

Mitigation of Climate Change and Agricultural/Environmental policies: the Costa Rican paradox¹.

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Abstract

Climate Change is a raising issue for the planet. Although agriculture is called to play a role in CC, the integration of CC in agriculture policy agenda is still limited and difficult.

The Costa Rica exhibit an interesting paradox. Whereas Costa Rica is a leading and pioneer country regarding conservation and CC mitigation involvement, its agricultural agenda is still poorly integrating these issues.

Combining new institutional and policy analytical frameworks, this paper intends to identify explicative factors of this paradox.

Based on literature review and direct interview of actors involved in policy process, we analyze the evolution of agricultural and environmental policy agendas and institutions, the panorama of existing representative organizations of agricultural sector, and the recent initiatives that integrate environment and CC issues in agriculture.

We show that Costa Rican paradox derived from the conjunction of 4 explicative factors: 1) the institutional reforms of public administration in the early 90s, 2) the diversity and conflictive interests among representative actors of the agricultural sector, 3) the limited integration of environmental issue in the mental model of the leading representatives actors of the agricultural sector, and 4) the asymmetric balance of power between organization.

We finally conclude on some practical recommendations to promote the integration of CC in agricultural sectors and the emergence of sounded agro-environmental agenda.

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1 - Introduction

Climate Change (CC) is affecting a wide range of social and environmental systems, with perceptible manifestations of extreme weather events that yields serious effects on rural livelihoods and food security (Flitner and Herbeck, 2009; Ionescu *et al.*, 2005). Therefore CC is an important issue for both developing and less developing countries, and raises a debate in the global agenda. However, international agreements to mitigate CC have shown difficulties and limits. The last world summit, the 15th Session of the Conference of Parties (COP) to the UN Framework Convention, on Climate Change (UNFCCC), held in Copenhagen from 7 to 18 December 2009, only yielded a general political statement, the so-called Copenhagen Accord, which gives emphasis on the reduction of emissions from deforestation and forest degradation (REDD), while gives no importance to agriculture and food security (FAO, 2010).

Agriculture and forestry are the dominant land uses in most countries around the world. Therefore, its participation to CC adaptation and mitigation strategies is an important factor for any successful working agenda. These strategies are twofold and aimed, one side a reducing greenhouse gas emissions, and on the other side reducing vulnerability of communities, risks associated to extreme weather and poverty (Glantz *et al.* 2009). Achieving this global goals require the definition of specific aims and objectives at country level, which on turns, requires the integration of productive and environmental sector agendas, into a group of consistent agricultural/ environmental policies. This construction of an integrated national agenda might be complicated, since it requires mechanisms of social participation and the adoption of a decision making model (Lahera, 2002).

Costa Rica shows an original paradox regarding the articulation of agriculture and environmental agenda. On one hand, Costa Rica is considered as one of the leading countries in term of commitments to protect environment and to face CC. Since the middle of the 90's decade, the country adopted several political policies to protect the environment and the forestry sector. Besides the country participation in the definition and negotiation of many regional and international environmental agreements (Solís, 2006), it has been developed an important national environmental agenda. Since 1996, it has implemented a successful national program of Payment for Environmental Services (PES) for forestry areas (Pagiola, 2008). Moreover, the Government developed a national strategy for Climate Change and decided in 2007 to become one of the first C neutral countries by the year 2021 (MINAET, 2009).

On the other hand, Costa Rican agricultural policy agenda poorly integrates CC issue. Since 1994, Costa Rican agricultural policy is mostly oriented toward competitiveness and promotion of agro-export business activities, even when this activities cause negative environmental consequences: rapid development

of intensive pineapple production generate water pollution, banana and horticulture make intensive use of pesticides use,... (Kruseman *et al.*, 1994 in Sáenz, 2006). The support agenda of small scale multi-production agriculture has been abandoned until the recent international food crises and implementation of a national food security plan, the so-called *Plan Nacional de Alimentos* (SEPSA, 2009). In spite of an existing an agro-environmental agenda (MINAE *et al.*, 2004) and a world debate around the implications of CC on food security (Glantz *et al.* 2009; Flitner and Herbeck, 2009; FAO, 2007), the food security plan basically promotes the increase of area and yield of three basic grains: rice, corn and beans, but is poorly connected from an environmental and a real rural development agenda.

The present paper aims at understanding what are the reasons of this paradox? Why Costa Rica, which has developed a green image and an international leadership in environmental and CC commitment, has not yet developed neither an effective agro-environmental agenda nor an agricultural strategy for CC?

In this paper, we review the major facts behind this paradox and identify its explicative factors. The paper is organized as follows. The section two reviews major insights behind the dynamics between climate change and agriculture, and presents the situation of agriculture in Costa Rica. Section three present the analytical background and the applied methodology. In the section four, we present the major outcomes of the research. In section five, we discuss the explicative factors of the paradox. We finally conclude with some operational recommendations for an effective integration of an environmental/agricultural agenda oriented toward food security and poverty reduction.

2. Agriculture, climate change and food security

2.1. General overview

Over the last two-three decades the attention of the scientific community has been attracted by the fact that climate is changing. Multiples studies have been performed for a better understanding of the dynamics of this change, its effects on social and environmental systems, and the identification and evaluation of different options to cope with this phenomenon (Ionescu *et al.* 2005). CC has direct and indirect effects on agriculture and food security. CC manifests in terms of high variations of the frequency and intensity of storms, droughts and flooding around the world. It alters the hydrological cycle and rain regimes, with consequences in food availability (FAO, 2007). This has serious implications for the developing world, especially in those countries with higher risks associated to weather conditions (i.e. the Shahelian countries). CC effects on agriculture can be broadly divided into two major groups: (1) biophysical effects such as food production, water availability and quality, soil conditions, pest and disease outbreaks, temperature patterns, sea level conditions; and (2) socio-economic

effects such as food yield production, contribution of agriculture to GDP, food prices, trade regimes, civil unrest (FAO, 2007). These effects can be effectively addressed by specific national strategies, focusing on ecosystem goods and services, and social well being (Glantz *et al.* 2009). In fact, the term “biodiversity for food and agriculture” has been yet incorporated in the context of the Millennium Ecosystem Assessment (MEA, 2005) to describe a wide range of the so-called *ecosystem services* that are dependant of the biodiversity, and are crucial for the present and future food security (Flitner and Herbeck, 2009). This notion provides a potential path to better integrate agricultural and environmental sector agendas as part of national policy strategy to cope with CC.

