

ALLOCATION OF USE RIGHTS AND ADJUSTMENT OF INSTITUTIONS

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Summary

The introduction to this chapter recalls that, today (at the start of the new millennium), the rationalization of fishing, farming and pollution systems that are limited by productive, reproductive or assimilative capacity of marine renewable resources, as well as the technological intensification process, depend primarily on the regulation of access. For that purpose, the institutions with which this regulation is effected must be adjusted to the new conditions of resource scarcity. The second section of the article reviews the legal controls which are required, at different scales, for adjusting uses that are fully developed to the natural capacity of living and environmental resources, and for developing new farming systems. These controls include State sovereignty, resource property, and use rights. The fluidity of ecosystems and the mobility of stocks limit the usefulness of space for expressing exclusive rights upon renewable resources and their uses. The third section reviews the basic mechanisms that can be used for selecting users and limiting their respective uses of natural resources. These mechanisms include social controls, command and control, the market, and taxation schemes. In practice, and particularly with respect to the various modes of co-management, these mechanisms are combined in varying proportions. The fourth section examines conditions that are important for adjusting the mandate and structure of bodies responsible for the regulation of access in areas of national jurisdiction. They include the clarification of

exclusivity regimes, the distinction between resource property and use rights, the extraction of the resource scarcity rent, the capability to respond to unforeseen changes, and the role of national authorities in the adjustment of institutions.

1. Introduction

The full exploitation of marine renewable resources has three major consequences: commercial uses are economically inefficient; resource conservation becomes more critical; and recurrent conflicts arise between user groups (see *Harvesting the Seas*). The control of over-capacity, overfishing and conflicts, which at the start of the new millennium affect commercial production, is an economic problem. This control, however, depends on the prior adjustment to the new conditions of resource scarcity by the institutions which govern the regulation of access (see *Rational Exploitation and Conservation of Marine Ecosystems*).

When marine renewable resources are not limiting, the conservation of their productive, reproductive or assimilative capacities is the primary concern. This kind of regulation can be effected by the enforcement of technical measures that define the practices, but not the intensity, of exploitation. Where such measures apply equally to all user groups, they can be implemented by command and control, i.e. by the enforcement of norms and decisions by public administrations. The methods elaborated when renewable resources are not limiting are not intended for regulating access. In commercial production, regulation of access implies a selection of users and limitation of their respective harvests. Since these limitations have direct distributive effects, they cannot be enforced either effectively or efficiently, by command and control. Thus, the current degradation of management performances is rooted in the inadequacy of conventional management methods.

Access regulation is equally important for the development of more intensive aquaculture systems (see *Rational Exploitation and Conservation of Marine Ecosystems*, section *The Exploitation and Conservation of Natural Resources*). Compared with agriculture, technological intensification is less advanced in the maritime domain. With ongoing advances in zootechnics, aquaculture can be expected to fill the gap between a supply which is blocked by wild stock productivity, and the growing demand for food (see *Harvesting the Seas*, section *Historical Development* and sub-section *World Fishery Potential*). However, for these expectations to materialize, the development of legal controls on cultivated stocks and ecosystems should keep pace with the extension of physical controls over new physiological functions of cultivated species and their environment, as well as with the development of aquaculture and other uses of marine ecosystems.

Thus, access regulation appears as the primary condition for resource conservation, use rationalization, conflict mitigation and aquaculture development (see *Rational Exploitation and Conservation of Marine Ecosystems*, sub-section *Biological and Economic Conditions of Economic Development*). To adjust commercial uses to fish stock productivity and ecosystem capacity, human and natural inputs must be allocated in proportion to their respective scarcities. Such adjustments are effected by regulatory

systems consisting of three elementary institutions (see *Rational Exploitation and Conservation of Marine Ecosystems*, section *Rationalization of Uses*):

- legal controls on the resources and their uses;
- mechanisms for allocating quantitative use rights; and
- structures for implementing such controls and mechanisms, and the technical measures aimed at conserving resource productivity.

Interesting information on the evolution of farming systems can be found in the history and geography of agriculture. This reveals the relationships that exist between the process of technological intensification, the economic and social organization of rural communities, and land property regimes (see *Harvesting the Seas*, sub-section *Exploitation Systems*). The diversity of solutions worked out by rural societies also shows that the regulation of access has no standard solution. Regulatory systems must be adjusted to the physical properties of the resources, the technical features of production systems, the economic and social organization of producer groups, and their cultural values.

