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## **CAP and Kyoto Conference Taxation or Environmental Standards to Improve Carbon Sinks**

The improvement of air good quality is a worldwide priority. The Kyoto Protocol, and the agreements achieved in the following process negotiation, have defined the LULUCF activities (land use, land use change, forestry) the industrialized countries have at disposal to reach the engagements of reduction of the climate emissions-changing. The CAP (Common Agricultural Policy) reform affirmed that the content of the policy will secure a multifunctional, sustainable and competitive agriculture throughout Europe. It will also be able to maintain the landscape and the countryside, make a key contribution to the vitality of rural communities and respond to consumer concerns and demands regarding food quality and safety, environmental protection and maintaining animal welfare standards. In regulation absence firms pollute into air CO<sub>2</sub> without being held to pay a price of the service of assimilation of the greenhouse gases supplied from the agroforestry sector. The greater social efficiency of taxes than adopting reduction standard (as signed in the Kyoto Protocol) is demonstrated. In spite of that, the society has no general agreement on supporting farmers and the overcoming of practical problems following this policy remain as a narrow road. Despite the uncertainty of public policies, a practical purpose is then needed in sustainable forestry, considering the social advantage of financing afforestation, giving clear goals of being CO<sub>2</sub> sinks.

**KEY WORDS:** *Kyoto Protocol, Agricultural poltery, Atlas Project.*

### **1. The CO<sub>2</sub> Absorption in Agroforest Sinks**

The improvement of air good quality is a worldwide priority. A significant reduction of the atmospheric pollution, considered as responsible for the heating of the planet and for the climatic changes, requires the combination of national and international measures. On this basis specific acts have been adopted in large convention of the United Nations Framework on Climatic Changes (1992) and the Kyoto Protocol (1997). The signatory parts decided to reduce from 2008 to 2012 gas emissions of at least 5% with respect to the levels of 1990. The engagement of the UE concerns a reduction of 8%.

The United Nations Framework Convention on Climate Change (UNFCCC) fixed several actions to stabilize the atmospheric concentration of greenhouse gases at a level which don't cause damages to the climatic systems, in the irreplaceable role of the geosystems in global cycle of the carbon and in its control emission (Ciccarese *et al.* 2003).

The attention is focused to the reduction of use of fossil energy sources and towards the policy of reduction of their consumptions, both the growing costs and for the international dreads and the emissions of carbon dioxide and other greenhouse-gases, including concerns on deforestation and degradation of ecosystems that are considered among principal causes of the total climatic changes.

Parts 3.3, 3.4, 6 and 12 of the Kyoto Protocol, and the agreements achieved in the following process negotiation, have defined the LULUCF activities (land use, land use change, forestry) the industrialized countries have at disposal to reach the engagements of reduction of the climate emissions-changing (Ciccarese et al. 2003).

The emissions and the absorptions which turn out from the change in use of the soil can be included (according to precise accounting rules) in the national budgets of the greenhouse-gases, to compensation of a part of emissions caused by the combustion of fossil energy, in the case in which the difference between absorptions and emissions is positive.

The LULUCF activities are admissible if:

- have started from the 1990 (basic year of account),
- they have been induced by activity of the (human-induced) man and they are not imputable to natural causes.

And however admitted a partial account of the carbon changes due to the land use change which limits the contribution of the agroforestry, to not contradict the aims of the Protocol that aim specific national policies of cutting of the emissions.

The admitted activities are those realized after 1990 and accounted to the net emissions balance between Afforestation, Reforestation and Deforestation processes, meant as permanent variations in the land use from not forest to forest (and viceversa).

The Marrakech COP7 has identified the definition of forest, afforestation, reforestation, besides all the LULUCF measures, with the identifying of four additional activities:

- Forest Management,
- Cropland Management,
- Grazing Land Management,
- Revegetation.

The potential absorption of the carbon through the management of plantation resources is valued between 60 and the 87 Gt for a 50 year period, seem to the 7-15% of the average emission of fossil fuels in the period 2000-2050 (IPCC 1996, 2000).

Forests and their products have a limited capacity in removing CO<sub>2</sub> from the atmosphere and are not perennial tanks. On the contrary, the benefits deriving from the replacement of the fossil fuels with bio-energy are irreversible. The production of an energy unity from biomass (instead of a fossil source) avoids in permanent way gas pollution.

A plant using biomass to produce energy looks like an eolic plant, which does not discharge in atmosphere the amount of emissions produced by an energy plant which use not renewable fuels.

