

# Institutional Changes and Forestry in Central America.

By

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## **Abstract:**

The Central American countries are struggling to reach sustainable development within the current context of globalization and high competitiveness. So far, economic development policies in Central America have been very antagonistic with forest maintenance, however, forest products and services have been increasingly important in these economies. Services such as ecotourism, biodiversity, carbon sequestration, water maintenance and non-wood products from the forest are nowadays recognised to be ecologically and economically important. The problem is that the forest is considered as a minor contributor to national economies. From the economic point of view the forest is mainly related to products exchanged in the market, but if we study the forest from an ecological economics perspective, we also include the human beings-nature relationships in a longer term perspective. The absence of a more integrated vision produces very serious implications for policy initiatives and affects people and national economies. In order to change this myopia and take into account the whole *forest system*, it is argued that new *institutions and/or adjustment of the existing ones* must be introduced. What kind of institutional set-up and how does it affect the innovation trajectory of forestry is at the core of this research.

## **Keywords:**

Institutional change, forestry sector, competitiveness, sustainable development.

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## **1. Introduction: The International Context.**

The international business environment is changing world-wide not only because the revolution in the information technology which creates new patterns of productive specialisation but also because of the pressures on the environmental considerations. Several international agreements are nowadays governing global competitiveness. For instance the European Act (1986), the Maastricht Treaty (1993), the NAFTA agreement (1993), the WTO (1994) and many other regional agreements for trade of commodities and services. In the same line, global agreements are emerging related to environmental concerns. Some examples are the Agenda 21 (non-binding instrument) signed in the Earth Summit or UNCED Meeting in Brazil, or binding instruments such as the Framework Convention on Climate Change (CCC), the Convention on Biological Diversity (CBD) and the Convention on Desertification, which are intimately linked to forest issues.

Taking into account this global framework it is very relevant to examine possible of competitiveness and sustainability of different sectors of the economy. This is particularly true for the Central American countries, which are facing important transformations in their macroeconomic models of development, due to the recent recovery of their democracies, openness of their economies, new policies trying to tackle the extreme poverty conditions and larger attention to environmental degradation. A proof of political willingness to change direction towards consolidating peace and regional integration including economic and environmental issues is the President's recently signed Alliance for Sustainable Development (ALIDES). The Presidents recognised that economic and social development in the region and in each country, must be compatible with actions to safeguard natural resources and use them sustainably, unless the whole process is going to be jeopardised (Rodriguez, J. and Salas, A., 1995).

At this point it is important to define what is understood for sustainable development and competitiveness.

### **1.1. Desarrollo Sostenible.**

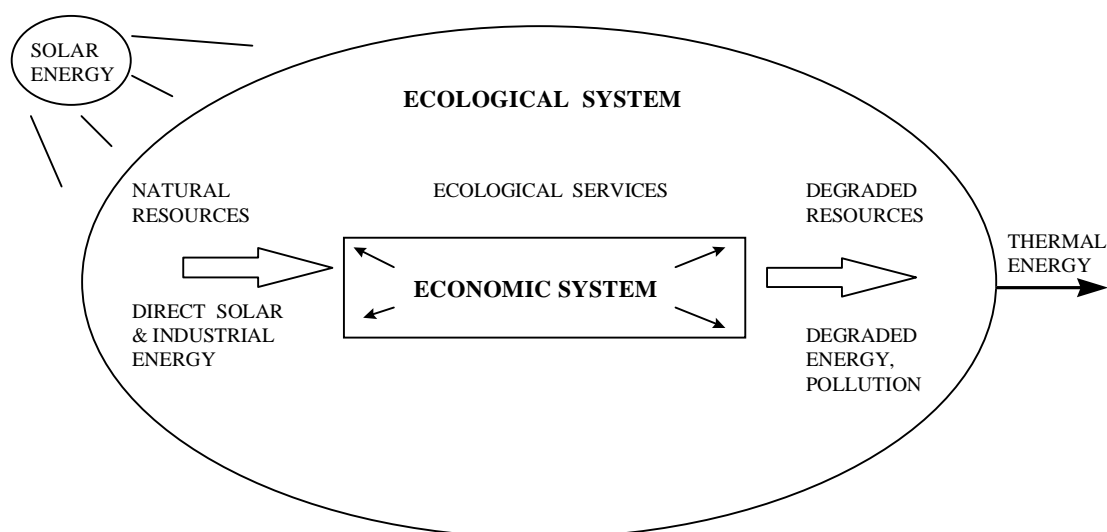
Though there are many definitions for sustainable development, the best known came out from the Brundtland Commission Report (WCED 1987) as "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change...enhance both current and future potential to meet human needs and aspirations". This definition is really questioning the traditional understanding of economic development that has historically focused on the goal of economic growth - defined as rising gross national product (GNP), which generally downplays the importance of distribution issues and environmental health. Furthermore, in neo-classical environmental economics negative externalities result from impersonal market failures; distribution has no bearing on their causes. Lately in the best case when talking about economic development economists include besides GNP and traditional economic indicators, some other ones such as health, education, housing and other social indicators. This step forward in economics is very important since inequalities of wealth and power are a noteworthy feature of human societies. Additionally, we may stress, these inequalities are of crucial importance in understanding the causes and consequences of environmental degradation (Boyce and Segura, 1992).

At the UNCED conference it was recognised that the origins of the ecological and social crisis lies deep within the assumptions of our economic systems. In the words of Alicia Barcena, Executive Director of the Earth Council, "as the concept of sustainable development evolves we are moving more and more towards a profound change of values, the celebration of diversity and the economics for community. This will overcome the concept of development as overconsumption and growth".