Aquatic living resources impose particular constraints on the adjustment of institutions. Fish populations are mobile and aquatic ecosystems are fluid. As a consequence, the spatial scale of unit resources is greater than that of producers' harvests. This discrepancy of scales between use and resource units prevents individual producers from adjusting separately their uses to the productive, reproductive, or assimilative capacity of renewable resources. To be effective, this adjustment should be effected at the scale of resource units and encompass all uses and users. For that purpose, collective or public solutions are required, and resource property systems and regulation structures should reflect the spatial distribution of fish populations and ecosystems.

The slow progress in the adjustment of institutions shows that the prospect of considerable economic and social benefits is not a sufficient condition for the emergence of solutions that match the new conditions of resource scarcity. Institutional reforms have high short-term social and political costs. Furthermore, all users do not have equal capabilities to benefit from new institutional arrangements. Some institutional innovations may run counter to the cultural values of certain groups. These constraints, however, do not lessen the potential social benefits of access regulation. It is, therefore, important to analyze the terms of access regulation and the role of elementary institutions.

2. Exclusivity Systems

2.1. State Sovereignty

The new Ocean Regime, i.e. the legal framework established under the new Law of the Sea, extended to the area of sea up to 200 miles offshore the two-tier scheme that on land governs the property of natural resources. Under this scheme, title deeds are warranted by the sovereignty and fundamental functions (defense, police and justice) of States. In the historical development of property systems, common regimes appeared finally less costly than the collective initiatives taken by particular groups. To combat

theft and wrangling, public solutions have ultimately prevailed. The authority devolved to coastal States on the resources distributed in the 200 miles strip gives them the necessary authority to undertake the reforms necessary to regulate access. Many have consequently done so to limit the fishing activity of foreign fleets.

However, the new Ocean Regime does not provide a fully-fledged solution for transboundary resources. If sovereignty enables coastal countries to adjust their institutions to regulate the exploitation of resources which are distributed within each EEZ, their authority remains divided for shared stocks and ecosystems which are distributed over more than one EEZ, and diluted for straddling resources extending across the offshore boundary of EEZs. In addition, open access conditions continue to prevail in the high seas (Figure 1). To overcome these constraints, the Law of the Sea encourages coastal States to cooperate in the management of transboundary resources. The sharing and dilution of authority which remain, however, have important repercussions for the adjustment of national institutions, as well as for the negotiation and implementation of multilateral agreements.

