

## **The role of markets and property rights in the environmental protection**

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### 1. Introduction

One of the most known analyses of the environmental problem is the discussion of the externalities as a market failure and the solutions that could be offered by public policies and law to deal with them. The classic discussion of the opposed ideas of Pigou and Coase has been renewed nowadays in the discussions of the option between command and control measures, taxation of emissions and promotion of pollution reduction through a carbon emissions reductions trade system, related with the climate changes. Generally considering, the Pigouvian model suggests taxation over polluting activities. Coase has criticized the approach of the economists after Pigou who accepted the so-called Pigouvian taxes as the solution to externalities. The possibilities of transacting over the social costs were the subject discussed in his “The problem of social cost”. Therefore, the main aspect of the discussion in the environmental field is

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whether the market can lead to the achievement of goals of environment protection instead of, or in addition to a system of taxation over polluting activities.

As far as property rights are concerned, the Pigovian approach represents a restriction on them. In addition to taxation, that is itself considered as an economic instrument, environmental laws have created an extensive set of rules characterized as “command and control” that would correct the externality problem by restricting the right of land owners to explore its property and require them to maintain a forest area or requiring industry owners to meet emission and technological standards among other examples.

The alternative policy tool of transactions of emission marketable allowances or carbon reduction certificates means an appropriation of former common natural resources. The state creates a kind of a property title for pure air and locates it to the firms, leading them to transact over it. The environmental policy approach therefore is based on the attribution of property rights and the creation of a market that was formerly inexistent.

A similar shift, from a policy of property rights restriction to a new approach of the attribution of value for environmental goods as a strategy for its preservation, can be observed in the monetary evaluation of preserved resources such as forests and sources of drinking water. The conservation of natural resources is turned into a precified good which entitlement is given to property owner in order to enable him to sell it in market basis. The value of the forest tends to increase with the enlargement of the market for the environmental services it is able to deliver.

The paper proposal is to discuss this shift in the approach of environmental protection policies from property rights restrictions to the possibilities of transaction either of emission market permits or environmental services. A central aspect of the

paper is the role of the market and the property rights to further environmental protection.

## 2. Environmental problems and market failures

In the capitalist economic system, markets become the central institution of economic organization. Prices are used by markets to communicate the needs, wants and limits of the society and direct the economic decisions to bring about the provision of such needs and wants at the lowest cost. However, market prices do not adequately state the value of many environmental goods and services and therefore they are not provided or delivered in the amount desired by the society.

We can take biodiversity as an example. Biological diversity is related to the broad range of existing animals and vegetal species. Its conservation requires the preservation of the species' natural habitats. However, biodiversity is at risk because of the conversion of forests into agricultural land, urban areas, or the introduction of invasive species directly or indirectly related to economic activities. The market fails to adequately value the biodiversity conservation since the prices of timber, urban land or agricultural goods are much higher, what leads to a process of deforestation. Therefore, no matter the importance of the biodiversity conservation and a strong preference society has for it nowadays, markets do not seem to be able to bring the economic decisions in the direction of the conservation.

A market failure is said to occur whenever a market does not allocate scarce resources to generate the greatest social welfare<sup>1</sup>. As the example of the biodiversity shows, markets may fail to lead the decisions in the direction of environmental

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<sup>1</sup> HANDLEY, Nick et al. *Environmental economics in theory and practice*. New York: Palgrave Macmillian, 2<sup>nd</sup> edition, 2007, p. 42.

protection. Environmental problems are usually associated with two market failures: the externalities and the public goods.

Externalities are costs which burdens are posed on third parties instead of on those that do participate in a market transaction. It happens when “one person’s actions affect other people, who neither receive compensation for harm done nor pay for benefit gained”<sup>2</sup>.

The externalities can be negative or positive and both can be related to environmental issues. Pollution is a classical example of negative externality, because its costs are borne by third parties that can be an individual (a neighbor of a noisy activity), a group (fishermen in a river polluted by an industry) or the society as a whole (people affected by the climate change deriving from different man-related activity). Environmental protection, on the other hand, produces positive externalities that also can affect individuals or big groups (the conservation of the remaining world rain forest is said to produce positive external benefits for the whole world population, even to future generations).

