



Entrepreneurship, Innovation and Bureaucracy the  
Possible Emergence of an "anti-Commons  
Tragedy" in Portuguese Aquaculture Sector

---

Manuel Coelho, Manuel Ferreira and José António Filipe

EasyChair preprints are intended for rapid dissemination of research results and are integrated with the rest of EasyChair.

August 26, 2024

# Entrepreneurship, Innovation and Bureaucracy

## The Possible Emergence of an “Anti- commons Tragedy” in Portuguese Aquaculture Sector

Manuel Coelho<sup>1</sup>; Manuel Alberto M. Ferreira<sup>2</sup>; José António Filipe<sup>3</sup>

<sup>1</sup>coelho@iseg.ulisboa.pt

<sup>2</sup>manuel.ferreira@iscte-iul.pt

<sup>3</sup>jose.filipe@iscte-iul.pt

### **Abstract**

Last decades of the 20th century have shown many problems arisen from the emergence of commons mismanagement and under-defined property rights (The “Tragedy of the Commons”, cf. Hardin, 1968), affecting, especially, the design of environmental and natural resources management policy.

In the 80s, Michelman introduced another problem, this time about the excessive fragmentation of property rights. A new concept, “anti-commons”, was 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.

Michelman introduced the concept of “anti-commons” 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, “anti-commons” is 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 suboptimal use of the common resource. 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 his 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 anti-commons can create a lot of problems in the development of local initiatives of entrepreneurship, affecting the potential of innovation and of regional development.

There are only a few empirical studies on anti-commons tragedies in the real world, most of them focusing on pharmaceuticals industry. The *main purpose of this paper* is to use this conceptualization to study the design and execution of aquaculture policy in Portugal and to introduce the possible emergence of an “anti-commons tragedy” when we approach the difficult process of approval and execution of projects of aquaculture in the Portuguese coastal areas. Our results are consistent with the suggestion of Buchanan and Yoon (2000).

*Keywords:* Anti-commons, Bureaucracy, Coastal Development, Aquaculture

*Overall Theme:* Entrepreneurship and Innovation Networks

## **Introduction**

Last decades of the 20th century have shown many problems arisen from the emergence of commons mismanagement and under-defined property rights. It's the “Tragedy of the Commons” (Hardin, 1968), affecting the design of environmental and natural resources management policy.

In the 80s, Michelman introduced another problem, this time about the excessive fragmentation of property rights. A new concept, “anti-commons”, is 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.

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

The *main purpose of this paper* is to use this conceptualization to study the design and execution of aquaculture policy in Portugal and to introduce the possible emergence of an “anti-commons tragedy” when we approach the difficult process of approval and execution of projects of aquaculture in the Portuguese coastal areas.

The paper is made of 5 points. In the first point we discuss the concept of *commons* and its relevance for the design of public policy. In the second we introduce the celebrated metaphor of the “Tragedy of the Commons” and discuss the consequent mismanagement of fisheries resources in an open access property rights regime. In the third and fourth point we study the emergence of another interesting conceptualization – “*anti-commons*” and propose its use to explain the under use in Portuguese aquaculture case. The emergence of such an “Anticommons Tragedy” is explained in the fifth point which introduces an analysis of bureaucratic circuits in the Portuguese aquaculture business. In this context, we critically review the actual development plan of Portuguese aquaculture – sixth point.

## 1. On Commons

“Therein the tragedy (...). Ruin is the destination toward 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)

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

The problem started 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) in the cited metaphor of the “Tragedy of the Commons”.

Some academics use the term common property and open access interchangeably. 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, 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.

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 everyone 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. 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. The common property is the case where 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. By the contrary, 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.

## 2. Open Access and Tragedies

Surveying several contributions we can propose this typology, based on Berkes and Farvar (1989), of idealised types of property-rights regimes relevant to common property resources:

|   |
|---|
| <p><i>Open Access (res nullius):</i><br/>Free-for-all; use rights are neither exclusive nor transferable; rights to access are common but open access to everyone (therefore no one property).</p>  |
| <p><i>State Property (res publica):</i><br/>Ownership, management and control held by a government agency; public resources to which access rights have not been specified</p>  |
| <p><i>Communal Property (res communes):</i><br/>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.</p> |

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”.

It’s in the second case that we find the celebrated metaphor of the Tragedy. Property rights are in the core of the problem of natural resources management. Since the seminal paper of Gordon (1954), the central idea in Fisheries Economics 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 fisheries and the presence of externalities in the process of capture lead to market equilibrium solutions that imply the overexploitation of the resources and industries’ overcapacity. That what we call the “Tragedy of the Commons”, and we must note, this is a result of the open access situation.

The identification of the property regimes is, then, 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). For the “entrepreneur” and for the public authorities all those 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.

The problem stands not in the “common” use or management. In the case of the “true” common property, the property regime 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; Nobel Prize Prof. Elinor Ostrom gave us a lot of interesting studies in this field) 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 current, 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.

