# CITIZEN OWNERSHIP OF THE GLOBAL COMMONS: AN EXPLORATION OF HOW THIS MODEL COULD BE APPLIED TO HELP US SOLVE GLOBAL ENVIRONMENTAL PROBLEMS

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*The paper explores the concept of citizen ownership of the global commons and focuses on specific property rights and management regimes that could be used in order to effectively address the issues of pollution and overuse that impact many of the global commons. There are four major parts to this paper: The first section provides an overview of the theoretical framework that addresses the topic of global commons and sets the stage for the analysis in the following chapters. The second part introduces the reader to the concept of citizen ownership of the global commons and how this concept could work. The third and the forth sections provide an in-depth analysis and assessment of the Sky Trust model developed by Peter Barnes in his book "Who owns the Sky". The focus is on emphasizing how this model reflects the idea of citizen ownership and how it advances the goal of resource conservation. The last section consists of an imaginary scenario that was developed based on a real case study of a successful fishery in Australia. The aim is to prove that the Sky Trust model could be replicated for the management of other natural resources as well. In the conclusion section it is stressed that the model examined may still have limitations if applied at the global/international level.*

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## 1. Global commons: Definition and characteristics

There is currently a growing body of literature on the concept of global commons. One interesting idea that could be explored with regard to global commons refers to how they should be efficiently managed and preserved. This section provides a brief theoretical overview of the concept of commons or common pool resources in general and then focuses more in-depth on global commons as a special class of commons. The section also addresses the issue of property rights underlying global commons as they can represent an important prerequisite for the efficient management and conservation of the global commons.

Common-property resources include fisheries, wildlife, surface and groundwater, range and forests. They share two main characteristics. The first is excludability (or control of access). That is, the physical nature of the resource is such that controlling access by potential users may be costly, and, in the extreme, virtually impossible. The second basic characteristic of common property resources is subtractability, that is, each user is capable of subtracting from the welfare of other users (Feeny et al.1998). In light of these characteristics, common-property resources can be defined as a class of resources for which exclusion is difficult and joint use involves subtractability (Feeny et al. 1998). In the late 1960s biologist Garrett Hardin managed to spur the scholarly debate on the management of the commons as he predicted that resources held in common such as oceans, rivers, forests, are subject to massive degradation. His argument seemed to be very logical and his well-known metaphor "the tragedy of the commons" has become part of the conventional wisdom in environmental studies (Feeny et al. 1998). Hardin (1968) states:

> *"The rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another. [] But this is the conclusion reached by each and every rational herdsman sharing a common. Therein is the tragedy [].*
> *In a reverse way the tragedy of the commons reappears in problems of pollution. Here it is not a question of taking something out of the commons, but of putting something in []. The rational man finds that his share of the cost of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them. Since this is true for everyone, we are locked into a system of fouling our own nest".*

Hardin's predictions need to be nuanced in light of the existence of different types of property rights regimes under which common pool resources could be held and managed. There are four main types of property rights regimes:

- Open access is the absence of well-defined property rights. Access to the resource is unregulated and is free and open to everyone.
- Under private property, the rights to exclude others from using the resource and to regulate the use of the resource are vested in an individual (or group of individuals such as a corporation). Private property rights are generally recognized and enforced by the state. Unlike rights under open access, private property rights usually are exclusive and transferable.
- Under communal property, an identifiable community of interdependent users own and manage the resource. These users exclude outsiders while regulating use by members of the local community. Within the community, rights to the resource are unlikely to be to be either exclusive or transferable; they are often rights of equal access and use.
- Under state property, or state governance, rights to the resource are vested exclusively in government that in turn makes decisions concerning access to the resource and the level and nature of exploitation (Feeny et al. 1998, Feder and Feeny 1991).

The distinction among the four property regime types under which common resources can be held is nonetheless simplistic. Very often two or more property rights regimes are intertwined, the result being a hybrid system. For instance, in medieval England and contemporary South India rights to

the crop are private whereas rights to the stubbles after harvesting are communal. Similarly, in many parts of Sub-Saharan Africa land and tree tenure are separate (Feder and Feeny 1991).