A new economic paradigm is emerging. There is a world-wide better understanding that the economy as a part of its life-supporting environment, depends not only on the inputs of energy and natural resources for production and consumption, but also on services generated by ecosystems. In this sense, it is worth to stress that the economic system should be understood as a sub-system of a larger one: the ecological system (Costanza, R., H.E. Daly, and J.A. Bartholomew, 1991; Perrings, Folke and Mäler, 1992; Costanza, Segura and Martinez-Alier, 1996). According to this argument there is a group of professionals called Ecological Economists, who stands for a holistic and transdisciplinary research-action of the ecosystems and the economic systems. Work on ecological economics is growing rapidly where thousands of economists, ecologists and other professionals are actively analysing the interactions between economics and the environment. The problem for them is to continue with the production process, now and in the future, and at the same time maintain the level of biodiversity which will guarantee the resilience of ecosystems in which humans throw all the waste and pollution (See figure 1). Most of them are trying to figure out what economic policies, new technologies and institutional arrangements are suitable for limiting environmental degradation while at the same time achieving other social goals.

**Figure No.1**

## The economy as part of the ecosystem



Source: Perrings, Folke and Mäler, 1992.

At the world level, economic development models, along with the techno-economic paradigms (TEP) have been changing during the past without considering environmental impacts. For instance steam power, second TEP; electric power related to the third TEP; mass production in the fourth TEP; and the fifth TEP with the era of Information Communication Technology (ICT) of major dominance today, have been influencing policy making at national and international levels and none of them including the environment as one of the limiting factors to deal with. According to Christopher Freeman (1992) when he discusses about sustainable development, he states that “it is therefore not too soon to start thinking about and designing and building institutions and technologies which are likely to combine in a sixth (environmental) TEP”. The first five TEPs refer more to a set of common-sense guidelines for technological and investment decisions which finally led to new technological innovations and trajectories. However, it seems that the sixth TEP should not only be based on technical and organisational innovations, but also in a better understanding of the nature-economy relationship.

These non-mainstream economists looking for an alternative explanation of the causes of development, argue that national systems of innovation (NSI) is the more relevant causation for different countries to economically succeed or not. The NSI “is constituted by elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge...rooted inside the borders of a nation state” (Lundvall, B. 1995). According to this approach innovations on technology and improvements in the learning capacity is not only sources for development, but also a socially embedded process which cannot be understood without taking into consideration its institutional and cultural context. I would like to add to this argument, that since all society is currently involved in this process of learning about the economic-ecology relationships and limitations, hence new innovations, new technologies and new institutions should be also emerging in this transition period.

In conclusion, there are differences of the understanding and definition of sustainable development, but there is certainly a trend toward this new style of development or new paradigm. Therefore, it is important to include a simple definition which may help us to understand sustainability.

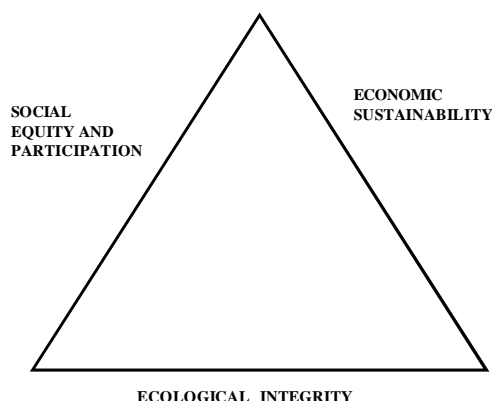
Sustainable development entails three dimensions:

- the social equity and participation
- the ecological integrity
- the economic sustainability

Sustainable development can be illustrated by an equilateral triangle (Fig.2). If it has two sides or if it has unequal sides it is not an equilateral triangle. In the same way if there is a predominance of any of the three dimensions, or if any of these three dimensions is missing, there is not sustainable development. There would not be sustainability if we cannot eradicate the politically intolerable and morally unacceptable poverty and discrimination. In the same way, as the level of environmental degradation increases, and the stock of natural capital decreases, the potential for economic development shrinks and sustainability will be further away.

Figure No. 2

## Sustainable Development



### 1.2. Competitiveness.

There are several definitions of competitiveness according to different authors and theoretical approaches. However, competitiveness is generally associated to indicators of rate of growth in each sector, performance, efficiency, technological change, salaries, productivity and/or production conditions<sup>2</sup>. Traditional economic theory considered that national endowments may explain differences of competitiveness among countries; but, more recent studies have shown that technological innovations, accumulated experience, user-producer relationships and economies of scale are also very important explanatory variables of competitiveness<sup>3</sup>. According to Fajnzylber (1989) *spurious competitiveness* is associated to low salaries, manipulation of exchange rates, subsidised exports and high profits in the domestic market, but on the contrary, *genuine competitiveness* require an increase in productivity achieved by the incorporation of technological progress.

There are several alternative concepts used to evaluate competitiveness, but none of them is actually including the social and environmental dimensions (Gitli and Vargas, 1996). Some economists already pointed out that there are opposing elements in the relation between competitiveness and environmental variables, especially because higher protection of natural resources degradation and the implementation of environmental regulations led to higher costs in the production processes. According to these authors there are net costs of environmental regulations (trade-offs) and only some exceptions will produce higher profits for private firms. Product offsets and process offsets may appear in certain instances, but they are only exceptions (Palmer, K, Oates, W.E. and Portney, P.R., 1995) On the contrary other authors, such as Porter, M. E. and Van der Linde, C. (1995) explained why the relation between environment goals and industrial competitiveness should not be seen as involving a trade-off between social benefits and private costs. Their argument is based basically

<sup>2</sup> Gitli and Vargas, 1996 state that these elements were systematised by Lia Hagunaver (1990) after carrying out an exhaustive review of the literature on the topic of competitiveness.

<sup>3</sup> For reviewing discussions on the concept of international competitiveness review Porter, M. (1990), Dosi, Pavitt and Soete (1990); Dalum, B. (1992) and Fagerberg, J. (1988 and 1995).

on the assumption that international competitiveness is dynamic and based on innovation. Therefore well designed regulations will produce “innovation offsets”.