The agricultural and forestry sectors have a recognize potential in the development of adaptation and mitigation strategies. According to Glantz *et al.* (2009), many potential changes in agriculture aimed to adapt to CC have mitigation synergies, while many potential mitigation synergies may yield benefits for adaptation and food security. Many of these options are intended to be effective in the “short term”, while there are many uncertainties around future changes in CC and future implications (Glantz *et al.* 2009). Therefore the issue agriculture/environment and CC should be a permanent discussion at country level, where most of relevant actors contributes with their concerns and major interests in the subject.

However, any policy making process aimed to identify, develop and implement mitigation and adaptation strategies passes through the understanding of the bio-physical process around agricultural activities and its socio-economic implications. For developing countries mitigation and adaptation strategies should reinforce environmental conservation and increase rural welfare. This requires leaving the notion that the agricultural sector is one single body subject to homogenous specific policies (Sáenz, 2006) and disconnected from the environmental/conservation sector.

2.2. Agriculture and nature conservation in Costa Rica

The agrarian production structure of Costa Rica is characterized by a high diversity of farm types, rural towns and settlements. This diversity in farm types is significantly different from other Central American countries. Large capital-intensive farms that produce for both the international and national markets coexist with extensive cattle production units (“*haciendas ganaderas*”) and small and medium size owner-operated farms (Ruben and Sáenz, 2008). The early entrance of Costa Rica in the world coffee market in the absence of coercive state institutions enabled smallholder producers to engage into commercial production, thus triggering a process labelled as ‘rural democratisation’ based

on a strong rural middle class (Hall, 1985; Seligson, 1980, in Ruben and Sáenz, 2008).

Within the so-called medium and small-sized farms it is possible to differentiate between two types of producers: (1) a more traditional peasant sector, comprised of low-income farmers living in former agrarian frontier zones and in rural settlements created by the Agrarian Development Institute (IDA)² and (2) an important group of commercial farmers that produce both traditional export crops (coffee, bananas, sugar cane) and non-traditional export crops (tropical fruits, vegetables and ornamental plants) and usually show good production performance. Being part of either category depends on a number of endogenous and exogenous factors, such as typical farm and household characteristics (i.e. age, education, and dependency rate), scale of production, resource endowments, spatial location and regional infrastructure, market characteristics, and access to production factors and information (Ruben and Sáenz, 2008). Therefore rural development policies is a tricky issue since it should address the wide range needs of different production units working under different economic, institutional and environmental conditions.

After 1980 structural adjustment policies were implemented and changed the public policy in Costa Rica from the former import substitution scheme, towards an open and more diversified economy. However, the agricultural sector still plays an important role in the growth of Costa Rica. It contributes with 10% of GDP and is the fourth most important economic sector, after industry, commerce, and transport and communications (Central Bank of Costa Rica, 2009). It is a provider of export commodities, employment, raw materials for industry, and is a source of food security. Although, the relative importance of agriculture declined with economic growth it is still important (Mellor 1995)

During the 90's decade, the agricultural sector started a continuing tension with a so-called national environmental agenda. Environmentalist desire to expand protected areas and reduce the intensity of farming whilst agriculturalist attempt to increase crop production to develop exports revenues and rural incomes. The World Conservation Union reports that satellite images show almost half of the world's 17,000 major nature reserves are still heavily used for agriculture, although agriculture is officially limited within these parks. Agriculture can be extremely damaging for biodiversity: the cutting of forest for agricultural purposes; misuse of pesticides and fertilizer pollutes water; fragmentation of ecosystems and elimination of wild species. These problems have been particularly sharp in the case of extension of successful intensive export-oriented activities (like pineapple, bananas, orange), which are grown under a plantation scheme in Costa Rica. On the other hand, small and medium-scale

² This traditional peasant sector produces mostly maize and other basic grains for self-consumption, livestock, and some cash crops. In many cases they use low-input production technologies, maintain simple post-harvest management practices, and devote some labor to off-farm activities.

farmers and their communities depend on biodiversity for vegetal materials, food provision, fuel, and medicine (Scherr, 2005). Moreover, protected areas provide a clean living environment for rural communities and a diversification of incomes opportunity for rural dweller through agro-tourism or eco-tourism (Furst et al., 2004). Therefore, any initiative of nature conservation is crucial for helping to control the negative effects of CC, while have an important role in the livelihoods of the people living in the surroundings.

3. Analytical framework and method

3.1. Institutional change and policy process

The analysis of the paradox of the low integration of environmental and CC in the agriculture agenda can be considered through 2 theoretical perspectives. Firstly, it can be seen as a specific change of institutional environment in the sense of the “rule of the game” (North, 1990). Following this perspective of institutional change, the limited integration of the environmental and CC issue in agricultural institutional environment can be interpreted as a *path dependency* problem (North, 1990). To understand the institutions, Denzau and North (1994) proposed the concept “mental model” to capture the cognitive framework that orient the decision process of the actors. Empiric studies on liberalization policy in Costa Rica showed that the “mental model” of leading producers organizations can affected the evolution of the institutional framework (Maitre d’Hotel, 2008). We can then formulate the hypothesis that the paradox of poor integration of environment and CC issue in agricultural institutional framework resulted from the “mental model” of leading actors involved in the decision process on agricultural institutional framework and that the path dependency of agricultural sector resulted from the poor integration of the environmental and CC issue in the mental model of these leading actors.

