

This Key Sheet is one of a series on fiscal reform in fisheries⁽¹⁾.

The purpose of these *Key Sheets* is to provide decision-makers with an easy and up-to-date point of reference on issues relating to the provision of support for sustainable livelihoods.

The sheets are designed for those who are managing change and who are concerned to make well-informed implementation decisions. They aim to distil theoretical debate and field experience so that it becomes easily accessible and useful across a range of situations. Their purpose is to assist in the process of decision-making rather than to provide definitive answers.

The sheets address three broad sets of issues:

- Service Delivery
- Resource Management
- Policy Planning and Implementation

A list of contact details for organisations is provided for each sub-series.

Overview of the debate

Unmanaged and poorly managed fisheries are overexploited to the point where all resource rent has been dissipated⁽²⁾. Since resource rent represents the wealth that the fishery can generate, and hence indicates the potential of the fishery to contribute to economic and social goals, there is a need for improved management with resource rent specifically targeted. Management authorities are faced with two broad problems. First, they must develop management instruments that enable resource rents to be generated on a sustainable basis. Second, they must establish fiscal arrangements that enable the resource rents generated to be shared between stakeholders, including government, in an appropriate way.

Key issues in decision making

Defining the issue - Traditional fishery management instruments (such as closed seasons, mesh size restrictions and the like) may have an important role to play but they cannot resolve the problem of resource rent dissipation. In fact, to the extent that they successfully improve conditions in the fishery, they may have the unintended effect of making things worse in the long run because they will increase profitability and hence encourage increased effort.

Successful management requires the design and implementation of arrangements that resolve the resource rent dissipation problem. What can be done will depend on the precise circumstances of the fishery. Like politics, fisheries management is the art of the possible.

Policy-makers are faced with some very broad choices, such as whether to manage the fishery using effort control measures (like licences), catch control measures (like individual quotas) or spatial measures (like territorial use rights). Other measures may be possible in particular circumstances (e.g. the monopsony in Mauritania in the 1980s and early 1990s).

Effort-based management - Given that free and open access conditions are at the heart of resource rent dissipation, one approach is to close access, requiring all who fish to obtain a licence.

Such an approach may be attractive because it is relatively simple to introduce and operate. However, a great difficulty with effort-based control is that it is difficult, if not impossible, to control all elements of effort. As a result, there is a strong incentive for fishers to replace controlled elements by using uncontrolled ones (this problem of input substitution is sometimes called "capital stuffing"). A related problem is that a given level of effort tends to become more effective over time as technology advances (leading to so-called "effort creep"). There is a need therefore for continual monitoring of the effectiveness of the scheme and for appropriate revisions to be made.

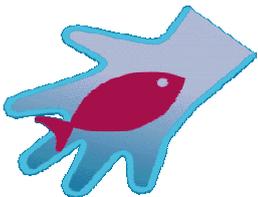
The speed with which the scheme is undermined in this way depends on how easy it is to substitute one input for another. If this is very difficult to do, then licensing may be an effective management system, although even here rents may still be dissipated to some extent through excessive innovation research, as fishers attempt to find ways to improve their fishing and economic performance within the licensing constraint.

Most licensing systems enable resource rents to emerge for a certain period of time but the rents are gradually eroded as inputs are replaced, unless management is able continually to update the scheme.

A good example of effort-based management, which tends to bear out the theoretical predictions made above, is the Australian Northern Prawn fishery⁽³⁾.

Catch-based management - Great attention has been paid by economists and others to the development of catch-based systems, particularly Individual Transferable Quotas - ITQs.

The main advantage of ITQs is that they should resolve the resource rent dissipation problem. If the Government sets the Total Allowable Catch (TAC) at an appropriate level and provided compliance is adequate, resource rents should be generated. As happens under conditions of free and open access,



DFID experience

- The DFID Workshop and Exchange of Views on Fiscal Reform in Fisheries took place in the context of a wider OECD-DAC ENVIRONET initiative examining issues related to environmental fiscal reform (EFR) for sustainable development and poverty reduction. Outcomes of this initiative will include a joint-agency paper on EFR - Environmental Fiscal Reform.
- DFID has also supported work on EFR in China, India and South Africa.

Centres of expertise

- Australian Bureau of Agricultural and Resource Economics - ABARE
- Department for Environment, Fisheries and Rural Affairs - DEFRA
- Department for International Development - DFID
- European Union - EU:
 - DG VIII Development
 - DG XI Environment
 - DG XIV Fisheries
- Food and Agriculture Organization of the United Nations - FAO UN, Fisheries Department
- GOPA Consultants
- German Technical Cooperation Agency - GTZ
- IDDDA
- Institut de Recherche pour le Développement - IRD
- Integrated Marine Management - IMM
- Marine Resources Assessment Group - MRAG
- National Oceanic and Atmospheric Administration - NOAA Fisheries
- Natural Resources Institute - NRI

increased rents will attract extra entry but in order to participate in the fishery new entrants must purchase an ITQ. The available resource rents will thereby be capitalised into the price of the ITQ.