This is probably why after reviewing these arguments Gitli and Vargas (1996) came out with a definition of competitiveness, which fits the idea of sustainable development, which I am going to use in this study:

“Competitiveness is associated with the capacity that a nation, productive sector or business has to increase its participation in the markets where it competes based on the creation and realisation of a greater aggregate value in its productive processes, increasing the retribution to productive factors and maintaining, or even improving, the conditions of the existing stock of natural capital”

This definition reflects not only the worries for maintaining the insertion in the international market, but also the medium and longer term concerns of increase the living standards of local population and sustain the ecological system for the reproduction of the economic processes. Precisely the Central American countries are looking at improvement in their international competitiveness, which at the same time enhance the welfare conditions without risking the ecological base for present and future inhabitants to continue using it.

## **2. The Central American Context.**

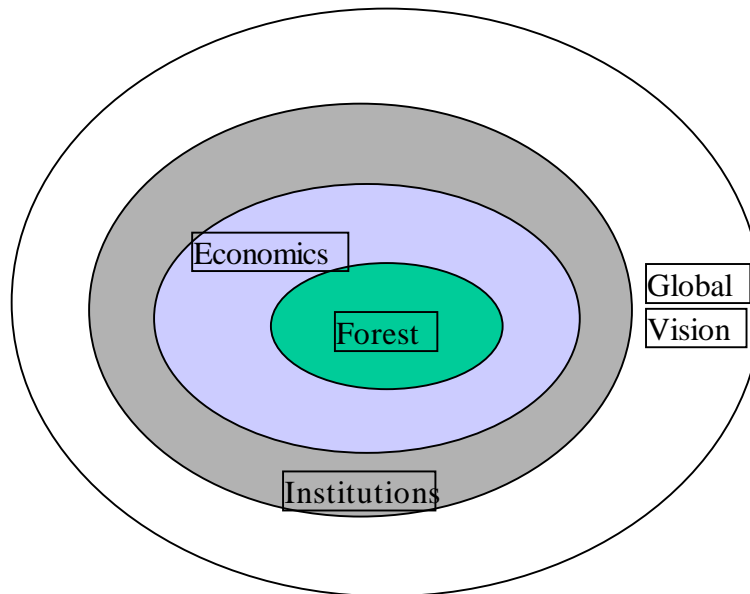
The Central American countries are struggling to reach sustainable development within the current context of globalization and intensified competition. In the past, economic development policies in Central America have been very antagonistic with natural resources and especially forest maintenance. Nowadays, there is a -regional and international- growing concern with the problems of deforestation, the conversion of forests to agricultural uses, and the effects of deforestation on climate change, loss of biodiversity, water cycle maintenance and local communities dependence on forest resources.

The economic development models have been among the most important causes of land conversion in Central America. During the 1950s, 1960s, and the 1970s, agriculture and livestock sectors achieved to develop at the cost of high rates of deforestation. National interests as well as international support (mainly from the World Bank and the Inter-American Development Bank, IDB) pressured for public policies to promote economic growth through increasing exports (mainly beef at that time). Additionally in the 1970s there was induced the import substitution model which jointly with an international crisis brought all countries to a severe economic problems. During 1980s and 1990s the new outward-oriented growth model has been based on exporting non-traditional products. These products again, are based on primary resources, and among others we may cite flowers, ornamental plants, pineapple, melons, oranges, shrimps, etc.

All these models of development have a shared global vision, or dominant patterns of behaviour, which at the same time shapes the legal framework and national institutions (Bandler and Grinder, 1975, cap.1 and Tversky and Kahneman, 1981). More concretely, in Central America the predominant global vision has been one where

forest was mainly associated with timber and it was considered as an obstacle to agriculture and other “development” activities. According to this vision, the legal and institutional frameworks were created, and they influenced economic policies and land use decisions against forestry. The relations and interactions among global vision, institutions, economics and resource management are not unidirectional, rather there are mutual interdependences and influences (Fig. 3).

**Figure No. 3**  
**DOMINANT GLOBAL VISION AND RELATION WITH FOREST**



However, it seems that the new concerns are changing this global vision. First, the awareness of interdependence between ecological and economic systems is larger. Positive and negative externalities related to natural resources, and particularly to forest are now widely recognised. Second, new goods and services from the forest are entering in the international sphere of trade and competition. These former free services have been so far perceived as very valuable positive externalities from the forest, but they are now becoming new commodities. The problem is that many of the services are actually addressed to international or global users, implying that international agreements must be reached before producers would receive any recognition. A classification of local, national and global beneficiaries is presented in table No. 1, and it is necessary to stress that in spite of the uncertainty of international agreements on this issue, there are already some services being negotiated internationally.

**Table No. 1.**  
**CURRENT BENEFITIARIES OF**  
**GOODS AND SERVICES FROM THE FORESTS.**

<i>Goods and services from forest</i>	<i>Benefits for the forest owner</i>	<i>Benefits for the country</i>	<i>Global benefits.</i>
<b>1. Wood products.</b>	X		
<b>2. Non-wood products from forest</b>	X		
<b>3. Maintenance of the hydrologic cycle.</b>		XX	
<b>4. Soil and water quality conservation.</b>		X	
<b>5. Wind and noise control.</b>		X	
<b>6. Natural scenery</b>		XX	
<b>7. Recreation and ecotourism</b>		X	
<b>8. Cultural and religious services</b>		X	
<b>9. Microclimate regulation</b>		X	
<b>10. Climatic change.</b>		XX	
<b>11. Maintenance of biological diversity in the forest ecosystems.</b>		XX	

Source: Segura, O.et.al. *Políticas Forestales en Centro America: Restricciones para el desarrollo del sector.* CCAB-AP. San Jose, Costa Rica. 1996.

