



Economics in policy-making 10

Property rights and ownership models

Different ownership models for natural resources determine how they are used as well as the outcomes that result from their use. This briefing looks at the how property rights have developed through history, how they have been enforced – and what issues these different ownership models pose for nature.

Property is fundamental

Property rights are central to the way that market economies work. Without clear and enforceable rights to property, and the freedom to sell these rights to somebody else, a market cannot function. Imagine if all your property could be arbitrarily taken away at any time? Because owning something would not actually guarantee you the rights to use that thing, it would be impossible to trade ownership securely or establish acceptable market prices for things.

Property rights are enforced, almost universally, by the state, which claims a 'monopoly on violence' over its territory: if anybody other than the state steals or abuses property rights, they risk being punished by state forces such as the police or military.

A state also finances itself by enforcing tax payments – a form of property confiscation, but one that is generally (in most liberal democracies) subject to some system of checks and balances that prevents its misuse.

Property throughout history

Although it is common to think of property as being 'private' (i.e. held by a given individual or institution) this is not always the case today, and was not always so in the past.

The concept of property evolved alongside civilisation, as small, hunter-gatherer societies moved to stable encampments and took up early agriculture. Along with private property, various other forms of common or general ownership developed. In ancient Babylon, for instance, 'Hammurabi's Code' stipulated that all land was originally owned by 'Marduk', the patron god of the city – who had allowed his vice-regent, the King, to oversee the fair use and exchange of land by his citizens. Likewise, land in the Ottoman Empire was owned exclusively by the state, but leased out for use by others.

'Commons' of various kinds – from grazing rights in fields to the use of rivers for fishing – also emerged, regulated often by convention and enforced by agents other than the state. Much agricultural land in Western Europe, prior to the enclosure movements, was held in common.

In some cases, the state has actually acted to *prevent* property rights being enforced, most obviously with the steady outlawing of slavery.

Although the tendency over time has been for property regimes to expand, reducing the number of things without owners, many important features of economic life remain exempt. Ideas (outside of the intellectual property regime), air and seawater are three obvious examples. In these cases, enforcement of property rights would be prohibitively expensive.

Enforcing property rights

Enforcing property rights is not always simple. Take intellectual property, for instance. Ideas and knowledge inside people's heads are, for obvious reasons, outside of property law. Yet, once these same ideas have been turned into physical things – such as writing, design plans, computer codes, or finished products – we can officially own them and claim property rights over them.

We can protect ideas (in their material form) through patenting, which provides a legal monopoly on an idea's use. Patents encourage innovation because once innovators are sure their idea won't be stolen and exploited by someone else, they are more willing to spend time and money developing it.

Copyright, in a similar way, protects the use of cultural ideas (such as art, music and literature), as well as sensitive or commercial information (such as Coca-Cola's recipe). Like patenting, it enforces a kind of legal monopoly over the reproduction of copyrighted material.

These forms of intellectual property are all subject to increasingly complex systems of legal regulations – which can often lead to lengthy court cases over their use.

Changes in technology pose huge challenges to the intellectual property regime: pirating a film, for example, used to be difficult, time-consuming and involve a loss of quality. Now, digital encoding makes it cheap and easy to reproduce huge volumes of recorded information.

Private property failures

Aside from the practical challenges surrounding its enforcement, there are clear theoretical problems with the property rights system. Conventional economic theory associates these with 'non-rival consumption', access rights, and the unintended side-effects of use.

Non-rival consumption

"Non-rival consumption" refers to the capacity of some goods to not be depleted through use. Ideas are, again, an obvious example, as they can be reproduced perfectly in perpetuity. Other examples might include the provision of lighthouses or free-to-broadcast radio transmissions. In all three cases, since additional consumers of the commodity have no impact on the availability of the commodity, enforcing private property rights does not guarantee a fair or efficient use. For that to occur, the commodity must be consumed as it is used, enabling the supply and demand price mechanism to function. If it does not, the commodity will almost certainly be under-supplied by the market alone.