Hardin's dire prediction of the inevitability of over-exploitation was a direct result of an inaccurate assumption that communal property and open access were similar (Feeny et al. 1998). In the years following the publication of his book a growing body of literature has started to develop. Collective action scholars contend that common pool resources that are managed by an identifiable community according to agreed-upon access and use rules can be efficiently preserved (Ostrom 1992). Communal property rights regimes seem to work best however when the resource is small in scale and confined within the political/geographical boundaries of a given community. A small size, isolated community also seems to favor the creation and maintenance over time of a communal regime (Agrawal 2001).

The aforementioned conditions or principles describe however only a limited range of commons. Further more, they seem to suggest that a different approach needs to be explored with regard to commons that are broader in scope. The concept of global commons fits this endeavor.

What comprises the global commons is a matter on which there is no clear agreement. Clearly the ozone layer, the oceans, the atmosphere, and rivers that cross national boundaries have implications not confined to a single country and are part of the global or international commons. An interesting question however arises with regard to natural resources that do not cross national boundaries but have the potential to impact for example global climate (tropical rain forests for instance). Snape and Gunasekera (1997) raise the question whether they are truly part of the global commons. Young (1996) sheds more light on what global commons are. His classification distinguishes among three different types of global commons:

- **International commons** are physical or biological systems that lie wholly or largely outside the jurisdiction of any of the individual members of international society but that are of interest to a number of members- or their nationals- as valued resources. Examples of current interest include high seas fisheries, deep seabed minerals, the electromagnetic spectrum, the stratospheric ozone layer, the global climate system, etc.
- **Shared natural resources**, by contrast, are physical or biological systems that extend into or across the jurisdictions of two or more members of international society. They may involve renewable resources (for example migratory stocks of wild animals), non-renewable resources (for example, pools of oil and gas that underlie areas subject to the jurisdiction of two or more states), or complex ecosystems that that transcend the boundaries of national jurisdictions (for example, river basins or regional seas).
- **Transboundary externalities** arise when activities occurring wholly within the jurisdiction of one state nevertheless produce results affecting the welfare of those residing in other jurisdictions. The classic cases involve tangible impacts, like the acidification of Swedish lakes arising from emissions of airborne pollutants on the European continent or the loss of biological diversity associated with the destruction of moist tropical forests in the Amazon Basin. International law scholars also stress the existence of transboundary externalities that may involve intangible concerns, as in the case of the destruction of a world heritage site (for example the city of Dubrownik, Croatia) as a result of civil war.

However the terminology is not unitary. Barrett (1996) uses the concept of transboundary commons to describe both resources that are not confined within the jurisdiction of any one party and also whose existence is valued outside the boundaries in which it is protected (biodiversity for example).

One interesting question with regard to global commons refers to the specific characteristics of this particular class of commons. There is obviously a difference in scale between local commons and global commons. However, this is not necessarily the most important difference. Barrett (1996) underscores that the main difference stems from the type of actors and stakeholders involved in

the management of global commons. Sovereign national states are the main actors who make and implement the rules regarding the managing of the commons. The complexity of the interaction among political sovereign entities is reflected in the difficulty to arise to agreement with regard to the global commons (or at least some of them).

Ostrom et al. (1999) underscore additional factors that particularize global commons and make necessary the creation of specific management regimes, completely different from the ones existing at the local level. These factors include:

- **Scaling-up problems**: Having larger numbers of participants - especially states - increases the difficulty of organizing, agreeing on rules, and enforcing rules.
- **Cultural diversity challenge**: It can decrease the likelihood of finding shared interests and understandings. The problem of cultural diversity is exacerbated, among others, by "north-south" conflicts stemming from economic differences between industrialized and less-industrialized countries.
- **Requirement of unanimous agreement as a collective-choice rule:** The basic collective-choice rule for global resource management is voluntary assent to negotiated treaties. This allows some national governments to hold out for specific privileges before they join others in order to achieve regulation, thus strongly affecting the kinds of resource management policies that can be adopted at this level.
- **We have only one globe with which to experiment**: Historically, people were able to migrate to other resources if they made a major error in the managing of a local common. We only have one sky and therefore there is no room for mistakes regarding the management of global commons.

**2. The concept of citizen ownership of the global commons**

Property rights are closely intertwined with the management of common pool resources. It seems sensible to first determine who owns the global commons and then to design specific institutional arrangements for managing them. Usually states hold the legal title to rivers, shorelines, and the air. A slightly different approach known as the public trust doctrine underscores that states merely hold these global commons "in trust" for the people, who are their beneficial owners. For example the Hawaii's constitution even says this explicitly (Barnes, 2001). More recent approaches involve the creation of international or transboundary umbrella organizations that should make and enforce rules regarding the global commons (Barrett 1996).