### **2.1 Current Forest Problems in Central America.**

a. If we review the national accounts in many countries, among them the Central American countries, we find that **the forestry sector is not adequately measured** It melts and mixes with several other sectors. For example seed selection and improvement, nursery plantations and reforestation are included in the agricultural sector; and logging, timber and furniture production are in the industry sector. Other products and services are included in different sectors and finally some products and services are not accounted for in the GNP figures at all.

**b. There are no economic policies focused on the forestry sector as a whole, or they are contradictory.** Agricultural and cattle policies have been affecting forest for a long time, but also industrial inefficiency and protection has indirectly affected it. Furthermore, some indigenous or peasant knowledge favouring agroforestry and silviculture activities as well as multi-use of the forest are many times unfairly competing with national and sector policies. Macroeconomics models have been shifting from (before 1960s) traditional agro-exports to (1960-1980s) import substitution and again to export led growth (1980 onwards), but in none of the cases environmental problems, not to mention forestry impacts, have been taken into account.

c. **The forest issues that split up responsibilities among different public organisations create confusion for policy initiatives.** Some ministries or agencies deal with different parts of the forestry sector creating abundant rules and legislation, but also leaving some important parts with no policy. For example the wood for energy, agroforestry or silviculture activities do not have consistent policies, due to the fact that these activities mix together agriculture and forestry activities, and they do not belong to the Forestry Service Department (existent in most of the countries as sub-sector of Agriculture or sub-sector of Environment Ministries), neither are they assigned to the Agriculture Ministry. Policies for conservation, preservation, management and development coming from different branches within the same government often conflict with each other.

d. The whole spectrum of **forest products and services is not really represented in the economy** of any country. Some of these services provided for national parks and forested landscape which lately have become widely recognised are not accounted in any place. This recognition without accounting create an increasing demand for forest maintenance around the world, but makes it impossible to actually pay for forest services to the owners.

e. **Forested areas are maintained without benefits for the communities who live in or around them.** People living in poverty or under the poverty line are directly linked to forestry since most of them live in the agriculture frontier, very close to National Parks or any other kind of protected and forested area. They live from products and animals that they hunt or harvest from the forest. Forested land is also cleared by loggers who sell timber to forest industry (saw mills) and squatters for agricultural production (mostly basic grains for feeding themselves<sup>4</sup>) and for sale to the agriculture sector in a later stage.

f. **The revegetation of Central America is an important issue to be addressed.** At the local level benefits from the forest should be larger than for alternative crops. It is important to stop the process of deforestation, (which currently is approximately 416,000 hectares per year, meaning 48 hectares per hour in Central America) and revegetate or reverse the process for biological sustainability, but it is also important to develop this activity with social and economic sustainability as well. According to land use capabilities the Central American region has 13.000 Th. Has. with no forest, part of this should be revegetated and produce welfare for the local population.

### **3. The Forest System: A New Rationale.**

World-wide forest has been mainly related to pulp, paper, paperboard and sawn wood. In Central America forest has been mainly related to timber. Of course from the traditional economic point of view forest is related only to products exchanged in the market. However, if we study forestry from an ecological economics perspective, we must include not only the products exchanged in the market, but also the human-nature relationships in a longer term perspective. This difference in approach is very

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<sup>4</sup> There is a complex dynamic relation between poor peasants and the agricultural frontier which shows that the main reason for them to deforest is survival. For further studies on this topic see documents of the Consejo Centroamericano de Bosques y Areas Protegidas (CCAB-AP) 1996 and Fact Finding on Recent Deforestation in Costa Rica. Environmental Working Paper No. 61 World Bank. Sept. 1993.

important since it has serious economic and policy implications for the countries and their people. Many of the forest products and services (see Box 1) treated up to now as externalities are being introduced in the market system and give us the opportunity to have a new rationale about forest.

As stated above, forest goods and services are currently registered within different sectors of the economy and some of them are not included in any sector. This fact contributes to conflicting policies from several government agencies. Additionally, government policies as well as cultural attitudes and institutional set-up toward forest resources do not encompass the whole spectrum of products and services. The neglect of important parts of the forestry sector produces serious policy implications for people and economy of these countries. The outcome of this reality is reflected in too much transformation of land use from forest to more market oriented products and activities (agriculture, cattle, etc.), including land with forest aptitude.

### **Box No.1: PRODUCTS AND SERVICES FROM FOREST**

*Timber:* lodging and production of timber for housing.

*Wood products:* wood for pulp and paper, wood for energy, firewood, charcoal, posts for fences, wood for crafts and Christmas trees.

*Non-wood products from forest:* medicinal herbs, tints, ornamental plants, resins, seeds, constructions materials, genes, chemical substances, liens, odours, meat and animal skins,

*Conservation:* the retention, creation, maintenance, reproduction and survival of animal and vegetable species.

*Education:* the woodland environment, the biodiversity and the landscape in general may serve as living laboratories and outdoor classrooms, or we may create the new term bio-education which includes from kindergarten to Ph.D. research professionals.

*Free Leisure:* it refers to pleasant, tranquil, desired and needed rest, vacationing or sporting activities around the woods, especially for the local population.

*Eco-tourism:* it refers to leisure paying for services in National Parks, private or public reservation areas or vacation resorts.

*Maintenance of the hydrologic cycle:* This refers to water recharge and the maintenance of rivers. Water for human, industrial and agricultural consumption, springs, and water for scenery are dependent of forestry. Prevention from floods, water transportation, and hydroelectric plants are also dependent from this cycle.

*Soil and water quality conservation:* run-off and wind erosion as well as sedimentation - which are reduced with forest- may affect quality of soil and water.

*Microclimate regulation:* local and horizontal precipitation and local humidity.

*Wind and noise control:* forest serve as fences for wind (agriculture activities) and noise (housing and vacation homes).