Access Rights

"Access rights" refers to the ability of the property owner to regulate access and use of the property. Fences, walls and doors are one way to do this with land and buildings, and can be legally reinforced. But at least

some things are extremely hard to prevent access to. The road network is one example, since it is too huge to police; another is open seawater. In both cases whilst it would be at least theoretically possible to restrict access, in practice the immensely high costs of enforcement generally prevent anyone from attempting to do so. In economic models, such resources are often termed "public goods". (These are not to be confused with the moral concept of "the public good")

Because of the impossibility of restricting access to public goods, their use may become economically excessive. The sea becoming overfished, for instance, is a classic example of the "tragedy of the commons" in which free access leads to excessive consumption. A single fisher does not intend to deprive others of a livelihood, but the effect of their fishing activities is to reduce the number of healthy, breeding fish in the sea, which in turn contributes to a steady depletion of stocks over time. In other words, the action of fishing has an externality – an unpaid cost that is paid for by others. Positive externalities sometimes exist, too: a lighthouse may be paid for by taxpayers in one country, but sailors from other nations would also benefit.

Different allocation mechanisms

In all the cases above, a private property regime may not be the best way of sharing out resources, due to the difficulty of enforcing meaningful property rights. As environmental issues very often have this feature, private ownership models might not be the most suitable way to deliver environmental sustainability or social justice.

There is, however, a classic argument in favour of granting property rights on public goods called the 'Coase Theorem'. This supports trying to impose at least some kind of property rights system over public goods, in order to allow users to trade their rights. Even if such property rights were imperfectly enforced, Coase Theory maintains they would lead to a socially more optimal outcome than would otherwise occur. The Theorem provided the theoretical rationale for the introduction of carbon trading, in which a public good (the earth's atmosphere) was subject to a trading regime. It is so far unclear if the attempt has been successful, however.

Activists and academics have begun to return to the issue of property rights and their allocation, seeking to break out of the old duality between private and state property.

Elinor Ostrom, winner of the 2009 Nobel Prize in economics, stressed the need for a diversity of property forms and governance structures in managing the use of environmental resources. By placing management as close as possible to use (i.e. local management), and allowing a range of different property forms, the complexity of issues generally involved in environmental questions can be reconciled. Ostrom stressed the importance of convention and tradition in containing knowledge about fair and sustainable use that could be lost through the imposition of a more formal property regime.

CASE STUDIES

The briefing provided the basic theory and outlined some of the key considerations when thinking about property rights and ownership models. The following case study ensures that what has been presented is relevant to the marine environment. This case study examines two examples of how ownership has been used to manage fisheries: catch shares and common ownership.

Property rights: Why are they relevant to the marine environment and fisheries?

You may have asked yourself how and why property rights are relevant to your work in marine conservation, fisheries, Marine Protected Areas (MPAs), etc. It's a good question, but as the briefing states: 'property is fundamental'. This is true in fisheries as well, and for this reason, two approaches for managing fisheries are presented: one takes what is known as a 'market-based approach', whereby the 'right to fish', or quota, or access to fishing grounds becomes an individual's (or a company's or community's) property, the other focusses on 'common ownership'.

Fisheries around the world have a dizzying array of management structures. Generally, as already outlined, these fall into private, public, or community cooperatives. In some cases, this has led to sustainable use of resources, allocated by public bodies (or government by proxy), rather than market-based mechanisms. In other cases, such as the EU, public management has failed to reverse the decline in fish stocks.

There are a number of positions that could be taken with regard to the right to fish. Consider two extreme positions. One is that the right to fish lies with the catcher. Those who have been engaged in catching have built a historical tradition of

rights and an expectation of future rights, and this constitutes their claim for rights. That is, it lies with the commoners who make use of the commons. The other is that the biomass and the right to harvest it lies with the nation or the Crown, and the sea is regarded as a national asset, or belonging to whichever nations share access to it. Both are extreme positions. However they hint at two alternative ways of managing the asset; by the commoners (fishermen) for the commoners, and by the nation for the nation.¹

The fundamental split is whether individuals or the state should own the rights. For 'public goods' (as described in the briefing) there are further necessary distinctions (Table 1).

Table 2,² shows the main types of allocation mechanisms (property rights) in fisheries, how they are allocated, and whether or not they are transferrable (essentially 'tradable').

The examples used as case studies are: ITQs (Individual Transferrable Quotas) in Denmark and 'co-managing the commons' (cooperative) in Alaska. Similar examples of each can be found all over the world, where some have succeeded and some have failed, which highlights the importance of choosing a locally relevant, adaptive approach to managing fisheries.

Table 1. A comparison of the features of public and open access goods

1. Public goods (non-rival and non-excludable)

Public goods provided by nature

e.g. Solar radiation, the northern gulf stream, those goods which are totally abundant, used by everyone and non-exploitable.

