job, making it more attractive for so-inclined fishers to leave the fishery, and reducing incentives for others to enter the fishery. In other words, such a move increases the *opportunity cost of labour* in the fishery, which can lead to an overall reduction in fishing capacity, and reduced pressure on the resource base.

Economic diversification may, in many cases, be the single most important need in the pursuit of sustainable, resilient fisheries. It is a particularly challenging task, however, and might be best tackled through an *integrated* portfolio of approaches, potentially involving (i) indigenously-created employment alternatives within the local region or community, perhaps based on comparative advantages in ocean-related activity (such as fish farming, coastal tourism, and the like), (ii) overcoming constraints on local development that may be due to factors at the macro-economic or macro-political level, and (iii) attention to institutional arrangements that promote effective governance at a local level.

Panayotou and Panayotou (1986) suggest that economic development efforts may be best focused on promoting non-fishing employment alternatives in those areas where geographical mobility is most limited. Similarly, Symes (2000, p.218) makes clear the particular need for economic diversification in small and/or peripheral communities:

> "the impacts of structural rationalisation, implying both the downsizing of the fishing fleets and their concentration in more favoured locations, will be most keenly felt in the smaller, more peripheral communities where the infrastructures are less developed and connectivity to the main economic centres is weak. The need, therefore, is to buttress

those disadvantaged, one-sided local economies through the diversification of their employment base and the creation of a range of alternative jobs".

## 5. Challenges in Implementing Fisheries Adjustment

### 5.1 Lack of Clear Decision Making on the Desired Future of the Fishery

Structural adjustment cannot be used effectively without knowledge of the desired direction to 'restructure' the fishery, i.e. without having determined the desired configuration of the fishery – in terms of fleet composition, preferred gear types, desired labour or capital intensivity, age structure of the fishermen, and the like. For example, it is sometimes claimed that in situations with extensive over-capacity, any move to reduce that capacity will be worthwhile. Such a claim is simply erroneous – without care in working toward overall societal objectives, a mis-guided reduction of fleet capacity could well have undesirable consequences, such as altering (or preserving) the fleet composition in a manner that increases inequity (by differentially impacting on certain fleet sectors) or that destroys working institutional arrangements (such as inherent compliance mechanisms, community-based management, etc.). There are thus real risks inherent in a rush to restructure, in the absence of clear societal objectives.

### 5.2 Easy Entry versus Barriers to Exit

The number of fishers participating in the fishery, and the aggregate fishing effort, can vary over time according to such factors as (a) the perceived profitability of fishing versus other economic activity, (b) traditional practices of the fishers, perhaps reflecting religious or cultural norms, (c) policy measures and management restrictions, as well as government actions such as buy-backs of fishing vessels, and (d) external 'forcing' factors - changes elsewhere in the economy or society, notably in the availability of non-fishing opportunities (affecting labour mobility).

Entry into fisheries can be a major problem, leading to over-capacity, over-harvesting and social unrest, among other effects. Consider, for example, a situation such as one that occurred some time ago in Costa Rica, when government policy to encourage agricultural exports provided incentives for local farmers in inland areas to cut down forest, so as to 'improve' the land, which then could be sold to ranchers, coffee growers or others. The small-scale farmers, having sold the land, found it increasingly difficult to find more land - in other words, it became more difficult to obtain a livelihood inland - so many migrated to urban areas and to the coast. The latter group began fishing, for example in the Gulf of Nicoya on the Pacific coast of the country. This increase in the coastal labour force, together with an institutional environment of imperfect fishery controls, led directly to increased exploitation of coastal shrimp and fish resources, and declines in abundance (Charles and Herrera 1994).

At the same time, exit from the fishery can be even more problematic. Pascoe and Greboval (2005) have summarized the barriers to exit from fisheries as follows:

> "These take two main forms: the lack of alternative employment opportunities and the 'non-malleability' of capital. In many cases, fishers have nowhere else to go. Similarly, there are few alternative uses for fishing vessels when fisheries are overexploited. As a result, the 'opportunity cost' of both labour and capital is negligible if not zero, and

fishers will continue in the fishery as long as they can continue to cover their running costs."