*Carbon sink:* carbon sink and fixation, protecting the globe from climate change.

*Hunting:* Forest keep wildlife which also serve as food for rural communities as well as sport for urban vacationers.

*Maintenance of biological diversity in the forest ecosystems:* ecosystem resilience, maintenance of the forestry capability of reducing impacts on protected areas (buffer zones), natural history, research bank (or library) for future development (of agriculture and pharmaceutical discoveries for instance).

*Cultural and religious services:* Rural and indigenous communities also have believes, sacred places and cultural values which should be respected. Existence value.

There are some professionals who refer to “forest clusters”. These clusters are related to linkages in the flow of wood from a growing tree to its final product. For instance in Finland the forest clusters are developed around key products such pulp, paper, paperboard and sawn wood (Lammi, M., 1996). We may imagine different clusters evolving from forest, in some new products such as medicinal herbs and non-timber products or in new services such as eco-tourism or biodiversity research. Each one of these final “new” product would probably develop forward and backward linkages, which later may give rise to an emerging new division of labour. If we take for example some products and services coming from a particular forest, such furniture and ecotourism, they develop chains of activities which at certain points create the possibility for other firms to specialise in intermediate products. This specialisation is possible because the willingness of other firms to buy its output (Andersen, E, 1996). The problem is that if the economy concentrates only in enhancing the competitiveness of a particular cluster without taking into account the existence of interdependence among them, it may undermine other related activities and clusters. Taking the same example, if in order to produce the furniture we should cut larger quantities of trees than is ecologically feasible, we are not only spoiling the furniture cluster (which may move to another forest or another country), but it would also destroy the ecotourism in the area. In the same way if we only want the ecotourism to be develop, we are going to affect the whole furniture cluster. Paraphrasing Andersen, the question is now not only why and how inter-firm division of labour emerges, but also how to maintain the whole forest system competitive enough to continue producing both activities in the long run. Lastly, is it possible to manage these apparent (competitiveness and sustainability) trade-off conflicts?

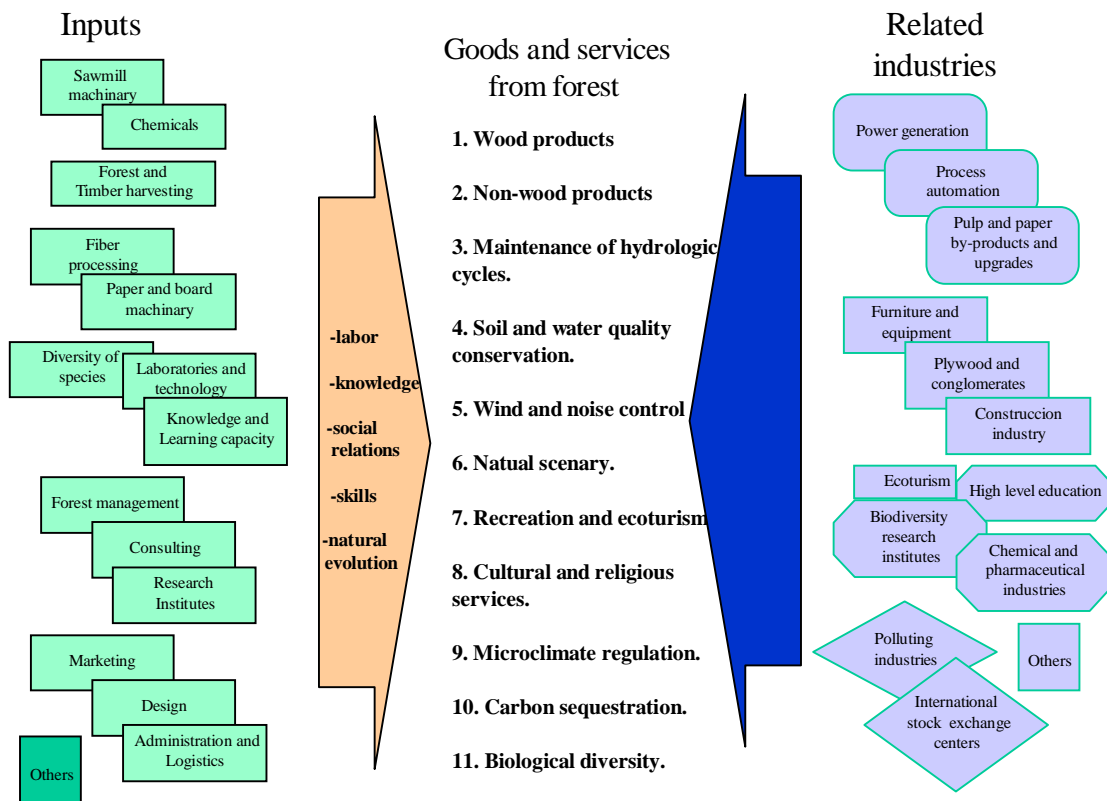
As stated above, some new commodities (so far treated as externalities) are emerging from the forest sector. For instance, forest services such as carbon sequestration<sup>5</sup>, biodiversity and water cycle maintenance. These may be conceived as “new windows” of opportunity which emerge in the transition from one TEP to another, using Carlota Pérez words. The problem is that in order to take advantage of these opportunities, it is necessary to re-shape the global vision and the institutional framework of the forestry activities. We foresee a **FOREST SYSTEM** which takes into account the whole group of goods and services coming from forest. Each one of the current and potentially existing clusters is only part of the system (Fig. 4). All of them together and their relationships form the forest system. Considering the above argument, economic and social institutions<sup>6</sup> should be re-shaped or re-created in such a way that they really conform the whole forest system.

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<sup>5</sup> It refers to carbon dioxide (CO<sub>2</sub>) sequestration, and carbon (C) fixation in the trees which is now recognised as part of a Joint Implementing programme to balance carbon emission in the atmosphere.