Public goods provided by the state

e.g. the road network, political institutions, street lighting.

Goods with this characteristic should be ruled through a state monopoly, because every other form of enforcement is insufficient.

2. Open-access goods or 'common pool resources' (rival and non-excludable)

Many goods that were formerly perceived as being public goods provided by nature, and thus non-rival and non-excludable, are actually not.

Through environmental degradation they are getting increasingly rivalrous, while still being non-excludable, because no ownership system is in place for them (fish stocks, forests...).

Impure public goods: e.g. a hospital, only works if demand for it is low.

Table 2. Ownership models for fishing quota

Type	Allocated to	Transferable
Individual Quota (IQ)	Individual	No
Transferable Quota (ITQ)	Individual	Yes
Individual Vessel Quota (IVQ)	Vessel	Sometimes
Cooperative ³	Group	Sometimes
Community Fishing Quota (CFQ)	Community	Sometimes
Territorial Use Rights for Fishing (TURF)	Individual, Group or Community	Sometimes

Case study 1: The private property approach to fishing – ‘Catch Shares’

Markets are a powerful force – for good or ill. They can enable great prosperity for millions and huge advances in technology -but, when markets do not account for the true costs of pollution or overuse, they can fuel environmental degradation.³

Some general principles: What is a catch share?

A catch share programme allocates a secure privilege to harvest a specified amount of a fishery’s total catch to an individual or group (groups can be community-based). Under a catch share programme, managers establish a fishery-wide catch limit; assign portions of the catch, or shares, to participants; and hold participants directly accountable to stay within the catch limit.

What are the main points of this approach?

- The main aim is deregulation.
- Catch limits are set.
- The limited catch is shared among fishermen.
- Shares can be held by individuals, communities or associations.
- It give responsibility to the users.
- It gives them the freedom to fish when and how they want.
- They must, however, stay within agreed limits.
- They can be more profitable as a result.

Catch shares are fundamentally different from other management approaches and have generally been implemented after a variety of other approaches have failed. Most commercial fisheries start as open access (where anyone who puts in the effort is allowed to catch fish). As competition increases, managers often limit access through licensing participants. When licenses do not effectively control the fishing effort and catches, managers implement more and more effort-based regulations to control catches. By allocating participants a secure share of the catch (i.e. giving a right or an entitlement to a share of the catch), catch share programmes can provide participants with a long-term stake in the fishery and link their current behaviour to future outcomes.

This security is thought to provide a ‘stewardship incentive’ for fishermen who previously were too uncertain to change their behaviour towards long-term conservation. Catch share programmes align the business interests of fishermen with the long-term sustainability of the stock, and they provide more stability and predictability within a fishing year and over time.⁴

Catch shares in practice: ITQs (Individual Transferrable Quotas) in Danish pelagic and demersal ITQ programs⁵

The Danish Pelagic and Demersal Individual Transferable Quota (ITQ) programmes include quota set-asides for small vessels and new entrants; fishpools, which promote cooperation and coordination among participants; and programmes to reduce discards. Denmark's catch share programmes demonstrate how innovative design features can be used to promote social goals within a system introduced for economic and biological reasons.

Synopsis

In 2003, the Danish government introduced an ITQ programme for the Danish herring fishery. In 2007, the system was extended to cover additional pelagic species including mackerel, horse mackerel, sprat, pout, sandeel, and blue whiting. At the same time, managers introduced an ITQ programme for Danish demersal fisheries.

In 2009, there were over 2800 Danish commercial fishing vessels and in 2007 over 2500 people were employed in fish harvesting.⁶ The pelagic and demersal fisheries consist of a variety of vessels, most of which fish in many locations and use multiple gear types. In 2007, the value of Danish landings was over \$450 million, 90 per cent of which were under catch share programs (55 per cent in the ITQ-Pelagic programme and 35 per cent in ITQ-Demersal Program).⁷

So, good design and implementation are critical for catch shares to succeed

Different fisheries can have varying goals. For example, one fishery may want to maximise profits while another may want to preserve the current owner-operator fleet structure. Catch shares can be designed to help incorporate and balance these various goals. ITQs have been implemented in many countries, including Australia, Canada, Iceland, Namibia, and New Zealand. Judged in terms of stock sustainability, a number of these have been highly successful. In these cases, their success is owed largely to the elimination of perverse economic incentives, such as the 'race to fish'. On the other hand, they come with their share of criticism, particularly around equity issues of transferring valuable public assets to the private sector, typically for free and in perpetuity (as well as intra-industry inequity due to the concentration of fishing rights).