There has been a pronounced trend towards ITQ-based management in the world's fisheries since the 1970s although many of the systems remain surprisingly poorly documented. One policy requirement is to analyse the impact of policy development, particularly when it concerns major changes such as moving towards ITQs. Arnason (2002) provides a detailed review of what is available for seven major fishing nations.

Spatial-based management - An alternative to either effort or catch-based control is to manage space. Usually an area of sea, often called a TURF (Territorial Use Right in Fishing), is set aside for one or a group of users. Such an approach lends itself well to the management of sedentary species, particularly shellfish. It is used in the UK, for instance, to manage oyster fisheries in some places. Fisher co-operatives are allocated exclusive rights to an area of sea for the purposes of oyster harvesting.

The approach may also be used to manage coastal areas. The best known example probably concerns the Japanese coastal fisheries which are managed through co-operatives. There is some interest in developing this kind of approach further in small-scale fisheries around the world.

One important point is that the scale of the use rights that it is possible to allocate in the case of fish (rather than shellfish) is usually less than the range of the fish resource itself. As a result, what happens inside the area depends, to a greater or lesser degree, on what happens outside. TURFs are hence dependent for their success on the management authority having in place an effective system for areas of sea outside the TURF.

Institutional arrangements - Management methods may be implemented under a variety of arrangements. Perhaps the most common approach is where a central authority allocates rights to users. However, alternatives exist. One possibility is to use decentralised management systems. Another is to use co-management whereby fishers have a share in decision-making.

Resource rent extraction - All three of the management approaches above (effort, catch, space) are capable of providing the basis to resolving the resource rent dissipation problem and ensuring that such rents are generated on a sustainable basis. These approaches are not the only ones but they are by far the most important currently in use.

Each of them may be used by the Government to extract resource rent from the fishery. The extent to which such rent is extracted will depend on a number of policy decisions and the detail of the management instruments used.

A first issue is how to allocate the initial set of rights. A second is whether they should be transferable between users. And a third is whether a charge should be made for the ongoing use of the right. By and large, developed and developing countries have dealt with these issues in different ways.

Developed countries such as Australia, Canada, Iceland, New Zealand and the USA have concentrated on licences and ITQs. They have tended to allocate the initial round of rights on the basis of historical performance, sometimes with minimum or maximum permitted allocations for reasons of equity. Rights are generally transferable between users, albeit with some restrictions – foreigners are not usually allowed to hold ITQs for instance.

The evidence suggests that licences and especially ITQs have had a substantial positive impact on both the biology and the economics of fisheries where they have been used. Fish stocks are generally in better condition than they were prior to the introduction of the system, and economic performance of the fleets is better – reflected in increased profitability and increased use right prices.

The improvement in economic performance amongst firms is partly the result of the decision taken apparently by all developed countries not to attempt to extract resource rents. In most cases, some attempt is made to recover the cost of management – in New Zealand about 7.5% of landed value is extracted to cover such costs and in Canada it is about 5%.

However, the decision not to recover rents has led to both legal and political challenges on the grounds that it is inequitable to transfer all the resource wealth to one group of people (Copes and Palsson, 2000). The problem of how to determine an equitable sharing of rents between different stakeholders, particularly between fishers and Government representing the wider community, continues to be debated (see for example Macinko and Bromley, 2002).

Developing countries, such as Chile and Namibia for instance, which have used ITQs or systems similar to them, have tended to use different approaches to developed countries in dealing with the issue of rent sharing.

Centres of expertise *cont.*

- Netherlands Institute for Fisheries Research - RIVO
- Organisation for Economic Cooperation and Development, OECD-DAC
- Overseas Development Institute - ODI
- Support unit for International Fisheries and Aquatic Research - SIFAR
- University of British Columbia - UBC, Fisheries Centre
- University of Portsmouth, Centre for the Economics and Management of Aquatic Resources - CEMARE
- World Bank
- WorldFish Center - WFC

In Chile, ITQs were initially allocated according to historical fishing performance. But each year 10% of quota is recovered from companies and is sold at auction. Namibia's allocation system has included a number of elements designed to achieve socio-political goals (such as the Namibianisation of fisheries exploitation) along with economic efficiency.

In both cases a key element of the system is the recovery of resource rent. Where auctioning is used, the design of the auction system requires careful attention. The Chilean auctioning system has led to the recovery of less rent than hoped, in part because the auction market has been thin with only a few companies involved.

Rather than rely on auctions, Namibia uses a range of fees payable by quota holders, by far the most important of which is the quota fee itself. In this way the Government has extracted about 9% of landed value each year making it one of the few countries around the world to draw a net income from its fish resources.