Of these two categories, the effects of a lack of employment alternatives are discussed below. The second, the *non-malleability* of capital, referred to by Pascoe and Greboval (2005), is equally a crucial determinant of policy impact. John (1994: p.8) has noted that non-malleable capital – arising notably in fleets of specialised vessels having few alternative uses – "tends to make capital investment relatively irreversible and labor relatively immobile, exacerbating the exit problem…" In such situations, common in many fisheries, the reduction of existing capacity is much more difficult, contrasting with cases in which capital is malleable (and investments are reversible), so that fishers can receive a reasonable resale value for capital if they exit the fishery.

It is important to differentiate among the forces influencing decisions to exit or remain within a given sector. Heen (1988) notes that with respect to labour dynamics in general, "The concepts of 'push' and 'pull' have been used to explain labour market behaviour. A person is 'pulled' by a better situation, for example a higher wage. 'Pushed' has been used in two different ways: 'push' by discharge or demotion, and 'push' of an unfavourable situation."

On this point, Hersoug (2006) notes that "There is little doubt about the general decline in the number of fishers, but labour researchers have for years debated whether push or pull factors have been the most important. …Bad times in the fishing industry may certainly explain why many quit and why few are recruited, but good times in other industries (such as construction, oil and gas, and public and private service), may be equally important."

### 5.3 Lack of Alternative Economic Opportunities

A key challenge to be faced in putting into place fisheries adjustment measures, as noted above, is the lack of economic or livelihood alternatives available for those involved in fisheries – a phenomenon common to many parts of the world. This is certainly the case in fishery-dependent regions, where, by definition, the local economy depends to a large extent on fishing activity. Indeed, many coastal regions, particularly if located at the periphery of the national economy, have a non-diversified employment base.

In such situations, the social opportunity cost of labour may be very low, implying that the *optimal* level of fishing effort (and potentially fishing capacity) is higher than would otherwise be the case. Furthermore, adjustment measures that target labour in the fishery may have major social impacts in situations lacking economic and livelihood alternatives. Indeed, those removed from the fishery through adjustment processes will have incentives in undesirable directions – e.g., to return to the fishery on an illegal basis or to leave their home communities (thereby disrupting the integrity of those communities)., Conversely, the building of livelihood alternatives, if successful, can counter perverse incentives such as these, thereby generating benefits from social, economic and ecological perspectives. .

### 5.4 Lack of Labour Mobility

Even if economic alternatives exist outside the fishery sector, constraints may still exist on the success of fisheries adjustment. In situations of perfect labour markets, fisheries adjustment that

reduces employment in the sector will result in a shift of individuals into other occupations, or to other locations. However, it is well established that in many fisheries, labour is relatively immobile geographically (i.e. fishers do not easily accept leaving their communities in search of new employment), and there is often an element of occupational immobility as well (i.e., a reluctance, or a lack of skills, to change into a job fundamentally different from fishing). These realities complicate an assessment of the social impacts of fisheries adjustment, typically implying higher negative impacts, when taken in conjunction with a lack of economic alternatives, noted above.

The difference in the occurrence of occupational and geographical immobility has been long noted. The results of Terkla *et al.* (1985) show that in many fishing ports studied, "labour out-migration is low because of strong attachment to community and family", and the study of Panayotou and Panayotou (1986) indicates that labour is "quite mobile between occupations but less so between locations". In Norway's fisheries, Heen (1988) similarly notes that "Geographical immobility is even more striking than occupational immobility".

Also important in examining labour mobility, and in assessing the human impacts of fisheries adjustment on communities, is to understand the value that fishers place on the communities in which they live. As Apostle *et al.* (1985: p.256) note, "it is essential to understand how inhabitants perceive their present-day existence. ...Do people continue to live in these small villages by choice, or from lack of alternatives?"

