

## **Territorial use rights in marine fisheries: definitions and conditions**

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#### **ABSTRACT**

Territorial use rights in fisheries (TURFs) have existed for centuries. They are widely available for sedentary resources. In addition, however, they have appeared in a number of marine fisheries in traditional communities and are also being acquired, legally or extra-legally, for such techniques as floating fish aggregation devices and other forms of fixed gear.

TURFs provide interesting opportunities for dealing with two major aspects of fisheries management -efficient production of net benefits and equitable distribution of benefits. Further exploration of the possible adoption of TURFs as a means for management seem desirable.

This paper explores some of the definitional elements of TURFs and the distinctions between territorial rights and common property. It also exercises some of the conditions that may have an effect on the creation and maintenance of TURFs. And it discusses briefly some of the implications for equitable distribution of benefits.

#### **I. INTRODUCTION**

Territorial use rights in fisheries (TURFs) have been known to exist for centuries. Traditionally they have emerged (and some are still maintained) where certain conditions permit relatively easy acquisition and defence of exclusive rights. Sedentary resources such as oysters, mussels, and seaweeds have long been subject to property rights. Sergius Orata cultivated oysters in Lake Lucrine during the early Roman empire (Bolitho 1961). Enclosed bodies of freshwater ponds, lakes, and floodplains have also been subject to exclusive use rights for centuries.

However, TURFs have also emerged in areas or situations where ease of acquisition and defence of exclusive rights is not readily apparent. They have developed in marine areas such as lagoons, along beaches, and with regard to coral reefs. And, more recently, TURFs are being established, legally or illegally, in association with fish aggregation devices (FADs) and other new or recently expanded technologies.

As more and more study is given to the culture and organization of fishing communities, there are indications that some forms of TURFs are more pervasive than previously thought to be the case, in both modern and traditional marine fisheries. A partial list of fisheries and techniques using, or permitting, exclusive territorial rights, indicates the range and variety of TURFs in both culture and capture marine fisheries: oyster and clam bottom; seaweed beds; raft culture; fish aggregation devices, both floating (payaos) and fixed on the bottom as artificial reefs; beach seine rights; fish pens and cages; set net rights; bottom fish traps such as lobster pots and octopus shelters; coral reefs; lagoon fisheries; fish traps at stream mouths for anadromous species like salmon; and others less formal such as tacit territorial divisions by some large-scale commercial fisheries.

These kinds of "sea tenure" situations are attracting increasing attention for several reasons - two of which are particularly important with regard to fisheries management. First, they are of considerable interest with regard to efficiency goals. The concept of the "sole owner" as a means for preventing the damaging consequences of open access to common property resources has long been recognized as being of fundamental importance (Scott, 1955). But until the widespread adoption of the extended economic zone (EEZ - a form of TURF in itself) occurred, there has been limited opportunity for, or interest in, practical applications of the concept.

The second reason is that localized TURFs appear to afford an important opportunity for improving (or maintaining) the welfare of small-scale fishing communities in developing countries. It is becoming increasingly apparent that these communities, which produce a major part of developing countries' fish catch, are persistently and pervasively depressed and have not generally responded to conventional attempts to improve their welfare. This is, in large part, due to the common property condition governing the use of the resources. Community control of the means of production, through localized TURFs, may provide an important tool in attempts to improve the fishermen's welfare. The corollary is equally important. If localized TURFs develop on their own, without satisfactory community control, they may create a class of "sea-lords" which could well worsen the plight of the small-scale fisherman.

For these reasons, an increasing number of studies are being devoted to traditional sea tenure systems, especially by anthropologists and sociologists (Cordell, forthcoming). But modern forms of localized TURFs are also emerging, and these, too, require study. In both cases, the need is to examine the ways in which localized TURFs can be used or adopted to meet both economic and social objectives. This paper provides a preliminary attempt to deal with one aspect of this examination - the natural and social conditions that facilitate or impede the acquisition and protection of localized exclusive use rights in fisheries. It begins with a discussion of the distinctions between common property and exclusive use rights and between generalized and localized TURFs. As a basis for understanding the conditions for enclosure, it examines some of the forces and factors that have supported the open access characteristic of common property. Several natural and social conditions that influence the acquisition of use rights are discussed as a basis for determining the opportunities for creating, re-establishing, or protecting localized TURFs. It concludes with brief discussion of the differences between efficiency and equity objectives and some of the opportunities and dangers that localized TURFs may create for the latter.