Secondly, this paradox can be considered from a policy change perspective, specifically from a cognitive policy analysis perspective. The limited integration of environmental issue and CC in the agricultural policy can be seen as a permanence of a “policy referential”, as “policy referential” capture the cognitive content of a policy (Muller, 2003). Authors working on policy change from a cognitive perspective, argue that a policy change occurs when 3 elements (Institutions, Interests and Ideas) converge (Hall, 1997; Surel, 1998). From this perspective, we can propose a second hypothesis which is that idea, interests, and institutions were not converging in agricultural policy system of Costa Rica to enable the inclusion of environmental and CC issue in agricultural policy.

We decided to combine these two perspectives in our analytical framework. We mobilized the concept of “policy referential” at national and sector level to capture cognitive content of agricultural institutional environment. And we

mobilized the concept of “mental model” to capture cognitive framework of representative actors of the sector.

3.2. Material and method

In line with our analytical framework, we combined 2 sources of information: literature and policy documents and direct interviews of actors involved in policy process.

Firstly, we review the legislative and policy documents of agricultural and environmental sectors to characterize the main evolutions of the agricultural and environmental policy framework and their institutions in Costa Rica from the 50s to nowadays. Then, based on comprehensive interviews of civil servants of different public institutions or individuals that participate in policy design, we characterize the national and sectorial “policy referential” and analysed the international, regional and national contexts of their evolutions. This phase allow us to identified the main representative actors of agricultural sector involved in policy process. To complement the information, we participate to events, meeting, and conferences where the dialogue between civil servants and representatives of interest groups took place.

Secondly, we developed specific interviews of representatives of identified organisations at national and local level. These interviews aimed at grasping their policy agenda, their strategy, their interests, their perception, their positions upon specific environmental or agricultural initiatives and finally their activities and initiatives, with a particular focus on their initiatives regarding environment and CC. This interviews information was completed with specific literature reviews of existing strategic documents and with analysis of discourses of leaders in forums between 2007 and 2010.

Finally, interviews information was confronted with literature information, observations and civil servants information. This information was systematize for around 30 representatives organizations of agricultural sectors according to a gridline including their agenda and their perception on environment and their level of incidence and nature of dialogue with state representative. Finally, categories of convergent actors have been defined according to their goals and functions, the type of farmers they represented, their dominant perception and position upon environmental issues and agenda, and their mental model.

3. Results

In this part, we present the results of (1) the long term analysis of policy evolution in Costa Rica with a focus on contrasted dynamics of agricultural and environmental policy agendas and institutions, (2) the analysis of agricultural sectors representative actors, 3) the analysis of current initiatives from

agricultural sectors that may contribute to a better integration to environmental and CC issue in Costa Rican agriculture.

3.1. Agricultural and environmental agendas and institutions dynamics

- **Policy referential change and contrasted effects on agricultural and environmental agendas and institutions**

The analysis of long term evolution of Costa Rican policy document shows that a drastic inflection occurred in the late 80s in the global referential of national public policies (figure 1).

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During the 1950 to 1980 period, in an international context of cold war and protected economy, Costa Rica developed an import-substitution oriented policy. With an incipient development of tertiary sector, Costa Rica adopted a development policy oriented toward the development of agriculture and industry. To promote the development of agricultural sector, it adopts a protectionist position, implemented large stated funded programs to support productive development with the support of international cooperation agencies, and developed public institutions to support agriculture. In 1960, the Ministry of Agriculture and Livestock (*Ministerio de agricultura y Ganaderia* – MAG) following by many specific public institutions such as: the Nation Production Council (*Consejo Nacional de la Production* – CNP) in charge of inputs supply, technical assistance and commercialization of the production (especially staple food production), and the Agrarian Development Agency (*Instituto de Dessarollo Agrario* - IDA) in charge of supporting the colonization efforts of small scale farmers. Government also promoted the development of cooperatives especially in some sector dominated by small farmers such as coffee and dairy cattle sectors. During this period, the environmental sector institutions and agenda was very limited. It consisted on one hand in the Water and Sewage Institute (Agua y Acantarillado - AyA) in charge of distribution of water for human consumption, and in the other hand, 2 specific directions inside the MAG, created by the first forestry law of 1969: the General Direction of Forestry Office (DGF) was in charge of first reforestation programs, and the System of National Parks, initially as sub-direction of DGF, and from 1977 as direction of MAG, was in charge of control and management of national parks.

In the 80s, with the end of the cold war and the reduction international aid, Costa Rica faced an important public deficit and entered an economic crisis. Costa Rica changed then drastically of global policy referential. The pre-existing referential characterised by import-substitution model and a pro-active interventions of the State in a regulated economy was abandoned. Costa Rica adopted the consensus of Washington paradigm, implemented structural adjustment plans and developed a liberalization policy. Costa Rica decided to

diversify its economy and to develop its services sector thanks to the attraction of international direct investments according to a liberal free trade paradigm.

In agricultural sector, this new orientation led to an important state withdrawal. The budget of MAG and the other agricultural public institutions were drastically cut down, many civil servants were fired. The existing support in terms of inputs supply, technical assistance and commercialization was abandoned, especially for staple food production. The new policy referential of agricultural sector was then the competitiveness and agro-exportation promotion. The agricultural policy was oriented toward the promotion of the diversification of agro-export products (i.e. pineapple, horticulture, flower,...)³. The attention of the public institutions was then oriented toward the negotiation of international or bilateral free trade agreements and the commercial opening (*apertura comercial*). As a result, the small scale traditional family agriculture entered in crisis, an important rural immigration process took place toward the cities of the central valley or toward United States of America.

Following the new policy referential, environment was considered as an opportunity for the development services economy, as ecology was identified as important attraction factor for the rapidly growing tourism sector in the late 80s. In 1988, the creation of the first ministry dedicated to environment, the Ministry of Natural Resources and Mine (MINEREM) by aggregating various existing directions formally in other ministry and especially from MAG such as the DGF and the National Park Service marked then an institutional turning point and the official recognition of an environmental sector. Then, whereas agricultural experiments a reduction of its institutions, the environmental sector experimented a consolidation of its institutions. In 1995, the organic law on environment (law # 7554) consolidated the institutions of the environmental sector by creating the Ministry of Environment and Energy (MINAE), and the National System of Conservation Area (SINAC) that regroups the former national park services, wildlife direction and forestry direction. MINAE was then recognized as the rector institution for sustainable development (including forest, wildlife reserve, national parks) but also for water and energy sectors.