In speaking of livelihood arrangements in coastal fisheries, Hersoug (2006) notes that:

> "The typical trait of such a coastal system of occupation is that it is flexible. Reduction in one sector does not necessarily result in unemployment. The individual has an occupational mobility which contributes to stability of the coastal settlement pattern, because even if a former fisher starts commuting, the family remains in the fishing community. These occupations were characterised as flexible, as they all required little formal education and few specific certificates. Today, this flexibility is considerably reduced as most coastal occupations have been through a process of professionalisation, where more formal education and certificates are required."

In a World Bank report, John (1994, p.18) has noted:

> "Studies relating to labor mobility in some developing countries indicate that fishermen are responsive to economic incentives and move between occupations, but there is less labor mobility between locations because of the attachment of fisherfolk to their area of residence. This tendency has implications for plans to create supplementary and alternative employment opportunities for fisherfolk in fishing communities. Such programs should be locale-specific…"

While the lack of labour mobility is a key challenge to fisheries adjustment, there is scope for movement, in that fishery labour processes are intimately related to the overall socioeconomic environment (Panayotou 1982). Several studies (e.g., Ferris and Plourde 1982; Panayotou and Panayotou 1986) have found that fisher labour dynamics are sensitive to market signals and

economic incentives, which can substantially increase occupational mobility.

### 5.5 Specialized Skills / Aging Work Force / Poor Retraining

The lack of geographical and/or occupational mobility noted above is certainly due in significant part to a real attachment to place on the part of fishers, and others in fishing communities. At the same time, immobility is also connected to other aspects of the individuals themselves, such as the specialized nature of skills held by fishers, as well as to the overall demographics of fishers – including an increasing average age in many situations. Finally, inadequacies in the re-training programs used in adjustment can limit the success of efforts that might otherwise help to increase occupational mobility.

### 5.6 Lack of Coherence between Fishery Policy and other Governmental Policy

Holland et al. (1999: p.63) have noted that in every case they examined of fisheries adjustment, "…governments have some types of social programs designed to help individuals in economically distressed sectors to adjust. However, these programs are often funded separately and are not coordinated with fishery capacity reduction programs." This is an illustration of a lack of policy coherence – i.e. a lack of coordination between fishery-specific policies and those outside the sector. Other examples could include (1) a regional development policy that seeks to maintain coastal communities, at the same time as fishery policy is seeking to reduce the number of fishers, or (2) a labour policy that supports rural employment at the same time as fishery policy indirectly aims to reduce that employment.

The need for policy coherence may be expressed within a fishery context when policy directions elsewhere in government (outside the fishery sector) – e.g., with respect to labour markets, social support programs or other policy – are not supportive of, or are counter to, fisheries adjustment measures. It is sometimes assumed that the non-fishery policy should be changed to make it 'coherent' with fishery policy. Of course, it is equally, perhaps more, reasonable to conclude that in situations of 'incoherence', fishery policy may be out of step with overall government policy directions, or with policy in certain key areas. In this case, it is important for fishery policy to broaden its horizon to mesh better with other policy directions.

### 5.7 Lack of Mandate to Integrate Fisheries with Regional/Community Development

It is apparent that one of the key problems faced in fisheries – ones seeking to relieve pressure on fish stocks without causing excessive damage to livelihoods and coastal communities – is the lack of integration of fisheries into regional economic development policy. Fishery agencies may implement policy that implicitly has major community and regional impacts, yet may at the same time claim to have no mandate to deal with such matters. Alternatively, it may be a lack of will to integrate, or even to consider, social, regional and community impacts. These considerations may not be high on the agenda in situations in which the dominant culture of an agency is one of biological and/or narrow fisheries economics thinking. In any case, this manifestation of a lack of policy coherence can present a major challenge to meeting the goals of fisheries adjustment.

## 6. Human Impacts of Fisheries Adjustment

### 6.1 Potential Individual and Community Impacts of Adjustment

#### *Effects of One-time Windfall Payments to Individuals*

Whether fisheries adjustment is approached directly through buybacks of fishing vessels and/or fishing licenses, or indirectly through adoption of a system of fishing rights to induce capacity reduction, this can produce situations in which a certain group in the fishery (often the vessel owners) receive windfall payments from the government, whether as cash for the surrendering of their vessels and licenses, or as a 'gift' of fishing rights (e.g., quota). In either case, this phenomenon produces wealth inequities within fishing communities, which in turn can have negative impacts on the social cohesion of those communities. A classic instance of inequity is the free provision of individual quota rights to vessel owners in a fishery, while nothing is provided to those in the same communities who happen to be crew members on the same vessels, and contributed to building the catch history on which the quotas are often based.