The public goods are a kind of positive externalities characterized by two specific elements: the non-exclusivity and the non-rivalry. The last means that the amount provided of the good for an individual does not reduce the amount available to others. The former means that it is impossible or very costly to exclude anyone from the enjoyment of the good or service. The classical example is the national defense. There is no way to exclude a tax debtor, for instance, from the protection a public national defense provided for those living in a Country, nor the amount some groups enjoy of it will diminish the amount available to other groups. The biodiversity conservation as

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<sup>2</sup> HANDLEY, Nick et al. *Op. cit.* p. 40.

well as the protection against climate change are public goods. Different environmental protection situations can provide some other examples.

The market is not able to produce public goods, because no one would pay for anything non-exclusive and non-rival. Therefore, they need to be provided by the government.

### 3. The proposed solution for the market failures

As referred to in the Introduction there are two influential approaches to the market failures problem, more precisely to the externalities.

The first one is influenced by Arthur Cecil Pigou, who wrote his “The Economics of Welfare” in the thirties. Pigou proposed that in case of negative externalities the government should impose a tax equivalent to the amount of its cost. As far as the problem of the externality is the lack of a signal of the scarcity of a natural resource or of the cost of pollution, the effect of such tax would be the correction of the price of the good and a decrease in its consumption. The opposite but similar policy should be addressed for positive externalities. A subsidy should be given for its producer in order to incentive the production of the good or service with social benefits can not be reaped by the producer in the price<sup>3</sup>.

In 1960, however, Ronald Coase criticized the so-called Pigouvian approach to the externalities problem. He argued basically that not so much governmental intervention was necessary to deal with externalities “if zero transaction costs exist”. He proposed the expansion of the set of markets to include non-market goods, provided the institutional constraints that prohibited the definition of property rights were removed.

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<sup>3</sup> MAY, Peter et al. *Economia do meio ambiente*. Rio de Janeiro: Elsevier, 2003, p. 61-63.

“The key is to give one person property rights to the non-market good, for example, pollution control”<sup>4</sup>.

It may seem inaccurate for lawyers to talk about the creation of property rights for non-market goods such as pollution control, but that is the way economists describe that set of policies which allow a bargain over the non-market goods related to the externalities<sup>5</sup>. An example can illustrate the discussion. A and B are two enterprises located at River Red. A is a paper mill and discharges waste in the river. B is in the rafting and kayaking business and A’s pollution reduces its profitability. If a right to cleaner water (considered here as a property right) were assigned to B, A could compensate B for the pollution. Or such right (to define the level of pollution control) could be assigned to A, and then B would be willing to compensate A. The possibility of bargaining would lead to an optimum level of pollution, which means a balance between the marginal costs and marginal benefits of the pollution.

Such example describes the so-called “Coase Theorem”: two disputing parties can bargain with each other and agree to an allocation of resources that is Pareto efficient, regardless of the party to whom unilateral property rights to the non-market asset are initially assigned<sup>6</sup>. Coase argues that externalities are a bilateral problem, meaning that society should not privilege a solution that would foreclose an efficient and profitable activity<sup>7</sup>. That is why he talks about “an optimum level of pollution” and

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<sup>4</sup> HANDLEY, Nick et al. *Op. cit.* p.45.

<sup>5</sup> This analysis derives from Coase proposition to consider as production factors not only the physical entity acquired by a firm but the **rights** to some actions over it, as the right to do something that produces a negative effect over other people (smoke ; noise, odor, etc).

<sup>6</sup> HANDLEY, Nick et al. *Op. cit.* p.45

<sup>7</sup> As he states: “The traditional approach has tended to obscure the nature of the choice that has been made. The question is commonly thought as one in which A inflicts harm on B and what has to be decided is: How should we restrain A? But this is wrong. We are dealing with a problem of reciprocal nature. To avoid the harm to B would inflict harm on A. the real question that has to be decided is; should A be allowed to harm b or should b be allowed to harm A? The problem is to avoid the more serious harm. COASE, Ronald. The problem of social cost. *Journal of Law and Economics*, v. 3, Oct 1960, p. 1-44.

the pollution benefits. That is an important aspect to be discussed because no industrialized society is able to live in a zero pollution world and no matter the policy instrument chosen, legislation will always tolerate a certain level.