<sup>6</sup> Following Johnson, B. 1992, institutions are defined as regularities and patterns of economic behaviour, or rather as the habits, norms, routines, established practices and rules, which restrict a pattern behaviour. Concrete entities like firms, banks, research organisations, state departments, etc., which are often referred to as institutions in every-day speech, are called organisations.

**Figure 4: FOREST SYSTEM (Composed by several forest clusters).**



Since some of these initiatives are already emerging, it is appropriate to review some cases, in order to evaluate and hopefully support a successful implementation of policy reform. In this sense, this research aims to study how institutional development has affected decision making related to forest land and what kind of institutional changes may be recommended to change the current situation. The idea is that the new **MODERN COMPETITIVE AND SUSTAINABLE FOREST SYSTEM** should not only adjust to the international trade and competitiveness of the global economy, but rather it should play an active role in approaching a sustainable development trajectory.

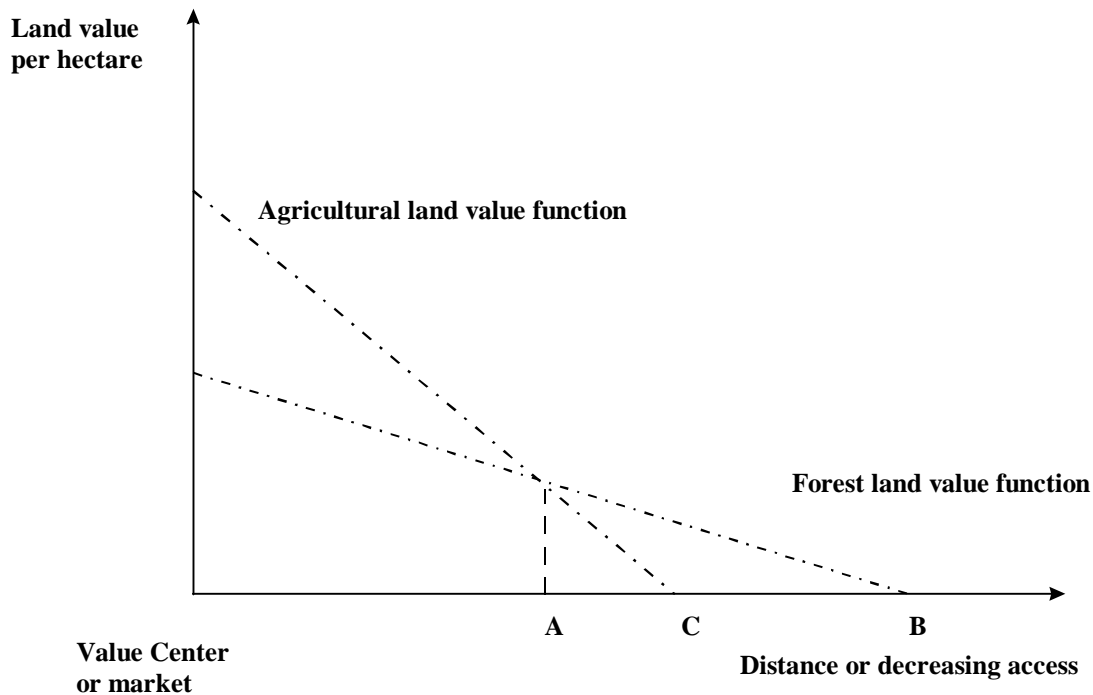
#### 4. Theoretical approach.

The problem of deforestation and forest land use is related to the different types of forest land and the increasing scarcity of forest resources (Hyde, et.al. 1996). Hyde et.al. made a classification of land and divided it into five groups. The first group is an economically residual standing natural forest, the second is the mature natural forest from which timber or other forest products are currently harvested; the third is the region of previous resource extraction; the fourth category of forest land may appear in the neighbourhood of the extensive agriculture, if the expected in situ return on forest investments exceeds the costs of protecting rights to forest property and finally the fifth is the agricultural land.

For a graphic representation we may observe figure No.5, where the land dedicated to agricultural productions is obviously renting more than if used in forest activities, or the land between the origin and point A. The area used for natural forest is too far from the market system (or protected), maybe with no access, therefore it is too expensive to produce anything there. Forestry is economically viable until its in situ

value declines to zero at point B, therefore natural forest is located beyond point B. The land in between these two areas is the area in where, in spite of that it may be land with forest aptitude, is being deforested.

**Figure 5: The Relationship between Land Value and Market Access.**



Source: Hyde, W., Amacher, G and Magrath W. in The World Bank Research Observer, Vol.11. Aug.1996

Reviewing the figure we may see that after point A, agriculture value declines to the level below the forest value. In the neighbourhood of point A some land may have a positive value for long-run production of forest resources. Forest plantations may be established by private owners or by communities; however, due to the fact that agriculture may rent more in the short run, most of the land is reclaimed for agricultural purposes up to point C. According to this logic, from C to B the land is an open-access resource. In this area, deforestation is mainly occurring because of the high costs of securing permanent property rights. Fences, forest guards and other forms of securing property have higher costs than the in situ value of any products harvested from the forest, and it becomes an open-access resource. In other words, access and harvest costs for industrial producers and the opportunity cost of labour for subsistence forest collectors starts to be very high when compared to the income from alternative activities. Therefore, taking into account the short run perspective and rational economic behaviour is only good for the mining of the resource and it is being deforested. One last category of forest land covers the region of previous resource extraction, in the left neighbourhood of point B. This land supports repeated or pulse harvests as the depleted natural forest re-grows to some minimum economic size.