Since then, under the impulsion of the MINAE, the environmental agenda enlarged and innovative instruments were consolidated valorising international, regional or national collaborations (figure 2). Firstly, MINAE strengthens the conservation agenda ("green agenda"). Costa Rica signed various international or regional agreements for conservation⁴ and the MINAE strengthened the national conservation agenda and policy framework: the conservation strategy for sustainable development (ECODES) was published in 1990, a first national plan of environmental policy was launched (*Plan Nacional de Política Ambiental*

³ This new agricultural policy initiated 88 was entitled agriculture of change ("agricultura de cambio") to symbolize the new orientation toward non traditional exports.

⁴ ratificación de La Convención Ramsar en 1991 on humedales

1996 –2000); a biodiversity law (law #7788) was approved in 1996, the national strategy for conservation of biodiversity (*Estrategia nacional de conservacion de la biodiversidad*) was approved in 1999, a strategy for conservation and sustainable development of the swamp area (*estrategia de conservacion y de desarrollo sostenible de los humedales*) formulated in 2001, a national strategy for environment (ENA) in 2005... In collaboration with Centro American regional authorities and with support of international donors, MINAE developed projects to support biologic corridor in the country which enables to complement the existing conservation outside of the National Parks and other forms of conservation areas. Secondly, MINAE developed a water agenda (“Blue agenda”). Under the impulsion of the water department of MINAE and in dialogue with the actors of various sectors such as energy and industry, the old water law was revised and level of water use fee (*Canon de Aprovechamiento de Agua*) was significantly increased in 2006. Third, MINAE developed a proactive agenda in forestry sub-sector. Under the impulsion of MINAE, the 4th forestry law was adopted in 1996 with the support of forestry sector (Le Coq et al, 2010). The innovative Payment for Environmental Services program (PESP) was created, including financing mechanism through a part of the oil tax, and a structure to implement it, the Forestry national Fund (*Fondo de Financiamiento Forestal* - FONAFIFO). With collaboration of international donors, the PESP was consolidated during the last decade and nowadays 850 000 ha of forest have benefited from this program (Pagiola, 2008). MINAE developed also collaboration with other sectors to promote environment concerns. It collaborates with the tourism sector (Costa Rican Tourism Institute – ICT) for the development of Ecological Blue Flag program launched in 1996 which initially aims at promoting the maintenance of clean beach and which progressively incorporate new ecosystem such as rural watershed. MINAE also developed also collaboration with the Ministry of Education to raise citizen awareness on environmental issue according to the national strategy of education and environmental extension, published in 2000.

To conclude, we show that, with the change of global policy referential that occurs in the end of 80s in Costa Rica, the balance of power between public institutions of agricultural and environmental sector change drastically. Whereas the agricultural sector experimented a decomposition of its institutions, the environmental sector experimented an autonomization and a consolidation of its institutions. The creation of the MIRENEM, and further MINAE in 1995 appears as a key institutional event, which set the official separation between environmental and agricultural agenda.

- **Integration of environment and CC in policies**

In line with the new global policy referential based on free trade, competitiveness and international direct investment attraction, environment is progressively considered as a comparative advantage of the country.

Environmental and progressively CC preoccupation under the impulsion of environmental institutions was rising in the 2000s in all the society and sectors, whereas integration of environmental and CC issue were still very marginal in agricultural agenda and institutions (figure 2).

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Along with the development and strengthening of environmental agenda, MINAE contributed to the development of national awareness on CC and the setting of a National Climate Change agenda. Since early 90s and the earth summit of 92, the forestry sector integrated the CC in their reflexion, considering the possible development of Carbon compensation mechanism as one opportunity for renewing funding toward forestry sector in Costa Rica (Le Coq et al, 2010). Thus, the 4th forestry law of 1996 which recognize the forest role in Environmental Services provision explicitly defined, as the first of environmental services, the carbon sequestration to mitigate CC. Under the impulsion of forestry sector, Costa Rica then played a proactive role in climate change reflexion and international negotiations, creating in the Costarican co-execution office (Oficina Costaricense de Implementacion Conjunta” – OCIC) in 1995 to formulate carbon compensation projects. The first key event related to CC took place then in 1997, during the administration of Figueres-Olsen (1994-1998), with the first sales of carbon to international markets within the framework of the newly created PES program. In the 2000s, the internationally recognized success of PES program administered by the FONAFIFO contributed to strengthen green image of the country and the positioning of Costa Rica in CC international agenda. As CC was of growing importance in international level, CC theme entered in national political agenda with the National Plan of Development 2006-2010 (MIDEPLAN, 2006) and in 2007, the president Oscar Arias Sanchez (2006-2010) decided further strengthen the green image of the country by declaring that Costa Rica will be one of the first carbon neutral country by 2021. The same year, the National Strategy for Climate Change was designed by a task force appointed by the MINAE though a participative process including representative of all the economic sector. Officially published in 2009, the National Strategy of CC was rapidly integrated by other sectors: the tourism sector developed its specific strategy as well industrial sector which is currently developing its specific CC strategy. Even if this national strategy concerns all the economic sectors, MINAE is still playing a leading role since the institutions related to MINAE have developed experiences on CC issues and policy. Forest related institutions, such as FONAFIFO, has developed experience and knowledge in CC international negotiation, in international carbon market functioning, in evaluation of C balance, and in setting innovative mitigation funding mechanisms⁵. Its water department has developed working

⁵ Since 2002, Fonafifo developed new source of funding known as certificate for environmental services (*certificate de servicios ambientales* - CSA) in order to capture voluntary funding from local and

relationships with key actors for reduction of Co2 emission, the energy sector and specifically hydroelectricity production enterprises.