## **II. DISTINCTIONS BETWEEN COMMON PROPERTY AND TERRITORIAL USE RIGHTS**

### **A. Common Property**

The condition of common property has characterized the use of most marine fisheries throughout the world for several centuries. This condition and its consequences have been fully discussed in numerous studies (e.g., Gordon 1954, Scott 1955, Christy and Scott 1965). Briefly, common property resources are those to which access is both free and open to a set of users or potential users. The set may be made up of fishermen from any country, such as on the high seas; fishermen from any particular country within its EEZ; or fishermen from any particular community. If the country, province, or community does not control access to a fishery, even though it may have the right to do so, the condition of common property exists.

Distinctions should be made between the term common property and such terms as community property, commonly owned property, public property, and the “commons”. Common property, as herein defined, relates specifically to the conditions governing access to the resource, not to the nature of the owners or the nature of those who exercise jurisdiction or control over the resource (Christy, 1975 at 697). It should be noted that there is some disagreement over this definition. For example, it has been defined as “a distribution of property rights in resources in which a number of owners are co-equal in their rights to use the resource” (Ciriacy-Wantrup and Bishop, 1975, italics theirs). This definition, however, begs the question because it removes the condition of free and open access.

Several significant consequences result from the condition of common property. First, there is a tendency to waste the resource physically. No individual fisherman has an incentive to restrain his catch in the interest of future returns, for anything he leaves in the sea for tomorrow will be taken by others today. Thus, fishery stocks tend to be used at, and frequently beyond, the point of maximum sustainable yield.

A second consequence is economic waste. In the absence of controls on capital and labour, there will tend to be too much effort spent on too few fish. In over-utilized fisheries, the same, or even larger, amounts of fish can be taken with fewer fishermen and vessels than are actually employed. This means that the same, or greater, total revenues could be produced with lower total costs.

The difference between total revenues and total costs that would occur if access to the fishery were controlled, or the common property condition were removed, is an “economic rent”. This is analogous (in somewhat over-simplified terms) to the rent that accrues to the owners of farm land, which they can extract by selling or leasing their exclusive right to the use of the resource.

In common property fisheries, this rent is dissipated because whenever it occurs (as in a newly developing fishery or with an increase in price for the product) it produces a surplus profit to the fishermen. Since access is free and open, the surplus profit will attract more fishermen (assuming there is mobility of labour). But the new fishermen will increase total costs without increasing total revenues (at least to the same amount). Only when total costs reach total revenues will the new entry stop. But at this point the rent will be dissipated.

The significance of this is that a TURF, if effective, will prevent the dissipation of rent from taking place and will produce a value associated with the resource itself. As discussed below, the amount of this value, or rent, is a measure of the effectiveness of the TURF in achieving economic objectives, even if the rent is expressed in non-monetary terms.

A related consequence is that average incomes of small-scale fishermen in developing countries tend to be at, or close to, the bottom of the scale. The common property condition is not the only cause of this consequence. There are other cultural, social and economic factors involved and the problems are complex and not readily understood. But the common property condition is certainly a contributory factor. If the condition were removed, and economic rents were produced, they could be shared among the

fishermen so as to increase average incomes. This, however, would require a means for sharing that might be quite difficult to impose and enforce.

A fourth significant consequence of common property is conflict. This occurs in the form of congestion among fishermen using the same resource with the same gear. It occurs between fishermen using different gear for the same resource, typically between large and small-scale fishermen. Or it occurs between fishermen using different kinds of gear for different stocks but in the same space, as between mobile trawlers and fixed nets or pots.

In essence the consequences of free and open access are generally quite damaging. The only possibly positive result is that common property fisheries may offer employment opportunities in situations where alternative opportunities are scarce or non-existent. But this is a short-term benefit which, in the long run (when alternative opportunities improve) may be outweighed by the other damages.

## **B. Territorial Use Rights in Fisheries**

A territorial use right in fisheries can remove, to a greater or lesser extent, the condition of common property. It is important to emphasize that this can only be done to a certain degree in the marine environment and that TURFs provide for relative rather than absolute controls. For example, an exclusive use right can be attached to a site for a raft for the culture of molluscs. But the value of the right will be affected by the flow of nutrients (and pollutants) through the site - a flow over which the holder of the rights has no, or only limited, control. The common property condition remains with regard to the flow of nutrients (and pollutants). Thus there is no clear-cut distinction between common property and TURFs.