A distinction needs to be made between use of the global commons and beneficial ownership of them. Barnes (2001) contends that these two rights can be severed and that the right to use should be freely sold and bough on the market while the right to reap the benefits resulting from the trading of commons should be granted to people. The concept of citizen ownership is similar to beneficial ownership. Citizen ownership is however closely intertwined with the creation of a market (s) for global commons and the transformation of these commons into commodities that can be priced and traded on the market. It seems indeed strange to think that the ozone layer can be sold and bought on the market. However, the idea of granting beneficial ownership of a global common to specific stakeholders in the society is not new.

Barnes (2001) underscores how beneficial ownership of the broadcast spectrum (air waves) was granted to corporations in the early 1930s. Invented in 1895, wireless radio was first used in ship-to-shore communication. However, numerous American entrepreneurs understood the value of this invention and soon instead of one-to-one communication one-to-many broadcasting, including advertisement, became popular. The explosion of commercial broadcasting quickly encountered a natural scarcity. As a result Congress set up a licensing system for broadcast frequencies. Private broadcasters were given, at no charge, the right to use a specific frequency. In exchange, the broadcasters

had to provide programming that served the public interest, convenience, and necessity. More recently, in 1995, when television station owners wanted to upgrade from analog to digital signals, a new set of frequencies were given to them by Congress free of charge. The argument currently made is that beneficial ownership of the broadcast spectrum should be granted to citizens and not to private corporations. Bollier (2004) underscores that the good news is that the market value of the broadcast spectrum has increased as the technology for cell phones, pagers and other wireless communication has advanced. So many companies want to use the public's airwaves that the federal government can now extract a great price for it and put those funds to public use. In the case of broadband spectrum it can be argued or speculated that in return for the right to use the air waves companies provide citizens with a benefit, namely information/knowledge/education, even if it is less tangible and harder to quantify. Therefore, at least up to a certain extent, citizens do have beneficial ownership in the broadband spectrum. If pollution rights on the other hand are grated for free to companies, in this case the companies retain both the right to use and the benefits associated with not paying for something they consume. Especially in the case of pollution it seems wrong to grant beneficial ownership to private corporations.

State ownership of the global commons, as mentioned before, is another possibility. Presumably, the government represents the public interest and acts in the best interest of its citizens. Barnes (2001) underscores two main reasons why ownership by the federal government should be avoided. On the one hand, he states, the government, as any other political body, is subject to pressure from private interest that stand to gain from use of common resources. On the other hand, even if the government gets the fair rent from the private corporations that use the common resources, there is no guarantee that the resulted money will be used as to benefit everybody. Even if money would be set-aside in a special pot, the government would be still faced with the need to decide which goals contribute toward the public interest.

The aforementioned examples illustrate some of the limitations associated with ownership of the global commons by either private corporations or the government. Citizen ownership presents itself therefore as the logical solution. However, it is still important to identify why citizen ownership represents a better alternative and from which standpoint. Is citizen ownership a better alternative from the standpoint of resource conservation? Or is it better merely from the standpoint of equity and fairness? Barnes (2001) underscores that one of the fundamental reasons for citizen ownership is essentially religious. Global commons as well as other natural resources are gifts or an inheritance from our common creator. They weren't given to either governments or private corporations. Efficiency and equity reasons are also important if one takes into account the other two forms of ownership available besides citizen ownership.

One concrete example of how the citizen ownership concept could materialize is The Alaska Permanent Fund. Every year, the Fund gives every Alaska citizen an equal slice of revenues from oil drilling on state lands. Now with some $27 billion in assets, the Fund generated dividends of about $1,107 for every state resident in 2003 (Bollier 2004). In order for any changes to be made in the structure of the fund or the use of the money, voter approval via referendum is needed. This proves that citizen ownership is really in place and that it is the citizens who decide how to cash in the revenues generated by oil. This case study features an excellent example of how both the state and the citizens share beneficial ownership of a common natural resource. Merely 25% of all the state revenues generated from oil drilling on state lands go into the trust. The rest is collected by the state government as part of the state budget and used for public infrastructure projects such as schools, roads, etc.

