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## **Costa Rica Case Study**

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## **1. Country trend observation: forest condition, agriculture and food security**

### **1.1. Trends in the condition of the forests in Costa Rica.**

The main trends that can be identified in the forest sector of the country since 1990 are the following:

- **Increase and consolidation of the forest cover.**

Costa Rica since the 50s went through the traditional transition curve that some countries had or are experiencing. From a period in the far past in which there was no deforestation, the reduction of forest areas begun at an increasing rate, reaching a minimum cover around 21% some 30 years ago, followed by a period of increasing rate of forest recovery until finally reaching a stabilization at around 52% of the country area (FRA 2015; SIREFOR 2015). This was at least the most widely accepted trend a few years ago, but today this is a controversial issue, since different studies sustain different minimums forest covers, from 21 % to 57%. The cause of this process was primarily the migration of population to the rural areas, followed by deforestation to clean land for cattle farming, subsistence production and then to industrial agriculture in some areas.

Subsequently, processes such as falling meat markets, the emphasis on the promotion of export crops and the emergence of job opportunities in non-agricultural activities (more explained in the next section) slowed this trend and allowed slowing deforestation and subsequently allowed the recovery of tree cover in abandoned farms, or through forest plantations. Costa Rica is then in the privileged list in which there is a net increase and stabilization in the forest cover.

- **Consolidation of the protected areas system of the country.**

Slow and constant increment of the number and area of the protected areas of different types and final stabilization at the current levels of 26.1% of the national territory.

Enforcement of the tenure rights by the State in the protected areas so that the 26.1% under this condition can be considered under true protection.

- **Consolidation of the Program of Payment of Environmental Services (PES) and reorientation of priorities.**

There have been consistency in the incentive policies that are stable in the amount assigned, the source of funds and the institutional stability. PES is a permanent program and not a project. The process begun at a bigger scale in 1986 (Laws 7032 and 7174) that created a forest bonus for plantations forestry first and then expanded to natural forest management and forest protection/preservation. With the law 7575, the system consolidated, the national Fund for Forest Financing (FONAFIFO) was created, with permanent resources taken from a proportion of the tax for consumption of fossil fuels to pay for environmental services (PES).

- **Priority to preservation.**

Along time the priority for the orientation of the incentives has changed. Initially the forest bonus was directed to fund reforestation and natural forest management. With the PES, the

payment to manage natural forests was cancelled and later reinstated but with high transaction costs. The PES continued supporting reforestation but also increasing transaction costs and in a climate of increasing costs of reforestation. Finally most of the efforts are targeting the preservation of forests. This is a dangerous strategy, because if it is difficult for the farmer to add value to their forests as productive systems, then the farmer he is discouraged to preserve them, particularly when it comes to secondary forests, the farmer will be discouraged to allow growth secondary vegetation and to do forestry and thereby to increase tree cover.

- **Increase in the area and composition of secondary forests**

In Costa Rica 12 life zones are present (Holdridge, L, 1971) and are located geographically in the north pacific (dry forest), the northern and eastern region, and the south region with tropical rain forest and the high elevations with cloud forests. The abandonment of degraded soils due to loss of competitiveness of some agricultural and livestock activities, activated the secondary succession and many areas returned to secondary forests. Later, the prohibition of land use change of natural forests (and considering secondary forests in this category) also contributed to the effect of a big increase of this forest ecosystem in the country. The total area of secondary forests is of almost 700 thousand ha (SIREFOR, 2015). It means an increase of 300 thousand ha between 1986 (Solórzano et. al. 1991) and 2013. Secondary forest stops degradation of soils abandoned by agriculture and cattle farming, improves back the water cycle and recovers biodiversity, but being an important forest resources also for wood production, secondary forests are mostly devoted for preservation, because of the lack of legal definition about them.

- **Reduction of the area and rate of forest plantations.**

Reforestation in Costa Rica begun in the 70s, through a tax incentive. The reforestation rate was low. In 1986 with the forest laws 7032 and 7174, a stronger incentive system begun with the creation of a reforestation bonus. In 1996, with a new modality, the PES, the benefits of the forests where legally recognized and the incentive system evolved from the forest bonus, to the payment for environmental services, making a strong paradigmatic change. This policy permitted to reach around 150 thousand ha of plantations. By today the reforested area has reduced to around 75 thousand ha. The plantations that are harvested are in general not replanted (SIREFOR, 2013). There are many reasons for this:

- At the beginning of the millennium, the MINAE increased the controls for plantations discouraging the activity.
- Prices of land are becoming limiting for the economic feasibility of plantations forestry, with the exception of teak (urban growth and the increase in the tourism and industrial scale tropical fruits cropping : bananas, pineapple, oranges, mangoes),
- Costar Rican plantation woods can hardly compete in prices with imported wood especially from Chile (due to sale of production and the Free Trade Agreement). The result has been that owners do not find attractive to replant what they have harvested, and change lands use partially to tropical fruits.

Between 1988 and 1995, the average annual reforestation area in the country was 10.600 ha. Between 1997 and 2013, the average annual reforestation was only of 3.600 ha, one third than in the previous period. The country lost the opportunity to create a plantations asset higher than 250 thousand ha ([http://www.fonafifo.go.cr/psa/estadisticas/PSA\\_decretosEjecutivos.pdf](http://www.fonafifo.go.cr/psa/estadisticas/PSA_decretosEjecutivos.pdf)).

- **Reduction of the area under PES for natural forest management.**

Policies protecting natural forests have emphasized restrictions and prohibitions such as the ban on change of use. It is an approach that does not necessarily guarantee the conservation and restoration, and it is also quite unfair to the landowner, since it precludes a sustainable use of resources. This also strongly discourages the farmer to promote the development of secondary forests, because the absence of clear conditions that enable them to value these ecosystems, such as production systems, the farmer prefers to avoid its growth, and in many cases are seeking ways to change of use, even in theory illegal. The period between 2000 and 2011, during which the application payment for ecosystem services natural forests under management was not allowed, together with the complex and costly management requirements have led to a reduction of this activity. The forest bonus permitted to put under management 44 thousand ha from the year 1992 to the year 1999. In 2001 and 2002, the PES system for natural managed forests was shortly reinstalled, but from 2003 until 2011 again no funds were allocated. From 2011 to 2013 only 986 ha were put under management.

- **Change in the composition of the forest production and increase in the imports of Wood and Wood products.**

The composition of round wood production has a changing trend along time. Traditionally demand was satisfied with the wood coming from deforestation, then with wood coming from managed forests, then with wood from remaining trees in pastures and agriculture land and finally with wood of plantations. The available statistics show that in 1998 most of the round wood produced was coming from trees in agriculture areas, followed by wood from natural forests and finally from plantations. By 2007, by far the wood was coming from plantations, followed from trees in agricultural land and finally and at a very low level, from wood from the natural forest. From 2007 until today, the structure of the origin of wood was the same, but with a strong reduction of the proportion of the plantations woods, that begun to be replaced by imported wood mainly from Chile (Barrantes, A. et. al. 2015).

The situation reflects the reduced profitability and complications that natural forest management represent, as well as the influence of the media and activism on the public opinion

- **Low and decreasing contribution of forestry to the GDP**

Is difficult to have a real figure of the participation of the forestry sector in the GDP of the country. The reason is that the only recognizable part is inside the agriculture – forestry - fisheries sector, and it only includes the production of round wood. Thus, in the official figures many other forest related products and services are not considered like fuel wood, timber extraction, transportation, processing in primary and secondary products. Moreover; the ecosystem services of forests are not considered in the national accounts.

The official statistics of the Central Bank of Costa Rica, give to forestry 0.39% of the GDP for 1991 and 0.17% of the GDP for 2015. This is an insignificant contribution. That shows a) the need to reactivate the sector and use the opportunities that it offers, and b) the urgent calculation of parallel environmental and vertically integrated accounts to reflect the real impact of the forest sector.

- **The evolution of tourism to the main export sector of the economy.**

Costa Rica has been able working to promote the country because of his natural beauty, the safety and no violence, the elimination of the army and its care for nature. The tourism sector has evolved strongly since 1990. In 1990, the number of visits to the country was 435 thousand people and in 2014, 2.5 million people. Is not possible to segregate how many of them where tourists, but the figure grew more than five times (Estadísticas ICT <sup>1</sup>). Is difficult to determine the relation of tourism to the forests, but there is also an evolution in the visitation to protected areas. In 1990 there where around 500 thousand visitors, of which 40.4% where foreigners, while in 2009 there were 1.28 million visitors 52,2% of which were foreigners<sup>2</sup>. The ICT (National Institute of Tourism) has oriented strongly its promotion campaigns to the forests and nature. Being the Tourism a main sector of the Costar Rican economy, there is a need to determine which proportion can be attributed to the forests.

- **Reduction of dependence on subsistence agriculture systems**

The decreasing trend of added value of agricultural products as a percentage of GDP, but at the same time the specialization of agriculture activities in intensive commodities production exportation, and the reduction of labor force in agriculture as a percentage of total labor force; are signs of a prevailing trend in the study period, according to which agricultural activities, particularly subsistence farming, have become less relevant to society, while tourism and related industries technology they have increased their participation in the economy and its contribution to growth of the service sector as a source of employment. Thus, human groups seeking to occupy forest areas and dedicate them to subsistence agriculture, have become an increasingly less common phenomenon in Costa Rica, particularly during the study period.

## **1.2. Trends in Food Security and nutrition**

- **Acceleration of the trend to construct an export oriented agricultural sector**

Long before 1990, Costa Rica was trying to be independent from food imports; small farmers produced for subsistence and sold the surpluses in the local and national markets of food. May be the exceptions were coffee, bananas and sugar, the two first crops for the export markets and the third one both for domestic consumption and the export markets. From the 50s to the 80s, it was a big growth in cattle farming, from small to big ranchers and both for the domestic and the export market.

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<sup>1</sup> <http://www.vacation-costarica.com/es/documentos-institucionales/estad%C3%ADsticas/informes-estad%C3%ADsticas/anuarios/2005-2015/685-anuario-de-turismo-2014/file.html>

<sup>2</sup> Ministerio del Ambiente. SINAC. Gerencia de Áreas Protegidas.

In the 90s, and until today, the agricultural production is open to globalization, export of tropical fruits, mainly bananas, coffee, pineapples, cantaloupes (melon), mangoes, papayas, and importing the deficits of traditional food, like corn, beans and rice. Basic grains are much cheaper for the country, bought on the international market, which produced locally. The local rice production has required a strong state support to survive this competition, which is continually challenged by several sectors. Local production of other foods, such as vegetables, and in the coming years, dairy products, increasingly facing the challenge to survive in the free trade agreements that favor the entry of imported products at very competitive prices.

Most of the agriculture exports are produced by big land owners or transnational corporations, with the exception of coffee, where most of the growers are small to medium size. In general the producers of export products are better organized, and have more technical support and incentives than the subsistence farmers. Coffee is a good example of integration of small farmers in cooperatives but also of technical and marketing support from the national Institute of Coffee and the Agriculture Ministry.

**Maintaining a situation of medium vulnerability in Food Security accompanied with an intensification of the agriculture for food production.**

Small farmers normally have their home gardens that contribute to food security, including small animals and cows. The bigger problem is with landless rural families that have problems of food security. Climate change is another factor of disruption of the food production cycle. Because of climate change, the el Niño, and la Niña effects on rains distribution, intensity and length of the dry season has become highly variable and in some years jeopardize the situation of rural population because of the loss of crops, shortage in food production, associated with financial debts, that puts at risk not only the food security, but even the ownership of properties that have been used as collateral for credits.

From a Food Security point of view, there are some figures that need to be mentioned (Muñoz, et.al, 2009) (FAO. 2015) (León et.al. 2004):

- From 1990 to 2013 poverty reduced from 26.3 to 17.7% %. But around 26% of the population is under a certain degree of Food insecurity.
- Food prices have been unstable but with a trend to increase.
- The emergent nations have put pressure on demand and can persist once the world financial crisis is over.
- The external dependency of Costa Rica from basic food has increased and the consequence can be a further increase in the internal food prices.
- The real cost of the basic food basket has increased in real terms, while the minimum wage in real terms has decreased,
- The inequity increased between 1990 and 2013 with an increase in the Gini Index from 0.44 to 0.51.

- **Inclusion of AFS and SPS in the PES Program and orientation of the AFS and SPS mainly to the support functions of agriculture and cattle farming.**



Agroforestry and trees-pasture systems are a good support to the ecological functions and services of a landscape, and they provide environmental services like control of wind and humidity, provision of nutrients, shade for animals, fuel wood, and generation of a wood asset to capitalize the farms. In the evolution of the PES system, the modality of AFS and SPAS have been introduced and farmers get a payment if they plant trees in their farms.

Since 2003 the system is operating and until 2013, a total of 5.4 million seedlings have been planted in farms with an average of 492 thousand trees a year. Trees in farms in different arrangements have been a long tradition in Central America and Costa Rica. But the main function of the trees has been mainly as part of agriculture providing environmental services to the farm, without orientation to Wood production. The consolidation of a forest culture in the farmer, who appraised the trees as a significant source of recourses, is hampered by legal uncertainty of achievement, and the lack of fair and transparent markets. To strengthen the profitable and growing incorporation of trees in agroforestry and silvo-pasture systems requires improving value chains and business environment for timber from them.

## **2. In-depth country assessment**

### **A. Context Assessment**

#### **2.1. Economic development**

The 80s was a decade when most of Latin American countries could not make their sovereign debt payments, and economic growth model of imports substitution did not gave the assumed results. The 90 decade was a period of time marked by IMF economic structural adjustment programs, that seen for changes in organization towards small and efficient Governments. The scope of that was to give a more important role on economic development to a growing private sector.

Moreover, globalization was a trend entering with force in the countries of the region, reinforced by the good results that commercial integration of Europe had shown. Aware of this global trend, Costa Rica's first free trade agreement with Mexico was signed on, that's how it begun the process of openness that characterizes this country and its economy: it is small but very open (Ministerio de Comercio Exterior 2000). Later other FTA where subscribed, and among the most important where the one with Chile (COMEX, 1999) and the one with the United States (COMEX. 2004).

Another global trend was the increasing importance the conservation of ecosystems to produce ecosystem services. A milestone in the period was the Earth Summit in Rio de Janeiro in 1992, which marked the route in terms of vision and public management of natural resources of the countries.

Costa Rica despite being a small and open economy, coupled with the constantly changing world, has maintained an upward trend in GDP, also same behavior was show in the GNI. The GDP lowest growth rate took place in 2009, a year after the global economic crisis of 2008, and presenting its highest growth rate in 1992 and 2006 around 9%. In 1992 the growth was due to the boost in the industrial sector, construction and tourism. The high growth period in 2006 was achieved by the strong momentum of the real estate business in the USA that influenced construction in tourism areas of the country. This was supported as well by some structural changes in the monetary economic policy that operated to control inflation.

The composition of GDP in Costa Rica is dominated by the consumption of households, goods exports is the second largest item, followed by the gross capital formation and the export of services. Economic activities that have higher added value are industry and manufacture, followed by trade and restaurants, then the transport and storage sectors and finally agriculture and services as the last one.

As for the forest sector contribution to GDP is relatively marginal because their greatest contribution was when the sector accounted for 0.47% of GDP in 1994 (BCCR statistics). Another element to underline is that since 1990 the trend in the percentage of participation of the forest sector in GDP is decreasing in real terms, which is a clear reflection of:

- Substitution of wood for other material in the building and house construction
- The international real state crisis
- The free trade agreement with Chile that provoked the substitution of wood from the natural forests by imported wood of plantations( Prochile. 2011)
- The crisis is perceived among those involved in the sector and this is reinforced by the shortage of local timber in the market space that has taken the wood imported from Chile and China.

This fact is a generalized situation in many countries of the world in which a high proportion of forests (52%) corresponds only to a low proportion of the GDF.

If we analyze agriculture, fisheries and forestry together as a percentage of GDP we can infer that for the period of analysis there is a decreasing trend and round on average 10% of total GDP. This shows that the Costa Rican economy has moved from its reliance on the goods and commodities to other sectors such as services, including call centers and customer service in business centers.