Whereas environmental agenda was growing, and the environmental concern was integrating into new sectors such as energetic, water supply⁶ and tourism⁷, environmental dimension and especially CC were poorly integrated agricultural institutional agenda which still principally oriented toward agricultural and productive issues. In collaboration with the ministry of external trade (PROCOTER), the MAG agenda was still concentrated in the negotiation of free trade agreement conditions of agricultural products and the promotion of the agriculture competitiveness (agro-export agriculture) and commodity chain integration. To counterbalance the negative effects on agro-export orientation, a plan for production reconversion (*plan de reconversion productiva*) was implemented in 1995 to facilitate productive reconversion of small and medium farmers toward more competitive export activities. In 2007, after more 20 years of reduction of public support and attention to national food production⁸, food security regains forces in the national agricultural official agenda with the international food crisis of 2007. A National Plan for Food (*Plan Nacional de Alimentos*) was launched in 2007 aiming at reactivate national production of staple food (mainly rice and bean) which basically consists in free distribution of seed and inputs to boost production as well as investment in transformation units. If the CC is mentioned in the PNA) which is the first mention of CC in an official document of policy of the MAG, the inclusion CC in PNA was very limited to some general considerations, and did not affect the implementation which was concentrated on the achievement of productive objectives.

international enterprise, linked to C compensation.

⁶ For example, the enterprise of public services of Heredia which is in charge of water supply in Heredia cities developed since 2002, its own system of PES financed by a tariff paid by final water user. This system enables to finance reforestation and conservation of forests in the watershed where water is captured.

⁷ Aside blue flag program, ICT developed since 1996 a certification for sustainable tourism (CST) which incentive tourism enterprise to adopt environmental friendly practices.

⁸ Although Costa Rica was self sufficient in staple food production in the early 80s, in 2007 the level of national production of rice, white maize and beans represented respectively 50 %, 22 % and 23% of the national consumption (SEPSA, 2007)

3.2. Re-composition of the rural sector actors: from a agricultural vision toward a multi dimensional rural vision

We present here the general panorama of agricultural actors' representatives, their agenda and influence level. Then we focalize our analysis on their perception of environment and CC and their position upon environmental agenda.

- **Panorama of agricultural actors representatives**

Representation of interests in the agricultural sector is multiple and reflects different orientations (Figure 2a and 2b). The analysis of the various organizations that play a role in policy agenda shows a diversity of organizations representing costarican farmers. This diversity is the results of a progressive evolution that took place during the XXth century and recomposition that took place since the 90s. Nowadays, two main categories can be identified: 1) a category of "traditional agricultural representatives actors" which derive from organizations that developed mainly in the XXth century and which agenda are mainly agricultural-oriented (figure 2.a), and 2) a category of "emerging actors" which encompasses the organizations that are developing since mid - 90s and whose agenda are not exclusively agricultural production oriented (Figure 2.b).

INSERT HERE FIGURE 3a.

The first actors of the traditional agricultural actors category are the groups of the Chamber (*Camaras*) that were created by business oriented producers. Most of the production sector count with its own chamber: the cattle raising chambers, the national chamber of pig production, the national chamber pineapple (CANAPEP), national chamber of milk producers,.... Since 1947, a National Chamber of Agriculture and Agro-industry (*Camara Nacional de Agricultura y Agro-industry- CNAA*) was created to represent the interests of the various productions sectors and *Camaras* toward the governments. As the largest federation structure in term of sector represented and economic power of this affiliates, the CNAA is engaged a continuous dialogue with the governments. The policy agenda of CNAA and the different *camaras* are oriented toward the negotiation of the good conditions of free trade agreements. Their orientation is clearly toward the promotion of the competitiveness and an agro-business export model, and the setting of conducive regulation framework that enables to strengthen or maintain their competitiveness⁹. Even if their structure are light in term of human resources, the economical weight of their

⁹ Their main orientation are stated for example in their competitiveness agenda of the agricultural and agro industrial sector ("*agenda de competitividad del sector agropecuario y agroindustrial ante la apertura comercial.*") which put many emphasis on reduction of tariff on agricultural inputs, access to labor,... (CNAA, 2005)

members and associates and their capacity to mobilize high level expertise led the CNAA and Camaras to have an high influence in national policy decision process¹⁰.

To promote, represent and regulate some specific agricultural production sector, Costa Rica has developed inter-professional bodies' structures. These organizations so called "*corporacion*" have a specific public/private status, with a board including the representation of producers, of processors and traders, and the State. Six *corporacion* have been created from the 30s to nowadays: the coffee Corporacion (Icafé) created in 1933, the Sugarcane agricultural and industrial league (*Liga Agrícola Industrial de la Caña de Azúcar* - Laica) in 1965, the Banana Corporación (Corbana) in 1971, la horticulture Corporación (Corpohorti) in 1996, the cattle raising Corporación (Corfoga) in 1998 and the Rice Corporación (Conarroz) in 2002. These organizations, created by national decree, are natural interlocutors of the State for their sectors. Thus they benefitted from a specific high influence. They have different orientations according to the sector they represent: *corporation* representing competitive export sector such as banana, sugar cane or horticulture have a more liberal orientations (Laica, Corbana, Corpohorti), whereas *corporation* of less competitive sector or dominated by small-holder producers such as rice, coffee or cattle rising, have a balance (Corfoga) or more pro-regulation positions (Conarroz, Icafé). Nevertheless, they all are globally oriented toward the defense of competitiveness of the sector, and the setting of conducive national regulation.

A third group of traditional agricultural actors consists in the organizations of the cooperative movement. Cooperatives in Costa Rica developed in the 60th to create a counter power to the existing control of the sector by agro-industrial enterprises and to promote a model of small agriculture. This movement was strongly supported by the State with investment support,... Specific institutions were created to support represent (CONACOOOP) and support the cooperatives (INFOCOOP). The raise of cooperative movement was especially important in 2 specific sectors of small scale production: the coffee and the milk production sectors. Nowadays, due to the coffee crisis of early 2000s, the numbers of coffee cooperatives have reduced to some 18 cooperatives, but its economic power still important with 40% of the national production (ICAPE, 2008). In the milk sector, the leading enterprise of the sector is a cooperative (Dos Pinos). Cooperative movement still an important interlocutor of government in specific sectorial policies. If the competitiveness is also an important orientation (especially for Dos Pinos), the defense and promotion of cooperative principles still an important value. Their orientation was more toward a protectionism of the national market. They maintain a regular dialogue with the governments and

¹⁰ The CNAA and the Camaras are generally consulted by the government officials and civil servants of MAG in all specific law and policy design process regarding agricultural sector, and participate with government civil servants to the negotiation of free trade agreements.

their power of incidence is fairly important. For example, whereas the most of the sectors were liberalized in the 90s in the framework of liberalization and reduction of tariffs, milk sector and coffee sector achieved to maintain either a trade protection tariffs (Milk) or regulation framework (Coffee) (Maitre d'Hotel, 2007).