By means of summarizing citizen ownership of the global commons is advocated based on a variety of reasons, including equity, efficiency, religion etc. The concept implies that if there is any

potential monetary value to be derived from using them, then those who use them should pay and the citizens should capture these revenues. Citizen ownership also implies that everybody benefits equally, usually via the same number of shares in the common resource. It is acknowledged that no market will ever be able to capture the full value of global commons. It is very hard to measure and to quantify for example how much the scenic beauty of the tropical forest is worth. However, the value captured by selling permits or quotas that allow companies to use a common (in the case of the forest let's say permits to cut down trees) is still more than what users pay today (very often they do not pay anything).

**3. Citizen ownership of the sky: How does the model work?**

Peter Barnes - a visionary entrepreneur (self characterization) - developed in his most recent book "Who owns the sky" a mechanism that allows citizens to be granted ownership of the sky and to derive benefits out of it. This section briefly describes and analyzes the model developed by Barnes. Though the model itself is focused on a specific type of global common- the sky or the capacity of the atmosphere to absorb carbon emissions, it has the potential to be extended to the management of other natural resources (for example water pollution).

Barnes' model is formed of two distinct instruments: (a) tradable carbon emissions permits, and (b) a dividend-paying trust named by Barnes the U.S. Sky Trust. These two instruments are inseparable and are meant to work together.

a) Tradable carbon emission permits

Tokar (1996) contends that there are two major types of instruments that can be used in dealing with air pollution (and other type of environmental problems as well): regulations and market mechanisms. Regulatory control has always been opposed by the affected industrial corporations and developers as well as by advocates of a free-market policy. As a result, the most significant developments in incentive programs have occurred in the area of emissions trading, through which air pollutants are viewed as tradable commodities, each with its own regional, national, and even international markets. In an emissions trading program, companies that emit less than their assigned limits, or caps, of a pollutant can sell residual allowances on the open market or bank them for future transactions. This gives other, higher-polluting facilities a choice: either buy allowances and continue releasing the same pollutant or clean their own emissions-whichever is cheaper. The only stipulation is that regional environmental quality continues to meet mandated standards (Schmidt 2001). This type of mechanism has been first used in US back in the 1990s when it was incorporated into the Clean Air Act amendments as a means for achieving the set goals for reducing acid rain--causing sulfur dioxide emissions. More recently, the 1997 international negotiations on controlling global warming in Kyoto, Japan, resulted in a protocol that includes emissions trading as one of the key elements in the plan to limit the atmospheric buildup of greenhouse gases (Schmidt 2001).

Tradable carbon emission permits envisioned by Barnes would be somewhat similar to the sulfur emission permits that already exist in the U.S. They would be sold every year to companies that bring fossil fuels into the U.S. economy. Each permit would represent the right to store one tone of carbon in America's share of the global atmosphere. Companies at the top of the carbon chain would buy and sell carbon emission permits in a manner that suits their needs. On December 31 of each year, they would have to own enough permits to cover all the emittable carbon they brought into the economy during the preceding year. If they didn't, they would be penalized (Barnes 2001).

This carbon permitting system would be different from the existing sulfur system in two important ways (Barnes 2001). First, carbon emission permits would be auctioned and sold rather than given away, or "grandfathered" to already existing polluters. The second difference is that while sulfur permits must be owned by the end users - the actual emitters, carbon permits would be owned by

the first users - the companies that introduce the carbon into the economy. In other words sulfur permits are downstream while the carbon permits would be upstream (see **Figure 1**). An upstream system makes monitoring and enforcement much more easier. These two aspects are essential to the success of air pollution management. Schmidt (2001) addresses the issue of monitoring when referring to "open market"[1] emissions trading schemes. He underscores that as these schemes are geared toward smaller sources, in practice monitoring is often poor, and emissions inventories are weak. The model proposed by Barnes - which implies a limited number of companies to monitor -, is therefore superior to the existing schemes.