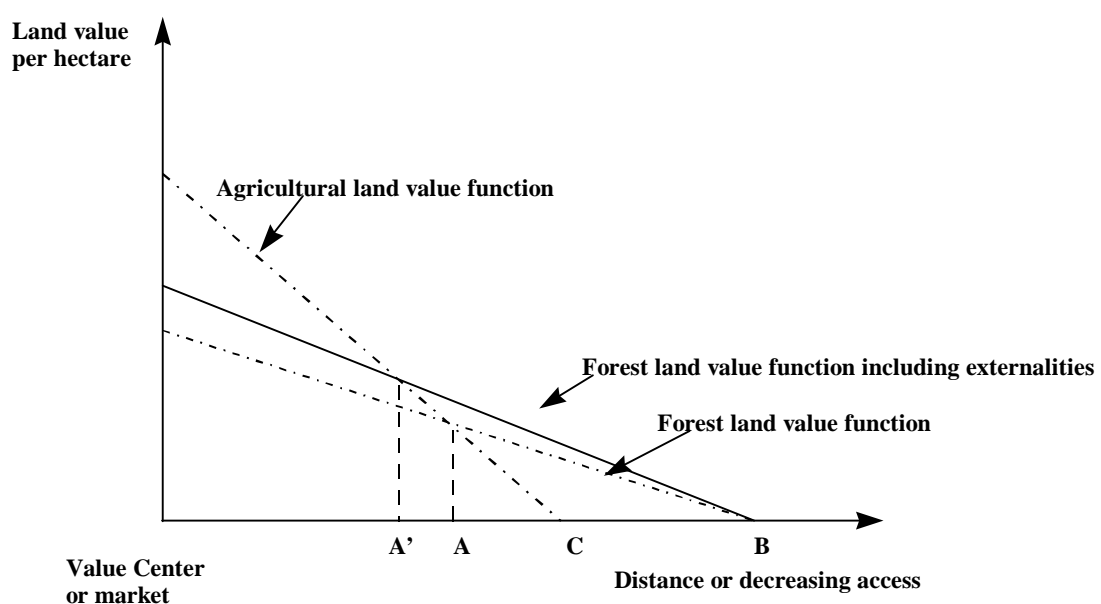
In short, since the area between the two points A and B has trees at some point in time, and the production costs of those trees are zero, but maintaining and securing property rights is more expensive than the income that this property may generate, the

area is going to be deforested or used as open access. The exceptions seem to be present at the boundaries of A and B, where in the former tree plantations may at some point compete with agriculture and there may be established forest or agricultural production up to C. In the last point (B) natural forest re-growth may continuously attract pulse people to harvest in the open-access area (op.cit.). The land between C and B will continue as an area of open access.

This theoretical approach seems to fit our problem, because first, it uses rational economics with self-interested rationality for the analysis, and second, because even when including the externalities (nonmarket environmental values) the conditions will remain the same. The graphical representation would be adjusted, and points A and B would move, but we would still face the challenge of dealing with an area of open-access resources.

If we suppose that the forested land in the right hand side of B is fully protected (National Parks or Conservation Areas) and we internalised benefits (say from carbon sequestration, etc.) from forest in the rest of the land, we enhance the value of standing forest. In terms of figure 6, the forest value function will rise to represent the inclusion of externalities, shifting A to A', meaning that it would be socially optimal for forest to compete with agriculture activities in this area. More standing forest would be maintain since trees storage carbon and the service of carbon sequestration would be paid by the polluting countries (A'-C is larger than A-C). The problem of managing open access resources decrease relatively, but in reality we now must deal with the problem of how to manage and distribute income from former free services (common pool resources), which are now becoming new commodities. Problems such as how to develop a payment system for services coming from biodiversity research-conservation and carbon sequestration should be faced.

**Figure 6: The Relationship between Land Value and Market**



Source: Figure 5 modified.

### **Theories for managing open access resources.**

1. The theory of managing open access resources may direct us toward different paths. One direction based on the logic of Garret Hardin's article *The Tragedy of the Commons* (1968), where he states that whenever many individuals use a scarce resource in common, they will degrade it; therefore in order to prevent this from happening it is necessary to create a "private enterprise system". Other models have also influenced this way of thinking. For example the prisoner's dilemma game, used in environmental micro-economics by several authors, also draw conclusions in the same direction that Hardin does.

2. An alternative theory is to create and develop alternative institutions for collective action. According to Elinor Ostrom in *Governing the Commons* (1990), there are in history examples of common areas being managed successfully without need of establishing individual private property, but common property. The idea is to create social arrangements including the different actors who are interested in the social benefits that land may produce. For instance, if local people, municipalities, national ministries, and other groups are interested in managing certain area for mutual benefit, they may create a "polycentric" arrangement, in such a way that check and balances of new incentives are agreed among all. Ostrom mentions several indicators that may serve as criteria of measuring success of such new institutional arrangements. These are efficiency, equity, adaptability and accountability.

3. Following the NSI approach, based on Lundvall, B.A. (1994) and others in the same volume, we may try to understand the institutional set-up and its effects on the forest sector dividing them into formal and informal institutions. Technical, organisational and institutional conditions may explain the behaviour of the decision takers<sup>7</sup> in the open-access areas and forestry activities. Further, it may be possible to understand what has been happening and what is necessary to change, studying the forest system measures that have been taking place in terms of products and process innovation and their diffusion (immediate performance) and the contribution of innovation processes to the social welfare function (ultimate performance). Characteristics of the present pattern of specialisation in the forest sector have strong and deep roots in the institutional set-up and the global vision.

4. An extension of (or part of) the institutional set-up is the valuation methods people in general and policy makers in particular use for decision making. Valuation is mostly rooted in economic monetary values, but there are many other important values people take into account when deciding about natural resources for example. Some of the individual values may also be challenged when decisions are being made for governing the commons (as opposite as individual property). In other words the traditional Cost/Benefit Analysis (CBA) and the traditional economic valuation methods which both are founded in traditional economics may not be the tool will help decision makers, since a larger multicriteria evaluation is needed. Therefore, institutions may

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<sup>7</sup> Decision takers (as oppose to deception makers) is referred to people who take decisions every day based on the global vision and institutional set-up. Decision makers refers to politicians or interest groups who become policy makers.

also be changing towards new evaluation methods which may be part of the innovation system in the region.