## 2. European Environment Policy, CAP and its Reforms

The European Union often has been criticized for having favoured the economy and the development of commercial exchanges despite the environmental impact. Today they recognize that the model of development it is not possible to found nor on exhaustion nor on degrade of natural resources and the environment protection becomes one of the greater challenges fore the future.

The sustainable development has been implemented in the Treaty of Amsterdam on the European Union that conferred the intervention in environment rank of political strategy and not more of scattered interventions.

The Fifth Environment Action Programme: *towards sustainability* established the beginnings of an European strategy for the period 1992-2000, based on voluntary and horizontal actions, as interest of every productive sector (industry, energy, tourism, transports, agriculture), in particular with respect to occupation, energy, agriculture, development cooperation, united market, industry fishes for, transports and political economy.

The Sixth Environment Action Programme of the European Community, Environment 2010: *our future, our choice* defines the strategy of the European community up to 2010, identifying as priority action climatic change, nature and biodiversity, environment and health, management of natural resources and waste.

These strategic programmes are based on a global approach, rather than on selected pollutants or economic activities, as in the past. They identify long-term objectives, based on an assessment of environmental problems in an integrated way to meeting economic, environmental and social objectives.

The aim is also to provide the opportunity to simplify and clarify existing legislation.

The action programme envisages the adoption of seven thematic strategies covering air pollution, the marine environment, sustainable use of resources, prevention and recycling of waste, sustainable use of pesticides, soil protection and urban environment.

The agriculture represented a priority aim of the European policies since the negotiations of the Treaty Of Rome which already defines the general aims of the Common Agricultural Policy (CAP).

The positive results of the CAP are darkened by undesirable secondary effects, such as productive surpluses and exponential growth of the agricultural expense. For this, CAP faced several reforms in the four decades of existence. Agenda 2000 and the MTR (EC 2003) reformed radically the agricultural objectives boosting agri-environmental measures within the Common Agricultural Policy, introducing decoupling of direct aid to producers (cutting the link between support and production) and the introduction of the single payment scheme.

The Union has to prepare its agricultural sector for international negotiations and to define limits of what it finds acceptable, as the Union is the greatest importer and the second exporter of agricultural products in the world.

The reform affirmed that the content of the policy will secure a multifunctional, sustainable and competitive agriculture throughout Europe, including in regions facing particular difficulties. It will also be able to maintain the landscape and the countryside, make a key contribution to the vitality of rural communities and respond to consumer concerns and demands regarding food quality and safety, environmental protection and maintaining animal welfare standards.

Multifunctionality in agriculture generally points to the benefits other than food or fiber that can come from agriculture - benefits that often go unrewarded in the marketplace and that can vary tremendously depending on farming practices (OCSE 2005).

These benefits (Non-Commodity Outputs NCOs) typically include contribution to the vitality of rural communities (through maintenance of family farming, rural employment and cultural heritage), biological diversity, recreation and tourism, soil and water health, bioenergy, landscape, food quality and safety, animal welfare.

It it to be noted that Developing Countries expressed concern that multifunctionality was just a fancy term for Europe and others to shut their markets to agricultural imports, and to continue dumping excess production overseas.

In many cases agricultural NCOs are public goods and many economic arguments for government intervention are based on the idea that the marketplace cannot provide public goods or handle externalities. A clean environment obviously has been labelled as a public good (Casini 2003) and the social optimum point concerns a clean environment.

If social benefits are expected to justify public support, a new system of subsidies designed to promote these benefits specifically should be devised. We have to consider, as our knowledge of social benefit is so limited, if may be preferable to suspend all subsidies for agriculture and in a specific topic for afforestation?

Public intervention may be based on a Check-and-Control system (with public imposition of environmental standards) or on economic incentives (considering taxes and subsidies), that is to assume the creation of markets environmental credits, up to stop to "simple facilities" of the private supply for a market exchange.

As well known, Pigou (1920) distinguished between private and social marginal products and costs and set the idea that governments can, via a mixture of taxes and subsidies, correct market failures - or internalize the externalities.

In producing NCOs (as positive externalities) agricultural practices it is evident that the absence of any incentive reduce to zero the private supply or set it onto an unsatisfactory level from the social point of view.

If agriculture (including forestry) is chargeable to produce optimum level of externalities, the main problem to be faced is the uncertainty in their evaluation and, as a consequence, the to determine real amounts of incentives to be paid to farmers.

Before embracing with enthusiasm public regulation, we must explore the possibilities to create markets that supply on voluntary bases public goods and services as they are more efficient.

It is well known that public policies lay on two main theories. One follows the Pigouvian approach (taxes and subsidies, both very difficult to determine), the other one is based on Coasian analysis of assigned property rights.