#### *Loss of Individual Sense of Identity and Exclusion from Community*

In addition to the financial aspect of adjustment arising in the above situation, there can also be a strong impact on individuals from a social perspective. Those removed from a fishery in the course of adjustment may well feel their sense of identity lessened, and may even feel they are no longer a full participant in their community. This can happen even if the individual was compensated well for leaving the fishery, but may be much more intense in the case of uncompensated crew members on vessels removed from the fishery through the above-noted mechanisms in which the vessel owners accepted buy-outs or sold their fishing rights.

#### *Loss of 'Critical Mass' and Consequent Decay in Fishing Communities*

In fishery-dependent regions, coastal communities will typically have the fishery sector as the 'engine' of the local economy. A decline in the fishery, whether through change in resource abundance or through deliberate restructuring in the sector, can have dramatic impacts on the integrity of the communities. A process of decay can set in, both in terms of physical decay of infrastructure (e.g., wharves) and community services (e.g., libraries, schools) that can no longer be well-maintained or supported, and in terms of a decay in the 'spirit' and cohesion of the communities.

#### *Inequities in Fisheries Adjustment*

In examining the major tool of fisheries adjustment, buy-back programs, Holland et al. (1999: p.60) have noted that "Whether intended or not, there are always equity implications relating to the distribution of buyback funding." One form of these inequities, relating to vessel owners versus crew members, was discussed above. Along these lines, the authors go further (p.62) to note that "These programs do nothing for other groups that may have been impacted by the crisis such as crew members who lost jobs, people working in processing and other fishery support industries. In fact buyback programs typically decrease employment opportunities for these groups." Holland et al. (1999: p.62) point out, however, that these negative repercussions of fisheries adjustment are sometimes addressed through supplementary programs which "include

unemployment compensation, early retirement pensions, job training and placement programs, financial assistance for post-secondary education, grants to develop new business, etc. They provide adjustment assistance to the groups not eligible for assistance from the buyback…"

***Health Impacts***

The interaction between restructuring processes (i.e., physical, biological, industrial, social and institutional restructuring, as described earlier) and health have been examined by Dolan et al. (2005: p.197) with respect to each of human, community and biophysical components of 'health':

- human health, i.e. direct impacts of restructuring on health measures, such as through alcoholism and suicide, as well as nutritional aspects;
- community health: related both to the ability to promote positive human health outcomes, and to the intrinsic value of the community and to "community-level condition";
- biophysical health: capability of the biophysical environment to maintain "both biological and social organization within the context of meeting human goals".

One could envision use of a table such as the following to monitor health impacts of fisheries adjustment measures, with each cell recording the impact of a certain form of restructuring on a certain category of health (human, community or biophysical).

| | Human Health | Community Health | Biophysical Health |
|---|---|---|---|
| Physical Restructuring | | | |
| Biological Restructuring | | | |
| Industrial Restructuring | | | |
| Social Restructuring | | | |
| Institutional Restructuring | | | |

## 6.2 Large-Scale and Dispersed Impacts

In considering the human impacts of fisheries adjustment, one naturally thinks first of the impacts on those directly affected within the fishery sector – fishers displaced through a fleet reduction program, fish plant workers out of work due to a reduction in processing activity, etc. Also commonly considered are impacts on fishing communities. However, a full assessment of social impacts must also consider societal costs incurred more broadly.

For example, if a small-boat fishery is 'adjusted' through fleet and fisher reduction measures, this may lead to direct economic and social impacts on individuals and a loss of 'critical mass' economically within some fishing communities. This in turn could lead to a consequent decay in coastal infrastructure such as harbours, wharves and the like, and the possibility of a centralization of fishing activities in larger centres. All this is of importance in assessing social costs of fisheries adjustment, but there are also potential impacts beyond this.