But inside the forest sector there are many explanations for this situation, valid for Costa Rica but also for other countries:

- The GDF calculation is not integral: a) it considers only the operations in the forests and not in the transportation and the primary and secondary transformation ( included in the industrial sector)
- The environmental services that the forests generate are not calculated in the national accounts.
- The proportion of the GDP due to tourism should be attributed even partially to the forest sector and is not the case.
- Both plantations, forest management and the forest industry are stagnated or decreasing, because the forest policy is clearly in favor of the preservation of the forests.

In short, the economy of Costa Rica is going through a conversion of its production process from one based on exports of agricultural products to a society that bases its economy on the service sector.

This strategy is determined by factors such as trade liberalization, attracting investment in services and high technology. This phenomenon explains the low participation of sectors such as agriculture. But as said before, the forest sector as a much higher potential that is not used.

## **2.2. Demography**

The general trend of population in Costa Rica is to grow. From 1984 to 2015, however, the birth and fertility rates are falling, low and stable. This combined with international migration patterns result in growth rate of the population of 1.1% (2000-2011), representing a fall of 1.7% over the period 1984-2000.

These demographic processes have resulted in an increased number of houses, but a decrease in the number of people living in them, example in the census of 1984, the average per house was 4.8 people, in 2000 4.1, and 2011 of 3.5 persons per house.

The trend of migration of population to urban areas in Costa Rica has been growing according to the population census of 1984, 2000 and 2011. However, the average annual rate declined from 3.8% to 3%. In general all major cities of the country continue to increase its population, only in the capital San Jose population growth has noticeable slowdown.

As for the gender distribution in the same period of analysis it is very regular representing 50% of each, women and man. However this distribution is not representative in sectors such as politics, agriculture and forestry, where men still dominate in the decision making from the farm level and in the middle and upper levels. The forest sector is by far not an exception.

Immigration in Costa Rica in 2008 was a total of 333.193 people. In 2011 according census data was around 500,000 people. The composition of the immigrants in Costa Rica are mainly conform of Nicaraguan people, followed for Colombians, Panamanians and Salvadorians people (INEC statistics). The highest migration movements were presented in early 2000s decade, but for of Nicaraguan migration was 90s decade the highest amount of people movement from Nicaragua to Costa Rica. (INEC statistics; Salazar 2001).

The Nicaraguan immigrants are mostly distributed in agricultural areas such as, Huetar Norte and Brunca region, that locations demand more labor in sectors as well as forestry, agricultural, and livestock. The rest of immigrant people prefer urban areas near to the capital city San José (Salazar 2001, State of the Nation 2001).

## **2.3. Agricultural tenure, investment, production, productivity and trade**

Costa Rica is a country that originated in an area of little relevance throughout the process of Spanish colonization. Its indigenous population, were warlike, less developed, and were marginal compared to more powerful and organized groups in the north of Central America and the area became less attractive to the conquerors. This eventually produced a country whose dominant class concentrated less power and wealth. Inequality between rich and poor was rebranded less extreme than in most Latin American countries, as demonstrated by the Gini index before 90.

However, the specific Gini coefficient for land ownership by the year 1990 (FAO 1992 cited by Herrera, M. Figure 1. Gini of land distribution. [Http://www.oas.org/ DSD / Spanish / Documents / Informacionsobretenenciadelatierraypoliticadetierra.pdf](http://www.oas.org/DSD/Spanish/Documents/Informacionsobretenenciadelatierraypoliticadetierra.pdf)) is higher for Costa Rica than for Bolivia, Chile, El Salvador, Honduras and Mexico; which shows a significant concentration of land, probably in the hands of owners, dedicated to large-scale farming, mainly for export.

Livestock activity, whether small or large producers, has been the main front of advancing agricultural frontier, and is one of the activities for which they have accumulated more land. The beef market was exploding and attracting people to produce cattle. This process continued until a crisis occurred in the beef market and the demand for cattle was drastically reduced and the prices fall down (de Camino et. al. 2000). But together with this crisis, many other factors provoked a decrease and latter a recovery of the forest cover until reaching the 52% of today. Some arguments that support this trend are:

- Prices of meat initially high, but then reduced in the mid-80s, discouraging the expansion of cattle farming.
- SAP (FMI) that forced to reduce incentives in agriculture especially in the second half of the 80s made cattle farming and some crops non profitable and the areas where abandoned as reserve for the future( secondary forest grew in these areas).
- Growth in the service and industrial sectors of the economy. Competition for labor force from the rural areas and migration to cities reducing pressure over lands.
- Different changes in the forest laws that on one side introduced a prohibition to change land use when in natural forest and at the same time the creation of incentives, like the PES, initially for all forest land uses.

During the 20th century the country develops its emphasis on the export of commodities, first with coffee, grown in the mountainous center of the country; then with the bananas, which became an important driver of deforestation in the coastal plains, although with ups and downs in its history of production, due to disease problems (as *Fusarium oxysporum*), market or social struggles. For the cultivation of bananas the country ceded large tracts of land to the United Fruit Company, and then came other companies for that crop, the most of them foreign capital. During the 70s, there are strong for the export of meat, which then decay during the 80 markets.

During the 80s, a part of the land previously used to grow bananas in the South Pacific, were converted to oil palm cultivation. The oil palm cultivation remained stable in its extension until the last decade, when it has given new impetus to this crop, and has been introduced elsewhere in the country.

It is considered that the country reaches its climax of deforestation in the 80, then the agricultural frontier tends to stabilize (FRA 2015; SIREFOR 2015).

Since then, probably deforestation has occurred, gradually and intentionally by farmers trying to turn forests into pasture, or by agricultural growers that have eliminated secondary young forests in specific sectors (Campos et al., 2007): But the frequency of such actions has been lower as the controls have improved.

The added value of agricultural products as a percentage of GDP has been falling throughout the study period (World Bank data:

<http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS/countries/CR-GT-NI-SV-HN?>), which shows the declining importance of agriculture in the economy. Wherein the total (and per capita) agriculture production has increased as well as the value added per agricultural worker (Costa Rica FAOSTAT CountryProfile.pdf) coincides with the consolidation of an agriculture for export business approach, and at the same time decreasing the subsistence agriculture emphasis in newly settled lands. Consistent with the foregoing, labor force in agriculture [% of the total labor force] has been declining, the amount of arable land has remained stable and there has been a slight increase of perennial crops. Grains, essential for national nutrition are mainly imported (FAOSTAT Country Profile 2015).

Unfortunately, forestry production has also had a significant decrease. Commercial reforestation in particular decreases dramatically after the last forestry law passed in 1996 - Graph 1 (OTS, 2008 - The sustainable wood supply in Costa Rica [http://onfcr.org/media/uploads/cyclope\\_old/attachments/AbastecimientoSostenible\\_Madera\\_CRnu34231.pdf](http://onfcr.org/media/uploads/cyclope_old/attachments/AbastecimientoSostenible_Madera_CRnu34231.pdf)). It may have been influenced the disappearance of the Forestry Department, whose emphasis was the wood productive activity, to make way for the creation of the National System of Conservation Areas, the emphasis seems to be strict conservation; at the same time, the integration of forestry incentives under the focus of PES, many officials can focus on the processing of payments for strict conservation. But it has also been an increase in land costs, there is a growing perception of legal insecurity in forestry investment and increasing competition from other land uses such as pineapple cultivation. The plantation wood consumption has steadily decreased since 2007 (Figure 7 -<http://www.onfcr.org/media/uploads/documents/usos-y-aportes-de-la-madera-estadisticas-2014.pdf>

The new market space for wood that has generated over the years making platforms for international transport of agricultural products (Figure 1 <http://www.onfcr.org/media/uploads/documents/usos-y-aportes-of-the-wood-statistics-014.pdf>), while it is an alternative for producers, creates pressure to harvest very young trees, represents a shorter-term income but makes forestry less profitable and some degree difficult to develop a forest culture in the country (Villalobos et al. 2012). All this, in the end, may encourage the reduction of productive reforestation.

Figure 2.9 of the National Human Development Report 2013 of Costa Rica (UNDP) shows the dramatic trend towards urbanization of the Costa Rican population. It is mostly people moving away from agricultural activities, and is employed in the service sector and industries. This development also takes away space to forests in some sectors; but mainly it removes space to some agricultural activities such as coffee, horticulture or livestock. Some struggle for space between urbanization and forests has been primarily in relation to tourism infrastructure.

## **2.4. Forest tenure, productivity and trends**

### **2.4.1 Forest tenure**

Costa Rica is a small country in the Central America region, with 51,100.00 km<sup>2</sup> of territory, in this area all productive activities such as, recreation, housing and conservation are given. One of these uses of the land is forest cover which currently represents about 52% of the area of the country. This is comprised by 25% in the National Protected Areas System, the other 25% are forests in private hands of which 5% is within the National Network of Private Reserves.

In Costa Rica there have been several studies of forest cover, with methodological differences and definition of forest that make comparisons difficult between them. However, it is possible to define the two types of prevailing tenure: a) public that approximately comprises 1.287 million ha and another million hectares in private ownership (Calvo 1996; Solorzano et al 1991; MIDEPLAN 1995; MINAE-SINAC 1996; IMN 1995). The following table shows forest cover data made by SINAC.

Table XX. Forest Cover in Costa Rica

Forest classification	Forest cover (ha)			
	1997	2000	2005	2012
<b>Forest</b>	<b>2,114,508.17</b>	<b>2,318,350.06</b>	<b>2,257,126.12</b>	<b>2,564,000.55</b>
Non Forest	2,557,338.18	1,229,921.95	1,986,731.63	1,982,305.27
Regeneration		897.37		
Plantations		5,437.61	123,400.50	74,596.85
Secondary forest			170,322.47	699,633.62
Deciduous forest				241,186.70
Mature Forest				1,548,583.38

Source: SIREFOR 2012

In general, the use of land in the last 25 years has been stable in the country. Since the 90s the formation of protected areas stabilized, the agricultural frontier is stable too, regarding the issue related to comparability of this data set and methodologies used in their collection. Current processes can be identified at a disaggregated level where there are areas of the country to provide net recovery of forest and other areas where coverage is lost. Nevertheless the net result is positive. In short, the different land uses and their ownership are kept fairly stable in aggregate terms in the Costa Rica territory.

#### 2.4.2 Investment in the forest sector

The system of forestry incentives in Costa Rica began in 1969 as an income tax exemption, companies that invest in the forest sector either in managing forests and forest plantations.

Thus, in 1995 the Government constituted the CAF in 1988 were an incentive system for forest production from plantations that not only stayed with this mode but broadened to activities such as the protection and management of forests. At this time a background of forest development, also granted soft loans. Among all these actions they were achieved to support approximately 143,000 ha until 1995, under some form of forest cover.

In 1997 initiated a new incentive system based on payment of ecosystem services provided by forests. The administration of this system went into a newly formed institution called FONAFIFO that also is responsible for a loans system to the forestry sector.

This new Government scheme called PPSA has more ways than the previous system and from 1997 to date have been achieved encouraging about 934 000 ha and about 5 million trees in AFS. With regard to amounts of money in the period of 1988-1995 40 billion colons they were invested in real terms about USD \$ 320 million and from 1998 to 2013 have invested some 6 billion approximately USD \$48 million dollars. In trend terms the state's investments have been growing in both periods

from 88 to 95 and 97 to date, however, worth noting that in the second period in constant terms the amounts are less than the first.

Another element, the State invest in the creation of the system of protected areas that currently has 166 areas around 1.5 million hectares. This has involved the purchase of land by the state and other arrangements with owners who are an important investment in the protection of forest resources.

However, private investment in the forestry sector shows a decline since the period 1990-1996, some 9000 ha are planted with incentives per year, and from 1997 onwards has been falling in position until about 3000 ha per year, this is reinforced by the fact that the country had in 1990 around 140000 ha forest plantation, and today the area has reduced to 70,000, representing a significant drop in investments by both the government and the private sector in reforestation.

Likewise with regard to the volume harvested from forests it went from more than 250,000 cubic meters in the decade of the 90s to less than 50,000 in the decade of 2000. Another important element is the supply of domestic wood is suffering the market competition since the beginning of 2000, other fact of private investment decrease is that more than 80% of wood consumption deficit has occurred in 2000 decade. Summarizing, the wood supply outreach a peak in production from 80s to 90s in early 2000 decade it starts to decrease this is a clear indicator that the private sector do not sees forestry as profitable business.

#### **2.4.3 Forest production and management**

In Costa Rica wood consumption it is quite extensive, from furniture, building products, the export sector that demands big amounts of pallets as well as paper, cardboard and conglomerates. On average the construction sector is one of the largest consumers of wood in the country, followed by the furniture industry which has locations with a long tradition in the production of furniture; however approximately since 2003 a deficit in the trade balance exists in wood products and since then wood consumption exceeds national production.

In short, the structures of wood consumption in Costa Rica can be classified as end-use housing and furniture as well as intermediate use pallets. In general the country has followed a low but stable growth rate and higher income which reinforces the demand for the products and therefore the increase in wood imports.

On the other hand, studies of domestic industry report that this uses between 58 and 75% of the installed capacity (Flores, 1983; McKenzie 1998; McKenzie 2002). This situation shows that the productive sector should be facing a series economic problems such as, wood supply is not stable in quantities and price term, and that political factors do not let utilize the potential of the resource by owners within a market logic.

The main types of forest use that provides the domestic market are wood, forest plantations, agroforestry and forests. The latter is the one that has been most affected by the policies that have minimized the management side and natural forests, by the implementation of administrative prohibitions that discouraged this activity. In the case of plantation the rate of harvesting exceeds the replacement rate, decreasing the existence of timber on the market. This phenomenon is partly explain by the market open process in Costa Rica, it gives the possibility for forest producer to sale

their products abroad markets, an example is the teak forest plantation are mainly sale to Asia markets than domestic markets.

#### **2.4.4 Forest products import and export**

The main exports are charcoal, round wood and manufactures products such as furniture, sawn timber. Teak round wood still presents a growing trend in export since its emergence as a product. This trend continues and the prices are growing, but the trend will find soon an equilibrium because the areas of Teak are just replaced when harvested and even they start decrease in export volume since 2012.

It is important to note that the value of exports the highest importance is represented by round wood, followed by products such as pallets, crates, boxes and the like. Moreover, the export of furniture has remain relatively stable with slight increases and low year to year, especially in the present decade.

The exported products are mainly shipped to the United States, Singapore, India, Vietnam, China and United Arab Emirates, these countries exception of USA are the major buyers of teak that is harvested in the country. Other markets for the wood of Costa Rica are the countries of Central America and the Caribbean such as Panama and Nicaragua, those are the two largest buyers of manufactured wood products from Costa Rica.

The strategy of commercial opening initiated some 20 years ago by the Government of Costa Rica has achieved the signing of free trade agreements with several countries. The one with Chile was signed in 1999 and with China in 2012. The mention to these two countries is emphasized since the first accounts for most of the wood imports and China accounts for 66% of exports in the last decade.

#### **2.5 Forest fires**

The incidence of forest fires on biodiversity and other factors related to quality of life, have been a concern for the last 15 years. This is reflected in the creation of national fire management strategy in 1997, a landmark that has generated and implemented various actions at national level.

The zone in Costa Rica that is most vulnerable to forest fires is Guanacaste province, it is located in the north pacific of Costa Rica, which is the driest region in the country. Guanacaste are conform for two Conservation Areas (management organization use by SINAC), Guanacaste and Tempisque Conservation Areas. The Amistad Pacífico Conservation Area is third area in forest fires incidence after those mention before. The Cordillera Volcanica Central Conservation Area does not have forest fire incidence since 1999 that could be for urban area growth because this Conservation Area is located near to most populated area such as Heredia, San José and Cartago.

In the decade of the 90s (taking the data of 1989 and 2000) on average annually 3400 ha burned. The highest incidence years were 1989 with 7000 ha, 1990 with 5000 ha and 1992 with 11,000 ha. In the type of land use where fires were detected mostly it was in the pastures, forests and then finally in forest plantations (SINAC-MINAE 2000). Is not possible to give a figure about how much of this area was destroyed by fire, because at least in the dry pacific area the forest have high resistance to fire and they grow again.