In addition, there is no clear-cut distinction between generalized and localized TURFs, and yet it is the latter that is of primary interest for economically or socially desirable fisheries management, particularly with regard to questions of equity. At one extreme, an extended economic zone can be a form of TURF, in that fishery use rights can be controlled within the territory represented by the zone. At the other extreme, the owner of an oyster bed has a right to control use over a much more limited territory.

Distinctions between common property and TURFs and between generalized and localized TURFs have to do with the size and nature of the territory, the kinds of use rights that can be exercised, and the specificity of the ownership. These various definitional elements are discussed below.

The territory governed by a TURF can relate to the surface, the bottom, or to the entire water column within a specific area. The size of the territory will vary with the use, the resources being harvested and the geographical characteristics. It should be sufficient in size, however, so that use outside of the territory does not significantly diminish the value of use within. The territory should be readily defensible and protected by the laws and institutions of the country. The boundaries of the territory should, therefore, be clearly demarcated and identifiable.

These elements of the definition do not necessarily mean that the territory must fully enclose the whole stock of fish throughout its migratory movements. A TURF is not so much resource specific as it is site specific. For example, a site in which a fish aggregation device is placed, may provide the basis for an effective TURF even if it covers an area of only a few square miles for a stock that swims through thousands of square miles. Similarly, beach seine rights may provide the basis for effective TURFs even though they are used for pelagic stocks migrating along the coast. The significant element is not the degree of enclosure of the stock, but the degree to which there is a value associated with the territory. For stocks that migrate through individual TURFs, the value of an individual right will clearly be affected by the degree of "upstream" use. At the extreme, a barricade that captures all fish moving along a coast will reduce to zero the value of a right further down the coast. But in most cases, the movement of the fish will not be fully interrupted, and downstream TURFs will still have some value. Individual values can be enhanced by agreement amongst TURF owners with regard to amount of catch, spacing of fishing devices, and other means.

The problems of determining the content of rights that are, or should be, exercised within a TURF are complex, and even more difficult than those of determining the content of property rights on land. Property has been said to be "a constellation of highly complex adjustments of entitlements and expectations" (Carmichael 1975). Variations in these entitlements and expectations with regard to land include, among others: the right to transfer or convey ownership of the land; the right to lease the land; the right to extract benefits; the right to be free of nuisance, such as the pollutants produced by a neighbour; the right to control future use through covenants; or the right to grant easements for special uses.

Concepts of property in the sea are much less advanced and more difficult to conceive because of the three dimensional nature of the sea and the fluidity of the medium and its resources. There are also difficulties of generalization because of different cultural attitudes towards property in different societies.

However, at this preliminary stage in the development of understanding of TURFs, it can be postulated that certain kinds of rights need to be exercised if TURFs are to be effective. One of these rights is the right of exclusion; that is, the right to limit or control access to the territory. A second right that needs to be exercised is that of determining the amount and kind of use within the territory. A third is the right to extract benefits from the use of the resources within the territory. These benefits can, but do not necessarily have to be, extracted through the imposition of user fees or taxes or the lease or sale of the rights. They can also be extracted in the form of profits to the owner - whether these profits be defined as to returns to labour and capital or in non-monetary terms such as larger or more satisfying employment opportunities.

Finally, the rights should include a right to future returns from the use of the territory. The length of tenure may vary but should at least be sufficient to allow the owner to capture a satisfactory return on any capital investments he has made. In the case of a community owned TURF, the tenure may be in perpetuity.

This discussion of the rights that distinguish TURFs from common property proceeds from an economic point of view. That is, the rights that are mentioned are those that are considered necessary to achieve economic efficiency. The author is fully aware that the discussion may be legally faulty and has deficiencies but hopes that the faults and deficiencies will provoke legal scholars to address the problems of providing property rights to the users of marine fisheries.

