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Tragedies on Natural Resourses a Commons and Anticommons Approach

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TRAGEDIES ON NATURAL RESOURCES
A COMMONS AND ANTICOMMONS APPROACH

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ABSTRACT

Ambiguous concepts blur analytical and policy prescription clarity.

In the literature on Natural Resources it would be difficult to find a concept as misunderstood as commons. This paper clarifies this confusion and establishes an adequate conceptualisation. A typology of property-rights regimes relevant to common property resources is presented and a new concept – anticommons - is introduced.

The reflex of this regimes distinction on the design of the natural resources policy is discussed and this conceptualisation is used to study exemplar cases in the area of fisheries and aquaculture policy in Portugal.

KEY WORDS: Property rights, commons, anticommons, entrepreneur, fisheries

JEL Classification: K11, Q20

INTRODUCTION

In the Natural Resources literature it is difficult to find a concept so misunderstood as commons.

Ambiguous concepts blur analytical and policy prescription clarity.

The aim of our paper is to rectify this confusion and establish an adequate conceptualisation. So, a typology of property-rights regimes relevant to common property resources is presented. The reflex of this distinction between regimes on the design of the natural resources policy is discussed.

Recently, a new concept, "anticommons", has been developed to put in evidence some problems one can see as the mirror image of traditional "Tragedy of the commons". These problems include the under-use of resources and may come from several sources, including bureaucracy. This paper also discusses this concept and its use.

Finally, this conceptualisation is used to study exemplar cases in the area of fisheries and aquaculture policy in Portugal.

1) ON COMMONS AND TRAGEDIES

"Therein the tragedy (…). Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all" (Hardin, 1968).

The term *commons* and *common property* is repeatedly used to refer different situations, including:

- property owned by a government;
- property owned by no one;
- property owned and defended by a community of resource users;
- any common-pool used by multiple individuals independently of the type of property rights involved (Schlager and Ostrom, 1992).

This perpetuates the “unfortunate tradition” of failing to recognise the critical distinction between common property (res communes) and nonproperty / open access (res nullius) (Bromley, 1991).

The problem started five decades ago with the article of Gordon (1954), on fisheries, and the confusion persisted in the papers of recognised authors in the Property Rights Theory (Demsetz, 1967). It was reinforced with Hardin (1968) and its much-cited allegory on the “Tragedy of the Commons”.
Some academics use the term common property and open access interchangeably. But we must recognise that ambiguous terms blur analytical and prescriptive clarity.

The current situation derives from the fact that none of the cited authors offer a coherent discussion on the meaning of property, rights and property rights, before presenting the problems inherent in common property.

First of all, if we want to rectify the confusion, we must recognise that the term property refers not to an object or a natural resource but rather to the benefit stream that arises from the use of that object or resource.
When economists think about property they are perhaps inclined to think of an object, and when they think in common property they accept the idea of common use of that object. This leads to the acceptance of the aphorism that “everybody property is nobody’s property”. The truth is that is only correct to say that “everybody’s access is nobody’s property”.

At the same time, we must recognise that, in the essence of the concept of property, there is a social relation. Property rights do not refer to relations between men and things but rather to the sanctioned behavioural relations among men that arise from the existence of things and pertain to their use (Furubotn and Pejovich, 1972). The prevailing system of property rights in a community can be described as a set of economic and social relations defining the position of each individual with respect to the utilisation of scarce resources.

So, there is nothing inherent in the resource itself that determines absolutely the nature of the property rights. The property nature and the specification of resource use rights are determined by the society members and by the rules and conventions that they choose and establish between them, about the use of the resources. Not by the resource, itself Gibbs and Bromley (1989).

One solution to the impasse over the use of the term "common property" is to distinguish the resource and the regime. This distinction, between the resource itself and the property-rights regime under which it is held, is critically important. In fact, the same resource can be used under more than one regime.

There are different proposals for this definition.
Bromley (1991) suggests 4 possible regimes in the case of natural resources. These regimes are defined by the structure of the rights and duties that characterise individual domains of choice. This definition includes: State property; Common property; Open Access and Private property.
In the case of private property, the individuals have the right to undertake the socially acceptable uses (and only those, which means they have the duty to conserve the resources) and to prevent the use from non-owners.
The state property is a regime where individuals have rules of access and duties to observe about the resource use face to a management agency, which has the right to determine these access / use rules.
In common property case the management group of "co-owners" has the right to exclude non-members and those have a duty to abide this exclusion. In this sense, the "co-owners" manage effectively the resource so they have also rights and duties with respect to the use and conservation of the resources.
In an open access regime, no defined group of users is set. The benefit stream from the resource is available to anyone. The individuals have, at the same time, a privilege and no duties with respect to resource use and conservation.