Private ownership (e.g. catch shares) and common ownership (presented next), are two contrasting models when it comes to how they approach the concept of property rights.

As you learned from the briefing on market failures and regulation, externalities such as pollution or overfishing actually cause a massive amount of damage now and for future generations, but are not included in the price. This systemic problem with the current economic approach has brought fish stocks to a critical situation. For this reason, taking the 'free-market approach' even further as a solution has produced some criticism.

Case study 2: The cooperative or 'common ownership' approach: Co-management and reclaiming the commons – some lessons from Alaska⁸

In this case, the rights, quotas, or fishing grounds are held in common ownership, by associations, community groups, and groups of fishers. This can be done as co-management with local or national government, with NGOs, or with other stakeholder groups.

Before Alaska became a state in 1959 the region's salmon was managed by the US federal government and harvest levels were suffering as a consequence of this distant management. In 1938, harvest levels approached 120 million fish. Within 20 years the harvest had declined to only 20 million fish. This resource, which was so critical to coastal communities, was eroding rapidly and this was a key driver in Alaska's movement for becoming a US state. Regional self-governance

could be strengthened as could control of local and regional resources. But the decline continued.

Pressures on the habitat, too many boats (overcapacity), conflicts, inequality between different gear types, and different harvesting methods were all contributing to the decline. The complexity was hampering sustainable management of the salmon fishery.

This crisis led to the decision to:

- limit the entry of new fishing vessels to the fleet
- invest in rebuilding wild salmon stock
- build salmon hatcheries

CASE STUDIES

- improve stock enhancement
- design an approach for 'ocean ranching'

Private ocean ranching (Box 1) had already been trialled in Oregon further down the west coast of the USA. This private model was being rolled out around the coastal USA from the 1970s onwards. 'Hatcheries' are one of the most critical assets when it comes to ocean ranching. The fear was that multinational companies would control that vital aspect of their fishery and therefore control their future. The local fishermen resisted this private interest. As far as they were concerned the commons were not for sale, privatisation was not the solution; a non-profit corporation governed by all stakeholders in the region (and fishery) should manage it.

The fisher's demands were listened to in full and understood by the government. In 1976 Regional Aquaculture Associations (RAA) were established. Fishers from five regions automatically became members of the local RAA. These RAAs provided direct social and economic benefits as well as control over management. This community control is an essential feature of the approach. Financially these RAAs were designed to be self-financing and sustainable – the system set-up is one which is mutually beneficial and collaborative rather than market based, i.e. your share (entitlement) is not up for sale. This multistakeholder partnership between the state and local people and resource users (both business and community) is a very different set-up from privately owned ranching facilities.

The results have been transformative. Two hundred million salmon were harvested in the late 1990s, an increase of 80 million compared to the 1930s. Through carefully managing ecological risks, the breakdown of wild vs. ranched stock is 65:35 per cent, and most importantly in terms of the ownership of the resource, 70 per cent of the harvest is designated 'common property'.

This case study from Alaska provides an example of co-management which is now widespread in both fisheries management and marine protected area (MPA) management, which should enhance benefits (both social and economic) for fishers and other users. The target of the one Regional Aquaculture Association (The 'NS'RAA) plan was to ensure that 85 per cent of the harvest is common property. This plan was met (overall, all the RAAs have achieved 70 per cent common property of the harvest). Traditional conflicts between gear users have been reduced radically by applying innovative management measures and techniques which have been designed and agreed on by all the fishers active in the region.

Looking at the NSRAA (one of the regional associations), for example, the results are striking:

- They had paid off their \$5 million capital by 1980.
- The 70 per cent common harvest aim had been exceeded and the common property part of the harvest regularly reaches 80 to 85 per cent of the landings / harvest.
- Annual operating costs and some capital improvements (investments in the hatchery) are covered by the RAA 'cost- recovery harvests'.
- Since the year 2000, the NSRAA has had \$1.5 million set aside as capital reserves which can be used whenever it is needed to improve, repair, and enhance their hatchery and livelihood.
- The association employs 23 full-time staff and between 20 to 30 seasonal and part-time staff. Positions include biologists, engineers, tagging supervisors, and general maintenance staff / labourers. There are also administrative, accounting, and shipping positions.
- The self-imposed tax of \$22 million between 1980 and 2000 ensured the equity and working capital needed to produce an increased harvest yield of \$122 million.
- The association has developed an organisation culture driven by the goal of meeting the needs of fishers and communities.