There is no readily apparent distinction between localized and generalized TURFs in terms of the content of the rights. The extension of national jurisdiction generally provides individual countries with the right of exclusion, the right to determine amounts and kinds of use, and the right to extract benefits. Although the Third UN Convention on the Law of the Sea (to be signed in the near future) partially restricts some of these rights, it does not significantly diminish them. Countries can exercise these rights by extracting revenues from foreign fishermen or by limiting the access of their domestic fishermen. To the extent they do so, they are exercising the rights associated with a TURF, as described above. Localization of a TURF depends more upon the size of the territory and the specificity of the ownership than upon the content of the rights.

The question of the nature of the owner of a TURF is in part a matter of effectiveness and in part a matter of equity. First, it should be re-iterated that the discussion does not assume ownership of the resource but ownership of a right of use. This makes unnecessary the intractable task of defining the resource. Does it include only a particular stock, or does it include the prey on which the stock feeds, control of the predators, the nutrients which support the stock, the medium in which the stock swims, etc.?

The owner of a TURF can be a private individual; a private individual enterprise; a group of individuals such as a cooperative, an association or a community; a political subdivision such as a town or a province; a national government; or even, conceivably, a multinational agency. In addition, owners of individual TURFs can create a form of cooperative ownership in which individual rights are constrained by

joint decisions. For example, owners of raft culture sites may find it mutually advantageous to agree to joint decisions on the number and size of rafts that can be placed in any one site.

Generally, the effectiveness of a TURF will be greatest where the specificity of the ownership is the highest. Individuals can usually make decisions more easily than groups of individuals.

However, with regard to the objective of improving the welfare of small-scale fishing communities, ownership of use rights by private individuals could well be damaging. In these cases, some form of communal ownership of a TURF will be desirable.

As can be seen, it is difficult to provide a clear-cut definition of a localized territorial use right in fisheries. An effective localized TURF generally refers to a relatively small and clearly distinguishable territory; provides rights of exclusion and determination of kind and amount of use and rights to extract benefits; and is relatively specific in its ownership. An effective TURF is one in which use outside of the territory does not significantly diminish the value of use within the territory. As such, effectiveness can be measured in terms of the value associated with the use right. This value will be reflected in the amount that potential owners would be willing to pay to acquire the TURF. In the case of communal TURFs held in perpetuity, the value of the TURF can only be approximated in economic terms and may have significantly greater importance to the welfare of the community than can be measured in economic terms.

There are several advantages likely to be associated with localized TURFs. Although these potential advantages need to be tested and to be studied in more detail, it is presumed that they will permit more economically efficient use of the resources and that they may provide important opportunities for improving the welfare of small-scale fishing communities. The owner of a TURF can limit the inputs of capital and labour at the point where the greatest net benefits are produced. This could be at the point where net economic revenues are maximized, but it could also be at the point where social objectives are maximized (such as maximum employment at satisfactory levels of income). One of the chief likely benefits of a localized TURF is the right to determine the objectives to be sought from the use of the territory.

An additional likely advantage is that a localized TURF provides both the opportunity and the incentive to manage the resources within the territory. Since the owner of a TURF (individual or community) has an exclusive right to future products, it will be in his (or its) interest to ensure the flow of future products. This would facilitate the imposition of management measures as well as the task of enforcement. It can be noted that the most effective form of enforcement occurs where it is in the self interest of the user to comply with the rules.

The major, and fundamental, problem is that the establishment of localized TURFs may require redistribution of wealth. The provision of exclusive rights means that some present users of the territory are likely to be excluded. Although this may be socially and economically desirable it may also be politically difficult.

### **III. THE CAUSE OF COMMON PROPERTY**

In order to understand the conditions that may favour the creation of localized exclusive use rights, it is helpful to examine the countervailing forces and factors that have led to the widespread condition of common property. Generally, it can be said that where the costs of acquiring and defending exclusive use rights are greater than the benefits, the condition of common property will exist. Costs and benefits, in this regard, are only partly economic. They must also be considered in social, political, and cultural terms.

One of the most obvious difficulties is that of attempting to enclose a fugitive resource. For a stock that swims thousands of miles, no nation, group, or individual can readily prevent others from using the stock. Even where the migratory movements are not so extensive, no individual country can readily defend exclusive rights if the stock is shared with a neighbouring country or countries. The obvious difficulties of trying to acquire exclusive national rights over a migratory stock contributed strongly to the emergence of the principle of the freedom of fishing. It was generally said at the time that the principle was becoming formalized in international law (the 17th and 18th centuries) that a country could acquire exclusive jurisdiction in the seas only to the extent it was defensible from land -- that is, the range of a cannon shot: "imperium terrae finiri ubi finitur armorum potestas" (van Bynkershoek 1737).