### **5. Statement of the problem.**

According to several studies of the Central American land, 60% of the total area (32.000 thousand Has<sup>2</sup>) has forest aptitude. There are only 19.000 thousand Has<sup>2</sup> with protected and non-protected forest (Salas, J.L.et.al., 1996). Forest is starting to be perceived as a source of income and development due to new activities such as ecotourism and potential alternatives such as new products and services.

In this sense forest may be seen as an opportunity for development for the next century. But it is clear that *in order to turn forest into a new component for development, it is necessary to increase the capacity of creating linkages and develop activities around the forest system. More value added should be produced from the raw material and probably a combination of activities should be developed to take advantage of the new sources of income.* If this does not happen, all the new income would be a simple transfer of money from third countries, similar to charity, that would never improve the conditions and standard of living for the population. In order to attend this problem it is necessary to create policies which empower participation, increase competitiveness in the sector, and sustain the ecological system.

There is a dominant group of economists arguing that State intervention in the economy should be only to facilitate private investment, and that further intervention is a clear violation of the market forces and will produce distortions and welfare problems. There is also abundant literature and empirical evidence that economic policies with clear State intervention will produce higher competitiveness and welfare if it is successful in correcting market failures. Additionally, studies about TEPs have shown that changes are predetermined by economic and social institutions and actors (Freeman, 1992), for instance government policies to develop particular infrastructures, research programmes, subsidies, management systems, training activities, etc. Therefore, it is clear that though some changes are going to be driven by market mechanisms, other non-market mechanisms are also important. From the ecological economic perspective, market failures may exist not only in human resources capital, and natural resources capital, but also in the development of innovation and technology suitable to sustainable development.

In other words, economic policy is not necessarily to distort competition but to correct market imperfections and negative externalities, therefore increasing the competitiveness of specific economic branch.

In economic terms, we may represent the productive function of the forestry sector, as following:

$$Q = A f (K, L)$$

where Q is the total output, K is the capital stock, which in this case may include man-made capital and natural capital, L is the labour force and A is the exogenously determined technologies and institutions. This research is interested in reviewing A, especially the institutional component as explanatory variable to be modified in order to achieve sustainability and competitiveness.

**Some of the research questions coming from these arguments are:**

5.1. Are there trade offs between environment and economic issues in the case of developing the forest system? Is the strategy of increasing competitiveness compatible with sustainable development in this sector?

5.2. Are the institutional arrangements and current incentives structure coupling the new vision and paradigm.

5.3 Which alternative methods or arrangements may be use to solve the problems of managing common resources from forest?

5.4 How to improve sustainability and competitiveness (including the economic conditions of the agents involved in the forestry sector) for the forest system.

**6. Conclusions and following research.**

To date, markets have been unsuccessful in allocating resources and dealing with externalities generating economic development trajectories which jeopardize the sustainability of the economic and ecologic system. Small less developing countries, such as the Central American ones suffer even more from such patterns of development, especially when in order to achieve competitiveness to compete at the international market it is necessary to adopt technologies (i.e.agrochemicals, etc.) from industrialised countries, which not only affect environment but also human health.

Markets may help in the allocation of resouces, but certainly there are sets of rules, norms, habits and routines established which restrict the functioning of the market and shape the relations between economics and the environmental considerations. Economics is nowadays much more consious of the relationship with nature and the limitations of technical change, therefore, institutional changes are starting towards sustainable development. This is happening not only at the international level within the realm of the WTO, the World Bank and other international agencies, but also at the national and regional level all around the world.

Considering the unsustainability at the global level, but thinking in the need for policies at national and local level, the forestry sector emerges as a new window of opportunity. There are several services and products from forest which are now valued in different way than before; they are now traded as commodities, therefore they may serve not only as source of income for the region but also as the engine to promote development and growth under sustainable conditions. In order to create such a **COMPETITIVE AND SUSTAINABLE FOREST SYSTEM** it is necessary to re-create the institutional set-up which up to now have been threating the forest. Of course, to a certain extent, the institutional capacity to solve these problems is related to the specific technical aspects, but it is also related to more general aspects of public administration in each country. It is possible to forsee opportunities in the forest sector due that there has been in Central America some inventions of various innovative mechanisms for obtaining resources, organizing the necessary tasks, and providing incentives to landowners to develop new products and services.

Finally, in order to answer the questions from the previous section, a larger analysis of three clusters from the forest system is being designed. Two new services and one “new” product. These are: carbon sequestration from forest (joint implementation initiatives), biodiversity research-conservation, and eco-label furniture products. The hope is to identify synergies within themselves and among the three clusters, but if not, we may identify potential economic and institutional changes, which allow policy recommendations for a re-direction towards a more integrated competitive and sustainable forest system.

In this sense specific objectives of the following research are:

7.1. To **examine and describe** current institutional arrangements that explain current performance of the forest system (conventional uses and externalities).

- Formal institutions
- Informal institutions
- Production structure
- Technological level
- Valuation system

7.2. To **examine and describe** the current structure of incentives influencing forest system performance

- Direct economic incentives
- Indirect economic incentives (Des-incentives)
- Extraneous incentives

7.3. To **analyse** the possibility of alternative institutional arrangements and incentives for an alternative more competitive forest system, through the three study cases.

- user-producer interaction
- learning economy
- alternative valuation
- alternative management of common resources

7.4. To **elaborate a proposal of institutional arrangements and incentives** to favour the creation of a Modern Competitive and Sustainable Forest System.

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