### **3. The Emergence of Anticommons**

Last decades of the 20th century have shown many problems of commons mismanagement arisen from under-defined property rights. But, in the 80s, Michelman introduced another problem, this time, about the excessive fragmentation of property rights. A new concept, “anti-commons”, 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 “anti-commons”, the purpose of Michelman 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, “anti-commons” 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 anti-commons as producing other tragedies, something like a mirror effect of “Commons tragedies”. 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 anti-commons”. 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 anti-commons 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.

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 anti-commons can create a lot of problems in the development of local initiatives of entrepreneurship, affecting innovation and the potential of regional/coastal development.

#### **4. Anti-commons Conceptualization and the Portuguese Aquaculture Case**

There are only a few empirical studies on anti-commons tragedies in the real world, most of them focusing on pharmaceuticals 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. In this context, our research introduces the possible emergence of an anti-commons 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). Our research methodology integrated the analysis of:

- the rules of the game,
- norms for differentiation and approval of projects,
- institutions and Administration management circuits,
- performance indicators of *Physical Execution* (number of projects funded) and *Efficiency Execution* (investment costs of the projects); time of approval and execution of projects; stakeholders’ and Management Agency perception on the process.

The central results of the analysis were 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 and the 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.

Second, the emergence of the problem of the “tragedy of the anti-commons” is a reality, in the sense of Buchanan and Yoon. These results reflect the excessive partition of the property rights and the existence of multiple bureaucratic circuits. In the aquaculture segment, we can see that there are too many entities, and it is necessary to require their approval for the project. All the administrative procedures motivate a situation of delayed global authorization. The stakeholders’ perception of this process suggests that interesting projects 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”.

Third, 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.

## **5. Legal Procedures, Entrepreneurship and Bureaucracy**

The purpose of this point is to make an analysis of the complex procedure scheme of approval and implementation of projects, just to have an idea about the possible roots of anti-commons tragedies in this sector.

Aquaculture is fitted under the control and supervision of Ministério da Agricultura, Desenvolvimento Rural e Pescas – Agriculture and Fisheries Ministry (See Regulation: Dec. Regul. n° 14/2000 – September 2000). The Decree specifies the requisites and conditions needed to install and exploit a plant on this area. The Dec. Regul. n° 9/2008 (March 2008) defines, also, a set of rules specifically for installations offshore. The responsible Agency for Aquaculture is DGPA (Direcção Geral das Pescas e Aquicultura), which is responsible for supervising and controlling the activity of aquaculture sector.

The initial steps for a project approval are (D.R. n° 14/2000):

1. Request to DGPA;
2. The request must have the following elements attached (Art 10° - n° 3):
  - a. Copy of ID card of the requester.
  - b. Authorization to use the aquatic domain, issued by the competent authority.
  - c. Property documents for the land.
  - d. Technical description of the productive process.
  - e. Topographic plant of the local (1:25000).
  - f. Design layout of the facilities (1:5000).
  - g. Detailed project of the infra structures, at 1:200.
  - h. Coordinates of the area referred to a central country reference point.
  - i. Plant and detail drawings of the infra structures at 1:50 or 1:100.
  - j. Sea sign project, depending on the type of installation.

The competent authority for this specific kind of activity is named Administração da Região Hidrográfica and has a huge power, demands an aquatic tax and controls all the activities within 500 m from the cost line.

This decree refers that (art. 12°) whenever the site is located on an area under maritime jurisdiction, DGPA along with ‘Capitania do Porto’ (Port Captain Administration), promotes the following two actions within the next 30 days after having received the whole process:

- a. Writes an edict with the authorization request, which must be visible for 30 days on a few legal buildings, so that third parts can claim against the request.
- b. Call the survey committee.

If there are reactions against the project, it may be enough to block the project.



Art. 10° - nº 7 states that the project referred on j) of the number 3, is sent by DGPA to the Captain of the Port of the area, with the objective of emitting a binding opinion, within 60 days, after consulting the Instituto Hidrográfico and the Direcção de Faróis (Lighthouse Direction).

The process is sent now by DGPA to each of the 10 entities involved in the survey that are described in the 13<sup>th</sup> article –see art 11° - nº 4.

This part of the process may have already consumed 2 to 3 months.

The referred entities that compose the survey committee are the following:

- a. ‘Capitão do Porto’ (Port Captain) or another officer who may replace him.
- b. DGPA representation.
- c. IPIMAR representation.
- d. Maritime Public Domain, representation.
- e. ICN (Institute of Nature Conservation) representative (today ICNB).
- f. DRA representation (Direcção Regional do Ambiente - Regional Department of Environment).
- g. Instituto Português de Arqueologia representation.
- h. Direcção Geral de Veterinária.
- i. Direcção Geral de Saúde.
- j. Municipalities’ representatives (all involved areas).

Gathering all these representatives on a certain date is quite difficult. The committee only works with the presence of most of its members.