Pattern on forest fire incident from 2000 to 2015 continues Guanacaste ahead followed by Amistad Pacífico and so on. The land use where fire incidence is the highest are pastures in Guanacaste,



where pasture is the most common land use, followed by agriculture, and prevalence practice is to burn the pasture area in the dry season, and that is main driver of fire incidence in Guanacaste. One of the effect of that behavior is a 4,500 ha of forest in protect areas burned, but incidence on forest plantation is very low because the farmers control more their areas, aspect that is difficult to manage in Government protected areas.

## **2.6. Policies and legal aspects**

A fundamental historical element of the agricultural policy of the country is manifested in the existence of Lands and Colonization Institute (ITCO), from 1962, which shows the focus on settlement and distribution of land, understood as a development strategy. This institution was renamed the Institute of Agrarian Development (IDA) in 1982, showing a reduction of emphasis on colonization of new lands, but remained in some degree the activity of land allocation to farmers, both as state land purchased from private lands as a mechanism for development and employment generation. That institute name changed again in 2012 to become the Rural Development Institute (INDER), whose mandate is much more ambitious, aims to be an entity that promotes the definition and implementation of development plans in key rural areas

It could be that from now this institution will help that forests and forest plantations be incorporated into the local development strategies, but in his previous history has tended more to encourage agricultural use, mainly as a means of development for families that were beneficiaries of land distribution, where the food supply for society appears as a secondary key product.

The state has promoted or favored the action of various forms of autonomous institutions that promote the development of some major crops, such is the case of the Coffee Institute (ICAFE), existing since 1933 (<http://www.icafe.go.cr/> / [icafe / icafe.html](http://www.icafe.go.cr/icafe.html)); Agricultural Industrial League of Sugarcane (LAY), created in 1965 and amended in 1998 by Act 7818 (<http://www.laica.co.cr/quienes.php> ); National Banana Corporation (CORBANA), formed in 1971 (<https://www.corbana.co.cr/categories/quienes-somos> ) or the National Horticultural Corporation, created by Act 7629 of 1996. The focus of these initiatives has been producing commodities for export. Only the case of the Horticultural Corporation may include one aspect of contribution to the national food besides export. Horticultural areas have not been, however, areas of forest loss in recent decades.

Figure 4.6. of State of the Nation Report 2014 shows that in 1994-2013 the crops with highest relative increase in their areas were pineapple, oil palm and sugar cane. In the same period the banana lose some area, but the percentage change is much more dramatic for staples such as beans and corn. Rice cultivation did increase their area, but this has some financial support from the state, which have been questioned, as some people pointed out that, for the country is more practical to buy cheaper rice in the international market than to produce on their own territory. In Figure 4.7 of the same report notes that from 2010 to 2013, just palm oil shows a significant increase in cultivation area, followed by sugar cane.

During the government of Jose Maria Figueres (1994 -1998), the establishment of productive activities of the company INTEL was promoted in Costa Rica. This was the first step in a process of establishing or developing other generating companies of computer-related products, whose share

in gross domestic product has been significant, and is part of a trend toward the development of jobs in the services sector (Figure 1 Orozco and Martínez, 2014 SINAC).

Promoting the country's image as a tourist destination linked to the attractions of nature has been successful; this type of tourism has grown in recent years, as evidenced by tourist visitation to national parks (Figure 2 Orozco and Martínez, 2014 SINAC). This has stimulated economic activity while many private initiatives of tourist services, including the establishment of private nature reserves or small farmers who conserve forest areas with the expectation that constitute a tourist attraction. Some of these owners formed the Costa Rican Network of Private Reserves, which had 199 associates in 2010, and reported 81 429 ha in conservation; while for 2015 they have 255 members, who report 95000 ha in conservation (Personal consultation. Carlos Sandí, Red Nacional de Reservas Privadas, Sept. 2015).

International trade agreements are important elements in the economic development of the country (information on these agreements is in <http://www.infoagro.go.cr/ComercioInternacional/Pages/administracionTratadosComerciales.aspx>). Costa Rica has in place: the process of Central American Economic Integration since 1961, the free trade agreements with Canada since 2002, the Caribbean Community since 2005, Chile since 2002, Central America and Dominican Republic since 2002; Central America and Panama since 2008; Dominican Republic-Central America-United States (CAFTA-DR) Republic since 2009; China since 2011. In addition, negotiations have concluded free trade agreements with Mexico (process between 1995 and 2011), Peru, Singapore and the Association Agreement between Central America and the European Union (EU-CAAA). Additionally, they are negotiating a treaty with the European Free Trade Association and Canada.

Treaties may affect land use in many different ways: may favor some crops and disadvantage others. So far it is difficult to link them with deforestation trends. There are agricultural activities that are complementary to forest production, because they are more likely to be combined with growing trees, as in the case of coffee cultivation or livestock. Both activities, however, can relatively easily be established at the cost of removing primary or secondary forest, even in conditions of illegality. Coffee is a crop whose importance in Costa Rica has been decreasing steadily, partly due to strong international competition, partly because their traditional growing areas are giving way to urbanization. Today we talk to reinvigorate this crop in some lowland areas where it has been documented that his disappearance has generated space growth of secondary forest (Arana et al. 2009). Until today, a struggle between the forest (mainly secondary) and crops is maintained, but mostly with export crops. In some cases the state promote them as a way of defending the livelihood of farmers, and in other cases to favor foreign exchange earnings and employment generation from export.

Figure 2.15 of the National Human Development Report 2013 of Costa Rica (UNDP) shows clearly how dramatic is the decrease of importance of the traditional agricultural activities for the economy in the period of study, given the diversification of production.

The livestock meat and milk has remained fairly stable, but the third decade of this century has been set to finish the safeguards for local milk production established in the CAFTA, and this could eventually affect the livestock, either for land use for forestry or other productive activities.

The free trade agreement with Chile has favored the import of Chilean wood, which is increasingly important in the domestic market and is facing stiff competition for domestic producers, which probably discourages commercial reforestation with middle quality species at present (figure 1 (OTS, 2008 -The sustainable wood supply in Costa Rica [http://onfcr.org/media/uploads/cyclope\\_old/attachments/AbastecimientoSostenible\\_Madera\\_CRnu34231.pdf](http://onfcr.org/media/uploads/cyclope_old/attachments/AbastecimientoSostenible_Madera_CRnu34231.pdf)).

Although the free trade agreement with China is more recent, that country has become the main source of imported wood furniture, followed by the United States, with whom there is also a free trade agreement (Figure 4 - <http://www.onfcr.org/media/uploads/documents/applications-and-contributions-in-the-wood-statistics-2014.pdf>). While the United States is both the second largest source of imported wood products in Costa Rica, and the main destination of exports of wood products of the country, China is the first source of imports, but not a major buyer of processed products made of wood from Costa Rica (Barrantes & Ugalde 2015).

Chile is a major producer of lumber, which constitutes 46% of imports of wood and wood products to Costa Rica, whose exports of similar products, in contrast, are 53% of timber, mainly logs, and mainly teak, directed to USA and Asia markets (Barrantes & Ugalde 2015).

From 1969-1990 the Forestry General Directorate, the Ministry of Agriculture, promoted various forms of incentives and achieved the reforestation of more than 100,000 ha. But from 1990 to 1995 this responsibility was transferred to the so-called Ministry of Natural Resources, Energy and Mines (MIRENEM) and later the Ministry of Environment and Energy (MINAE) whose launch in 1996 coincides with the establishment of the Forestry Act 7575.

The main law governing forestry today is 7575, but other laws affecting the activity include the law creating the National Park Service No. 6084 (August 17, 1977), the Law of Conservation of Wildlife No. 7317 (7 December 1992), the Organic Environmental Law No. 7554 (13 November 1995) and in particular the Biodiversity Law No. 7788 (May 27, 1998), based on which the National System of Conservation Areas (SINAC) was created. It represents a strategy of regionalization of the country for the management of natural resources. SINAC is responsible for the control of forest activities, and in theory for the technical support for them. But the sharp drop in reforestation activities from 1997 (OET 2010 Sustainable wood supply in Costa Rica) evidence that the loss of productive approach of the former Forestry Department, and the emphasis on conservation (control) of the mandate of SINAC has not been positive for the recovery and conservation of forest cover through plantations (graphic 4:14 plantations with incentive and PSA. State of the Nation 2014).

Forest incentives applied in the country, before starting the application of the figure of payment for environmental services (as defined in the law 7575 of 1996) are described in the report of FRA 2000 (reference Internet). There have been no major innovation in the monetary sums of the incentive from then until today. The period following the establishment of the payment for environmental services, can be described as unsuccessful for the commercial reforestation activity. However, this period seems to coincide with a tendency to stabilize the masses of natural forests. It is very likely that the PSA is an element that contributes to that stability, but it is difficult to separate the effect of having a ban on land use change in land under forest since 1996, which makes that any change of use to agriculture or livestock must necessarily be conducted illegally, and only feasible as a result of deficiencies in the control. Additionally, the migration of farm workers to the economic sector of services is another very significant element that can contribute to this stability of forests. Therefore,

growth in the area of forests that some authors have described for Costa Rica, is due largely to the growth of secondary forests on abandoned cropland.

The prohibition to change land use let the owners the alternatives to apply for PES for forest preservation, which amounts are not always attractive enough or would outweigh the costs to access the payment. Then, they need to opt between preserving without payment or practice forest management. Forest Management with high transaction costs and practically with the imposition of an administrative ban (use of the red tape strategy) makes forest management hardly feasible. On the other side there is a perception in various social sectors that the preservation contributes both to mitigation and adaptation of climate change. Finally, forest preservation has been assumed to be associated with tourism, which now an important sector of the economy. More than 90.4% of the PES incentives are for absolute preservation (FONAFIFO, 2015). In 1986 when a more clear policy of incentives began, almost all the resources went to reforestation and forest management. Nowadays, most of the incentives go to preservation of forests. This was a clear change in the priority of policy along time, from a wood producing objective, to a preservation objective. Summarizing: preservation of natural forests has been favored by: a) low transaction cost, b) clear priority of the State to preserve than to produce wood, c) clear preference of regents to process preservation PES d) the pressure of the environmentalists groups, d) the assumption of a relation between tourism development and areas under preservation. The result is that between 1997 and 2013 a total of 946 thousand ha have been supported with PES for preservation. Finally, is important to say that a growing preservation movement has begun among private forest owners that do it with and without PES, and with and without connection with Ecotourism.

In the period from 1994 until today, only 51 thousand ha of natural forests have been under management, what is nothing in relation to the area of natural forest that the country. Some of the reasons for that includes (figures from FONAFIFO data base, <http://www.fonafifo.go.cr/>):

- The environmentalist community of the country is opposed to natural forest management.
- Some relevant authorities in the period 2000 to 2011 were also skeptical about the validity of natural forest management.
- Natural forest management without payment for environmental services is not financially feasible.
- Imports of softwood from Chile competed with the Wood of natural forests.
- The State institutions applied in the praxis a ban against FM, by increasing the requirements and not respecting que minimum time to process the paper work necessary to get the permits.

As a consequence: the supply of wood from natural forests fall down from 248 thousand m<sup>3</sup> in 1998 to 23 thousand m<sup>3</sup> today (figures from the data base of the National Forestry Office (ONF) <http://www.oficinaforestalcr.org/category/publicaciones-tecnicas-onf/>)

In 2004, by Decree No. 31714-MS-MAG-MEIC (involving the Ministry of Health, Ministry of Agriculture and Ministry of Economy), the Secretariat of National Food and Nutrition Policy (SEPAN) is created as an instance the Minister of Health, which aims to help ensure food and nutritional security; with the guidance of the health sector, but by integrating the agricultural and economic sectors. Being an instance of the health sector, its possible effect on the actions of the Ministry of Agriculture is indirect, and their ability to influence the land use, limited.

In 2011, the Ministry of Health published a National Policy for Food Safety and Nutrition 2011-2021. This indicated that the availability of food may be both domestic production and imports, although the emphasis is on the importance of strategies to encourage local production. Its strategic keystones are related to food safety, management of information on issues affecting food security (surveillance), climate change and emergency care. Although defines policies and strategies for food production, there is no evidence that this policy may be significantly affecting trends in land use.

In 2008, before the international crisis caused by the increase in food prices, the Ministry of Agriculture implemented a National Food Plan, the strategy included two elements: a. the promotion of food production; and b. social assistance to vulnerable families. This plan was implemented until early 2010, and its objective was to reposition the national agriculture and recover national staple grain production capacity to supply the domestic market with a long-term vision. It was considered, therefore, that this plan marked a radical shift in agricultural policy pursued by the country over the past twenty-five years as intended to revive production of basic grains, whose promotion had been abandoned by the state. The plan aimed to increase the areas of rice, corn and beans in 45, 110 and 150% respectively. It managed to increase rice production as planned, but this was not achieved with corn and beans; Additional problems for grain storage and market were evident, forcing the state to buy the beans produced at prices much higher than local market while the international market dropped after starting the program (Alonso 2011). There is no evidence that this program has significantly influenced trends in land use, but it is evident that for the country is very difficult to sustain a competitive national production of basic grains, and fewer still without a government investment.

Meanwhile, the availability of food for consumption in the country has been generally stable, its diversity has increased and the availability of some foods such as meat, seafood and vegetables, has increased (Figure 2 FAO. Nutritional profiles by Country, 1999. FAOSTAT Country profile 2015). However, in recent years it has also increased inequality, poverty and data from nutritional deficiencies (FAOSTAT Country profile 2015). It is a problem of poverty and inequality, rather than food availability.

It is assumed that forests could contribute to food security through non-wood edible products. While there are some forest foods traditionally used in the country, there are no data demonstrating its use to a relevant scale for the population. Only very particular cases as palm hearts, have a relatively significant commercial market in some towns, but their harvest is usually done illegally in national parks, which is more a problem. Additionally, sport hunting was banned in the country by Executive Decree No. 35700-MINAET of 14 October 2009, further evidence of the predominance of an environmental vision with emphasis on restrictions on the use of biodiversity. This decree allows hunting "subsistence" on indigenous reserves. However, the use of forest resources for food use in indigenous communities, although not precise data on it, appears to decrease, as these communities are influenced by consumer trends of other non-indigenous communities (Chalapunte, 2012).

The Research Program of CGIAR on Climatic Change, Agriculture and Food Security (CCAFS, 2014) offer a list of the main recent policies directed to food security in Costa Rica (Tabla 1. Normativa relacionada con cambio climático, agricultura y seguridad alimentaria –CCAFS 2014 Estado del Arte en Cambio Climático, Agricultura y Seguridad Alimentaria en Costa Rica. CCAFS, CGIAR. 2014).

## **2.7 Institutional frameworks for land use change governance**

The use of land in Costa Rica is ordered according to the restrictions that arise from various laws, and the establishment of zones with different categories of protection of natural resources and ecosystem services; but primarily through regulatory plans, which can be generated for the management of special areas, such as the so-called Greater Metropolitan area; or should anyway exist for each of the municipalities. In practice, however, many municipalities do not yet have regulatory plans.

Numbers on land use planning, as regulatory plans, tend to make a strong emphasis on planning of urban growth. They often include restrictions on areas which are credited with a key role in water regulation, or designated as priority use of agricultural areas.

Among the laws that restrict land use (Ministry of Housing and Human Settlements, 2012) may be mentioned: the Urban Planning Law (Law No. 4240 of November 15, 1968; amended by Law No. 4574 of May 4, 1970; 4971 of April 29, 1972; 6575 April 27, 1981; 6595 of August 6, 1981; 7015 of July 22, 1985 and 7495 of May 3, 1995) linked to the national plan for urban development; the Law on Maritime Zone (No. 6043, 1977) that regulates the use of the coastal zone and the urban and tourist activities there, among others; The Organic Environmental Law (No. 7554, 1995) which provides broader concepts on land use; the Law about Use, Conservation and Management of Soils (No. 7779, 1998); The Law on Biodiversity (No. 7788, 1998); National Law on Emergencies and risk prevention (No. 8488, 2006); Costa Rican Indigenous Law (No. 6172, 1977) that affects the use options of 6% of the national territory, corresponding to indigenous reserves; Law on Transformation of Agrarian Development Institute (IDA) in the Rural Development Institute (INDER) (No.9036, 2012); and the Municipal Code (No. 7794, 1998).