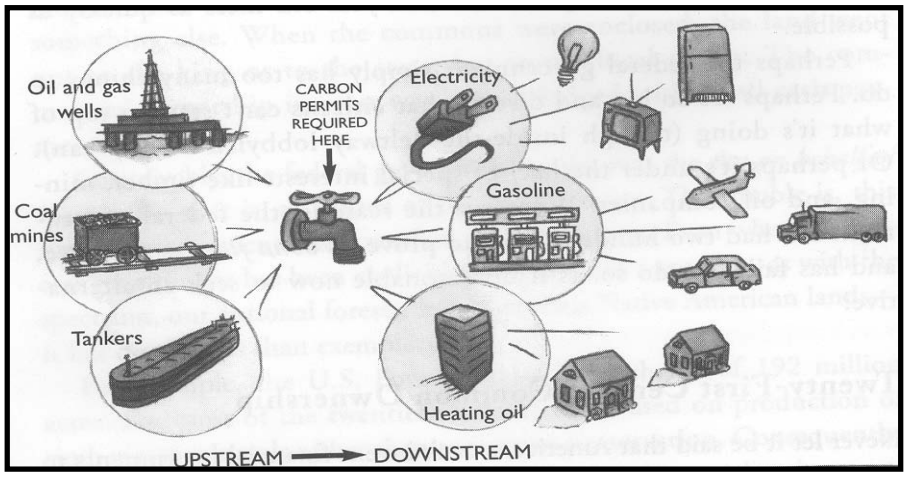


**Figure 1** Source: Barnes (2001)

b) The U.S. Sky Trust

The carbon-trading scheme in and by itself is not innovative in any way. Barnes' major contribution stems from his idea of combining a market mechanism with the concept of citizen ownership of global resources such as air. The US Sky Trust represents the organizational framework that allows citizens to have beneficial ownership of the revenues generated by the trading of carbon emission permits. The initial emission rights are given to the trust, which periodically sells them to polluters and distributes the revenues to all citizens equally. Barnes (2001) envisioned the trust as featuring a dual mission: on the one hand, it is a civic institution; on the other hand it represents a technical mechanism for allocating scarcity and distributing the revenues generated by the trading of the scarcity. Several key characteristics of the trust contribute toward the accomplishment of this dual mission.

- **Mission of the fund**

The Sky Trust has three purposes: (1) to protect the atmosphere for future generations, (2) to assure that those who use the atmosphere for waste storage pay a market price for doing so, and (3) to divide revenues from the atmosphere equally among all citizens (Barnes 2001).

- **Shareholders (citizen ownership)**

Each citizen would receive one non-transferable share in the Sky Trust. The right to hold one share would be similar to other rights that are part of the citizenship package such as the right to vote, the right to freedom and free speech, access to justice and equal treatment, etc. The share in the Sky Trust would be very similar to shares in a mutual fund for example. The only notable difference is that one cannot sell or transfer it (Barnes 2001).

[1] "Open market" emissions trading is a scheme US Environmental Protection Agency developed in 1995. Unlike cap-and-trade programs, neither the overall sectors nor the individual trading sources regulated under an open market trading system are subject to a cap. Rather, any source that finds that its actual rate of emissions is below permitted levels for even a short time is eligible for credit that it can save for later or sell to another source.

- **Election of trustees**

The first trustees would be appointed by the president and confirmed by the Senate. Their terms would be staggered from three to eleven years. As each appointed member's term expires, the vacant seats are filled by shareholder election. The trustees elect the chair from among board members (Barnes 2001).

- **Dividends**

All revenue from carbon emission permit sales is put into a pool. From this pool are subtracted all administrative costs, and all contributions made toward mitigating the negative impacts of establishing a market for carbon. The amount remaining is equally split among the total numbers of the citizens who have registered to become shareholders. The result is the equal dividend that is sent to all shareholders in December. There would be no restrictions with regard to how dividends can be used. However there would be incentives to encourage savings (for example for retirement) or specific spending ways (for example to pay for college tuition) (Barnes 2001).

- **Future**

There is no guarantee that dividends would go up over time. The value of dividends depends on two main factors: the management of the trust on the one hand, and the demand and supply for carbon permits on the other hand. However, at least on the short-term, because of the dependence of the economy on fossil fuels and no current reliable alternative source of energy coupled with rising ceilings for carbon dioxide in the atmosphere, the financial results of the trust are expected to be positive (Barnes 2001).

- **Cap for carbon emission**

Each year the board of trustees decides, by majority vote, how many carbon-emission permits to sell. By law, the trustees must take into account the following factors: (1) the measures taken by other country, (2) the physiochemical state of the atmosphere and, (3) economic and regional impacts (Barnes 2001).