The difficulty of enclosing a fugitive resource, however, is a relative matter. It depends upon the extent of the migratory movement of the stock, which ranges from sedentary resources such as seaweeds and oysters to highly migratory resources such as some species of tuna. It also depends upon the extent of the relevant geopolitical boundary, whether this be the coastline of a community, country or, possibly, group of countries acting in concert. Furthermore, as noted above, it is not always necessary to enclose the whole stock (or its environment) in order to acquire a territorial use right that has value.

A particularly important difficulty in acquiring or maintaining exclusive use rights results from the pressures of individual fishermen to increase their shares of the sea's wealth. Prior to the extensions of national jurisdiction, the principle of the freedom of seas led to a distribution of wealth that favoured those who had the ability to invest in large vessels capable of fishing in distant waters. Within present extended economic zones, the same pattern of distribution occurs although on a smaller scale. Where there are no, or few, territories governed by exclusive use rights, those with the most powerful vessels acquire the largest shares of the catch. The owners of such vessels are generally opposed to the creation or extension of territories from which they would be excluded, and they tend to favour maintaining the condition of common property.

In situations where territorial rights have been acquired, there is a tendency for them to break down if there is no strong legal and institutional protection of the rights and if outsiders perceive a high value in gaining access. For example, salmon trap rights at the mouths of Alaskan streams were eventually outlawed as a result of rising prices for salmon and growing pressures by the excluded fishermen to increase their access to the resources and reduce the ability of the trap owners to control the resource. This redistribution of wealth was facilitated by the fact that most traps were owned by non-residents of Alaska, who could not mobilize effective political support in the state.

Traditional territorial rights, with even less protection under law, have not generally been able to withstand the pressures resulting from a large increase in the value of access to the territory.

Breakdowns in traditional territorial rights can also occur from within. In a subsistence economy, the amount of catch taken from a territory is limited by needs of the community. Competition for the favoured fishing sites within the territory may not be particularly strong, and there could be large benefits derived from systems allowing equitable access to the favoured sites. But where there is a shift to a cash economy, the competition increases and generally tends to break down the fragile traditional allocation system and the territorial control.

The forces towards common property are also present in many technological developments, particularly where there is a shift from fixed to mobile gear and from country craft with limited range to motorized vessels with larger range. These developments, combined with the move to cash economies, have been a major force in breaking down traditional territorial use rights.

An additional factor in the maintenance of the condition of common property is that of the North Atlantic historical and cultural traditions of the principle of free fishing. According to this tradition, anyone has a right to fish wherever he pleases. Although this tradition derives from, and is supported by, the concept that the sea's wealth should be distributed in accordance with power, it carries a weight of its own. In

North America, the tradition is often advanced as a fundamental right that should not be abrogated by such regulatory techniques as limited entry or fisherman quotas (passim in Rettig and Ginter, 1981). This tradition has undoubtedly influenced fishery advisers from North Atlantic states to encourage the breakdown of exclusive rights systems which they find existing in developing states.

Partly as a result of the above factors and forces and partly as a result of the lack of knowledge of the benefits of TURFs, there are few countries where legal and institutional mechanisms exist to protect territorial use rights.

In view of these forces, the costs and difficulties of acquiring or maintaining exclusive territorial rights have generally been great. From the opposite point of view, the benefits derivable from such rights have frequently been perceived as being small. One of the major arguments in favour of the freedom of the seas advanced by Hugo Grotius in the 1600s was that the fishery resources of the ocean were so abundant that exclusive territorial rights had little value. No one is willing to pay for exclusive access to a resource that is freely and abundantly available elsewhere.

On a global scale, there have been significant changes in the costs and benefits of acquiring territorial rights over fishery resources. The benefits of such rights have increased considerably as scarcity, and the awareness of scarcity, in fishery resources has grown. The costs of acquiring the rights have diminished, in part, as a result of the discussions at the 3rd UN Conference on the Law of the Sea and the widespread acceptance of extended jurisdiction in international law.

Defense of such rights is facilitated by modern military control and surveillance systems. As a result, large-scale TURFs in the form of EEZs have been created.