There are many critics for Coase's approach<sup>8</sup>. In the environmental field, they point that the bargaining would be impossible in case of diffuse effects of externalities, as most environmental problems cause nowadays. One of the conditions for the Coase's Theorem is the absence of transaction costs and of course a negotiation involving big groups would not only be costly, but almost impossible. As long as future generation rights are at stake too, such negotiation would get even harder.

In spite of those critics, the ideas of Coase influenced the discussions of whether the market can lead to the achievement of goals of environment protection instead of or in addition to the so-called command and control policies and has been in the roots of the proposals for market instruments in Environmental Policies<sup>9</sup>.

Command and control instruments for the protection of the Environment are those based on the imposition of a specific behavior for firms or individuals. The most common examples are the imposition by governments of emission standards for the different pollutants of the air and water and mandate technologies. These examples regard pollution control. As far as biodiversity and forest protection are concerned, command and control policies often oblige land owners to maintain a forest area in percentage of the land.

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<sup>8</sup> An illustrative critic of the Coase theorem that claims it does not describe the real world is proposed by FARBER stating basically that "Saying that pollution victims pay bribes, however, is quite startling, because it does not really happen.". FARBER, Daniel A. The Case Against Brilliance. *Minnesota Law Review*, v. 70, April 1986, p. 919.

<sup>9</sup> As McAallister states, "The idea of cap and trade regulation often is traced back to a 1960 article by Ronald Coase that formed the basis for the Coase Theorem. MCALLISTER, Lester. Beyond playing "banker": The role of the regulatory agency in emissions trading. *American Bar Association Administrative Law Review*, n. 59, 2007, p. 273- 274.

The imposition of Pigouvian taxes and subsidies are not considered command and control, but an economic instrument, since it produces direct impacts on the costs of some good or service that may be prejudicial or beneficial for the Environment. Another kind of economic instrument used in Environmental policies is the creation of markets involving the right to pollutant emissions and more recently environmental services<sup>10</sup>.

The case for market instruments for the environment protection is often related to any kind of suspicion about government ability to regulate pollution control or environmental conservation. The most consensual reason however is related to efficiency. Different firms have different costs to achieve the legislation standards and to control pollution. Markets would allow them to transact among them in order that the firms which costs are low can achieve the best environmental performance and the others can pay them to do so.

The present challenges of the environmental protection requires the construction of sound policies that can combine command and control and economic incentives. On the other hand, the creation of environmental markets requires a lot of governmental intervention building up the rules of its functioning and its success will depend on “moving beyond the government versus market debate”<sup>11</sup>. Therefore, it should be stressed that the enlargement of the role of the markets in the environmental protection does not mean exactly the reduction of importance in the State’s role.

#### **4.The creation of markets for pollution permits.**

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<sup>10</sup> For a concept of environmental services, see 5, below.

<sup>11</sup> The analysis done by Landel Mills and Ina Porras has the new institutional economics as theoretical background. As they state, it considers the “markets no longer always the optimal arrangement for allocating resources, but one of the multitude of institutional arrangements that guide decision making and resource allocation.” . LANDEN MILLS, Natasha and PORRAS, Ina T. . Silver bullet or fools’ gold? A global review of markets for forest environmental services and their impact on the poor, March 2002, available on [www.iied.org/pubs/pdfs/9066IIED.pdf](http://www.iied.org/pubs/pdfs/9066IIED.pdf), consulted in 03/18/2008, p. 11.

A policy for the pollution control may include a market for pollution emission allowances. The basic idea beyond it is to assign a limited number of allowances for a specific group (or groups) within an industry (or industries) and allow those who are able to cut their emissions further than their quota to sell it. Firms that are not able to restrain their emissions within their allowances, on the other hand, can buy it. The market is said to allow a more efficient result in terms of the achievement of pollution reduction because firms have different production and technology systems and therefore, their ability to cut emissions is very different as well. That would save the regulator from the difficult task of defining the adequate level of emissions standards to be applied to such different firms and industries or to define the appropriate technology to be installed by them. The emission standard and the technology system moreover, require a complicate monitoring activity by the government, often resulting in disputes and negotiations between the regulator and the firms. The cap and trade system would allow the firms to plan their way of compliance although requiring a sophisticated monitoring of data and information.