Surveying several contributions, we can now propose this typology:

Idealised types of property-rights regimes relevant to common property resources [1,2]

Open Access (res nullius)	Free- for-all; use rights are neither exclusive nor transferable; rights to access are common but open access to everyone (therefore no one property).
State Property (res publica)	Ownership, management and control held by a government agency; public resources to which access rights have not been specified
Communal Property (res communes)	Resource use rights are controlled by an identifiable group of co-owners; there exist rules concerning access, who are excluded and how should the resource be used and conserved; community-based resource management system; "true" common-property.

1) The fourth property-rights regime is private property.
2) Based on (Berkes and Farvar ,1989):

This typology leads to a clear distinction between the "true" common property (res communes) and the open access regime (res nullius).
It is important to recognise that, in the first case, the group of "co-owners" is well defined and that a management regime for determining use rates has been established. In this sense, the common property reminds something like "a private property of a group of co-owners". Of course, the autonomy of decisions, especially in the case of transferability of rights, is much more limited than in the case of private property.

The property rights (his common absence or vague stance) are in the core of the problem of natural resources management. Since the seminal paper of Gordon (1954), the central idea is that, in conditions of free access and competition, the market leads to non -optimal solutions in the use of the resources. The open access nature of many natural resources and the presence of externalities in the capture/use lead to market equilibrium solutions that implicate an overexploitation of the resources - "The Tragedy of the Commons", in the words of Hardin – and industries' overcapacity.

Then, the identification of the property regimes is not only a question of describing the attributes of the resource. It's a matter of putting in evidence the institutional structure and the process of decision over resource use (Seabright, 1993). In this sense, the problems of common property resources (res-communes) are much more complex because they involve the contractual relations between the co-owners, but more solvable than the problems carried by open access, at least because of the permanent risk of new-entrants, in this last case.

For the "entrepreneur" and for the public authorities these different situations are critical when thinking about possible projects of investment and the design of natural resources policy. What is important to retain is that open access regime presupposes the non-existence of property-rights over the resources, perfectly defined and controlled. On the contrary, the "true" common property is defined by the impossibility of access by non-owners and the clear definition of use rights among members. This resource-use regime (there are a lot of examples in the world) has been successful in managing the resources over centuries, contrary to the idea of "the tragedy of the commons". It's the open access that "creates" tragedies.

So, despite the usual, undifferentiated use of the term common property, it is useful to clarify the concept. If some resources are identified as common property when there is no institutional basis for regulation, the misunderstood designation can be a barrier to understand public action.

2) THE EMERGENCE OF "ANTICOMMONS TRAGEDIES"

Last decades of the 20th century have shown many problems of commons mismanagement arisen from under-defined property rights.

In the 80s, Michelman introduced another problem, this time, about the excessive fragmentation of property rights. A new concept, "anticommons", was introduced to put in evidence some problems one can see as the mirror image of traditional "Tragedy of the commons". These problems include the under-use of resources and may come from several sources, including bureaucracy.

With this new concept of anticommons, Michelman's purpose was to explain "a type of property in which everyone always has rights respecting the objects in the regime, and no one, consequently, is ever privileged to use any of them except as particularly authorized by others". In this sense, "anticommons" can be seen as a property regime in which multiple owners hold effective rights of exclusion in a scarce resource.

The problem stands in this: coexistence of multiple exclusion rights creates conditions for sub-optimal use of the common resource. The undefined limits for property rights generate several problems that are expressed by the under-use of the resources and loss of value. So, we can become aware of anticommons as producing tragedies seen as the mirror effect of the tragedy of the commons.

When multiple agents have the right to exclude others from the use of a scarce resource and no one of them has an effective privilege to use it, we are in presence of a "tragedy of the anticommons". When several agents may take decisions about how to use a specific resource, jointly hold by all of them, and when one of them may impose his/her own decision to the others, imposing his/her veto power, we are in presence of this kind of anticommons problem.

In this situation, all the agents have to agree about the utilization that they have to give to the resource they hold together. If not, the resource simply may be not used or may be underused.

The "*Tragedy of the anti-commons"* happens when resources remain idle even in the economic region of positive marginal productivity. Acting under conditions of individualistic competition, exclusion rights will be exercised even when the use of the common resource by one party could yield net social benefits.

Buchanan and Yoon (2000) suggested a special view of this problem. The authors stated that the anti-commons construction offers an analytical tool for isolating a central feature of "sometimes disparate institutional structures". This means that the inefficiencies introduced by overlapping and intrusive regulatory bureaucracies may be studied with the help of this conceptualization.