Contrary to Pigou's theory that only governments, by means of taxes and subsidies, can internalize externalities in economic exchange or production, Coase argued that, when one considers opportunity cost in its full meaning, no such devices are necessary: private losers and winners in such cases can internalize these externalities themselves through negotiation and that the result will be identical regardless of which party has rights of ownership over the cause of the externality. In short, the manner in which a property right is initially assigned will not affect the efficiency of resource allocation. The only exception, Coase granted, is when there are transactions costs to negotiation.

Such formulation tried out solutions to the market failures in which the public participation play an indirect role, leaving room to Non-Governmental Approaches - NGAs (OCSE 2005).

In particular in the case of NCOs, the NGAs are defined both as a dealing between private persons for the supply of NCOs with payments from consumers (demand) to farmers/land managers (supply), and the voluntary supply of NCOs without compensation.

### **3. Taxes Vs Environmental Standards**

In regulation absence, firms pollute into air CO<sub>2</sub> without being held to pay a price of the service of assimilation of the greenhouse gases supplied from the agroforestry sector.

The damage occurring by this environment degradation does not hit firms (and it does not constitute an inner cost in the private marginal costs) but it hits the entire society.

The external costs do exist both in the event that some person actually pays (as buying air-conditioners to prevent houses from a warmer climate) and also when the damage is not directly paid (under the hypothetic losses of cropping opportunities for macro-changes of climatic areas).

When firms use and degrade a no-price natural resource (i.e. the biosphera function of assimilating the CO<sub>2</sub>) they do not sustain inner costs and their curve of marginal cost is not influenced by that, however being a cost for the society.

The taxation of pollution follows the pigouvian model that, to be efficient, must to reflect the exact marginal cost of pollution (Pigou 1920). This assumption appears soundly obvious but the exact evaluation of taxes faces unsurmountable practical difficulties. As a consequence, very often public agencies adopt confused solutions.

Instead, taxes and other instruments based on the market mechanisms (as negotiable permissions) offer the more efficient means from the social costs point of view because they internalize social costs in firms decision. They are the less expensive means to obtain an imposed standard, that cannot be efficiently reached through voluntary behaviors.

Following well known models (Pearce and Turner 1990), simplifying the presence of three firm curves of marginal costs (respectively  $MCR_1$ ,  $MCR_2$  and  $MCR_3$ ) of pollution reduction, and assuming a public demand to achieve environmental standard as the reduction pollution to  $S_b$  for any firm.

The public intervention can impose to each firm not to exceed the fixed standard so that firms are forced to a reduction of pollution equal to  $S_b$  per each, or to impose a tax  $t^*$  in order to push firm 1 to catch up point X, firm 2 the point B, firm 3 the point Y on the respective curves of marginal cost of pollution reduction.

It is demonstrated that total costs of pollution reduction are greater adopting the solution based on imposed standard than on adoption of taxes.