More precisely, a cap and trade system is composed of five components. First, the Environmental agency sets a cap on total emissions for a set of sources over a compliance period. Second, the cap is divided into allowances, each representing an authorization to emit a specific quantity of pollutant. Third, the allowances are allocated among the sources and can be traded among them. Fourth, the sources are required to measure and report their emissions throughout the compliance period. Finally, after the end of the compliance period, the agency compares the emissions of the sources with the allowances and impose penalties for those which emissions are higher<sup>12</sup>.

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<sup>12</sup> MCALLISTER, Lester. Op. cit., p. 274.

There are basically two methods for assigning the allowances. One is the definition of it on a basis of historical emissions (called grandfathering). The other is by means of an auction process where the firms would bid for the allowances. In both cases, if the policy goal is to reduce pollutant emissions, the assigned quotas must take the desired emission level into consideration. Some unsuccessful experience failures derived from a generous initial distribution of quotas that made cheaper to buy them than investing in technological change for emission reduction.

Some cap and trade programs were established in the US since the nineties. We will discuss briefly two of them. The acid deposition program, created in 1995, that was considered successful and the Regional Clean Air Incentives Market that did not achieve its pollution reduction aims.

#### 4.1. Acid Deposition Program.

The Acid deposition program. was created by a 1990 amendment in the Clean Air Act, but was implemented only in 1995. Its policy goal was to reduce the emissions of sulfur dioxide (SO<sub>2</sub>) from electric generating plants.

The main features of the program<sup>13</sup> was the creation of annual emission allowances and their distribution by the Environmental Protection Agency (EPA) among the plants based on their past emissions and the possibility of transferring of such allowances, provided a certification by the agency were issued. Initially (from 1995 until 1999) it involved only the largest coal-fired electric generation units and promoted a cap reduction from 8.7 to 7 million tons worth of SO<sub>2</sub> allowances. After 2000, the program enlarged its universe including almost all fossil-fuel fired electric generating units. The

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<sup>13</sup> This description is based on PERCIVAL et al. *Environmental regulation. Law, Science and Policy*. New York: Aspen Publishers, 4<sup>th</sup> edition, 2003, p.542- 246 and MACALLISTER, Lester. *Op. cit.* p, 273-277.

goal for 2010 is to establish a cap about 50% of the amount of SO<sub>2</sub> emitted by all electric generating units in 1980. Since its implementation, the program has met or exceeded expectations in terms of compliance rates and emissions reductions. The law expressed limited the annual emission cap, although the allowances could be used in the following year.

As far as the legal nature of the allowances is concerned, the Law specifically states that “Such allowance does not constitute a property right” and describes it as a “limited authorization to emit sulfur dioxide”.

Another important aspect of the program, that is considered as a special ingredient for its success was the role played by the EPA and the monitoring system created by the agency.

First it should be noted that no market mechanism can prescind of an inspection activity because the plants may emit more pollutants than their allowances. The Clean Air Act defines as illicit the emission of sulfur dioxide (SO<sub>2</sub>) in excess of the amount allowed by the quotas, but how was that rule implemented?

The program basically created a stringent monitoring system based on technology that required all sources to install a continuous emission monitoring systems (CEMS). This electronic device is able to measure actual emissions of SO<sub>2</sub> and other gases on a continuous basis. The data is compiled by the source computers and then submitted to the EPA.

Needless to add that the creation of such a system required investments from EPA and the work of a well trained staff. That is an important element to discuss the importance of the government role not only to create but also to maintain a pollutant emissions market.

#### 4.2. Regional Clean Air Incentives Market - RECLAIM

The RECLAIM is a regional program of the State of California, more exactly of its South Coast Air Basin (Orange County, and parts of Los Angeles, San Bernardino, and Riverside Counties), that came into effect in 1994. The goal of the program was to reduce the emissions of NO<sub>x</sub> and SO<sub>2</sub> from the largest stationary sources in the basin<sup>14</sup>.

The sources covered by the RECLAIM Program are more heterogeneous than those of the Acid Rain Program, including not only power plants, but also refineries, asphalt and cement producers, and a wide variety of industrial sources. As the acid deposit control, the program adopted a cap and trade system. RECLAIM Trading Credits (RTC) is the unit of currency in RECLAIM. One RTC represents a license to emit one pound of pollutant.