According to the Urban Planning Law, Article 1: "the Regulatory Plan is the local planning instrument that defines a set of plans, maps, regulations and other documents, graphic or supplement, policy development and plans for distribution of the population, land use, roads, utilities, community facilities, and construction, maintenance and rehabilitation of urban areas." This law gives authority to local governments to plan and manage urban development, within the limits of its jurisdictional territory, indicating that the master plan includes a development policy, a study of population projections of population growth, a study of land use, pathway analysis of communal infrastructure and public services, among others. The emphasis on urban focus is clear.

It must be remembered that from a legal point of view, changing land use on land considered to have natural forest cover, it is prohibited since 1995. Then, the legal change of use, can only be allowed under special conditions, such as when the state decrees that a project would merit the use change is a project of "national interest". Such a decree has faced in recent years, on more than one occasion, the opposition of a significant sector of society. In this context, decisions that favor a change in use are usually taken in centralized and senior policy level.

One of the most important examples of the difficulty of promoting changes in land use legally in Costa Rica, came from the government declared of national interest a mining project to be held in the Crucitas area in the north, through Decree No. 34801-MINAET, signed in October 2008; which would allow the developer to change land use in the workplace. This removal of forest cover and other potential environmental impacts attributed to the project, drew criticism from various

sectors, demonstrations against and application of legal remedies against, that ended with the cancellation of the decree by an administrative court in December 2010, and subsequent demands on the state by the company.

Moreover, Article 17 of the Organic Law on the Environment establishes as indispensable assessing the environmental impact of human activities that alter or destroy elements of the environment; and by Executive Decree No. 31849 - MINAE - MOPT - MAG - MEIC of June 24, 2004, was created the General Regulation on Procedures of Environmental Impact Assessment (EIA), which includes the Strategic Environmental Assessment, and integration of the variable: environmental impact, on land use planning. These provisions have been used to some extent to regulate infrastructure building initiatives in forest areas, and even to discourage forestry, often to an excessive degree.

In 2012 was published the National Policy on Land Management (PNOT) 2012-2040 (Ministry of Housing and Human Settlements -MIVAH-, 2012), this policy is promoted by the Ministry of Housing and Human Settlements, and endorsed by the Council of the Sector Land ordering and housing, and tried to be consistent with National Development Plan 2011-2014. This policy states that according to Decree No. 001-MIDEPLAN 2010 the MIVAH is the Rector of Land Planning and Housing Sector, which also comprises the institutions:

- Housing Mortgage Bank (BANHVI)
- National Emergency Commission (CNE)
- National Institute of Housing and Urbanism (INVU)
- Institute of Municipal Development and Assistance (IFAM)
- Agrarian Development Institute (IDA), which later became the INDER
- Ministry of National Planning and Economic Policy (MIDEPLAN)
- Costa Rican Tourism Institute (ICT)
- Ministry of Agriculture and Livestock (MAG)
- National Institute on Innovation and Transfer of Agricultural Technology (INTA)
- Ministry of Environment, Energy and Telecommunications (MINAET), currently MINAE,
- National System of Conservation Areas (SINAC)
- National Environmental Technical Secretariat (SETENA), the body responsible for approving environmental impact studies when these are required.

In PNOT (Ministry of Housing and Human Settlements -MIVAH-, 2012) are considered three structural axes:

- Habitat quality (which refers to the conditions of life for people)
- Territorial jurisdiction (referring to elements that facilitate economic development)
- Environmental protection and management (including aspects of water resources, soil, biodiversity, carbon neutrality and environmental education)

Policies such as PNOT, often articulated a vision of a group of actors in a given time, they can eventually get to influence the modus operandi of a group of officials, or cause changes in laws or regulations. But such processes are often slow, and not always effective. The issue of land use, moving very slowly in Costa Rica, and the speed of the development projects far exceeds the capacity of municipalities to develop and implement regulatory plans. In practice, some laws and rules already in force are those regulating land use.

The potential for change of use of forest land, legally, are very limited, but use changes particularly in sectors of secondary forest often occur because of the difficulty of defining and controlling this type of coverage, and because the regulations continue to hamper the use of forests for productive purposes, and tempt the owners to switch to more profitable production systems.

## **2.8. Financial Strategies, Programs and Instruments**

The main agricultural products in Costa Rica are bananas, pineapples, coffee, melons, ornamental plants, sugar, corn, rice, beans, and potatoes. Regarding the livestock sector the main products are beef cattle, poultry, and dairy. Traditionally, the sectors that have received greater protection and promotion in the country include coffee, bananas and dairy sector.

In the past 14 years the agriculture has received loans from the banking sector in average of about 9.5 million of USD dollars. While in Central America and the Caribbean 1990-2000 the average share of agricultural expenditure to total public spending reduction was 4.4%, in 2001-2013 this proportion dropped to 2.2% of the total. This decline has been more pronounced in Costa Rica, because reduction percentage was of 8.8% (from 13.8% in 1990 – 2000 to 5% in 2001 – 2013) (CEPAL, 2014).

As we mentioned in previous sections SAPs had a significant impact on production and State policies. One of the first actions is to promote non-traditional export products while promoting imports since taxes are reduced to these. These actions were accompanied by a reduction of the interventions and actions of the State in domestic production.

The path of Government financial strategies in forest sector was pretty much the same to agricultural sector, first during the period 1985 – 1995 the sector received too many incentives to increase their forest plantation area. From 1997 – 2015 the incentives was reduce its amounts, and commercial Government policies promoted market competition without a clear strengthening strategy of domestic wood market.

### **2.8.1. A brief assessment of major agriculture subsidy policies and their specific features**

One of the first actions in addition to SAPs in export promotion strategy was signing the PL-480, where some rules of the game and conditions were put to imported products, between United States and Costa Rica.

In this context, the law No. 5162 was created entering to promote exports, where two instruments were a marketable title value in the stock market are created arises. One was the CAT tax payment certificate and other certificate to CIEX increase exports, both instruments were issued by the Central Bank of Costa Rica. Basically, these instruments seeking support to non-traditional agricultural export activity also give agricultural products the conditions for competitiveness in global markets.

In the period from 1990 to date, the main policy for the agricultural sector were the free trade agreements until 2012 where the 7509 law which treated differently proposed in the collection of property taxes is created. This highly targeted to medium and small producers.

Basically in the last 25 years Costa Rica's policy has been geared towards promoting exports through free trade agreements. Within this policy is the creation of the Promoter of Foreign Trade COMEX,



which was created by law in 1996 to 7638 this entity is vested with full responsibility for the country's international trade negotiations.

The main incentive in law #7509 is the establishment of possibility a special tax payment on the land value for small and medium owners, it consist in land tax that will not increase more than 20% base cost as a result of new farmer valuation report by Government tax authority.

The new policy for the agricultural sector in Costa Rica 2010 - 2021, this aims to increase the competitiveness of the sector in the country, this in all scales of agricultural entrepreneurship and supported by the institutional sector for farmers access present opportunities to generate profitable businesses with access to internal and external markets.

As mentioned CAT were subsidies to the agricultural sector had access, they were in effect until 1997, in period from 1991 to1997 the incentives represented approximately 10 million of USD dollars. Its highest point was precisely in his last year which comprised 5.7% of the Costa Rican government spending.

If Costa Rica incentives for the export of non-traditional agricultural products did not cause an expansion of the agricultural frontier as it is in the last 25 years it has not changed in aggregate terms. The effect of these incentives which resulted was an intensification of production.

### **2.8.2. A brief assessment of forestry subsidy policies**

Costa Rica has a long tradition on the issue of incentives for reforestation, one example is that since 1969 much of the forest institutions which guided the development of the sector for several years and the first incentive to reforestation is created.

Forestry Law in 7032 included an incentive system called CAF ( a forest bonus), instrument consisting of a registered certificate that could be negotiated used to pay taxes, and local or national rate established any tax or enforceable under the National Stock Exchange ; the system operated until 1995, when the government made a series of commitments to heal public finances. In any case the CAFS system evolved over time including a wide set of different modalities and also creating the CAFA, involving prepay for easy access to small and medium owners organized.

The biggest change came with the 7575 law that allocates a proportion of the fuel tax under the principle "polluter pays" principle and the principle that "forests produce environmental services should be compensated." This change is a milestone or turning point that allows secure funds for the activities of the forestry sector which currently fall under the concept of REDD +. The investment financing with a share of fuel taxes is the biggest support system, and it is still in place for almost 20 years. Moreover, these funds have been used in practical terms of national counterpart to external funding that had to be additional to the contributions of the country and have not replaced them. The next table summaries information on incentives programs in Costa Rica.

Incentive	Description	Impacts and effects
Certified Forest Fertilization (CAF)	Address to any person, that is interesting in develop commercial forest plantations. They are shown granted after the establishment of the plantation. Payment is divided into five tracts	38.086 ha planted between 1988-1995  Favoring large forestry companies and homeowners who could advance the investment took the chance.

Certified Forest Fertilization Advance	<p>Aimed at promoting plantations in small and medium landowners.</p> <p>The amount granted per hectare was divided into 5 payments.</p> <p>The first payment was made in advance.</p> <p>One requirement was that smallholders should be organized in a legal form acceptable as NGOs, Association, etc.</p>	<p>33818.00 ha planted between 1988 to 1995</p> <p>It allowed the entry of small and medium industry property owners who could not make the initial investment required.</p> <p>It allowed access to cooperatives, agricultural center, among others.</p> <p>Approximately 60 groups agreed to the benefits for partners</p>
Forest Development Fund FDF	<p>Reforestation incentive</p> <p>It consisted of 70% of the subsidized cost of the plantation and the other 30% being supplied by the owner with labor.</p> <p>Only for smallholders.</p>	<p>12,809 ha were planted.</p> <p>Social inclusion of the most marginalized forestry and requiring no title to be eligible sectors, this gave room for the settlers entered the IDA process.</p>
Exemptions from import taxes and real estate 1990	<p>Reforestation incentive.</p> <p>It consisted of tax exemption of real estate, as well as imports of machinery to be used in reforestation operations.</p>	<p>It has approximately 16,000.00. over a period of years, some companies that used this incentive are Ston Forestal Bosques Puerto Carrillo SA, Canateca, Flor y Fauna SA</p>
Forest Management Certificate CAFMA 1992 - 1995	<p>Incentive designed to encourage forest management of forest.</p>	<p>22120.00 ha under management.</p> <p>This impact was partly in the interest of forest certification.</p> <p>This incentive leave out small forest owners although it has passed 50. 30 ha. as entry requirement</p>
Forest Protection Certificate CPB	<p>This was designed with the idea of protecting natural forests in buffer zones of PAs and the aquifer recharge zone and bare areas.</p> <p>It consisted of a non-refundable bond, beneficiaries were legal and natural extensions of 1-300 has people. The payments were for five years on an annual basis</p>	<p>22,200 ha. protected</p> <p>Landowners expressed payment is low compared to other land uses.</p> <p>It has generated insecurity on the part of the owners as they fear expropriation of land in the scheme are in the buffer zones of Pas</p>
Forest Conservation Certificate	<p>Basically I had the same format CPB.</p> <p>It was created in 7575 in the Law Article 22 and 24, the first is for preservation and the other for regeneration.</p> <p>It has not launched any inducement</p>	<p>The areas must be protected by a minimum term of 20 years.</p>
Forest credit	<p>This incentive is a program of soft loans, so it has lower interest rate, these loans come from tax funds of wood and other national budget</p>	<p>724 credit projects approved between 1982-1998</p>

<p>Program Payments for Environmental Services PPSA 1997 – 2015</p>	<p>These are forest incentives that are created with the idea of paying the owners for the environmental services they provide. The conditions in which PSA is payable are:</p> <ul style="list-style-type: none"> <li>• Forest Protection</li> <li>• Recharge Water Protection</li> <li>• Natural regeneration lands Kyoto</li> <li>• Forest Management</li> <li>• Reforestation</li> <li>• Reforestation with Native</li> <li>• Plantations established</li> <li>• Natural regeneration productive areas</li> <li>• Agroforestry Systems</li> <li>• Agroforestry systems with native species</li> </ul>	<p>From 1997 to 2012 they have entered the program 934,274.60 hectares and about 4,677, 135.00 SAF trees.</p>
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The PES system began in 1996 with 4 modalities, two of reforestation (plantations and AFS) and the other two was forest management, and forest protection respectively. Now days, the PPSA modalities are more than 10, that increase on modalities is part of the adaptation of the PPSA scheme to each condition in forest ownership and production system in Costa Rica.

The evolution to a wide range of modalities is on regard of several factor, but the basic budget is the same (fuel tax) and that means more competition between modalities and types of beneficiaries with the same funds. However FONAFIFO has negotiated other funding projects that have been added to the system, as ECOMERCADOS (2000- 2005) and ECOMERCADOS II (2006- 2010), which are credits that the country contracted with the World Bank (with a refundable) and a GEF not refundable part and the project with the German Development Bank KfW, a donation for PSA in the North Huetar Region.

In the current pattern has been incorporated to protect the watersheds (water) and land located in areas with conservation gaps; the importance of agroforestry systems increases; it also gives an opportunity to form secondary forests for production purposes wood and additionally attaches importance to the SAF and reforestation with native species. In some cases these modalities are due to funding agreements with organizations that provide resources for specific purposes, but the end is all under the PSA format which allows to maintain system integrity.

In any case, the 17-year period were paid for PSA:

- 843,151 ha for protection, i.e. 49.597 ha by year.
- 28,992 ha for Forest Management, i.e. 1,705 ha by year
- 60,511 ha. Reforestation, i.e. 3,618 ha by year
- From 2009 to 2013 allocated 98 contracts for conservation gaps, covering 10,000 ha. in the form of protection, for a total of US \$ 6 million
- From 2001 through 2013, 4884 contracts were assigned totaling 437,000 ha and US \$ 123 million in areas of biological corridors. Distribution by modality is not available, but one can assume that follow the general trend of being assigned to protection. This means that 46% of PSA allocated among e1997 and 2013, were placed between 2001 and 2013 to biological

corridors. This is very important from the standpoint of improving connectivity between different natural forests in the country.

- In Indigenous territories, between 1997 and 2012, 97.3 thousand ha were allocated. The modalities are protection; between 2007 and 2011 1502 ha were allocated to natural regeneration; between 2000 and 2005 some 90 ha in the form of reforestation and finally between 2004 and 2012, 807,000 trees in agroforestry systems (15% of the total issued in the country). It is possible that the amounts are not exceptionally large, but annual rates have been increasing, especially in protection and AFS.
- Unknown promotion systems used, as most leaned protection and trees in AFS, and very few for reforestation and forest management. Reforestation is an important future income when harvesting and forest management can be an immediate present income to harvest timber and effort well be worth a try to interest these communities albeit slightly increase the allocation to these two modalities that generate PES also harvest and are also REDD + actions.
- The statistics kept by FONAFIFO, only give information on the number of trees in properties assigned to women, and the number is quite low. In total, between 1997 and 2013 have been awarded contracts to 2050 women (out of more than 13 thousand contracts)

Additionally it should be noted that new modalities:

- Natural regeneration, the modality cover 12,766 ha around 1,547 ha by year
- AFS trees in a total of 5, 411.004 individuals at a rate of 491,909 trees per year.

In total, in the period, they have benefited 946.678 ha at the rate of 55.687 ha per year, 89% for protection, 3% for Forest Management, 7% Reforestation and 1% for natural regeneration. If we make the equivalence correspond to 1,111 trees ha. SAF, we can add the plantation area some 4,870 hectares. The percentages vary only in the order of 0.5% will not make the correction to the total.

### **3. Analysis of positive trends: key contributing factors**

From the total of 14 trends identified for forests, food security and nutrition, five of them are clearly positive. In any case is important to consider that these trends interact with each other, both in positive and negative sense, with itself and with the remaining eight trends mentioned in chapter 1. The trends form a system and have both positive and negative feedback loops, and thus is difficult to analyze them in isolation.

#### **Stabilization of the Forest Cover.**

This has happen because the pressure of human groups, which require removing forest to get land and dedicate it to subsistence agriculture has been declining for market drivers (related with changes on demand of commodities), education and structural changes in economic development, further there is a prohibition in the law to change land use when in natural forest. The prohibition is an expression of the priority in preservation, then the PES modality that cover more hectares every year PES is protection of forest. At the same time, environmentalists and government officers

do not see complementarity between natural forest management and preservation, and have first reduced and then suppressed the PES for FM. This situation, coupled with the complexity of processes and requirements to perform management of natural forests, prevent giving value to secondary forests, as a route to strengthen this form of coverage. The underdevelopment of value chains for forest production, and strong competition from imported timber, are causing a dangerous reduction in the reforestation of the country.