This has some influence on the creation and maintenance of localized TURFs because of the increase in national authority. But the costs and benefits of exclusive territorial rights must still be considered in terms of the specific conditions and situations that exist in the different fisheries and areas.

#### **IV. THE CONDITIONS AFFECTING THE CREATION AND MAINTENANCE OF TERRITORIAL USE RIGHTS**

There are several natural and social conditions that can influence the creation and/or maintenance of effective localized TURFs. As noted above, effectiveness, in terms of efficiency criteria, can be measured by the value (economic or non-economic) associated with territorial use rights. This is a matter of degree and depends on the extent to which use of the resources outside the territory affects the value of use within the territory. Effectiveness, in terms of social criteria, depends upon how the value produced by the TURF is distributed. The following discussion is focussed on effectiveness in efficiency terms. Social effectiveness is discussed in the next section.

The important conditions that influence the creation and maintenance of an efficient localized TURF include those related to the resource; definability of boundaries; the technology used; cultural attitudes; wealth distribution effects; governmental systems; and legal and institutional frameworks. There is a high degree of inter-relationships among the conditions and none is sufficient, in itself, to provide the basis for an effective TURF. Several of the conditions are subject to change, which may result from economic forces, political developments, technological innovations, or new laws and institutions. In some cases, the changes can be influenced by society so as to create more favourable conditions for the creation and maintenance of localized TURFs.



## A. Natural resource attributes

There are several resource attributes that have an influence on the potential or actual effectiveness of a localized TURF. Sedentary species can easily be made subject to territorial use rights -- either on the bottom or when attached to rafts. Distinct biomes such as those associated with either natural or artificial reefs also have favourable territorial aspects. Localized TURFs can be created for species which can be raised in a physically enclosed space, such as fish pens and cages; for species which are attracted to, and aggregate around, artificial devices; and for anadromous and catadromous species (e.g. salmon and eels) which migrate into fresh water.

It is more difficult to establish effective localized TURFs over species which do not have the above characteristics. However, in some cases, it may be possible to exercise satisfactory controls through cooperation among those holding neighbouring territorial rights. For example, a stock which migrates along a coastline could be subject to individual community use rights which, in turn, are limited or governed by joint controls over the amount of each community's gear or catch.

The resource conditions favourable to the creation or maintenance of localized TURFs are not restricted to sedentary species. Several other kinds of species, even highly migratory ones, may be effectively governed by territorial rights.

## B. Boundaries

Territoriality is also strongly influenced by the degree to which the boundaries can be readily defined and defended. This is generally related to the natural attributes of the adjacent land. Boundaries can easily be associated with a small island or reef, a lagoon, a river mouth or other relatively small and distinct geographical features. There is also a relationship to land boundaries set by man. Communities or individuals can define marine territories along beaches and out to the distance that can be used by a beach seine or to a distance where activities are readily observable from shore. Boundaries can also be defined with regard to artificial devices placed on the sea surface as, for example, the circumference of a circle around a fish aggregation device. Generally, the easier it is to identify and define a boundary at sea, the easier it is to conduct surveillance and monitor the use of a territory.

## C. Fishing technology

Different fishing techniques and gear also have an important effect on the creation and maintenance of territorial use rights. There are numerous kinds of gear that are fixed to the bottom -- pots, traps, set nets, trot lines, some longlines, weirs, etc. Sites for the placement of these kinds of gear can be made subject to territorial use rights on a permanent or seasonal basis. Effectiveness of a gear-associated TURF is dependent upon the size of the site, since numerous small sites may lead to large amounts of gear and small returns to each unit.

Gear or fishing techniques which require access to large areas of the sea (e.g. trawls and purse seines) do not readily permit the creation of TURFs. Furthermore, such mobile techniques may conflict with the use of stationary gear and reduce the value of TURFs associated with the latter.

Governments can thus influence the feasibility of establishing localized TURFs by regulations on the use of different techniques or gear or by programmes encouraging the development of different technologies. Rising prices for fuel may also have an effect to the extent that they make stationary gear more profitable.

## D. Cultural factors

There are limited generalizations that can be made about the cultural conditions favouring or disfavouring the creation of localized TURFs. It can be assumed that most cultures permit the acquisition of exclusive

use rights (privately or communally) over land resources. It is likely that most cultures would also permit the extension of such rights to the sea, as is indicated by the pervasiveness of traditional sea tenure systems. There may, however, be some areas where local cultures would impede or preclude localized TURFs. Consideration should clearly be given to cultural conditions before attempting to create a system of TURFs.