Other issues in resource rent extraction - The systems discussed above are the main ones currently in use but they are not the only way in which Governments may extract resource rents from their fisheries.

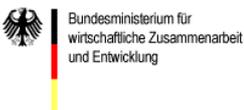
The case of Mauritania illustrates two other possibilities. First, Mauritania extracted resource rents to an outstanding degree in the 1980s and early 1990s using a system of so-called export taxes, although they would be more accurately described as royalties on catch collected at the export point. Second, access rights may be sold to foreign fishers either individually (or through joint venture arrangements) or more often through access agreements negotiated between States. Many other countries have also benefited from their fish resources by selling fishing rights to foreign fishers.

The most important EU fishing agreements have been with Morocco (now ended) and Mauritania. In both cases, the Coastal States benefited from the substantial payments made by the EU in return for access by EU fishers to their fish resources. Despite such benefits, access agreements have come in for criticism, partly because the payments have not represented resource rents extracted through good management but have arisen mainly from the subsidies that the EU has been prepared to give to its fleet in order to secure fishing opportunities. In fact, it may be argued that the existence of access agreements has taken the pressure off the Coastal States to make difficult decisions to improve their fisheries management systems that they would otherwise have been forced to make in order to be able to generate and extract the resource rents.

How much rent to extract? If management systems are in place that enable resource rents to be generated, the Government will have to decide on its aim in terms of how much rent it wishes to extract. The extreme possibilities are for the Government to leave all rent with the fishing industry, or for the Government to take all rent. Neither extreme has much to commend it. The former will lead to very high use right prices and is likely to be considered inequitable, undermining the system in the long run. The latter is likely to be very difficult to achieve in practice and involve the Government in excessive compliance expenditure. The best solution appears likely to lie somewhere in the middle ground based on a partnership between the fishing industry (broadly defined) and the Government. Leaving some rent with the industry will give it an incentive to develop fishing-based activities to generate extra resource rents. Moreover by giving the industry a stake in the future of the resource, the compliance problem may be lessened.

Key literature

- Arnason, R. (2002) *A review of international experiences with ITQs: An annex to Future Options for UK Fish Quota Management*. Hatcher, A., Pascoe, S., Banks, R. and R. Arnason (eds). Portsmouth: University of Portsmouth. CEMARE Report R58.
- Copes, P. and G. Palsson (2000) Challenging ITQs: Legal and political actions in Iceland, Canada and Latin America: A preliminary overview. In: *Microbehaviour and macroresults. Proceedings of the Tenth Biennial Conference of the International Institute of Fisheries Economics and Trade (IIFET)*, 10-14 July, Oregon, USA. Corvallis, Oregon: IIFET.
- Elliston, L. and L. Cao (2004) *Managing effort creep in Australian fisheries: An economic perspective*. Canberra: ABARE Report to the Fisheries Resources Research Fund.
- Macinko, S. and D.W. Bromley (2002) *Who owns America's fisheries?* Covello, California: Center for Resource Economics (Island Press).
- Rose, R. (2002) *Efficiency of individual transferable quotas in fisheries management*. Canberra: ABARE Report to the Fisheries Resources Research Fund.



(1) This special series of Key Sheets on Fiscal Reform in Fisheries disseminate the outputs of a '[Workshop and Exchange of Views on Fiscal Reform in Fisheries - To Promote Growth, Poverty Eradication and Sustainable Management](#)' organised by SIFAR/FAO, Rome in October 2003 and sponsored by DFID. See Fiscal Reform in Fisheries Key Sheet 1: [Workshop overview](#).

(2) See: Fiscal reform in fisheries, Key Sheet 2: [Resource rent](#).

(3) See: World Bank/SIFAR/IDDRA Policy Brief 10: Appropriate policy frameworks: The case of the Northern Prawn Fishery, Australia, an output of the World Bank-funded 'Study of Good Management Practice in Sustainable Fisheries'. Based upon a case study by Ian Cartwright in 2003, which comprises Appendix 7 to the main Study Report.

N.B. Text in blue indicates online links.



Authors:

Tim Bostock (SIFAR),
Stephen Cunningham,
Arthur Neiland, and
Elizabeth Bennett (IDDRA)

Web / PDF production:
Joan Varley (SIFAR)

Key Sheets are available on the Internet at: www.keysheets.org
or through the websites of DFID and the Netherlands Ministry of Foreign Affairs

Department for International Development
Tel: +44 (0) 20 7023 0548
Fax: +44 (0) 20 7023 0470
Email: t-bostock@dfid.gov.uk
Website: <http://www.dfid.gov.uk/>

Netherlands Ministry of Foreign Affairs
Sustainable Economic Development Department
Tel.: +31 (0) 70 348 4229
Fax: +31 (0) 70 348 5956
Email: dde@minbuza.nl
Website: <http://www.minbuza.nl/English>