There are at least 3 members of this committee whose starting point is usually against:

- a. Capitão do Porto, because he predicts more work and trouble in the future if the project is installed.
- b. Maritime public domain representative, for the same reason.
- c. ICN because they are always against everything in advance.

All the other members do not even care about the subject and their participation is not pleasant at all for them.

The survey has to be scheduled within the next 30 days after the end of the edict term (art 14°). The result of the survey is considered favourable just if the whole committee members agree (art 15°).

DGPA informs the requester about the result of the survey within the next 30 days. If the result is favourable under restrictions the requester has 30 days to correct the project according to these restrictions (art 16°).

So, the edict is usually published 2 or 3 months after the request demand. It has to be published for 30 days before the survey is set up and the scheduled date for the survey may still take 30 days more to be set. All this may have taken more than 5 months.

This shows how “disparate institutional structures” may lead to an irrational ending. Of course, all these steps and difficulties are major obstacles to innovation and put the entrepreneur, especially the one who wants to develop a small business in an uncomfortable position. A significant loss of value may result with this process. This leads to a problem of value destruction because financial resources are required for the project but no value is created due to the delay on the approval. The authorities involved in the approval process (environmental, territorial, health, etc) have prevented some value-reducing development but also value-enhancing development.

## **6. Risk Evaluation of Aquaculture Portuguese Development Plan**

The analysis suggests the following risk evaluation on the design of recent Fisheries Operational Program (2007-2013):

One of the axes, in which the 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 of 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.

### **Final Remark**

Fisheries and aquaculture policy persist as a fundamental area of biologists' intervention, in Portugal, as in other countries with fisheries tradition.

Step by step, the economists are becoming more and more listened in the definition of the guidelines and in the execution of fisheries and aquaculture development programs. In a certain way, the so-called “tragedy of the commons” and the visibility of its effects, overexploitation and overcapacity, were extremely important for this new attitude. Facing the potential of Fisheries Economics in the explanation of the sector problems and in the introduction of proposals to obviate them, fisheries administrations opened the doors to economists' participation.

Now, it seems that also the economists must look at this new conceptualization of “anti-commons tragedy” with a special attention. If we want to fundament cases of under-use, as it seems to be the case of Portuguese aquaculture, this may be another “door of opportunity”. And may also, be relevant in terms of developing new practical indications and proposals for entrepreneurs and public powers.

## **Bibliography**

BROMLEY, D. (1991), "Testing for Common Versus Private Property: Comment", *Journal of Environmental Economics and Management*, Vol. 21, Nº 1, pp 92-96.

BUCHANAN and YOON (2000), "Symmetric Tragedies: Commons and Anticommons", *Journal of Law and Economics*, Vol.43, nº1, pp1-13.

DEMSETZ, H. (1967), "Toward a Theory of Property Rights", *American Economic Review*, Vol.57, pp 347-359.

FILIFE J., COELHO, M., FERREIRA, M. and PEDRO, M. (2008), "Anti-Commons: How tragedies happen; some cases and the evidences on Fisheries", *China–USA Business Review*, Vol.7, Nº11, pp.9-1.

FILIFE J. , COELHO, M. and FERREIRA, M. (2006), "A Tragédia dos AntiComuns: um novo problema na gestão da pesca?", ISEG/UTL, Seminário do Departamento de economia, WP nº15/2006.

FILIFE J. , COELHO, M. and FERREIRA, M. (2007), *O Drama dos Recursos Comuns. À procura de Soluções para os Ecossistemas em Perigo*, Sílabo Editora, Lisboa.

FURUBOTN, E. e PEJOVICH, S. (1972), "Property Rights and Economic Theory: A Survey of Recent Literature", *Journal of Economic Literature*, Vol. 10, Nº 4, pp 1137-1162.

GORDON, H. S. (1954), "The Economic Theory of a Common Property Resource: The Fishery", *Journal of Political Economy*, Vol. 62, pp 124-142.

HARDIN, G. (1968), "The Tragedy of the Commons", *Science*, Vol. 162, pp 1243-1247.

HELLER, M. (1998), "The tragedy of the anticommons: property in the transition from Marx to markets", *Harvard Law Review*, 111.

HELLER, M. (2008), *The Gridlock Economy*, Basic Books, New York.

MICHELMAN, F. I. (1982), Ethics, economics and the law of property, in J. R. Pennock and J. W. Chapman, eds. *Nomos XXIV: Ethics, Economics and the Law*, New York University Press, New York.

SCHLAGER, E. e OSTROM, E. (1992), "Property-Rights Regimes and Natural Resources: A Conceptual Analysis", *Land Economics*, Vol. 68, Nº 3, pp 249-262.

SEABRIGHT, P. (1993), "Managing Local Commons: Theoretical Issues in Incentive Design", *Journal of Economic Perspectives*, Vol. 7, Nº 4, pp 113-134.