In Nova Scotia, Canada, for example, citizens in urban and inland areas value their proximity to the sea and to the historical fishing culture along the coast, as reflected in the above-noted harbours and wharves, along with the small-scale fishing boats based there. In other words, a loss or decay in those aspects would generate a negative impact on many citizens – while certainly the impact on any one resident of an urban centre would be less than that on a displaced fisher, nevertheless the aggregate loss across all individuals could be substantial. At the same time, tourists coming to Nova Scotia do so to a large extent for the ocean and coastal experience, with the widely-distributed small fishing towns dotting the coast being a part of that experience. If fisheries adjustment leads to a reduction in the quality of that environment, we can expect tourism decline resulting in economic losses, which in turn translate into a loss of employment and livelihood, as well as a range of social impacts.

### 6.3 Impacts of Policy Approaches to Fisheries Adjustment

Earlier parts of Section 6 of the paper have included discussions of the impacts of various forms of fisheries adjustment, such as buy-backs, vessel decommissioning and labour force restructuring. Here, the implications of a number of broad-based policy initiatives are explored, with emphasis on rights-based allocation systems, and attention as well to integrated management and community-based management.

#### *Rights-based Systems*

Rights-based fisheries management is often advocated as a mechanism for fisheries adjustment. This typically involves the recognition or allocation of two major forms of rights (Charles 2001, 2002):

- *Use rights* designate the right to access the fishery and harvest fish resources. These provide an important means to avoid the problems of *open access* in fisheries, in which an uncontrolled scramble to access resources often leads to fish stock depletion. Use rights can generally be placed within two major categories: access rights authorise entry into the fishery or into a specific fishing ground, while withdrawal (harvest) rights typically involve the right to a specific amount of fishing effort or the right to take a specific catch.
- *Management rights* designate the right to involvement in management decision making. They lie at the heart of co-management initiatives, the idea being to produce better 'buy-in' of fishery participants, who work together to create and manage their own fishing rules. Management rights may be held to varying degrees by a range of stakeholders in the fishery, depending on the type of management involved (e.g., operational vs. strategic).

The connection of use rights to fisheries adjustment lies in the idea that a well-defined and suitably limited set of use rights holders will directly benefit from, and thus more likely support, desirable adjustment measures. Indeed, the set of use rights holders may well be a logical body to judge the desirability of potential fisheries adjustment measures. This approach also provides a means to internalize, amongst the use rights holders, both the costs and the benefits of fisheries adjustment that may be needed. Parallel to use rights are management rights; when fishers hold the latter as well as the former, they may well be in a position not only to accept adjustment but to drive the process of implementing it, since they are directly involved in management decision making.

The recognition of existing use rights or management rights, or the allocation of new rights, has the potential to facilitate fisheries adjustment, but also the potential for many social, cultural and institutional impacts. Perhaps the two key forms of impact relate to (1) equity and distributional issues relating to who receives the use rights, whether fishing vessel owners, licensed fishers, crew members, etc., and (2) the loss of community well-being in response to shifts of fishery capital, labour or supporting infrastructure out of the community, as a result of shifts in rights allocations. These matters have been discussed in detail elsewhere (e.g., Charles 2002); readers are referred to those original sources.

### *Integrated Ocean and Coastal Management*

Integrated management frameworks explicitly link fisheries with other uses of the relevant ecosystem (ocean, coast, watershed), with the goal of greater coordination and effectiveness in governance. A key aspect of this lies in assessing and managing the many interactions between sectors, and of the various sectors with the overall ecosystem. Such a framework provides the opportunity to integrate as well the adjustments made to the various sectors – for example, restructuring in the fishery, leading to reduced labour use, might support expansion of other sectors (where the labour can be absorbed), or alternatively it might exacerbate the effects of downsizing in those sectors.