When an entrepreneur seeks to invest in a project and the action is inhibited by the necessity of getting permits from several national and regional agencies, each one holding exclusion rights to the project, we may face the "Tragedy of the Anticommons".

In this context, the possible emergence of a situation of anticommons can create a lot of problems in the development of local initiatives of entrepreneurship, affecting the potential of regional development.

3) THE DESIGN OF NATURAL RESOURCES POLICY: THE PORTUGUESE FISHERIES /AQUACULTURE POLICY CASE

This conceptualization can be used, in operational terms, to reflect about the design of Portuguese Fisheries and Aquaculture Policy:

- In the first case we use the concept of open access to study the problems of cod fisheries in the High Seas and the consequent tragedies arising in the management of straddling stocks.
- In the second case we introduce the possible emergence of an Anti-commons tragedy when we study the difficult process of approval and execution of projects of aquaculture in the Portuguese coastal areas.

3.1) COD FISHERIES. THE MANAGEMENT OF HIGH SEA FISHERIES.

Property rights are, also, in the center of fisheries management difficulties and the problem becomes more complex when fisheries are transboundary by nature.

Extended Fisheries Jurisdiction gave the coastal states property-rights and the potential of a sustainable management of fisheries. However, the general evolution towards more exclusive rights didn't mean the exclusion of open access regimes in international fisheries. The Law of the Sea (1982) doesn't exclude the principle of the "freedom of the seas" which remains in force in the High Sea (besides the limits of 200 miles of Economic Exclusive Zones, EEZs).

One of the most penetrating subjects that emerged as a consequence of this statute was the management of straddling stocks.
Given that the fish are endowed with mobility, it was inevitable that the coastal states, after the establishment of Economic Exclusive Zones, verified that they were sharing some of those resources with neighbouring countries. Many coastal countries also verified that some of the acquired stocks passed the border of EEZ to the High Seas, where they were subject to the exploitation of distant waters fishing fleets from other countries. There is no rigorous typology: we can designate this last category of fishing resources as straddling stocks.

The imprecise definition of use rights in the areas of High Seas adjacent to EEZs (Munro, 2006) generates a lot of difficulties in the management of straddling stocks.
The Portuguese cod fisheries give good examples of this kind of management difficulties (Coelho, 1999, Coelho e Lopes, 1999).

Only in the 90s, Portuguese national fishing fleet lost more than 35% of the tonnage, a third of the fishermen and almost 30% of the production. As the Portuguese population

maintained a high level of fish consumption, the commercial deficit of fish products almost duplicated during the first half of the nineties.

The segment of distant water fisheries, especially of the cod, it is accompanying this crisis in the fisheries sector as a whole. In one decade, from 1976 to 1986, this segment of the Portuguese fisheries had to face two new situations and essential restrictions to the development of fishing activities. To know: the new regime of the 200 miles and the adhesion of Portugal to European Community with the consequent integration in the Common Fisheries Policy.

The cod fisheries segment grew (in the 30s and 40s) in a corporate logic of strong intervention and State protection. It had, underlying, the condition of open access to the resources.
The introduction of the regime of the 200 miles altered the rules of the game deeply, creating new property rights and putting the traditional fishing zones (most of them in the area of Newfoundland) under Canada's jurisdiction.

In the first phase, Portugal tried to cross this restriction through the accomplishment of bilateral agreements that, maintaining substantial quotas, minimized the negative effects of the new economic and juridical context in international fisheries. It was not, however, enough to hide the problems of overcapacity of cod segment and to avoid the current social difficulties of the adjustment process.

With the adhesion to EEC, the situation of the sector became worse. In the origin of this aggravation we can find:

- the transposition of the bilateral agreements for the supra-national management of European Commission;
- the (then) bad (fishing) relationships EEC-Canada;
- overfishing and severe decrease of the cod stocks in the 90s;
- subsidies evil-guided through the Policy of Structures of CFP, reinforcing the problems of over-investment;

- the insecurity in the definition of the Fisheries Policy to proceed, for this segment, on the part of the national public powers.

The perspectives, in the short/medium period, are not smiling. The cod stocks in the Newfoundland area don't show clear signs of recovery. The shares in the NAFO area are insufficient and the scientific information about the stocks in the Northeast Atlantic area (namely the Arcto-Norwegian stock) is also a motive of preoccupation. So, this segment will pass therefore a period of great difficulties, unless someone opens up new perspectives of activities reorientation for new areas and new products.