The RECLAIM Program was designed so that the annual weighed average reduction in RTC allowances for all facilities was about 7% and 8% for each pollutant, which would result in a reduction of about 47% between 1994 and 2000. However, the actual result was a reduction close to 20%. Moreover, that reduction was much smaller than the one promoted by command and control policies between 1989 and 1993 (38%). In addition, in 2000, there was a sudden shortage of energy in the California state that required the generation firms to buy more allowances and their price rose suddenly. Many sources sold them so many allowances that there was not enough to sustain their own needs and the cap was exceeded.

The reasons appointed for such poor results are related to a weaker monitoring system, as compared to the acid deposition program, to a generous distribution of allowances in the first five years of the programs and the lack of sufficient information

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<sup>14</sup> For a description of the program, see McAlister, op. cit, p. 293-298.

for the firms, especially the smaller ones that did not enable them to plan their strategies to reduce emissions.

Due to the heterogeneity of firms included in the program, it was not possible to require all of them to adopt the CEM system of information and data. As a consequence, the regional authority was not able to rely extensively on the electronic monitoring system, as the EPA does in the acid deposition program. There was the need for in loco verification by the agency and the occasion for many claims for revision. Moreover, RECLAIM did not provide for automatic sanctions for noncompliance in RECLAIM, unlike the Acid Rain Program.

However, the main reason for the failure is certainly the generous distribution of allowances that led some firms to delay the investments in emission reductions, since the market provided cheap allowances. The lack of sufficient information, especially for smaller firms contributed to their passive behavior, and the lack of planning strategies for technological changes or innovation related to the emission control.

That situation can make a case for the discussion of which role the government should have in the emission allowance markets, especially those involving a heterogenic group of sources. The RECLAIM experience showed the need for a support action to provide information and assistance to the firms in order to help them plan their compliance to the policies in the long run.

As Michael Porter<sup>15</sup> points out, there are some characteristics for a well designed environmental policy: the information collection and publicity in order to allow the firms to be conscious of their own deficiencies in the production process and of the costs of their pollution emissions as well as to signal them that they will not be able to

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<sup>15</sup> PORTER, Michael and VAN DER LINDE, Claus. Toward a new conception of the environment-competitiveness relationship. In GRAY, Wayne B. *Economic costs and consequences of environmental regularion*. Aldershot: Dartmouth Publishing Company, 2002, p. 415-416.

have opportunistic gains resulting from the noncompliance. The RECLAIM failed to focus on these characteristics.

#### 5. The creation of markets for environmental services.

The notion of environmental services is related to the attribution of monetary value for some nature functions, like biodiversity conservation, carbon sequestration and watershed protection. In the past, it was believed that the protection of forest areas should be done either by the government or by command and control restrictions imposed on private owners, the most frequent one is a rule requiring the conservation of a percentage of the land. The present discussions recognize the need of a deeper involvement of private owners of forest areas in their protection, acknowledging the importance of the conservation and the financial onus imposed to them if forbidden to develop economic activities<sup>16</sup>.

However, there is an initial obstacle for environmental services markets. They are characterized, as public goods, for being non-exclusive and non-rival. Would there be willingness to pay for a service that is delivered to the whole world society indistinctly, as the carbon sequestration? What about for the conservation of the biodiversity for the present and future generations?

The construction of an environmental services market, therefore, requires some changes in the demand and/or supply sides that alter its characteristics of non-exclusivity and non-rivalry. Those changes may be a consequence of the present

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<sup>16</sup> There is a concept in economics that explains such financial onus, called “opportunity costs” understood as the value lost by preventing the resources from being used to produce other goods. SEIDENFELD, Mark. *Microeconomic predicates to Law and Economics*. Cincinnati: Anderson Publishing Co. 1996, p. 21).

scarcity of natural resources. We can consider as examples a decision of a water supplier firm to pay land owners to protect watershed or of an ecotourism hotel to pay a neighbor to conserve a forest area in order to keep the landscape for the enjoyment of its costumers. It may also be the result of institutional creation as the Kyoto Protocol market mechanisms that allowed the private appropriation of quotas of carbon sequestration<sup>17</sup>.