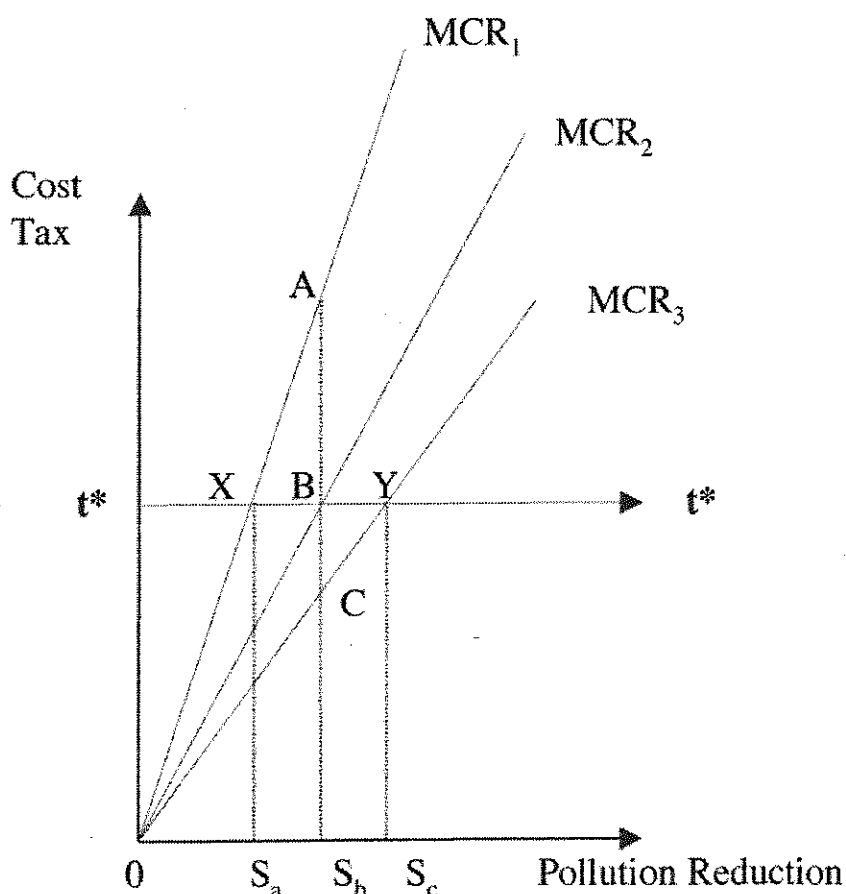


Figure 1. Pollution reduction, Taxes vs Standard

With regard to figure 1, adopting a fixed standard, the total costs of reduction are:

$$TCR_{st} = 0AS_b + 0BS_b + 0CS_b \quad [1],$$

instead, adopting taxes, total costs of reduction of pollution are:

$$TCR_{tax} = 0XS_a + 0BS_b + 0BS_c \quad [2].$$

Subtracting [2] from [1] it is:

$$TCR_{st} - TCR_{tax} = SaXASb - SbCYSc,$$

and being:

$$SaXASb > SbCYSc,$$

the result is:

$$CTR_{st} > CTR_{imp}$$

The greater social efficiency of taxes than adopting reduction standard (as signed in the Kyoto Protocol) is demonstrated. In spite of that, the overcoming of practical problems following this policy remain as a narrow road.

The transfer of resources from society to farmers (by means of taxation) in spite of the theoretical explanation of the greater efficiency of taxation is not immediately justifiable to refuse environmental standards. As a matter of fact, the taxation is not clearly targeted and it is not directly identified/identifiable with the yield transfers through the CAP that, even after the above-mentioned "revolutionary" reforms, do not give certain levels of "decoupling" between concession of monetary substants to farmers and production of environmental services. CAP does not explicitly affirm that farmers will be paid if (and only if) they will produce certain amounts (and quality) of environmental services (Romano 1999).

#### 4. The Atlas Project

Despite the uncertainty of public policies, a practical purpose is then needed in sustainable forestry, considering the social advantage of financing afforestation, giving clear goals of being CO<sub>2</sub> sinks.

The Mediterranean basin must be conceived as a geographical unity. As a matter of fact (underlined by several researches), in the Mediterranean region co-exist many cultures, religions, societies of very diverse historical background and social structures

(Di Comite and Valleri 1994). In the same time, states in different stages of economic development do co-exist, facing great similarities or disaffinities (FAO 1994). In any case, one can distinguish sub-groups of countries, according to different criteria, without detecting community of interests.

It is thus apparent, that only common problems, such as pollution or other threats to nature (Flora and Fauna) which arise from the geographical unity, can induce common policies and common concerns. As a matter of fact, economic interests and social differences in the Mediterranean countries will induce divisions and isolations rather than political or economic unification and integration.

As the equilibrium of the environment is strongly subjected to forest existence, the introduction of a global viewpoint, targeted to the sustainable use of basic resources is essential in order to indicate a new Forest Policy (Corinto 1996). Therefore, the introduction and diffusion of eco-compatible forestry managing in the whole Mediterranean Forest System is necessary in order to assure future maintainance of natural resources and, as a consequence, of human life.

Within such a framework, the Atlas Project (Chiarelli *et al.* 1995) could be a model for the natural resources managing. The forest task aims to develop an eco-compatible model of the forest use, but we are perfectly conscious that the environment global managing is a matter for policy makers. In fact, we believe that the Atlas Project will produce a global Policy view-point to be implemented both by local governments and International Institution and not only a more or less sophisticated algorithm. Quantitative analysis of technical informations and data are both essential, but we hope that the main result of our study will be a practical support for political decision making agencies.

In our hopes the Atlas Project will achieve some environmental and socio-economic goal in the Mediterranean related to:

- the increase of the wood reserves and wood products in an easily accessible area in the Mediterranean basin for European needs reducing the exploitation of the equatorial forest,
- provision of working activities *in loco* to the populations of the Atlas chain mountains which are now suffering from an excessive increase and cultural depauperation, and, as a consequence,
- the actual absorption and storage of the CO<sub>2</sub> produced in excess in the industrialized Europe countries under the CDM (*Clean Development Mechanism*) of the Kyoto Protocol.

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