- **Role of the government**

The Congress would need to pass a law in order to establish the trust and the cap-and-trade system for selling carbon emission permits. Once the trust would be establish the role of government should be minimal. The trust is not subordinated to either the Congress or the president and shareholders can vote trustees out of office.

- **Negative impacts**

A possible direct consequence of establishing a cap for carbon emissions is an increase in prices of different products and goods that are obtained from a production cycle that at any given point implies the use of fossil fuels and other raw materials that generate carbon emissions. There is no doubt that higher carbon prices will hurt some families and communities more than others. Coal miners could be expected to loose their jobs; farmers and truckers who drive long distances will also be hurt. To help those who would be the most hurt by higher carbon prices, the Sky Trust includes a ten-year transition fund. In the first year of operation, 25% of the Sky Trust's revenues will flow into this fund; the remaining 75% would go for dividends. Another mechanism to mitigate the short-term negative consequences is a ceiling price per ton of carbon emissions during the first four years of existing. By capping the price per tone to a relatively low level the economy and the consumers are given a transition period to adjust and make changes based on the new conditions (Barnes 2001).

- **Transparency and accountability**

Citizens would be able to see where every dollar comes from and where it goes. Thus, there would be no co-mingling of sky income with other funds. Shareholders would receive an audited annual report with complete financial information. The very nature of the trust as opposed to a corporation

should increase accountability as well. Unlike corporations, trusts have long-term missions that their trustees are legally bound to fulfill. The way to enforce this obligation in the case of Sky Trust is through the election of the trustees by the shareholders (Barnes 2001).

## 4. Assessment of the proposed Sky Trust model

Assessing any conservation or pollution mitigation tool mechanism can be a daunting task. There are very few academic studies that provide clear criteria against which the performance of a policy tool can be evaluated. Furthermore, in the case of a mechanism that has not been yet implemented, the costs and benefits are merely presumable. It is not possible to precisely determine how the Sky Trust will work when implemented in a real life context. This section provides a brief assessment of the model envisioned by Peter Barnes and strives to identify the comparative advantage of this approach in reference to other existing mechanisms.

Kerr et al. (2006) identify several criteria to be used when assessing approaches meant to internalize externalities in watershed projects in India. While the context differs, the evaluation criteria set forth are relevant and general enough to be applicable to the Sky Trust model. Further more, the rationale underlying the trade-and-cap system is to make polluters pay, in other words internalize their externalities. The criteria developed by Kerr et al. suggest that the mechanism should be:

### Cost-effective

One of the problems with numerous conservation mechanisms stems from high transaction costs. Pagiola et al. (2005) underscore how in the case of payment for environmental services programs (PES) transaction costs can be substantial, acting as a hindrance for the enrollment of small landowners in the project. In the specific case of PES programs paying for consultant fees represents one of the most important transaction costs. Market approaches are however commonly presumed to lower the administrative costs of implementation and monitoring as opposed for example to the traditional, legal, control and command approach. An example in this sense is the U.S. SO2 emission program that began nationwide in 1995. In the first year, emissions from the largest polluters fell by 45% with 100% compliance and an estimated overall cost savings of 50% compared to the previous command and control approach (Kerr 2006). At least similar outcomes, if not higher, are expected in terms of cost-effectiveness from a carbon emissions trading scheme.

### Direct

As mentioned before the Sky Trust is expected to accomplish three main goals: to protect the atmosphere for future generations, to assure that those who use the atmosphere for waste storage pay a market price for doing so, and to divide revenues from the atmosphere equally among all citizens. All these objectives are addressed directly. Carbon dioxide is probably the largest waste product of the economy and a dangerous pollutant. It becomes even more of a problem in conjunction with the destruction of forests that act as huge carbon storage thanks. As carbon emissions increase, the greenhouse blanket that envelops earth thickens as well and generates global warming and other climate changes. A trade-and-cap system for carbon emissions will gradually limit how much carbon is released into the atmosphere. It is very clear that under this system those who want to continue to pollute would have to pay for doing so. Further more, by lowering the number of permits scarcity is created. In turn, the atmosphere gets cleaner and cleaner and the price of permits can be expected to rise.

### Creates strong incentives to comply

As mentioned in the previous section, the cap-and-trade scheme attached to the Sky Trust would involve an upstream carbon permit system. This system makes monitoring very easy and low cost. Several advantages of this system in terms of compliance include: (a) it is easy to keep tabs on carbon at the beginning of its journey through the economy than at its end; (b) only a few thousand firms

would need to own upstream carbon permits as opposed to a downstream system where nearly everyone would; (c) no need to monitor every smokestack or tailpipe but rather to know the quantities of coal, oil, and natural gas that pass through the upstream companies, information that's readily available (Barnes 2001).