The more important markets for environmental services are biodiversity conservation; watershed protection; carbon sequestration and landscape beauty. Their level of maturity and institutionalization vary as well as the difference between the stakeholders and agents that act or are anyhow involved with it.

One import concern that can be raised about such market relates to equity. Some weak groups presently live in the forest areas where many of the services are generated and the policies for the increase of those markets need to avoid a process of exclusion of this people deriving, for instance of the increase in the price of the land where they live. Moreover, many of these groups lack formal property rights over the land making easier the process of exclusion.

As a matter of fact, the creation of markets related to forest areas should be linked to policies of poverty alleviation and income distribution. Some discussions about poverty draw attention to the basis for generating benefits and the institutional frameworks in which the relevant groups act. Markets can be a way to realize gains from the forest based assets, but that will require policies to support weak groups and avoid their exclusion of the activities.

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<sup>17</sup> The Kyoto protocol allows the emission of certificates for carbon sequestration activities related to the reforestation of areas and for the reduction of emissions of greenhouse gases that may result from technological changes in different industrial activities. The last is more common and does not represent exactly a service performed by nature. However, its market is very close to the carbon sequestration one, ruled by the same norms and by the same authorities. Besides, the avoidance of climate change is considered also as a public good. See Handley et. Al, idem, p. 61.

Due to this relation of forest environmental services and poverty alleviation, the most important forest based commodities, traded as product of any kind of environmental service, will be described. A deeper analysis of the characteristics of each market, however, is not within the aims of this paper. The commodities are the following<sup>18</sup>:

- a) Biodiversity-friendly products. Companies sell biodiversity-friendly products when the willingness to pay for them allow a premium price to be charged;
- b) Biodiversity credits/offsets. Where a development results in a reduction of biodiversity, developers can be required to offset this damage through biodiversity enhancement in other places. It allows the generation of finance for biodiversity.
- c) Bioprospecting rights. Allows an exploitation of possible products derived from the biodiversity and is based on a payment for the owner of the biodiverse land.
- d) Conservation easements. A landowner is paid to conserve an area by means of a contract with someone else who wishes to protect some natural ecosystem. The easement has a perpetual nature and in case of the sale of the land, the new owner will be bond by the easement.
- e) Land lease/conservation concession. It is a land lease involving the allocation of forest use rights in a defined area to the lessor who may explore some of the forest products in a sustainable way.
- f) The obtention of credits for carbon sequestration deriving from afforestation/reforestation activities within or not the Kyoto Protocol market mechanisms.

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<sup>18</sup> LANDEN MILLS, Natasha e PORRAS, Ina T. Op. cit., p. 29-30.

The functioning of all those markets depends on a structure of intermediate activities such as brokers and consultants and the sophistication of those structures varies depending on the level of complexity of the market. The market participants may also be very different in all cases. Some of the activities above require a stronger participation of the States, some others have a deeper involvement of NGOs and others have private parts as the most important drivers (carbon credit markets for instance).

Some of these services required a minimum area and therefore, for small properties to be able to provide them there is a need of cooperative arrangements to create pools of owners. That can be induced by legal rules or even by the work of multilateral agencies and NGOs.

An interesting example of a rule enacted to create a market for small scale carbon offsets is the Decision 14 of the Conference of the Parties in the Kyoto Protocol which establishes a simplified procedure for the credits generation for small scale of forestation and reforestation in the developing Countries (through the Clean Development Mechanism)<sup>19</sup>.

## 6. The role of property rights in the environmental policies

As mentioned in the introduction above, command and control policies would represent a limitation on property rights. In order to justify such limitation, the doctrinal discussion about them laid their roots on the social function of property, which concept was enlarged in order to encompass an environmental dimension (the socio-environmental function of property). The socio-environmental function of the property

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<sup>19</sup> [http://www.mct.gov.br/upd\\_blob/0012/12356.pdf](http://www.mct.gov.br/upd_blob/0012/12356.pdf) consulted in 04/12/08.

therefore would allow most kind of restrictions imposed by the legislation on the owners of land or firms on their right to explore their property rights over it.

As discussed above, the origin of the creation of markets for the emission of pollutants or for the natural activities of environmental preservation is the proposal done by economists to assign “property-rights” to “non-market goods”. Such origin caused a kind of confusion between the right to transact something and the concept of property rights. And of course, we can not consider a right to pollution control as a property right.