### *Devolution and Community-based Management*

The growing policy trend toward devolution of management responsibilities to more local levels, and the accompanying expansion of interest in community-based management approaches, provides both challenges and opportunities – challenges in terms of greater difficulty in carrying out conventional centralized adjustment measures (e.g., central government bodies seeking to impose fishing capacity reductions across multiple local jurisdictions), and opportunities in terms of creating local 'buy-in' for actions mutually agreed-upon by central governments and local/community bodies. Some of these considerations are explored in the following section.

## 7. Social and Community Mechanisms for Fisheries Adjustment

A naïve approach to fisheries adjustment might see social values and social dynamics as mere constraints, even annoyances, to be faced along the path to downsizing fishing fleets and fishery labour forces. This would be an unfortunate perspective. First, there is no reason to believe that among the multiple societal objectives being pursued through fishery policy, any one class (such as social objectives) is intrinsically any less important than others. Second, from a practical point of view, it is important to realize that social and community mechanisms can assist in fisheries adjustment, assuming of course that chosen routes to restructuring are compatible with basic social realities.

Indeed, one can envision social factors impacting on fisheries adjustment initiatives in four major ways:

- as 'driving forces' for change
- as constraints on change
- as supporting vehicles of change
- as direct instruments of change.

One of these, the constraining aspect, is well known – for example, when people depend strongly on fishing, cutting the fleet drastically does have social impacts, and that reality is certainly a constraining force. However, the other three ways in which social factors interact with adjustment – driving forces, supporting vehicles and direct instruments – are clearly ones with potential to help, or indeed promote, the adjustment process. Social forces may drive the need for change in the fishery, for example to ensure food security or reduce poverty. Supporting measures may include a range of social and cultural approaches and institutions that could be brought into the adjustment process, in a participatory manner that allows for compromise in designing the adjustment measures. Finally, social mechanisms can be direct instruments of change, for example through broad-based public campaigns.

These interactions between social factors and fisheries adjustment are perhaps particularly important to take into account at a local and community scale. For example, the Pacific Marine Conservation Council and Ecotrust (2003: p.7) comment that:

> "Any reduction of the fleet, whether carefully designed or the result of regulatory or market forces, cannot help but have considerable impacts on coastal communities. Social and economic impacts can vary considerably from community to community, depending on local fleet composition, traditional target species, transportation, processing facilities and other portside infrastructure, and other factors. Likewise, any change in the composition of the fishing fleet—and hence in the size, location, and timing of fishing activity and effort along the coast—has consequences on the marine environment and living resources."

Given realities such as these, Symes (2000, p.219) has noted that in modern times, "There is a greater awareness of the need to tailor the solution to the particular local conditions and to rely much more on a bottom-up approach." Local-level approaches, and community institutions, can take a wide variety of forms. For example, while central managers may focus on reducing capacity through individual-oriented buybacks, license retirement, etc., creative alternatives at the local level might include labour pooling (such as informal agreements amongst fishers to share a vessel) and the more formal formation of fishing cooperatives, in which fishers coordinate their fishing activity and share in the results. There seems to be strong arguments for government support to local-level and/or community-specific measures such as these that may achieve at least some of the results of fisheries adjustment but from a grass-roots approach. There is also the potential at this scale to take advantage of social forces and moral pressure to increase compliance and overall support for fisheries management.

## 8. Conclusions: Moving Forward

This paper has reviewed a wide range of considerations connecting social considerations with fisheries adjustment. The importance of an objectives-based approach to fisheries adjustment has been highlighted – one in which policy actions are based on a clear set of societal objectives, rather than single subordinate ones that may not reflect the full reality of fishery goals. The paper has described some approaches to fisheries adjustment, some challenges in implementing that adjustment, potential human impacts resulting from fisheries adjustment, and opportunities to utilize social and community forces to support fisheries adjustment.

It has been suggested (Symes 2000: p.220) that in addressing fisheries policy needs, "A balanced and integrated approach is essential. The position of the fisheries sector undoubtedly needs strengthening… [and] …more robust strategies are needed to stimulate new forms of employment and a reduced dependence on the fisheries sector. For both of these agendas, State support through policy direction and financial assistance will be necessary."