**Has long-term impact**

The cap for carbon emissions can be lowered over time as to eventually achieve a sustainable level of carbon in the atmosphere. This implies a long-term goal for the Sky Trust. Further more, carbon emission permits would be sold every year. Thus, a constant flow of revenues would be generated and made available to the trust, in order for it to be able to function year after year. As mentioned before, the trust would function in a similar way to other financial institutions. In other words poor financial results may affect its existence and stability on the long term. However there are several mechanisms built into the structure of the trust that should prevent this from happening- for example trustees can be voted out of office if they do not accomplish the mission they were entrusted with.

**Protects poor people's livelihoods**

The Sky Trust model does not specifically emphasizes poverty reduction as one of its objectives. However, by incorporating the idea of citizen ownership of the sky it strives to be more equitable. Every citizen will receive the same share or amount of money. Equity and fairness is an important feature of the trust when compared against other natural resource conservation mechanisms. Communal management systems have been proved to be often exclusionary of different types of members within the community. These members can include women- especially in those societies where women are not allowed to own land-, landless people in general, outsiders- in the case of fisheries where user rights are granted to the members of the community, etc. (Agrawal and Gibson 1999). Market-oriented, contemporary approaches may suffer from the same limitation. For example, payment for environmental services is becoming an attractive way to conserve natural resources via providing incentives for owners or indigenous populations not to do anything that could negatively impact the resource. However, in the case of Costa Rica- the country having one of the most well know PES scheme, it was found that in order for the program to meet its conservation goals, equity needs to be "sacrificed" (Pagiola et al. 2005). With the proposed Sky Trust, equity and resource conservation are intertwined with each other and there is no need to sacrifice one goal in order to achieve the other.

**Does not concentrate costs on a particular group**

Barnes (2001) underscores that the Sky Trust has several mechanisms built into it that all strive to minimize the costs of implementing a carbon emission cap and to make sure that this costs do not disproportionately affect merely one group within the population. Gradualism is a key feature. The initial cap is kept at the level of the year 1990. Also for a number of years the price per tone will be caped at a relatively low level (see previous section). People could easily offset this gradual increase in costs by minor efficiency improvements or lifestyle changes. People will also receive yearly dividends. In most cases the dividends alone may offset any increase in daily costs. In order to offset more generalized impact of a carbon emission cap- for example in the case of a mining community or certain groups of people, a transition fund would be created as part of the Sky Trust. The transition fund will capture for a number of years a portion of the revenues generated by the trading of carbon permits. This money could be used to pay for training people who loose they job because of this specific policy, to invest in amenities or other public works in affected communities, to fund research, etc.

**Replicable across scale and context**

The model developed by Peter Barnes refers specifically to the U.S. However, it would be easy to replicate in other different contexts (in other countries). The author even alludes to the possibility

of integrating the Sky Trust model with other existing international mechanisms that aim to limit carbon emissions. For example he mentions that the U.S. cap for carbon emissions would be based on the chunk of sky (carbon emission levels) allocated to U.S. under Kyoto (or any other treaty). One of the limitations of the model refers to its replicability across scale. Ideally a global common should be managed globally. If a global trading scheme for carbon emission permits is to be created then all nations need to agree. Lack of agreement on the level of caps and the necessity for drastic measures meant to curb carbon emissions are the very reasons that prevent Kyoto from being a functional tool. The Sky Trust will add another dimension different countries need to agree upon, namely citizen ownership of the revenues generated by the selling of the permits. This will only make things more complicated and probably limit even further the likelihood of Kyoto or the Sky Trust to be implemented. The highly political debate surrounding the creation of the Sky Trust cannot be avoided even at the national level. The state needs to sanction the creation of the trust. The Sky Trust model once sanctioned by the political sector holds the promise of being easily replicable across context and scale.

**5. How could this trust model be applied to natural resource management? An imagined scenario**

An interesting question that arises from the analysis of the Sky Trust model developed by Peter Barns is how it could be applied to a broad array of natural resources. In other words, which are the circumstances under which the model is most likely to work?