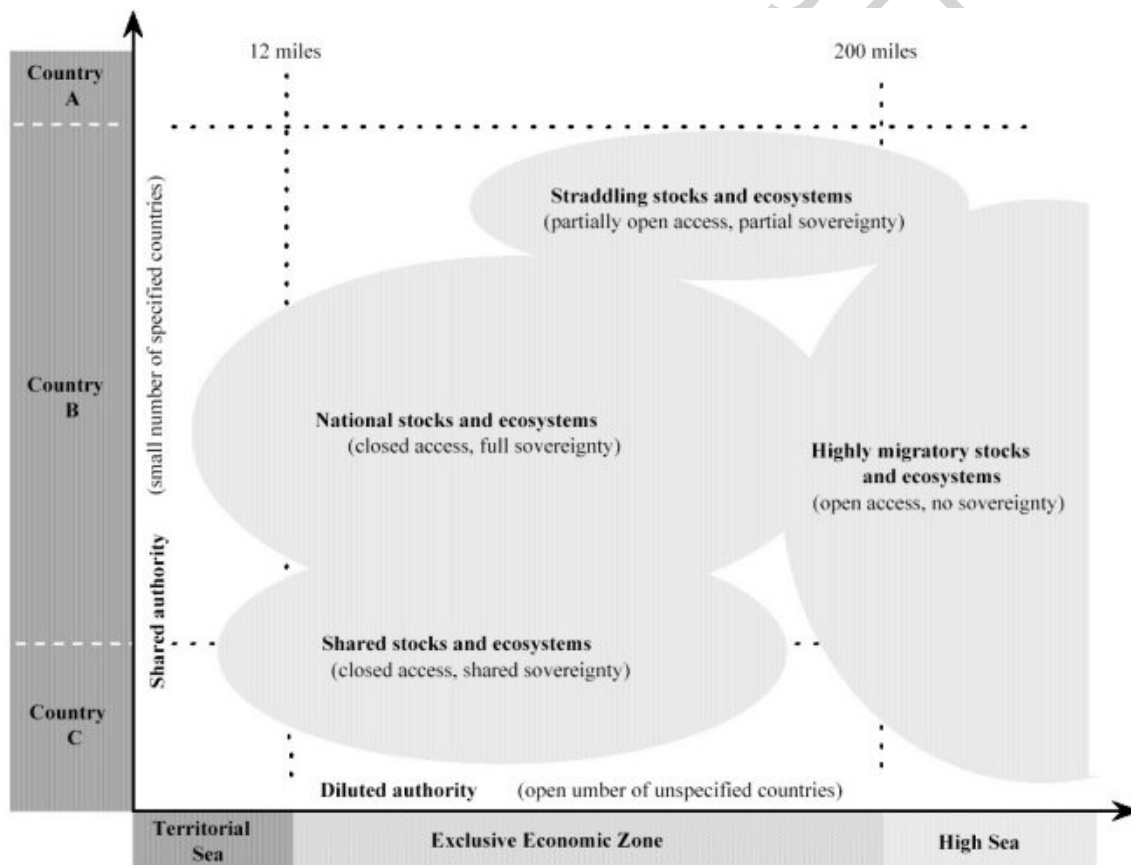


Figure 1. Spatial distribution of marine renewable resources and jurisdiction areas.

Coastal States can draw benefits from cooperation when it can reduce the externalities affecting their uses of transboundary resources. In the case of shared resources, transaction costs are limited by the small number and determination of the parties concerned. The geographic distribution of fish stocks and ecosystems across EEZs can provide criteria for the negotiation of arrangements. However, owing to the

heterogeneous structure of unit resources in their distribution areas, simple geographic criteria are seldom sufficient. Some countries claim that the location of spawning and nursery areas in their EEZs give them special rights over the exploitation of corresponding stocks. Their claims gain more weight when they conduct ranching programs to sustain or enhance the recruitment of certain fish stocks. Nevertheless, countries that expect benefits from a joint regulation of access may offer compensations to their neighbors to obtain their agreement. This would be the case, for example, for stocks in which young fish are concentrated in the EEZ of one country, and older fish in the EEZ of another. Under such circumstances, the second country can offer compensations to the first country in exchange for a limitation in its catches. As the protection of juveniles will result in an overall increase of stock productivity, it may allow, for example, the latter to harvest its quota in its own EEZ.

With respect to straddling and high sea fish stocks, the higher number and indetermination of the parties concerned increase the transactions costs incurred in the negotiation and enforcement of joint agreements. These costs could be reduced by the devolution of an adequate authority to regional or international bodies. Such a development, however, seems unlikely in the foreseeable future, at least until it is realized that multilateral arrangements (governance without governments) are not sufficient to achieve the desired effectiveness. As a consequence, collective initiatives taken outside international agreements are likely to remain scarce, insufficient and precarious. The agreement signed between Australia, Japan and New Zealand to limit their catches of southern bluefin tuna is a good example of such arrangements. Despite their interest, they can be relinquished at any moment by the arrival of fleets from other countries.

Thus, transaction costs are likely to check the emergence of cooperative agreements for the regulation of access to transboundary resources. On the other hand, faster progress can be expected in countries which share few resources with their neighbors. The greater authority that countries such as Australia, Greenland, Iceland or New Zealand have over the resources surrounding their shores partly explains why many island states are leaders in the adjustment of institutions applicable to domestic fleets (see *Rational Exploitation and Conservation of Marine Ecosystems*, section *Conclusions*).

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Biographical Sketch

Jean-Paul Troadec was involved in the 1960s in surveys and assessments of fishery resources conducted by the French Institute of Research for Development (IRD) in the Gulf of Guinea. He then joined the FAO Department of Fisheries, where he participated in the Department programs in the fields of fishery statistics, stock assessment, and fisheries management, before being in charge of the Fisheries Development Planning Service. In FAO, his work focused on the conditions of fishery development in developing countries, and on the change in fishery management approaches resulting from the full exploitation of world resources. In the 1980s, he became Director of the French Scientific and

Technological Institute of Maritime Fisheries (ISTPM), and then, Director for Living Resources in the French Research Institute for the Exploitation of the Sea (IFREMER). His research interests concern the changes of marine production systems—including the uses and conservation of marine environments, the institutional aspects of their management, and the related changes in research priorities resulting from the full exploitation of fishery resources. He has presented a Ph.D thesis on the biology and population dynamics of West African croakers at the University of Marseilles (France), and edited a book on fisheries management.

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