In the 80s and early 90s, a groups of organizations developed and shaped a small and medium farmers / or peasant movement. The first agricultural specific syndicate, the Agricultural Producer Union (*Unión de Productores Agropecuarios* - UPA Nacional) was created in 1981 to defend the specific interests of small and medium farmers. Further, many local associations was created and, in 1995, was officially created the national platform of peasants (*Mesa Nacional Campesina* –MNC). These small and medium farmers' representatives' organizations developed an important activities to withstand the government in its orientation toward liberalization in late 80-90s. Their political agenda is to promote land access to small farmers, developed or maintained adapted public supports in term of credits and technical assistance. They also are against free trade agreement, and deregulation. In the end of the 90s, with the consolidation of the liberal agenda in spite of their revendication, the movement of small and medium farmers knew an relative reduction of its mobilization power and an atomization with the development of new associations such as the National Union of Costa Rican agricultural producers (*Unión Nacional de Productores Agropecuarios Costarricenses* - UNAG) created in 2004 by some ex-leaders of UPANational, or more recently the peasant alliance (*Allianza Campesina-AC*) created in 2007. UPANational which is more oriented toward the promotion of market oriented small production, maintain a relative fair level of dialogue with governments and achieved some real incidence¹¹. The other organizations (MNC, UNAG, AC) have policy agendas more oriented toward land reforms, very small scale production, food crops oriented production, food security and food sovereignty. They have a very fluctuant and more or less conflictive relationships with successive governments.

INSERT HERE FIGURE 3b

The second large category of actors, “emerging actors “ emerges in the late 90s and 2000s and are developing their influence recently. If they do not have the same trajectory, experience, and level of influence on agricultural policy agenda than the traditional actors, they represents emerging forces in the agricultural sector and contribute to shape a new kaleidoscopic vision for rural area development. These organizations mainly represent interest of small scale farmers. These organizations promote a more “integrated vision” of rural

¹¹ For example, UPA Nacional achieved to negotiate state support to withstand coffee crisis in early 2000s. With MNC, these organizations achieved to negotiate the implementation of the national plan for reconversion in 1995.

development including diversified agricultural production models, local non agricultural economic activities development, social and environment dimension (figure 3b). According to the type of small farmers they represent and the emphases they put on one or another dimension, we can distinguish 4 main groups in this category.

A first group of actors promotes an agro-ecologic vision of agriculture. Two main national organizations promote organic farming. The Educative Corporation for costarican development (*Corporación Educativa para el Desarrollo Costarricense* – CEDECO), a NGO created by 5 local organizations engaged in different organic production (coffee, sugarcane, vegetables,...) with the objective to promote organic production. In 2001, the movement of organic agriculture of Costa Rica (Movimiento de Agricultura Orgánica Costarricense – MAOCO) was conformed by various local organizations involved in organic production and NGOs to promote exchanges between them and represent their interest in policy arena. Other organizations are more oriented toward the promotion of agro forestry system and community forestry, such as the national platform of forestry peasant (Junaforca) or Centro American Coordinating Asociation of indigenous and peasant of communitarian agro-forestry (*Asociación Coordinadora Indígena y Campesina de Agroforestería Comunitaria Centroamericana* - ACICAFOC).

A second group of organizations put more emphasis on development on the diversification of economic activities in rural community. According to the main activities on which they are concentrated, two main groups can be considered: the organizations oriented to the promotion of agro-tourism such as the Costa Rican association of community based rural tourism (*Asociación costarricense de turismo rural comunitario* -ACTUAR), and the organizations oriented toward the promotion of small scale agro processing in rural area such as ANAMAR and CMC for women.

A third group of organization emerged to represent specific segment of producers. Two national organizations emerged in the late 90th to represent women specific organizations: the coordination of peasant women (*Coordinadora de Mujeres Campesina* - CMC) created in 1996, and the National association of agro-industrial producers women (*Asociación Nacional de Mujeres Productoras Agroindustriales Rurales*, ANAMAR) created in 1997. These organizations put emphasis on women situation and promote women rural economic activities. Two national or regional organizations developed also in the 90th to represent specific interest of Indigenous populations: the national platform of indigenous (*Mesa Nacional Indígena* – MNI) in 1991 and ACICAFOC, created by 9 organizations throughout the country in 1991.

Finally, a last group of organizations defend more conservationist orientation such as FECON, Ecoceiba, Apreflofas,... These ecologist organizations have

their agenda concentrated on the protection of the species and natural habitat. They are not directly involved in agricultural agenda design but they have an indirect influence since they are involved in denunciation of agricultural activities that affects environment (water quality, deforestation, etc...), such as intensive pineapple or banana production.

We can notice that the the global agenda of the agricultural sector follows the main orientation and interests of the *Camaras*, *Corporation* and in a lower extend Cooperative movement. The small and medium producers orientations, even if they achieved some incidence have been marginalized and their vision is very poorly reflected in the national agricultural agenda, with exception of the recent PNA which is dedicated to small and medium farmers and integrate support to production of staple food.

- **Perception and position of agricultural representatives toward environmental issue**

The analysis of the perception of the different representative of agricultural toward environment shows that the integration of environmental and CC issue is contrasted between the traditional actors and the emerging actors (figure 4).