Environmental problems affecting the global commons (other types of natural resources as well) may be grossly divided into two classes: the pollution, or "putting-in" issues on the one hand, and the taking-out or extractive issues, like fishing or hunting or even farming. Cap-and-trade schemes (or tradable environmental allowances or TEAs) work best when the problem that needs to be addressed is pollution. The best-known TEAs are about pollution- that is, the sulfur dioxide TEAs in the U.S. Acid Rain program (Rose 2005). The proposed model of the Sky Trust also focuses on pollution control as well, particularly the effort to cut back on global greenhouse gas emissions. However, there are nonetheless extractive TEAs in the form of fishing quotas. Other scenarios under which extractive TEAs could potentially work can be also imagined.

The remaining part of this section features a real case study from Australia documented in the New York Times. It describes the successful management of a local fishery via an interesting system of quotas and a hybrid property rights system- in fact a combination of private and communal property rights. This case study lends itself very well to a creative analysis of how the fishery management system could be structured according to the Sky Trust model.

Port Lincoln, population 13,000, is a little fishing town on a remote peninsula of Australia's southern cost. Lobstering turned out to be an excellent business for the last decade or so mainly due to a system of quotas run by the lobstermen under government supervision. The government started it in the 1960's by setting a limit on the total number of traps used by the fleet in Port Lincoln. Licenses for those traps were assigned to the working fishermen, and from then on, any newcomer who wanted to set a trap in those waters had to buy a license from someone already in the business. It's like New York's taxicab system, which has a fixed number of taxi licenses or "medallions": a newcomer who wants to own a cab must buy a medallion from someone who is retiring. Just to give you an idea about how profitable this system is for the lobstermen: in 1984 a trap license sold for approximately $2,000 apiece. Today it is worth more than $35,000 (Tierney 2000).

How would this system be different under the Sky Trust model? The first step would be very similar as either the government or the local association of lobstermen sets a limit on the total number of traps to be used. However, instead of granting these licenses to existing lobstermen for free, they would be auctioned yearly. In other words lobstermen would have to pay a yearly fee determined by the market in order to be able to operate in that fishery. All the money generated by the selling

of licenses would go into a fund. According to the idea of citizen ownership of the commons each member of the community would receive a portion of these revenues. Different scenarios could be developed at this point. Either all money would be distributed in equal shares to the community members or a certain percentage could be distributed while the rest could be used for community infrastructure projects. Thus, as opposed to the real case study, under the imaginary scenario the community as a whole would benefit from the trading of lobstering licenses.

Apparently, the imagined scenario seems to be fairer and more inclusive. Not only the community as a whole benefits from a common resource that is located within the boundaries of the community but outsiders and community members who want to start lobstering can openly compete for a license. Is there however any limitation to this imagined scenario? First, lobstering requires investment in a boat and traps. It is highly improbable that anybody would invest money in such equipment without knowing for certain that s/he would have a license for the next year or the following years. Second, the very incentive lobstermen have to enforce and comply with the quota system is the increase in the value of the license over years (Tierney 2000). In fact they gain equity by protecting the common resource. Therefore, creating a system that does not allow them to benefit from an increase in the price of the license may represent a disincentive to conserve the natural resource.

This imaginary scenario is only meant to show that the implementation of a specific property rights and management model needs to take into consideration a variety of factors. The Sky Trust model, at least in theory, has nonetheless the potential to be replicated to the management of other natural resources.

**6. Conclusions**

Global commons represent a special type of commons due to two main reasons: (1) a shift in scale from local or regional level to national and transnational level, and (2) the presence of the sovereign states as main actors in the creation and implementation of management regimes. The management of global commons cannot be separated from the concept of property rights. One type of property rights regime explored in this paper is represented by citizen ownership of the commons. This implies that everybody benefits equally if and when a monetary value is attached to a common thus becoming commodity traded on the market. The model examined in more detail is the Sky Trust developed by Peter Barnes. Tough limited in scope to U.S. and the conservation of a single resource, the model has the potential to work across different contexts and at different scales. The imaginary scenario developed in the last section of the paper builds on this possibility of replication. One major limitation however is the fact that at the international level the creation of a Sky Trust and a cap-and-trade scheme for carbon emissions is hindered by the same factor as Kyoto, namely the political nature of the decision-making process accompanied by the difficulty of sovereign states to reach an agreement regarding the actual cap.

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