#### **E. Wealth distribution**

An effective localized territorial use right has a direct effect on the distribution of wealth. It provides a value to the owner (individual or community) of the use right and diminishes the value of fishing to non-owners who are excluded from the territory. The redistribution of wealth is, perhaps, the most important factor to be considered in the creation of new localized TURFs and in taking measures to protect traditional TURFs. Thus, decisions to create or protect localized TURFs are essentially political in nature. Since these relate more to equity than to efficiency considerations, they are discussed in the next section. It should be emphasized, however, that a localized TURF cannot be created by governmental actions unless there is a deliberate decision to redistribute wealth. It should also be pointed out that, without full government support, the enforcement and protection of a localized TURF is likely to become very difficult.

#### **F. Governmental authority and legal institutions**

A condition that follows the above is that the government must have sufficient authority to be able to make the distribution decision and enforce it. Where localized TURFs are used with regard to migratory stocks, sufficient authority to require cooperation among the owners of the TURFs may also be desirable. Finally, there must be laws and institutions that permit governments to exercise the necessary authority and that support the protection and maintenance of the use rights.

#### **G. Summary**

In summary, there are several different and important conditions that affect the creation and maintenance of localized territorial use rights in marine fisheries. With regard to the natural conditions, there appear to be a fairly wide range of possibilities -- not limited solely to the sedentary species. With regard to political conditions there may also be a wide range of possibilities, but these are crucially dependent upon the willingness and the ability of governments to make decisions on the distribution of wealth.

### **V. EQUITY CONSIDERATIONS**

The creation of localized territorial use rights can serve to meet efficiency criteria by producing a rent to the resource that, under the condition of free and open access, is generally dissipated. Who gets that rent or value is a different matter and should be considered in terms of equity rather than efficiency criteria.

Some territorial use rights have been, and are being, acquired by individuals. This is frequently the case for the culture of sedentary species -- either on the bottom or on rafts. It also appears to have occurred with regard to fish aggregation devices (FADs) where individuals have protected, sometimes by force and without legal support, an exclusive right to determine who shall fish within a territory around the FAD.

If there is a widespread extension of localized TURFs in the hands of individuals, it could be detrimental to the welfare of small-scale fishing communities. It would reduce access to fishery resources. But it would also, and perhaps more significantly, make the fishermen dependent upon the TURF owner, or "sea lord", whose interests would tend to be in reducing labour costs either by employing fewer fishermen or by paying low wages. Without satisfactory controls, the creation of exclusive rights in fishing areas could recapitulate the experience of inequitable distribution of land ownership.

Theoretically, it would be possible to provide some compensation to the fishermen or fishing communities by fully extracting the resource rents, by taxes or other means, that are created by the localized TURFs and by granting the rents, directly or indirectly, to the fishermen. In practice, however, this would be difficult to do. And, in addition, it is unlikely that economic compensation would be sufficient to make up for the loss of access to, or control over, the resources.

On the other hand, the creation of localized TURFs and the granting of the TURFs to fishing communities offers possibilities for significant increases in the welfare of those communities that acquire them. Under ideal conditions, the TURFs could provide for local control over the resources within the territory and could permit local determination of the objectives to be derived. The community, would be in a position to choose whether it wishes to extract resource rents, to increase the income levels of its fishermen, to increase employment opportunities, or to achieve some combination of these goals. It could also determine the kind of gear to be used, the technological innovations to adopt, the time and seasons of fishing, and other management measures. With exclusive territorial rights it would have a strong incentive for ensuring that the management measures are respected.

Although ideal conditions will never exist, the possibilities of partially achieving the above results are sufficiently high to warrant further studies of the concept of localized TURFs. Such studies should deal, in part, with further and more detailed examinations of the conditions permitting the creation of localized TURFs or the maintenance and enhancement of traditional territorial rights. The studies should also focus on the ways in which the benefits of traditional systems are shared or distributed and should seek to identify the kinds of controls over newly created TURFs that would ensure equitable distribution of benefits both within communities acquiring the rights and among neighbouring communities of small-scale fishermen.