What is depressing, in this case, is that this segment is the most efficient in the Portuguese fisheries. After a profound downsizing process (from a fleet of long distance fisheries of almost 80 units we are now reduced to no more than a dozen of big vessels) we are still confronted with an overcapacity problem (face to the disposable resources).
Anyway, while the stocks rebuild, and given that the time of the nature is very different from human time, the Public managers cannot stop defining, and executing, social support policies for the affected populations.

So, what can be done?
As we said, the Law of the Sea doesn't exclude the "freedom of the seas"- the High Seas remain with a statute where the regime of Open Access is in force. So, potentially, we are able to find a "Commons Tragedy" in the resources management, besides the 200 miles limits.

And that's what we've been observing.
The problems of "unfinished business" in the New Law of the Sea (UNCLOS, 1982) - particularly,
- the imprecise definition of use rights in the areas of High Seas adjacent to the EEZs,
- and the consequent difficulties in the management of the straddling stocks,

were the origins of a lot of "fish wars", in the 90s.

The proposed solution is the cooperation between interested countries, in the context of a Regional Fisheries Organization (NAFO, in this case).
This answer could be seen as an approach of "Res Communes" type-solution. The members of the organization would agree in the rules of resource use and management. In the sense of Bromley, "property of all, managed by all".
However, note that the question of access (especially the question of the possibility of a new-entrant in the Organization) is still unsolved.

The U. N. Agreement (1995) on Transboundary Stocks and Highly Migratory Species pretended to be this formula of cooperation among interested states. Curiously, in the European Union, USA and Canada it was well received, but in Portugal it was seen with reserves.

Despite some interesting results, this Agreement continues to be the motive of discussion, especially in the context of NAFO. The debate is now turning to the problematic of the enlargement of EEZs and a certain rehabilitation of the juridical and economical statute of the Continental Platform.

Facing the weak results obtained in the recovery of the cod stocks, the leaders of the organizations of fishing of the Newfoundland have been proposing the enlargement of the EEZ to the limit of the 350 miles making it to coincide with the limits of the Continental Platform.

The United Nations recognise that the limit of the 200 miles doesn't make any biological sense. As a matter of fact, the statute of EEZ is much more of functional type. On the contrary, the Continental Platform has a geomorphologic unquestionable existence. The coastal countries consider it an extension of their territory. For some policy makers a new extension of EEZ would be a logical step in the process that took to the establishment of EEZs, recognising that it was not enough to assure the necessary conservation of the stocks. To extend EEZ for the waters above the continental platform would be in

agreement with the rules that govern the bed of the Platform. These rights belong to the coastal State of whose terrestrial mass the Platform is the natural extension.

So, does Portugal have advantages to align in the process of "creeping jurisdiction" so wanted by Canada or Norway?
In the context of Portuguese fisheries, extension of EEZs would have undesirable effects. Portugal would loose fishing opportunities for long distance fleet, without granting additional benefits or resources, given the closeness of our Platform. In the design of Public Policy Fisheries managers should not forget this.

3.2) AQUACULTURE: ENTREPRENEURSHIP AND BUREAUCRACY?

As we said, the "*Tragedy of the Anti-Commons"* happens when resources remain idle even in the economic region of positive marginal productivity.

There are only a few empirical studies on anticommons tragedies in the real world, most of them focusing on pharmaceutics industry.
As suggested by Buchanan and Yoon, the anti-commons construction offers an analytical tool for isolating the problems of bureaucracy. We think that this conceptualization can be used, in operational terms, in the design of the Portuguese aquaculture development program (Filipe, Coelho and Ferreira, 2006).

This paper introduces the possible emergence of an anticommons tragedy when we approach the difficult process of approval and execution of projects of aquaculture in the Portuguese coastal areas. To study this problem, we used the results of the evaluation process of the last Operational Fisheries Program, funded by European Union (POP 2000-2006/ QCA III).
In this context, our research methodology integrated the analysis of:

- the rules of the game,
- norms for differentiation and approval of projects,

- institutions and Administration management circuits,
- performances: indicators of *Physical Execution*, number of projects funded, and *Efficiency Execution*, investment costs level of the projects, time of approval and execution of projects, stakeholders and Management Agency perception on the process.

The central results of the analysis are the following:

First, the Portuguese experience shows that, contrary to the Government expectations, the impacts of investments in the aquaculture sector has been of little relevance and directed just for traditional species.

Investments have not allowed significant productions. This situation is the reflex of:

- the insufficient dimension of economies of scale
- technical and organizational inadequacies of the project promoters,
- the dimension of the environmental issues that are involved,
- the lack of a plan that regulates the coastal areas and that establishes the territories to be used in the aquaculture sector.