### **Consolidation of the Protected Areas System**

The public protected areas system has grown at a continuous pace since the 50s and until the 80s, and then has remained stable based on information of priority area to conserve, political willingness on conservation, and a new kind of tourism looking for ecological activities. The protected areas covering around 50% of the total area of forests.

A phenomenon rise from Protected Areas System and a set of environmental policies address a group private owners that prioritize protection of their forests, with and without PES. Also, there are privates that have a willingness to protect per se, and others expect to develop ecotourism as a source of income.

### **Stability of the forest incentives programs (1985 – 2015)**

Practically all countries of the world have begun its forest sector development through the granting of incentives. Many of them have succeeded, especially when they have keep the incentive for a long period that gives stability in the support to the owners. Without any doubt, PES has contributed to stabilization of the forest cover of the country. In the case of Costa Rica, the incentives exists since the 70s, continued through the 80s, but in both decades without a budget security. From the mid-90s, the PES system was created and has a more or less stable financing, since it depends on the consumption and tax payment on fossil fuels, a product that has a very low price elasticity. The system has practically 20 years of continuity and taking the forest bonus period the incentives exist already 30 years.

### **Increase in area and composition of secondary forests.**

Secondary forests have increased its area continuously, due to various factors. First, there is a prohibition to eliminate natural forests. Second they have a good production potential, but only in the development stage, then, there is pressure from illegal harvesting their trees remains; third, until now, the secondary forests do not exist legally (there are no clear laws regulating the management of these forests), and in order to manage them, owners can only apply the same regulations and requirements system than to natural primary forests, making the operations unfeasible.

### **The importance of ecotourism**

The Costa Rican Government has prioritized Tourism as a main sector of the economy, offering to international markets the image of a peaceful country with a well conserved nature, and

encouraging the country visit of a high amount of tourists every year. An undetermined proportion of the tourism is without any doubt associated to the forest cover of the country. Forest is not the only driving force to promote tourism, but is important enough. The only disadvantage is that there is the belief, that forest management and tourism are mutually exclusive when they could be complementary if properly managed.

It is easy to observe the stabilization of the forest cover has become a cultural issue in the country, supported by the prohibition to change land use, the existence of a solid public protected areas system, and the support of the PES for protection of forests, that has encouraged the maintenance of forest cover by the privates. In this process, the amount of secondary forests has increased strongly and as a consequence, the nature and forests have reinforced the strength of the ecotourism sector.

#### **4. Summary /conclusion**

Costa Rica has no formal forest policy, but has have at least since 1986 an implicit policy that affect the forests condition through the evolution of the laws, the reform of institutions; the modification of the type, amount and coverage of incentives, and other processes. First, the country begun to form a stable system of protected areas that begun in the 50s and stabilized in the 80s with small variations since then. About one half of the forest cover consists in state owned protected areas. The implicit policy has been consistent in moving from producing wood of plantations and natural forests (at the end of the 80s), towards a concrete purpose: to stop deforestation and increase the forest cover and protection (from the beginning of the 90s until today). The tools have changed being consistent with the general international trends and objectives of the conventions and taking advantage of the opportunities that it represents. As a result, the country has a strong reputation as being environmentally friendly, and very important, mainly with an internal funding approach. This internal effort as gained the recognizing of the multilateral and bilateral cooperation that have complemented the Costa Rican funds with loans and donations that have increased the capacity of the system. According to FRA 2015 (<http://www.fao.org/3/a-i4793e.pdf> ) Costa Rica is one of the few countries in Latin America with a net increase in the forest cover, that now has stabilized and there are no special threats than could change the situation in the near future. Every think is linked and correlated, and the good reputation of the country has been positively used by the tourism sector that has grown very fast , what can be at least be partially attributed to the maintenance of the forest cover.

But there are aspects that have not been used to its real potential. Forest conservation and forest production are complementary, and this condition has not been fully used. Costa Rica could have closed three cycles that are still open and have not progressed:

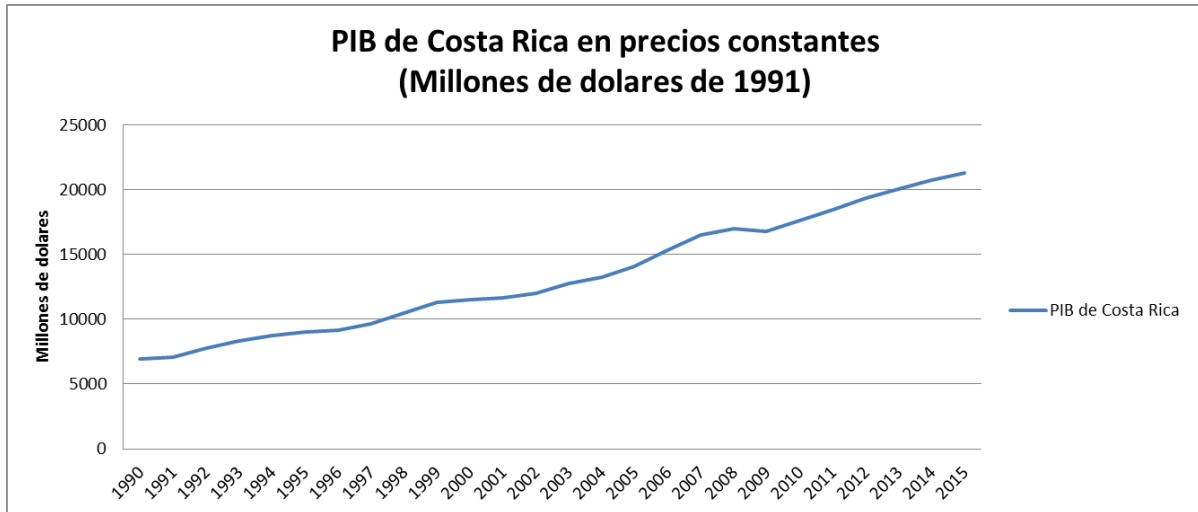
- The firs one is related to plantations forestry. The plantations reached in one moment some 150.000 ha, but instead of continuing an effort that reached some 10.000 ha per year, the harvested areas have not been replanted and the total area of plantations has reduced to 70.000 ha. Costa Rica could have specialized in precious woods and close the cycle with some 250.000 ha, that could be now in full production.

- The second one is related to natural forest management. At the end of the nineties, the country had some 50.000 ha under sustainable forest management. If the trend would have maintained, Costa Rica could dispose today between 200 and 250.000 ha under natural forest management, closing a second cycle.
- The third cycle is still open. The country has recovered degraded pastures and agricultural fields, reaching around 700.000 of secondary forests of different conditions, productive potential and quality. Again, the country could have put under forest management at least 250.000 ha of secondary forests. But this assumption means that the legal system by flexible to create a different set of regulations more appropriate for this type of forests.

The net result of the implicit policies has been positive, but it has also had demonstration and multiplicity effects over the international organizations (multilateral and bilateral) and has served as a good example for different projects and countries. Now could be the time to complete the scheme, by attempting to close the still 3 open cycles of plantations forestry, natural forest management and secondary forest management, making more visible the contribution of forestry to the social and economic development.

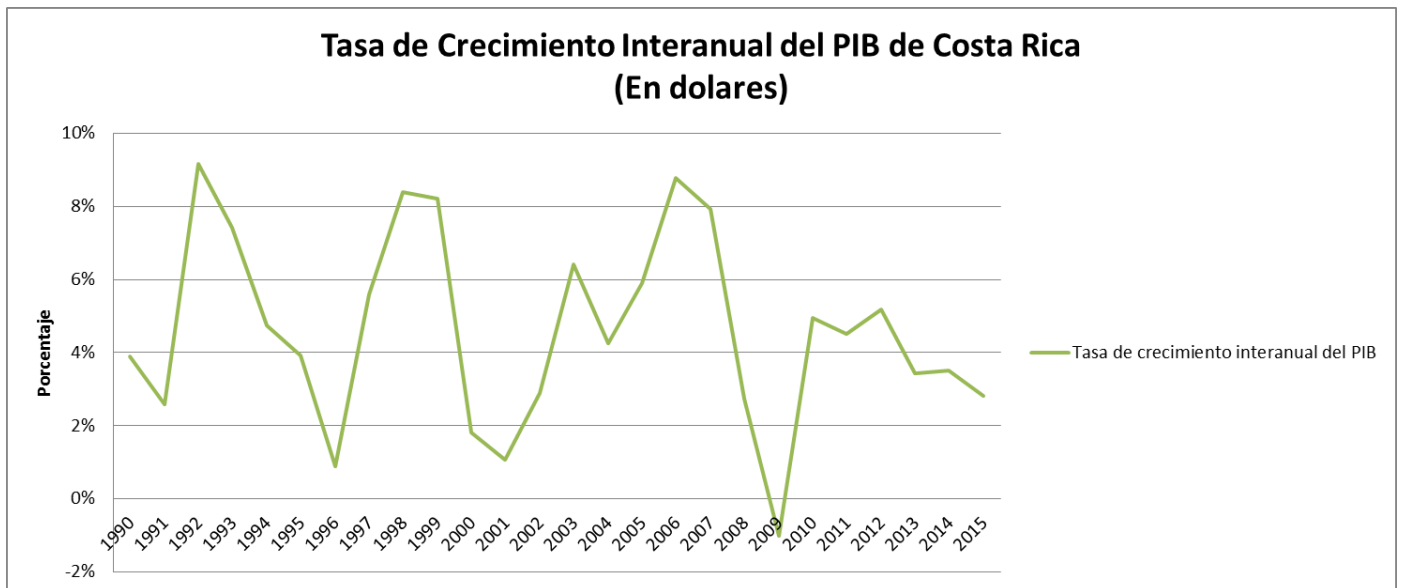
## Annexes

### Annex 1: Costa Rica GDP in constant prices



Source: Based on data from Banco Central de Costa Rica, 2015.

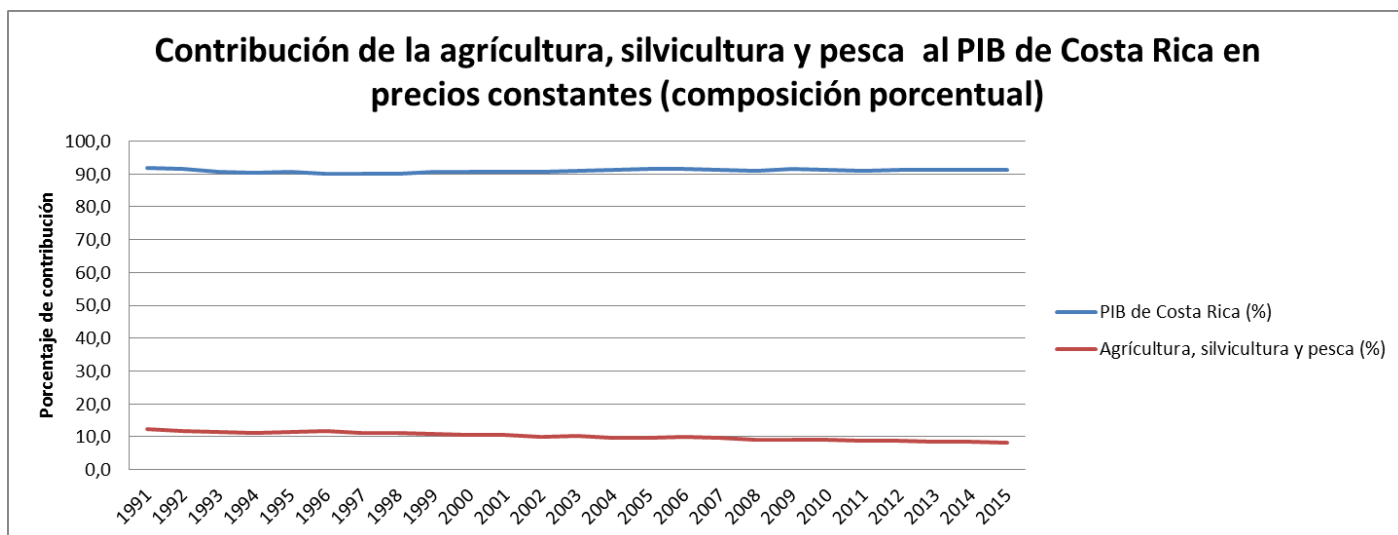
### Annex 2: Annual growth rate of GDP of Costa Rica



Source: Based on data from Banco Central de Costa Rica, 2015.

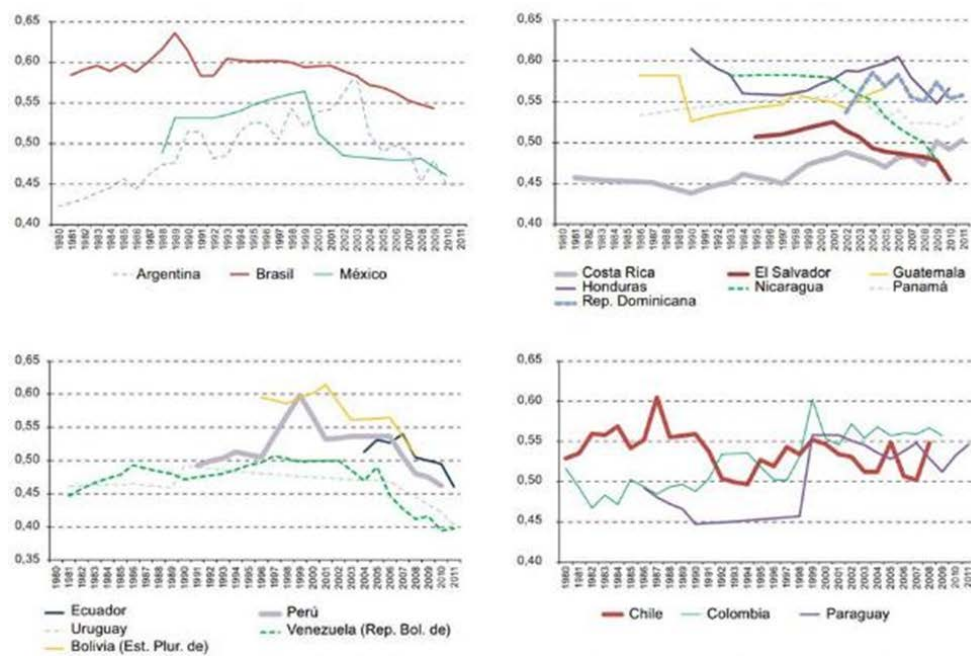


Annex 3: Contribution of agriculture, forestry and fisheries to GDP of Costa Rica



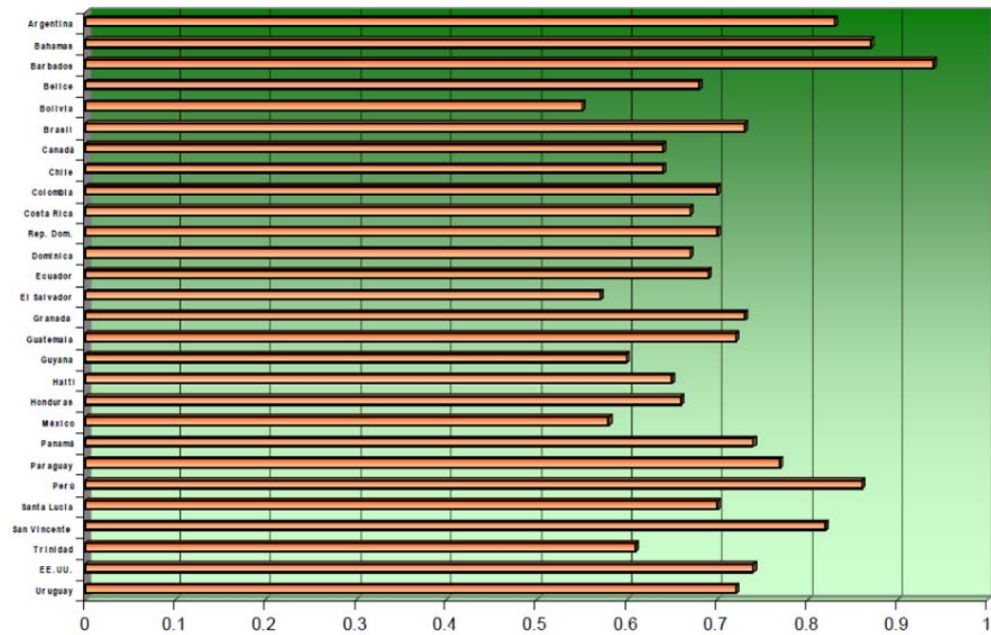
Source: Based on data from Banco Central de Costa Rica, 2015.