The concept of property is related to the rights assigned to the owner of a good: the right to use and enjoy as well as the right to dispose it by any legal way<sup>20</sup>. An important component of such right is the exclusivity, which means the right to exclude anyone else from interfering to it and gives the owner the right to claim it from anyone who unduly takes it.

The definition of property can refer to “the unrestricted and exclusive right to a thing”, or the “highest right a man can have to anything”<sup>21</sup> and refers to the idea of absoluteness that also characterized the property rights since the Napoleon Code of 1804 before the evolution of the concept encompassed the idea of social function and the limitations derived thereto.

The Declaration of the Rights of the men and Citizens includes the property as one of the fundamental and states the need to indemnization in case of depriving<sup>22</sup>.

Such concept was defined mainly in respect to the right over land and real estate in general, but the evolution of the economy allowed rights over other goods to become

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<sup>20</sup> PEREIRA, Caio Mario S. *Instituições de direito civil*, v. IV, Rio de Janeiro:forense, 4ª. Ed., 1981, p. 80.

<sup>21</sup> Blacks law dictionary. St Paul: west publishing co., 1991, p. 845.

<sup>22</sup> As states its principle 17: “since property is an inviolable and sacred right, no one shall be deprived thereof except where public necessity, legally determined, shall clearly demand it, and then only on condition that the owner shall have been previously and equitable indemnified.” Available at [www.wsu.edu](http://www.wsu.edu), last consulted 04/14/2008.

valuable and to require the law protection of its exclusiveness, as for instance the intellectual property. The law also protects the property of movable things as opposed to real estate. As a general rule, the movable things belong to the one who possesses it.

On the other hand, the evolution of the market transactions also created different titles that can be possessed and transacted as the variety of kinds of bonds and papers. These last would be close to an allowance to emit pollutant. However, the law can impose restrictions to their transfers or to any aspect of their use. Property rights today can refer to a broad range of tangible and intangible, movable or immovable things. It can vary also on the degree of the limitations imposed by law.

The question to be answered therefore is whether the emission allowances or a carbon credit may be subject to a property right.

As referred to above, the acid deposition control program states clearly that the allowances do not constitute a property right, although the statement would not by itself change the nature of the right, some of the legal rules about it may be analyzed to help the understanding of its nature.

One of the most important aspects of such rules is the possibility of cancellation by the regulator “at any time”. On the other hand most programs that create a tradable permit have a specific rule concerning the possibility of banking it for use or trade in a determined period of time, which can be considered as another limitation in the right of use and disposition of the thing. The allowance constitute an administrative permit and it is not possible to have a property right over it.

The characteristics of the emission allowances and the carbon credit are close to an assignment of rights. However, the possibility of assignment itself, although limited in time and subject to other law restrictions, means recognition of a right of disposition, which is the most fundamental basis of a market system. Perhaps, the identification of

the disposition right that is present in a transaction led the economies to identify all situations where such possibility of disposition is present as a property right.

## 7. Conclusions

This paper discussed how environmental policies can create market mechanisms to enhance the environmental protection in an efficient direction. The building of these markets is based in what the economists describe as the “attribution of property rights to non-market goods”. The most important examples of market mechanisms in environmental policies are the pollutant emission markets; the carbon credit markets as well as some environmental services market.

Of course the possibilities of contribution of such markets to the environmental preservation is not only controversial but also requires a strong role of states in its design and monitoring as well as a clear commitment to assure the markets will allow some equitable results, since the forest protection issue often involves weaker groups living in the forest areas, as well as small farmers.

The paper discussed also the nature of the “property rights” created by those markets. The legal doctrine does describe the property as a very formal concept that relates to the rights of the owner over the object: utilization, enjoyment and disposition. Such rights over emission allowances or carbon credits are subject to severe limitations, but it is still possible to recognize them and to conclude that it is the existence of a disposition right that allows the markets to exist, although the characteristics of its transfer is closer to a rights assignment than to property transfer.

Therefore the markets and the property rights have a very important role in the environmental policies and there is a clear trend to an increase in its utilization as

policies instruments. However it should be remembered the challenges those markets impose to governments for the achievement of the environmental and social goals of the policies