The emergence of the "tragedy of the anti-commons", in the sense of Buchanan and Yoon, is a reality. This situation reflects the excessive partition of the property rights and the existence of multiple bureaucratic circuits that create an enormous complexity and administrative slowness of the process of approval and implementation of the projects.

In the aquaculture area, we can see that there are too many entities, to whom it is necessary to require their approval for the project and that all the administrative procedures motivate a situation of delayed global authorization. The stakeholders perception of this process suggest that interesting projects (profitable and "friends of fishing") were not exploited just because there were too many rights to exclude. There

are promoters who want to exploit a resource with important economic, biological and social consequences, but administrative procedures simply make the project “not viable”.

We may also anticipate an important loss of value. In fact, this problem has destroyed value because the presented project has required initial financial resources and there is no created value because project had a delayed approval. The agent who supports the project loses an important period of time to implement it and he loses money because there is a long period without producing. In many situations, projects were not implemented because the favorable and the appropriate time had simply gone.

The Portuguese case suggests that environmental authorities embodied in the approval process have prevented some value reducing development but may have also prevented value-enhancing development. Economists and environmentalists have perhaps concentrated too much attention on the commons side of natural and environmental resources and have neglected the anti-commons side.

The Program evidenced a strong expectation from the private sector but the “impediments” of bureaucratic nature, especially those that result from the necessary environmental impact evaluation, seem to be the source of a set of difficulties that can appear at this level. This requires the Public Authorities to eliminate or minimize the bureaucratic obstacles associated to achievement of this kind of projects.

This debate brings also another interesting issue: neither the motivation of the bureaucratic authorities nor the constraints on their exclusion rights is captured by a simple, one-dimension, theoretic model. Those who are empowered to issue permits may not seek to maximize rents and, perhaps of greater importance, may be authorized to refuse permits only with cause. These agencies cannot, or may not desire to, capture pecuniary gains. So, the allowance for such non-economic motivation on the part of the excluders also suggests that the potential conflict may not be primarily distributional but also reflect different objectives for facility welfare development. The introduction of these institutional issues may enhance the scope of this research.

Finally, these conclusions suggest the following risk evaluation on the design of recent Fisheries Operational Program (2007-2013):

One of the axis in which Program is structured, aims to develop the aquaculture sub-sector of fisheries. This axis corresponds to about 42% of the total cost of the Program. So, it can be seen as one the most important objectives of the Portuguese Fisheries Policy. The proposed investment in aquaculture and in the sub-sector of transformation and trade of fisheries products stands about 165 million Euros. It is treated as a bulky investment that underlines the proactive nature of this axis in the global context of the Program.

At the same time, be noticed that in this axis the participation of the private initiative is foreseen as a very important involvement in the plan investments of the Program and it represents about 70% of the total private investment in the fisheries.

Obviously that we do not doubt about the opportunity and relevance of these objectives. However, we should notice that these objectives, especially at the level of the aquaculture development, involve significant risks:

- The experience has been demonstrating that the involved companies don't have the dimension, the economies of scale and the technical and organizational capacities to be involved in these projects;

- These developments involve an additional risk, larger periods of return of the investment and an additional competition in this area, particularly from the productions of the countries in the South of Europe.

- The Program evidences a strong expectation on the private sector. However, the financial participation of the Fisheries European Fund is lower than the usual rates of co-participation.

- This last problem gets a major dimension because of the “tragedy of the anti-commons”. The “impediments” of bureaucratic nature, especially those that result

from the necessary environmental impact evaluation, will be a strong obstacle to the Program execution.

CONCLUSIONS

The property rights are in the core of the problem of natural resources management. The central idea is that, in conditions of free access and competition, the market leads to non - optimal solutions in the use of the resources. Open access and the presence of externalities lead to market equilibrium solutions that implicate an overexploitation of the resources[1].

This idea of "Commons tragedy" is fundamental but, at the same time, is the root of a lot of confusions. In the literature, it would be difficult to find a concept as misunderstood as commons.
Ambiguous concepts blur analytical and policy prescription clarity. So, to rectify this confusion we must establish an adequate conceptualisation.

There is nothing inherent in the resource itself that determines absolutely the nature of the property rights. The property nature and the specification of resource use rights are determined by the society members and by the rules they choose and establish between them, about the use of the resources. Not by the resource, itself.

The distinction, between the resource itself and the property-rights regime under which it is held, is critically important for the design of natural resources public policy.

[1] Or under-use, in the mirror effect case of the "anti-commons".

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