Annex 4: Latin America (18 countries): Gini coefficient, 1980-2011



Source: CEPAL (2013). Indicadores de desigualdad de mediano plazo En América Latina.

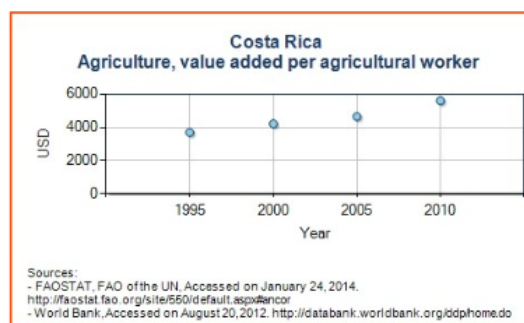
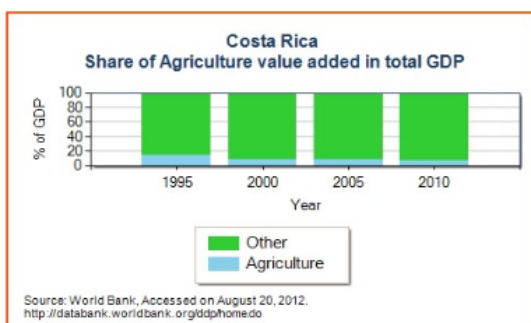
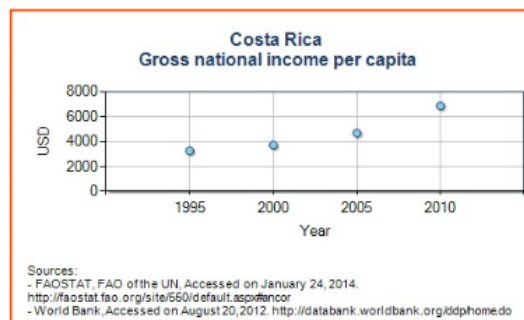
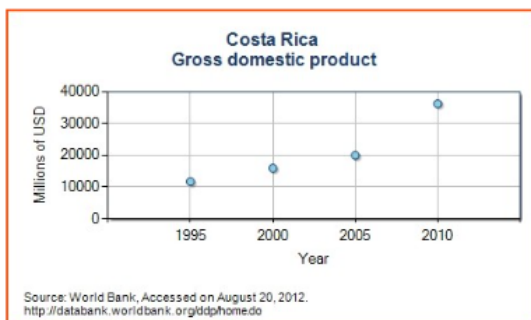
Annex 5: Specific Gini coefficient for land ownership by the year 1992



Source: FAO (1992) cited by Herrera (2005).El Estado de la Información sobre Tenencia de la Tierra para la Formulación de Políticas en América Latina.Recovered from:<http://www.oas.org/DSD/spanish/Documents/Informacionsobretenenciadelatierraypoliticasdetierra.pdf>

## Annex 6: Costa Rica FAOSTAT Country Profile

### ECONOMIC INDICATORS



### FOOD, NUTRITION AND FOOD SECURITY

**Costa Rica: Per capita food supply**

	Quantity [kcal/capita/day]			
	1996	2001	2006	2011
<b>Food Supply</b>	2713	2801	2872	2898

Source: FAOSTAT, FAO of the UN, Accessed on May 26, 2014. <http://faostat.fao.org/site/368/default.aspx#ancor>

**Costa Rica: Food Aid shipments**

	Quantity [1000 t]			
	..	..	..	..
<b>Cereals</b>	n.a.	n.a.	n.a.	n.a.

Source: FAOSTAT, FAO of the UN, Accessed on March 19, 2015. <http://faostat.fao.org/site/485/default.aspx#ancor>

**Costa Rica: Prevalence of undernutrition**

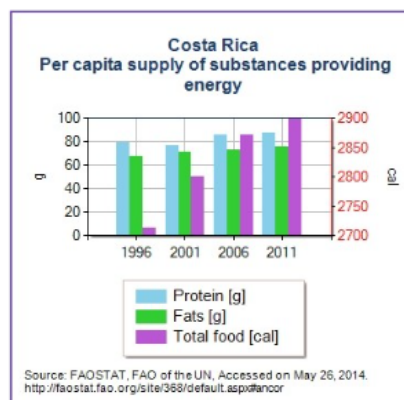
	Prevalence [%]			
	1999-01	2004-06	2007-09	2010-12
<b>Undernutrition</b>	-5	-5	-5	7

Source: ESS, FAO of the UN, Accessed on October 9, 2012. <http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/>

**Costa Rica  
Top Ten commodities  
Availability for consumption  
2011**

	Commodity	Quantity [kcal/capita/day]
1	Sugar (Raw Equivalent)	498
2	Rice (Milled Equivalent)	482
3	Wheat and products	322
4	Milk - Excluding Butter	264
5	Soyabean Oil	159
6	Palm Oil	158
7	Maize and products	98
8	Beans	97
9	Poultry Meat	73
10	Fats, Animals, Raw	72

Source: FAOSTAT, FAO of the UN, Accessed on May 26, 2014. <http://faostat.fao.org/site/368/default.aspx#ancor>



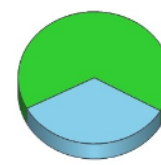
## POPULATION

### Costa Rica: Evolution of population and labour force size

	Size [Millions]				Annual growth rate [%]		
	1999	2004	2009	2014	1999-2004	2004-2009	2009-2014
<b>Total population</b>	3.84	4.25	4.60	4.94	2.05	1.6	1.44
<b>Total labour force</b>	1.63	1.82	2.08	2.27	2.23	2.71	1.76
<b>Labour force in agriculture</b>	0.33	0.33	0.32	0.31	0	-0.61	-0.63
<b>Agricultural population</b>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: FAOSTAT, FAO of the UN, Accessed on January 24, 2014. <http://faostat.fao.org/site/550/default.aspx#ancor>

### Costa Rica Rural and urban population - 2014



Legend:  
■ Rural: 33.96 [%]  
■ Urban: 66.04 [%]

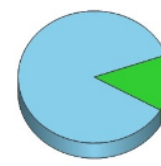
Source: FAOSTAT, FAO of the UN, Accessed on January 24, 2014. <http://faostat.fao.org/site/550/default.aspx#ancor>

### Costa Rica: Evolution of population and labour force composition

	Share [%]				Annual growth rate [%]		
	1999	2004	2009	2014	1999-2004	2004-2009	2009-2014
<b>Rural population [% of total population]</b>	41.51	38.81	36.30	33.96	-1.34	-1.33	-1.32
<b>Labour force in agriculture [% of total labour force]</b>	20.02	17.96	15.57	13.71	-2.15	-2.82	-2.51
<b>Females [% of labour force in agriculture]</b>	10.12	10.70	12.35	13.78	1.12	2.91	2.22

Source: FAOSTAT, FAO of the UN, Accessed on January 24, 2014. <http://faostat.fao.org/site/550/default.aspx#ancor>

### Costa Rica Gender in agricultural Labour Force - 2014



Legend:  
■ Male: 80.22 [%]  
■ Female: 13.78 [%]

Source: FAOSTAT, FAO of the UN, Accessed on January 24, 2014. <http://faostat.fao.org/site/550/default.aspx#ancor>

## LAND USE AND AGRICULTURAL INPUTS

### Costa Rica: Evolution of land use

	Area [Millions of ha]				Annual growth rate [%]		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
<b>Total area</b>	5.11	5.11	5.11	5.11	0	0	0
<b>Arable land</b>	0.21	0.20	0.20	0.25	-0.97	0	4.56
<b>Permanent crops</b>	0.28	0.29	0.30	0.34	0.7	0.68	2.53
<b>Forest cover</b>	2.43	2.42	2.54	2.65	-0.08	0.97	0.85

Source: FAOSTAT, FAO of the UN, Accessed on August 12, 2014. <http://faostat.fao.org/site/377/default.aspx#ancor>

### Costa Rica Land Use - 1990



Legend:  
■ Forest cover: 50.22 [%]  
■ Arable and permanent crops: 9.99 [%]  
■ Other land: 39.8 [%]

Source: FAOSTAT, FAO of the UN, Accessed on August 12, 2014. <http://faostat.fao.org/site/377/default.aspx#ancor>

### Costa Rica: Arable land and land under permanent crops availability (ratio per person)

	Ratio [ha]			
	1997	2002	2007	2012
<b>Total population</b>	0.13	0.12	0.11	0.12
<b>Population economically active in agriculture</b>	1.53	1.48	1.53	1.84
<b>Population dependent on agriculture</b>	n.a.	n.a.	n.a.	n.a.

Sources:

- FAOSTAT, FAO of the UN, Accessed on January 24, 2014. <http://faostat.fao.org/site/550/default.aspx#ancor>

- FAOSTAT, FAO of the UN, Accessed on August 12, 2014. <http://faostat.fao.org/site/377/default.aspx#ancor>

**AGRICULTURAL PRODUCTION AND TRADE**

Costa Rica: Evolution of crop production value per ha							
	Value [2004-2006 Int\$]				Annual growth rate [%]		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
Crop production per ha of land in use	3061	3261	3982	3758	1.27	4.08	-1.15

Sources:  
- FAOSTAT, FAO of the UN. Accessed on February 4, 2015. <http://faostat.fao.org/site/612/default.aspx#ancor>  
- FAOSTAT, FAO of the UN. Accessed on August 12, 2014. <http://faostat.fao.org/site/377/default.aspx#ancor>

Costa Rica: Evolution of the value of total agriculture production and food production							
	Value [Millions of 2004-2006 Int\$]				Annual growth rate [%]		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
Total agricultural production	2082	2235	2760	3052	1.43	4.31	2.03
Food production	1937	2081	2628	2915	1.44	4.78	2.09

Source: FAOSTAT, FAO of the UN. Accessed on February 4, 2015. <http://faostat.fao.org/site/612/default.aspx#ancor>

Costa Rica: Index of per capita production							
	Gross PIN [base 2004-2006]				Annual growth rate [%]		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
Food production per capita	94	90	105	108	-0.87	3.13	0.57
Agricultural production per capita	96	92	104	107	-0.85	2.48	0.57
Agricultural production per agricultural worker	83	87	108	123	0.95	4.42	2.64

Source: FAOSTAT, FAO of the UN. Accessed on February 4, 2015. <http://faostat.fao.org/site/612/default.aspx#ancor>

Costa Rica: Evolution of production quantities for selected commodities							
	[1000 t]				Annual growth rate [%]		
	1996	2001	2006	2011	1996-2001	2001-2006	2006-2011
Cereals	266	229	207	297	-2.95	-2	7.49
Oilcrops	110	165	220	270	8.45	5.92	4.18
Meat	182	187	214	248	0.54	2.73	2.99
Coarse grain	29.79	12.76	13.00	18.50	-15.6	0.37	7.31
Paddy rice	237	217	194	279	-1.75	-2.22	7.54
Coffee	154	150	101	100	-0.52	-7.61	-0.2
Cocoa beans	2.00	0.71	0.45	0.69	-18.71	-8.72	8.92
Wheat	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: FAOSTAT, FAO of the UN. Accessed on February 4, 2015. <http://faostat.fao.org/site/567/default.aspx#ancor>

Costa Rica: Evolution of trade quantities for selected commodities							
	Quantity [1000 t]				Annual growth rate [%]		
	1996	2001	2006	2011	1996-2001	2001-2006	2006-2011
Wheat exports	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Cereals exports	7.1	35.7	32.0	30.6	38.13	-2.16	-0.89
Rice exports	7.1	12.0	1.0	5.6	11.07	-39.16	41.14
Coarse grain exports	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Meat exports	29.0	19.6	21.9	29.3	-7.54	2.24	5.99
Cereals imports	690.1	782.9	908.1	893.4	2.56	3.01	-0.33
Green coffee exports	157.8	129.0	96.8	76.4	-3.95	-5.58	-4.62
Cocoa beans exports	0.4	0.3	0.4	0.2	-5.59	5.92	-12.94

Source: FAOSTAT, FAO of the UN. Accessed on August 30, 2013. <http://faostat.fao.org/site/535/default.aspx#ancor>

Costa Rica Top Ten commodities Production quantity 2012		
	Commodity	Quantity [t]
1	Sugar cane	4005752
2	Pineapples	2484729
3	Bananas	2136437
4	Milk, whole fresh cow	1014643
5	Oranges	280000
6	Oil, palm	255588
7	Fruit, fresh nes	240000
8	Rice, paddy	214308
9	Cassava	147375
10	Melons, other (inc.cantaloupes)	132017

Source: FAOSTAT, FAO of the UN, Accessed on February 4, 2015.  
<http://faostat.fao.org/site/567/default.aspx#ancor>

Costa Rica Top Ten commodities Production value 2012		
	Commodity	Value [1000 Int\$]
1	Pineapples	708262
2	Bananas	541418
3	Milk, whole fresh cow	316631
4	Meat indigenous, cattle	240531
5	Meat indigenous, chicken	157628
6	Coffee, green	134387
7	Sugar cane	130112
8	Oil, palm	111195
9	Meat indigenous, pig	85362
10	Fruit, fresh nes	83768

Source: FAOSTAT, FAO of the UN, Accessed on February 4, 2015.  
<http://faostat.fao.org/site/612/default.aspx#ancor>

Costa Rica Top Ten commodities Import quantity 2011		
	Commodity	Quantity [t]
1	Maize	589920
2	Wheat	224977
3	Soybeans	212450
4	Dregs From Brewing;Dist.	90539
5	Oranges	75111
6	Bananas	64874
7	Pineapples	56938
8	Cake of Soybeans	43448
9	Beans, dry	37591
10	Food Prep Nes	33767

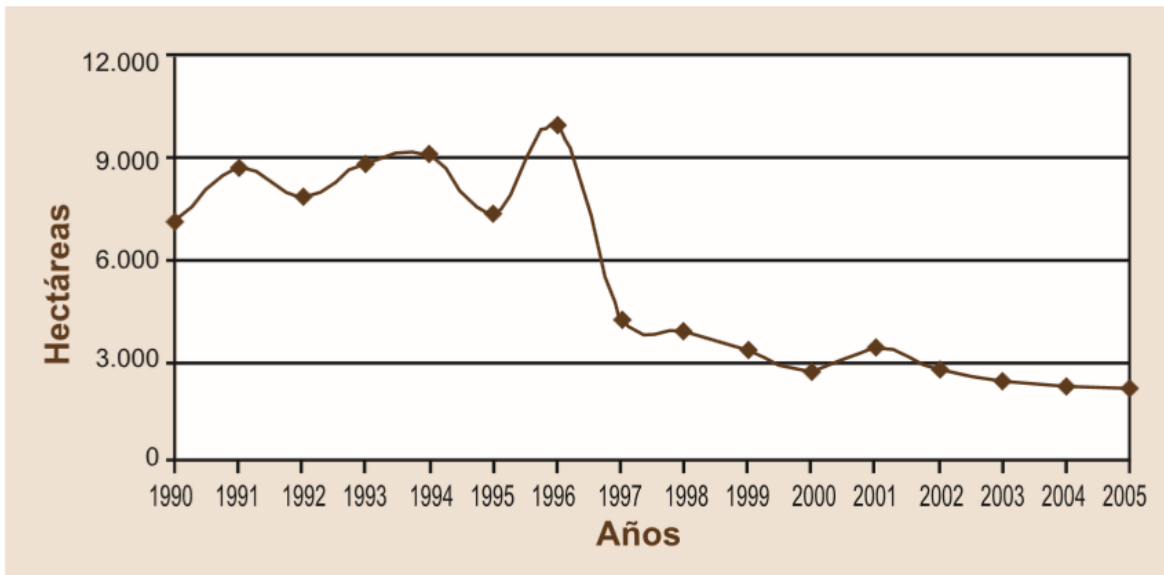
Source: FAOSTAT, FAO of the UN, Accessed on August 30, 2013.  
<http://faostat.fao.org/site/535/default.aspx#ancor>