The key in this would seem to lie in an approach to fisheries adjustment that properly takes into account the range of objectives, dynamics and structures relating to ecological, economic and social dimensions of the fishery, and of its surrounding environment.

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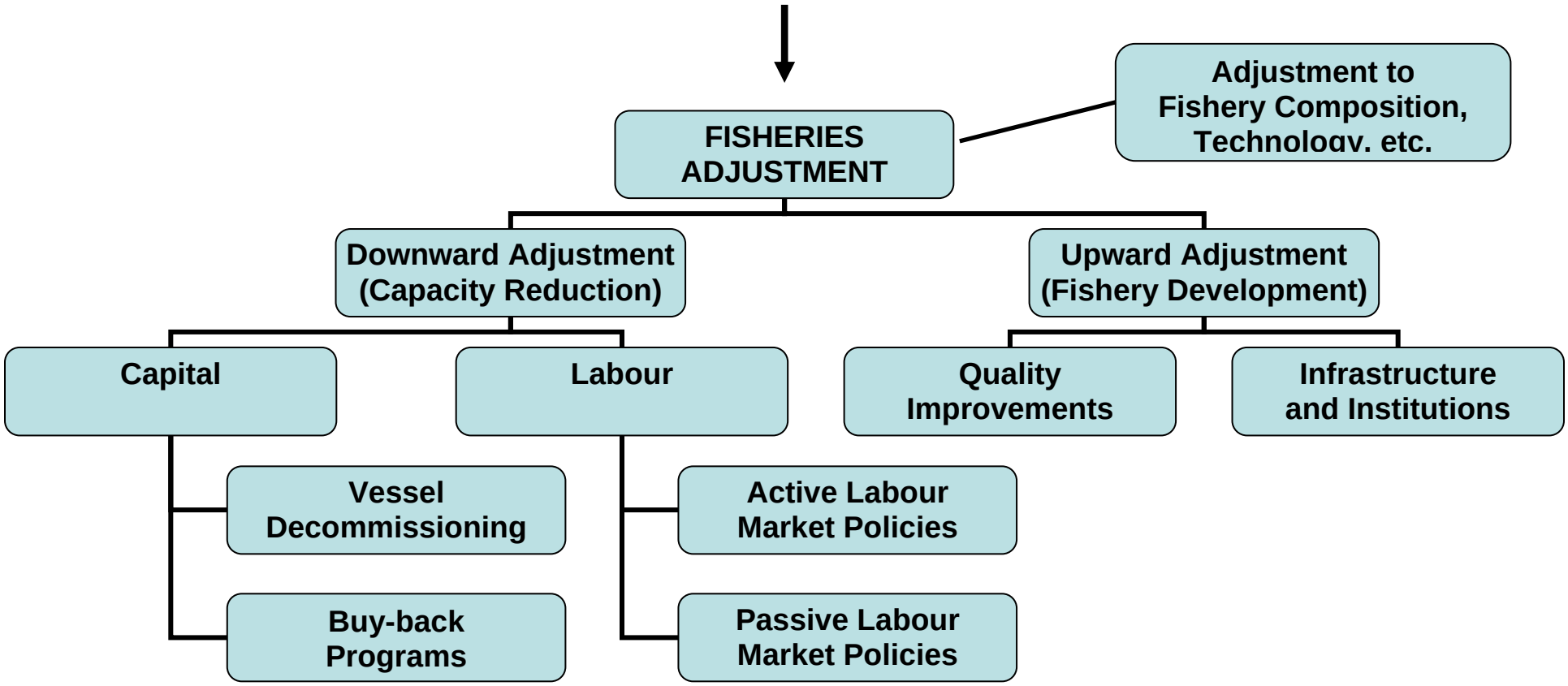
**Figure 2.**


FISHERIES ADJUSTMENT
Adjustment to Fishery Composition, Technology, etc.
Downward Adjustment (Capacity Reduction)
Upward Adjustment (Fishery Development)
Capital
Labour
Quality Improvements
Infrastructure and Institutions
Vessel Decommissioning
Buy-back Programs
Active Labour Market Policies
Passive Labour Market Policies