INSERT HERE FIGURE 4

Among the traditional representative organizations, the perception of environment is generally negative to neutral and their consideration of CC is very limited. For the representative of large business agro-exporting agriculture represented by the *Camaras* and for the *corporations*, the raising of environment concern is globally seen as a risk of limitation of competitiveness. Thus, they adopted mainly a defensive position against environmental policy development and all regulation that may limit their productivity (restriction on agro-chemical) or led to higher production cost (increase of water tax). If they are informed of CC issue, the CC issue is almost absent in their political agenda. The organizations of cooperatives movements, even they have a less negative vision of environment than *Camaras* are still mainly seeing environment regulations as an additional constraints for their activities. Even if they are informed of CC issue, they have not integrated it in their political agenda. Finally, the traditional representatives of small and medium farmers are more prone to be sensible to environmental issue. If environment is still very in the periphery of their political agenda for some of these organizations (such as UPANacional, UNAG or Alianza campesina), others gave more importance to environment in their agenda (such as the MNC) since they consider that small farmers production model are environmental friendly and then participate actively to consultation on some environmental initiatives (PSA, biodiversity law, ...), when they consider that they may help to maintain small traditional agriculture. For the organizations of this last group, CC is a new issue, they are poorly informed and thus has not yet being not integrated in their agenda.

On the other side, the category of “emerging agricultural actors” appears to be more environmental friendly oriented and more prone to consider CC issue. For some of them, their environmental concern is central in their agenda such as agro-ecology model promoters (organic movement: MAOCO, CEDECO, or agro-forestry movement: Acicafoc, Junaforca). They have integrated CC in their reflection and they consider the production model they promote (Organic, Agro-forestry) as options to mitigate green house effects. If the former have developed their own initiative mainly with the MAG, such as the law of promotion of organic agriculture (see following section), the latter have active participation in the environmental agenda¹². For the representative of specific groups such as indigenous representatives groups, environment theme is also an important in their agenda, as they defend traditional model of production (mainly agro-forestry) which they argued to be less affecting environment. Moreover, environment is considered as part of their model of thought¹³. They integrate CC issue as a way to defend their production and livelihood model. The groups of organizations promoting activities development in rural area also considers environment as important elements since it is part of the specific attractive of rural area (agro-eco tourism: ACTUAR) or because they consider it as civil necessity (Anamar, CMC). These organizations are sensible to CC issue even if it is not central in their agenda. For the conservationist organizations, environment is obviously a central preoccupation, the main goal of the organization. Climate change is also considered by these organizations, but they are more sensible to biodiversity than CC mitigation (C sequestration,...) issue.

Finally, whereas the emerging actors are more sensible to environmental and CC issue, the leading and more powerful actors involved in agricultural policy process, including business agriculture representatives and most of small and medium farmers traditional representatives, did not integrate environmental and especially CC issue in their “mental model” and their policy agenda. They even develop defensive position against the development of the environmental agenda, and have not perceived (or in a very limited manners) the role that agriculture can have in CC mitigation. Thus, as the MAG as institution is poorly involved CC, the leading and most powerful traditional representatives actors of agricultural sectors contributed also to the maintenance of a poor integration of environment in agricultural agenda and the poor integration of CC in agricultural agenda.

¹² Acicafoc and Junaforca, participated in negotiation with Fonafifo and MINAE to integrate a new modality of PSA for trees planting in agro-forestry system, which was included in the PSA scheme in 2004 (Le Coq et al, 2010)

¹³ In indigenous vision, the land is the mother, la *pacha mama*. Human activities cannot be arming the land, since it affects directly the equilibrium.

3.3. Toward a real integration between agricultural and environmental agendas?

We analyse in this section the current initiatives to integrate environment concerns in agricultural activities and agenda, presenting firstly the institutional initiatives, and secondly the actors' initiatives.

- **Institutional initiatives**

As the main agricultural agenda is still production and competitiveness oriented, some institutional initiatives has been developed which mark the first attempts to integrate environmental issue in the agriculture. Three initiatives can be pointed out.

Firstly, in the 2004, coordinated efforts of civil servants of MAG/SEPSA and MINAE in collaboration with an investigation centre, the CATIE, achieved to design a national agro-environmental agenda (*agenda de cooperacion technical agro-ambiental*). This agenda proposed several orientations to better integrate environmental within agricultural agenda and a process to better coordinate respective actions of MAG and MINAE. Nevertheless, if this document was used as a base document for the elaboration of a strategic document at regional level, this agenda has not been pushed forward by the national Ministries. Its diffusion has been limited. Moreover no practical policy instruments were derived or implemented from this agenda. Secondly, since 2005, a program to support the sustainable agricultural production (*Fomento de Production agropecuario sostenible* - FPAS) is implemented by the MAG with the fund of the Interamerican Bank for Development (BID). This program directly facilitates funds and technical assistance to support adoption of environmental friendly practices or technology by producers. It firstly integrates the principle that eco-friendly agriculture can contribute to improve environment, and firstly introduce the principles of a reward for environmental benefit for agriculture (*Reconocimiento por Beneficios Ambientales* – RBA), which is an approximate of existing Payment for Environmental services developed in Forestry sector by Fonafifo since 1996. This project enabled to create didactic integral farms (*fincas integrales*) to promote integrated environmental friendly farming system (including also *bio-digestors* as a mitigation practices), and financed 112 projects of local organizations as RBA throughout the countries. Thirdly, in 2005-06, MAG and MAOCO formulated a law to promote organic production in Costa Rica. This law, adopted in 2006, proposed different supports to promote organic farming in Costa Rica and firstly recognized officially the role of Organic Agriculture in the provision of environmental services (chap. 7 art. 23), such as forestry sector did in 1996, ten years earlier, in the 4th forestry law. In contrast with PSA Fonafifo for which implementation began as early as 1997 since support instrument were previously already existing (Pagiola, 2008), the implementation of an instrument to support organic agriculture took around 3 years. In early 2010, the first funds were dedicated by the MAG to finance a

new instrument the reward for environmental benefit for organic agriculture (*reconocimiento por beneficio ambiental de agricultura organica* – RBAO)¹⁴.

Finally, some institutional initiatives tend to integrate environment in the agriculture sector. Nevertheless, these recent or very recent initiatives are still limited to pilot phase and/or disconnected from the main agricultural agenda. They are developed by some specific unit of the MAG and mainly with the participation and support of specific emerging agricultural representatives.