Costa Rica Top Ten commodities Import value 2011		
	Commodity	Value [1000 USD]
1	Maize	193046
2	Food Prep Nes	148654
3	Soybeans	120447
4	Wheat	89781
5	Pastry	46493
6	Rubber Nat Dry	41398
7	Beans, dry	33770
8	Coffee, green	31570
9	Breakfast Cereals	29200
10	Beverage Non-Alc	27891

Source: FAOSTAT, FAO of the UN, Accessed on August 30, 2013.  
<http://faostat.fao.org/site/342/default.aspx>

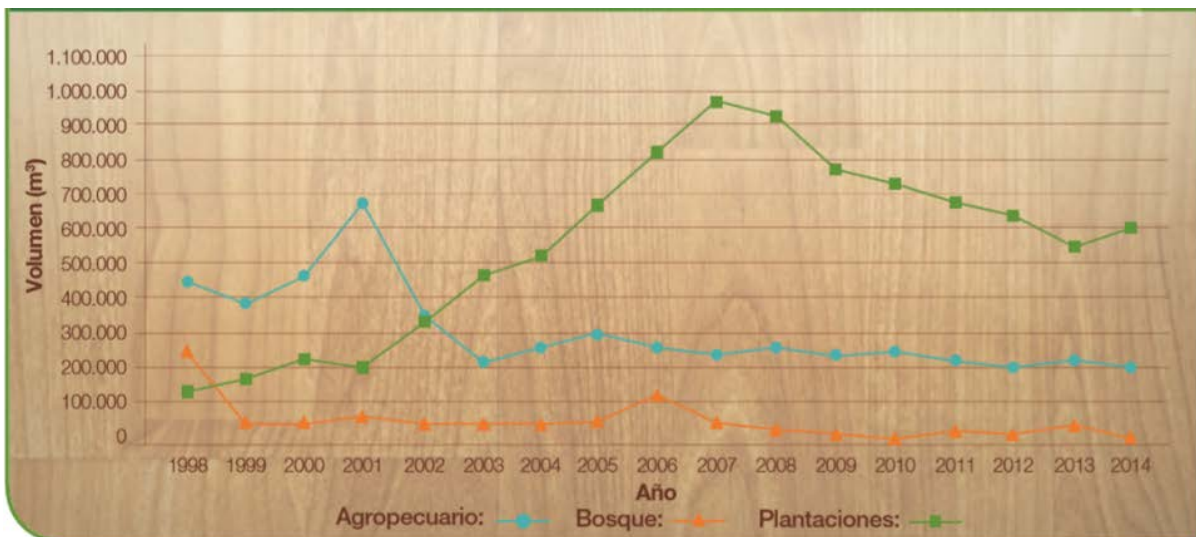
Source: FAOSTAT (2015).

Annex 7: Total newly afforested area (ha)-Costa Rica, 1990-2005



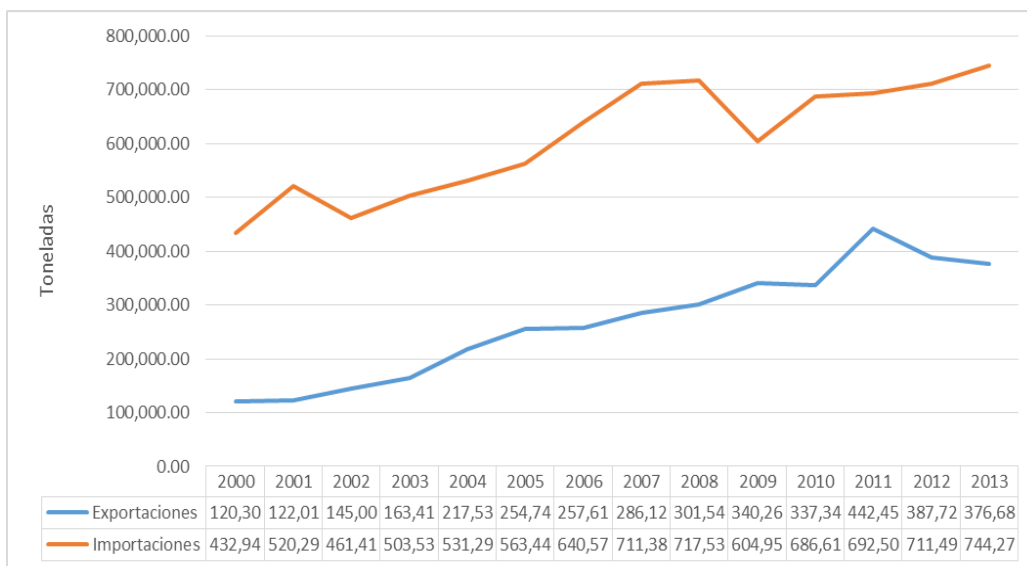
Source: Organización de Estudios Tropicales (2008). Abastecimiento Sostenible de Madera en Costa Rica. Recovered from: [http://onfcr.org/media/uploads/cyclope\\_old/adjuntos/AbastecimientoSostenible\\_Madera\\_CRnu34231.pdf](http://onfcr.org/media/uploads/cyclope_old/adjuntos/AbastecimientoSostenible_Madera_CRnu34231.pdf)

Annex 8: Wood consumption trends in the primary processing industry according to its provenience (m<sup>3</sup>-r), 1998-2014



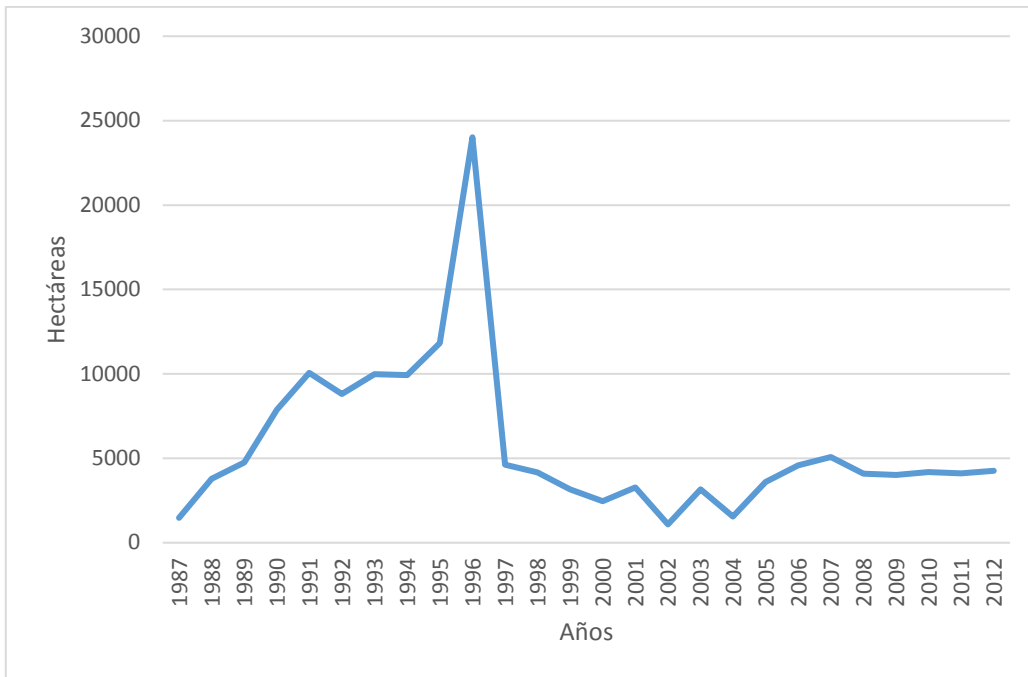
Source: A- Barrantes & Ugalde (2005). Usos y aportes de la madera en Costa Rica. Recovered from: <http://www.onfcr.org/media/uploads/documents/ usos-y-aportes-de-la-madera-estadisticas-2014.pdf>

**Annex 9: Exportation and importation of wood and wood products in ton from 2000 to 2013**

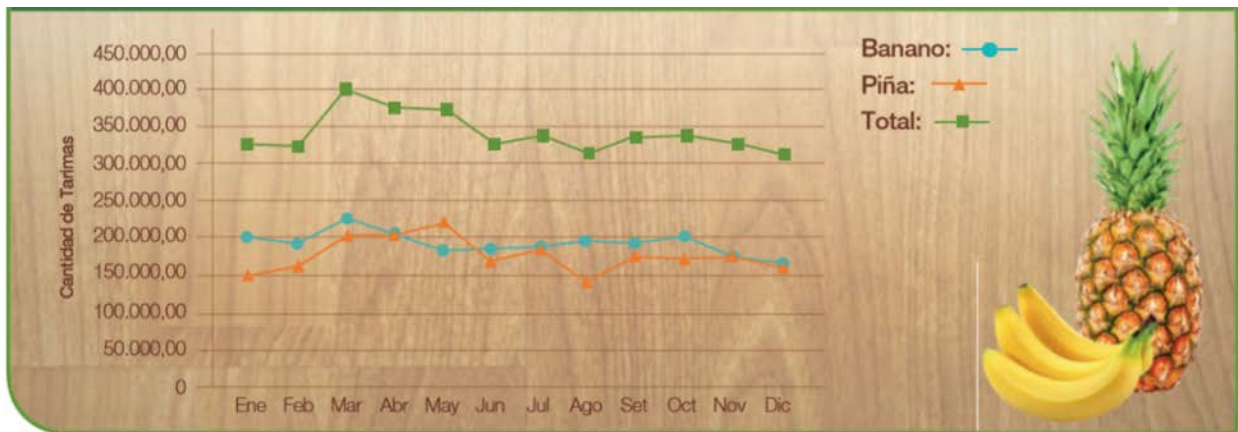




Annex 10: Reforest hectares under CAF and PPSA in Costa Rica from 1987 to 2012

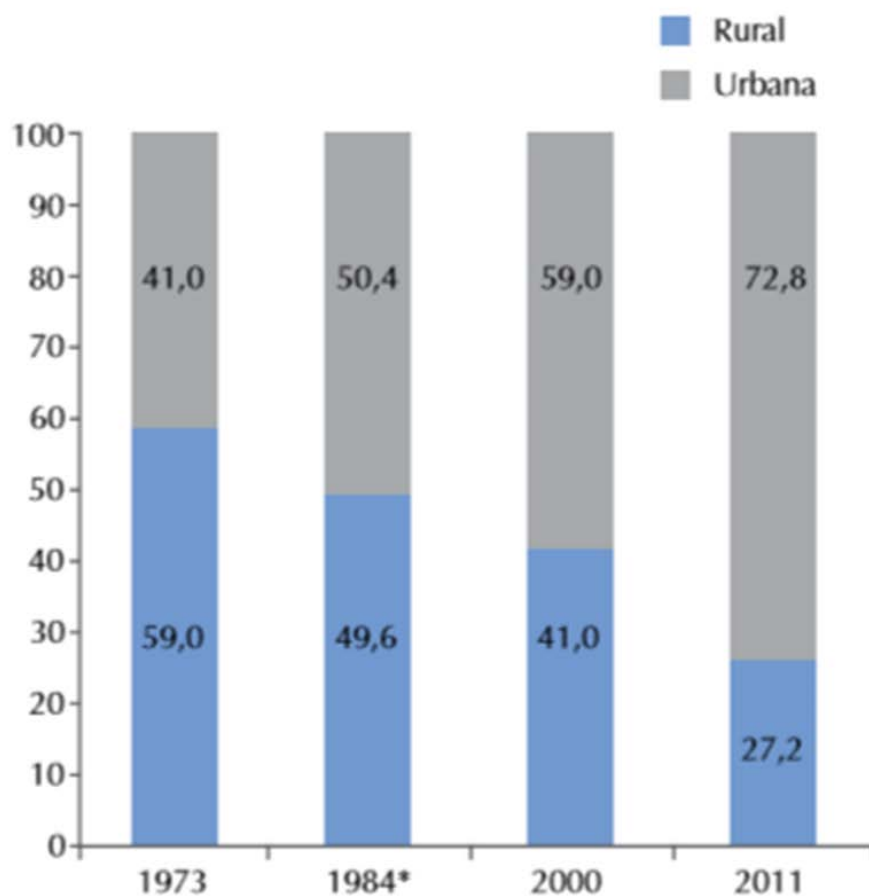


Annex 11: Number of pallets used in banana and pineapple exports per month for 2014



Source: A- Barrantes & Ugalde (2005). Usos y aportes de la madera en Costa Rica. Recovered from: <http://www.onfcr.org/media/uploads/documents/ usos-y-aportes-de-la-madera-estadisticas-2014.pdf>

Annex 12: Percentage distribution of population by area. Census 1973, 1984, 2000 and 2011



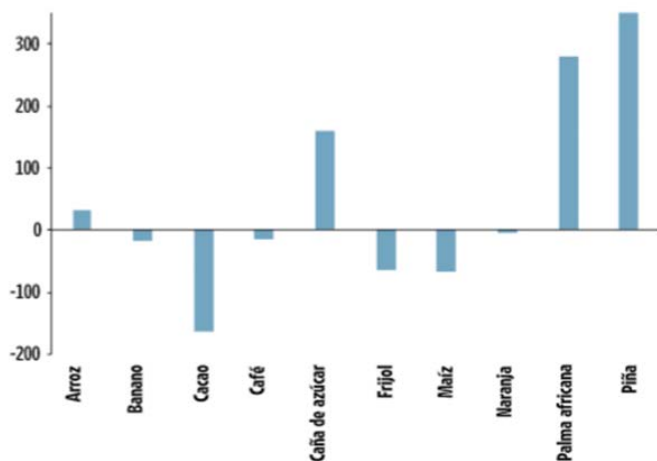
\* Dato ajustado para ser comparable con los años 2000 y 2011. Para años anteriores a 1984 la categoría rural debe incluir periurbano, rural concentrado y rural disperso.

Fuente: *Elaboración propia a partir de los datos de cada Censo. CCP, INEC.*  
Datos en línea

Source: Programa de las Naciones Unidas para el Desarrollo (PNUD) (2013). Informe Nacional sobre Desarrollo Humano 2013.