CASE STUDIES

Comparison and food for thought

Some fishermen operating under an ITQ or under public management do not have to take account of their activity's 'externalities', such as biodiversity loss and climate change, or indeed the sentimental (or 'existence') value that fish and a healthy marine environment have for people (briefing 3). This could increase exponentially as stocks become scarcer. It remains a theoretical possibility that private owners could even drive the stock to extinction if there is no scientific cap (a total allowable catch (TAC) for example).

Public owners, on the other hand, must consider the wider impacts because they are not external to the public's welfare. Given that true ownership must remain with the public, access criteria must be implemented

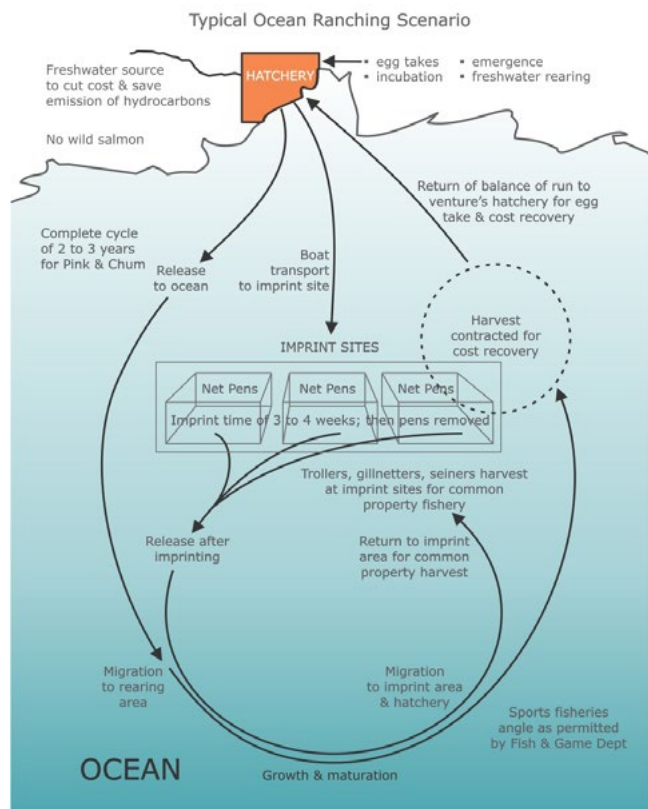
in both public and private management schemes. The use of the market to allocate quota does not mean other regulations cannot be enforced; for example a 'social and environmental licence' to ensure best practice, could be instigated.

Currently, neither the European Union (EU) nor its member states place any conditions on fishermen to deliver social and environmental benefits to society, in spite of the public ownership of the resource. Without these, the process of allocating quotas – essentially giving permission to exploit a commonly owned resource – is blind to virtually all of the impacts of fisheries and risks the future health of marine resources and the fishing industry.

BOX 1: What is 'Ocean ranching'

Ocean ranching involves the release and recapture of fish from hatcheries such as then one shown on the right, into ocean waters. Eggs are taken from the salmon brood stock and reared until they are of a suitable size to be released.

During the rearing period they are kept in a hatchery located near the mouth of a river. Once the offspring are large enough they are put in net pens located offshore in an area which avoids migrating wild stocks. Around a month in the net pen is enough from the young salmon to 'imprint' and so they return to the precise point they were released. Once they return they can be easily caught, reducing the costs and effort of 'hunting' the fish. But the key question is not *how* to ranch, but *who* will benefit from it?



Endnotes

- 1 Defra. (2008). *The economic benefits of fisheries management: regulatory design for stock recovery, equity and an efficient fleet*. Retrieval from http://www.vivideconomics.com/uploads/reports/economic-benefits-of-fisheries-management/Vivid_Econ_Fisheries_Management.pdf
- 2 EDF. (no date). Restoring fisheries and saving lives. Retrieval from <http://www.edf.org/oceans/catch-shares>
- 3 *Ibid.*
- 4 *Ibid.*
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- 6 Danish Directorate of Fisheries, 2009
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- 8 Conaty, P. and Lewis, M. (2012). *The Resilience Imperative: Cooperative Transitions to a Steady-state Economy*. Gabriola Island, BC, Canada: New Society Publishers.

Further reading and useful resources

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