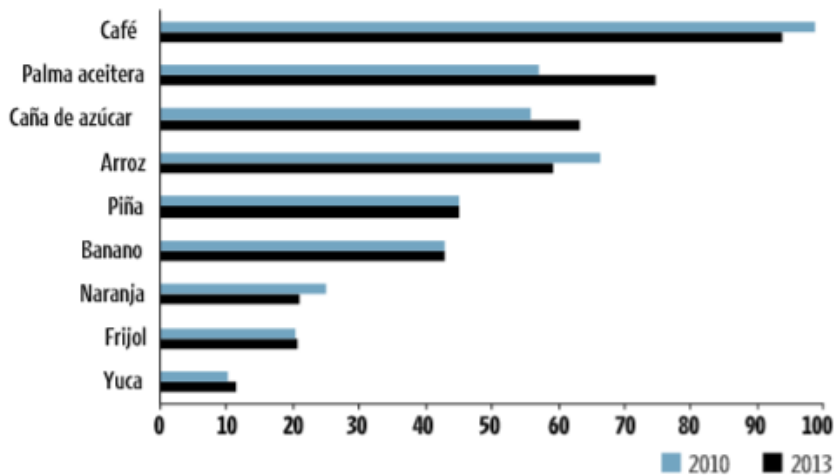
## 2.6

Annex 93: Variation of production of major crops. 1994-2013 (percentages)



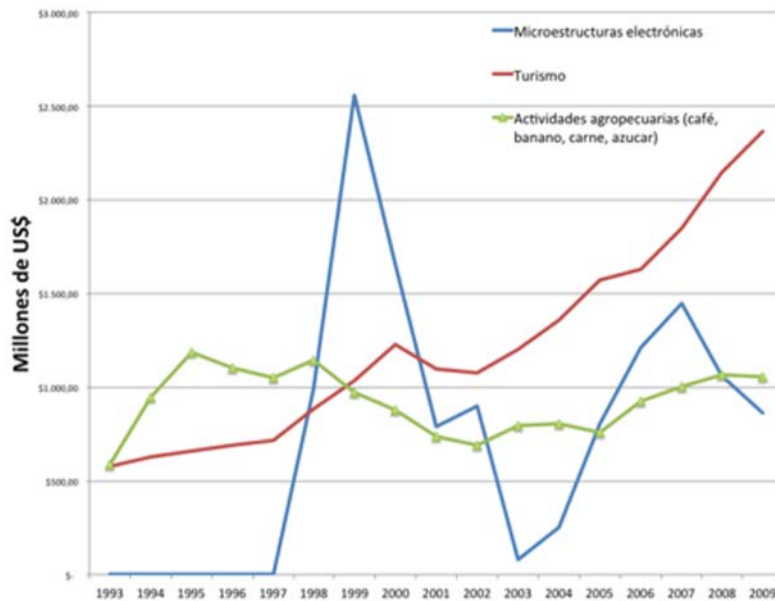
Source: Programa Estado de la Nación (2014). Recovered from: <http://www.estadonacion.or.cr/20/assets/cap-4-estado-nacion-20-2014-baja.pdf>

Annex 14: Extension of the main agricultural crops (thousands of hectares)



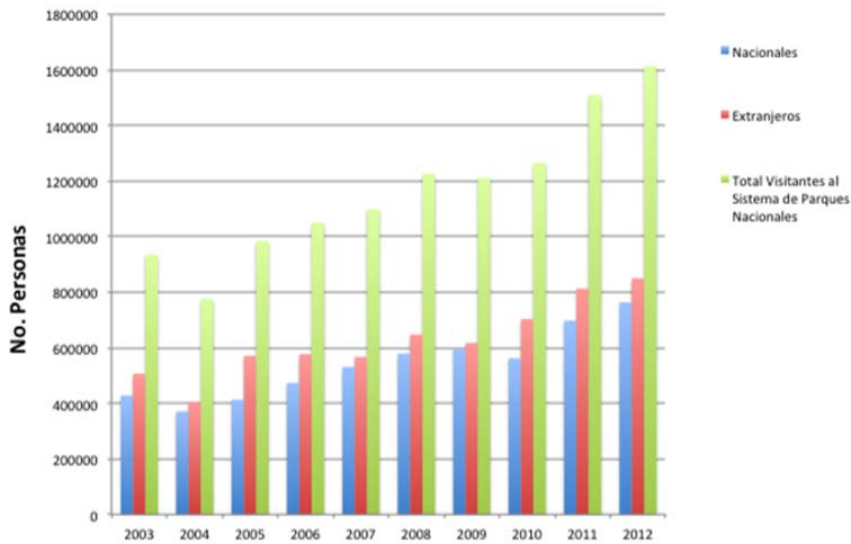
Source: Programa Estado de la Nación (2014). Recovered from: <http://www.estadonacion.or.cr/20/assets/cap-4-estado-nacion-20-2014-baja.pdf>

Annex 105: Tourism and other sources of foreign exchange to Costa Rica 1993-1999



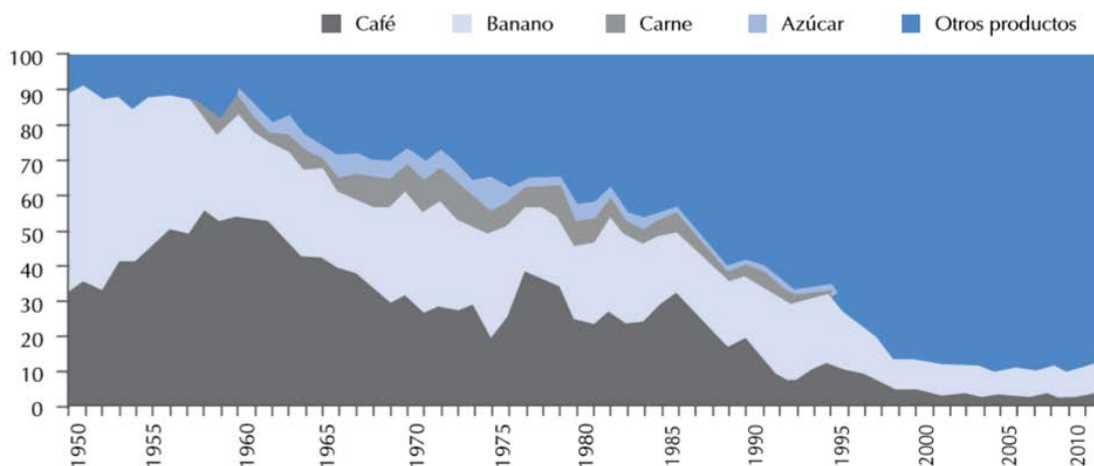
Source: Orozco & Martínez (2014). SINAC. V Informe Nacional sobre la aplicación de las disposiciones del Convenio sobre Diversidad Biológica y su eficacia para el logro de los objetivos del Convenio.

Annex 16: Visitors to the national park system



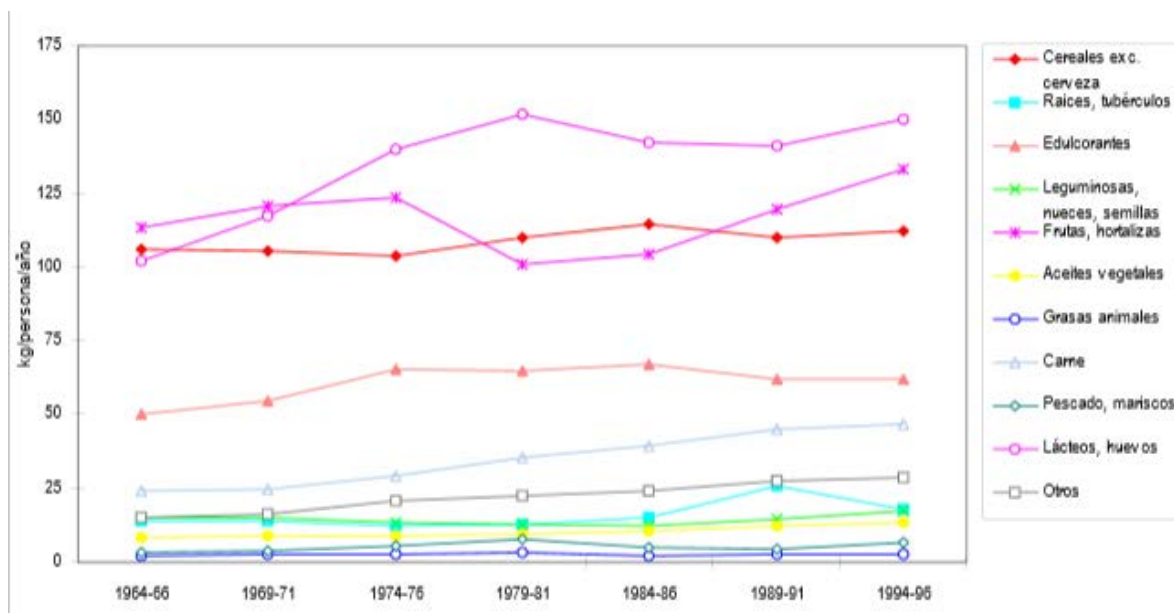
Source: Orozco & Martínez (2014). SINAC. V Informe Nacional sobre la aplicación de las disposiciones del Convenio sobre Diversidad Biológica y su eficacia para el logro de los objetivos del Convenio

Annex 117: Percentage breakdown of exports by main products. 1950-2011



Source: Programa de las Naciones Unidas para el Desarrollo (PNUD) (2013). Informe Nacional sobre Desarrollo Humano 2013.

Annex 18: Availability of major food groups (in kg / person / year) - Trend from 1964-66 to 1994-96



Source: FAO. (1999). Nutritional profiles by Country, FAOSTAT.

Annex 19: Regulations related to climate change, agriculture and food security.

ÁREA	NORMATIVIDAD
Desarrollo	Plan Nacional de Desarrollo 2011-2014
Cambio climático	Estrategia Competitiva C-Neutral 2007-2021
	Estrategia Nacional del Cambio Climático 2009-2021
	Plan de Acción de la Estrategia Nacional de Cambio Climático 2009-2021
	Estrategia Industrial Ante el Cambio Climático 2009-2021
Riesgo	Plan Nacional para la Gestión del Riesgo 2010-2015
Agricultura	Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010-2021
	Plan de Acción para el Cambio Climático y la Gestión Agroambiental 2011-2021
	Plan Sectorial de Desarrollo Agropecuario 2011-2014
	Plan Sectorial de Agricultura Familiar 2011-2014
Seguridad alimentaria	Política Nacional de Inocuidad de los Alimentos 2010
	Plan Nacional de Salud 2010-2021
	Política Nacional de Seguridad Alimentaria y Nutricional 2011-2021
	Plan Nacional de Seguridad Alimentaria y Nutricional 2011-2015
Forestal	Ley Forestal 1996

TABLA 1. Normatividad Relacionada con cambio climático, agricultura y seguridad alimentaria. (Elaboración propia).

Source: Estado del Arte en Cambio Climático, Agricultura y Seguridad Alimentaria en Costa Rica (2014).

Annex 20: Summary of laws on forest

Fecha rige	Último año de aplicación	Descripción
<b>DEDUCCIÓN IMPUESTO DE LA RENTA</b>		
1979	1991	Deducción del impuesto de renta para las personas físicas o jurídicas que desarrollarán plantaciones forestales con fines comerciales. Bajo este sistema se desarrollan las siguientes modalidades: deducción única, deducción básica más bienes de capital y gasto comprobado. También se permitió la venta de terrenos y plantación en los primeros años de la aplicación del sistema, venta de derechos de plantación (se mantuvo hasta finalizar con este sistema) e incentivo adicional. El período de deducción era por cinco años, aún cuando podían disfrutar de un incentivo adicional hasta el décimo año para cubrir gastos de mantenimiento y manejo.
<b>CERTIFICADO DE ABONO FORESTAL (CAF)</b>		
1988	1995	Dirigido a personas físicas y jurídicas interesadas en desarrollar plantaciones forestales con fines comerciales, específicamente madera para aserrío. Se les otorgaba además el disfrute de bienes de capital, que consideraba el reconocimiento para la construcción y reparación de infraestructura, y la compra de vehículos, caballos y otros, necesarios para el desarrollo de la plantación. El monto otorgado por hectárea, repartido en cinco porcentajes.
<b>CERTIFICADO DE ABONO FORESTAL POR ADELANTADO (CAFA)</b>		
1988	1995	Dirigido al fomento de plantaciones forestales por parte de pequeños y medianos productores forestales, agrupados en diferentes organizaciones, tales como cooperativos, centros agrícolas cantonales, asociaciones de desarrollo, entre otros. El monto otorgado por hectárea, repartido en cinco porcentajes. Por los escasos recursos económicos de los beneficiarios el primer pago se otorgaba antes de plantar para que pudieran cubrir las obligaciones del establecimiento.
<b>CERTIFICADO DE MANEJO DE BOSQUES (CAFMA)</b>		
1992	1995	Para fomentar el manejo de bosques propiedad de personas físicas o jurídicas. Esta modalidad se aplicaba para promover el manejo bosques sujetos a prácticas manejar o manejados. Al igual que los dos anteriores el monto se otorgaba por hectárea, distribuido en cinco porcentajes.
<b>CERTIFICADO DE PROTECCIÓN (CPB)</b>		
1995	1995	Con esta modalidad se pretendía contribuir al incremento del área (áreas denudadas) y a la permanencia de bosque natural, en aquellas áreas cuya función principal es la protección del recurso hídrico para consumo humano, así como en las áreas protegidas y en corredores biológicos prioritarios, asimismo,

		reducir, evitar o fijar emisiones de gases con efecto invernadero, atribuibles a la conservación del bosque incentivado. Se beneficiaban personas físicas o jurídicas en forma individual o agrupada bajo cualquier tipo de organización. Esta modalidad se aplicaba a bosques a manejar o manejados. El monto se otorgaba por hectárea, distribuido en cinco porcentajes.
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### REFORESTACIÓN CON RECURSOS PROPIOS

1987	1995	En el artículo 87 de la Ley Forestal 7174 (modificación de la 4465) establecía que los que reforestarán sin acogerse al CAF, gozaban de la exoneración de los impuestos territorial, hoy bienes inmuebles, tierras incultas y sobre la renta por los ingresos que obtengan de la venta de los productos de la plantación. Además la exoneración total del pago de impuestos y gravámenes de importación cuando se trate de equipo, vehículos, maquinaria e insumos, pero a partir de 1991 se eliminó este último incentivo.
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Fecha rige	Último año de aplicación	Descripción
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### FONDO DE DESARROLLO FORESTAL (FDF)

1989	1995	<p>El 1989 con la conversión de la deuda externa entre Costa Rica y Holanda se inicia el Programa "Fondo de Desarrollo Forestal", dirigido al fomento de plantaciones forestales y sistemas agroforestales para pequeños y medianos productores. En 1992 se fortaleció este programa a través de la cooperación del gobierno de Suecia, y partir del año 1994 se suma el gobierno de Finlandia. Cabe destacar que a partir del año 1996, mediante este programa se apoyó el manejo de plantaciones de unas 43,000 ha financiadas a través de CAFA y FDF.</p> <p>Por medio del CAFA y FDF se han beneficiado aproximadamente 10,300 terrenos de productores agrupados en 60 organizaciones de base.</p>
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### CERTIFICADO DE CONSERVACIÓN DE BOSQUES (CCB)

		En la Ley Forestal 7575 (artículo 22) se crea el CCB, con el propósito de retribuir a los propietarios o poseedores, por los servicios ambientales que generan los bosques, establece un plazo de compromiso por veinte años. Adicionalmente otorga la deducción del impuesto de bienes inmuebles y de los activos por área incentivada, y la protección contra el precarismo. Cabe destacar que hasta la fecha este incentivo no está operando
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### REGENERACIÓN VOLUNTARIA DE BOSQUES (CCB)

		El artículo 24 de la Ley Forestal 7575 establece los mismos beneficios indicados para el CCB, para aquellos propietarios de terrenos de aptitud forestal denudados y deteriorados, y que voluntariamente deseen regenerarlos a bosques. Al igual que el anterior hasta la fecha este incentivo no está operando.
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### MANEJO DE BOSQUES



1996		Para aquellos propietarios de bosques naturales que los manejen, el Estado ofrece a través del artículo 23 de la Ley Forestal como retribución a los servicios ambientales que generan, la exención del pago de los impuestos de bienes inmuebles y los activos, y la protección contra el precarismo.
<b>INCENTIVOS PARA REFORESTAR</b>		
1996		Para las plantaciones forestales que se establezcan con recursos propios el Estado ofrece como incentivos la deducción de los impuestos de bienes inmuebles, tierras incultas y los activos, la protección contra precarismo, y la exención del impuesto sobre la renta de las ganancias obtenidas por la comercialización de los productos de las plantaciones. Artículos 29 y 30 de la Ley Forestal 7575.
<b>DESALOJOS (PROTECCIÓN CONTRA PRECARISMO)</b>		
1996		Se otorga la protección contra precarismo a aquellos inmuebles sometidos voluntariamente al régimen forestal o dedicado a la actividad forestal. Artículo 36 Ley Forestal 7575
<b>INVERSIONES EN PLANTACIONES FORESTALES</b>		
1996		Se otorga la categoría de inversionista residente a quien invierta en plantaciones forestales, un monto no inferior a \$ 100,000 (de los Estados Unidos). Artículo 70 Ley Forestal 7575
<b>I. BOSQUE COMO GARANTÍA SISTEMA BANCARIO NACIONAL</b>		
1996		Las tierras con bosque, propiedad de particulares, servirán para garantizar préstamos hipotecarios ante el Sistema Financiero Nacional. Artículo 25 Ley Forestal 7575
<b>II. PLANTACIONES FORESTALES Y ÁRBOLES INDIVIDUALES GARANTÍA PRÉSTAMOS</b>		
1996		Los terrenos con plantaciones e individualmente los árboles en pie plantados en esas tierras, propiedad de particulares, servirán para garantizar préstamos hipotecarios y prendarios, respectivamente. Artículo 32 Ley Forestal 7575

Source: González & Lobo (1999). BREVE DESCRIPCIÓN DEL ESTADO DE LOS RECURSOS FORESTALES DE COSTA RICA.