- **Initiatives of actors groups**

The analysis of actual initiatives of organizations of agricultural sectors shows that most of them are developing more or less significant individual or collective initiatives to better integrate environmental and CC issue in agriculture (figure 5).

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Even if the organizations of the traditional category of actors have poorly integrated environment in their agenda and developed mainly defensive position toward environmental agenda, it is worth to notice that some of them developed pro-environment initiatives. Some *camaras* have developed recently environmental commissions or department to address the issue. These commissions or departments are in charge of proposing counter proposal to environmental restrictions and also to document the effects of agriculture on environment. At local level, some the agri-business agriculture enterprises are develop initiatives to develop a green image on markets (social and environmental enterprise responsibility concept), or to follow market demand. Hence, some enterprises integrated eco-friendly certification of products (such as Organic or Rainforest alliance certification in banana or pineapple production). Some begin to estimate the carbon foot print of their business, and participates to C emission compensation programs. Some corporations have also recently integrate some eco-friendly initiatives. Corfoga developed a joint program with Fonafifo to promote sylvo-pastoral system. Local organization of breeders jointly with MAG and CATIE, developed a pilot project funded by Global Environment Fund to test a new specific model of PES for sylvo-pastoral system. They are actually negotiating with MINAE and MAG to institutionalize this model into a PES or RBA instruments. Icafe promoted the improvement of the coffee processing units to reduce water use and water contamination. In the cooperative sector, coffee cooperatives have developed different environmental friendly certification. Moreover, a consortium of coffee cooperative (Coocafe) with ICAFE and CATIE developed a proposal to recognized Environmental Service provision (including C sequestration) of coffee agro-forestry ecosystem, is actually negotiating with Fonafifo a new specific PES modality for these

¹⁴ The MAG is currently developing manual of procedure for the management of the RBAO and identifying the potential beneficiaries of RBAO and. are actually

ecosystem (De Melo, et al , 2009). The traditional organizations representing of small and medium farmers due to their limited means are poorly developing initiatives toward environment and CC. Nevertheless, their local organizations are participating to PES or RBA programs or developing integrated production systems without any supports.

The organizations of the category of emerging of agricultural sectors are involved in many processes to integrate environment and are also developing C mitigation activities. First, organic movement is very active in promoting environmental friendly agriculture. MAOCO especially developed a political initiative with MAG in the already mentioned the design of the law of promotion of organic agriculture and the creation of RBAO. CEDECO is actually developing a pilot initiative (Cambio2) which consists in creating a new mechanism of funding based on compensation of C emission by enterprise (voluntary C market). Indigenous representative organizations, such as Acicafoc have developed specific compensation for environmental services mechanisms oriented toward indigenous productive models. They also participate in negotiation to facilitate access to Fonafifo PES program for indigenous producers. Some conservationists organizations which were not specifically rural oriented, such as Bandera Ecológica and carbon neutral Costa Rica, are developing mechanisms to support small scale farmers in accessing technology that reduce C emission (such as bio-digester) funded by local enterprise that want to compensate C emission.

Finally, at local or specific level, many initiatives are actually been developed by producers or rural organizations which tend to integrate environment issue in agriculture productive process and to participate to CC mitigation. Whereas the dominant traditional actors begins to integrate pro-environment initiatives to maintain market power or developed green image, the traditional small farmers representatives are currently overwhelming by the initiatives developed by the emerging actors representatives which are developing practical initiatives that enables small scale farmers to be better link to environment and CC issue, and to benefit from the raise of consciousness of the society in this issue. This contributes to create or enlarge two gaps. First, we show that a gap is developing between on one side the official agricultural policy agenda and the position of the traditional representative organizations that are poorly including environment and CC, and on the other side, the enterprises and the local organizations, that they are representing, and that are developing eco-friendly initiatives. Second, we evidence another gap between traditional leaders and emerging group's representatives especially regarding position on the environmental agenda, which contribute to the atomization and the reduction of power of the representation of small farmers in the global agricultural agenda.

4- Discussion

In this section, we discuss the results and highlight the explicative factors according to our theoretical background.

4.1. A case of path dependency

The poor integration of environmental and climate change appears as a case of a path dependency. Indeed, whereas environment and CC issue have been integrated the global policy referential of country and in policy referential of some sector (industry, tourism), the agricultural sector have experimented a very limited change in its institutional framework to integrate these issue. Our analysis enables us to identified 4 explicative factors of this path dependency.

4.2. Institutions and interests

In the line with “3 I concept” (Hall, 1997; Surel, 1998), we showed that the limited integration of environmental in agricultural agenda is rooted in institution and interests. Firstly, we show that the separation of the agenda between agriculture and environment is rooted in an institutional reform (here reform of the organization of public administration) which consisted in the creation of MINEREM and further MINAE. This reform of public administration separated the responsibility of the management of rural areas between the MAG in charge of agricultural productive land and the MINAE in charge of forestry and conservation area. Secondly, we show that the interest matters. The interests of the traditional representatives of the agricultural sector of Costa Rica especially *Camaras* and *Corporacions* are to limit constraints to competitiveness. Thus, they adopt a defensive position upon development of environmental agenda, and furthermore limited the integration of environmental and CC concerns inside agriculture agenda. Regarding ideas factors, the conclusion are more balanced as the ideas to integrate environment and climate change in agriculture exists but do not lead to changes. Thus, the concept of “mental model” helps us to go further in the identification of explicative factors of the paradox.

4.3. Mental model

The analysis of mental model of the organizations of agricultural and rural sectors allows highlighting another explicative factor of the Costa Rican paradox. We showed that the poor integration of environment and CC in agricultural agenda derived from the “mental model” of the leading traditional actors of the agricultural sector. On one side, the cognitive framework of the business agriculture representatives is based on the liberal paradigm. On the other side, the cognitive framework of the traditional small and medium farmers’ representatives is based on state supported development paradigm inherited of the situation of the 60s. These differences of “mental model” have led to maintain deep oppositions, antagonisms and polarized debates between these

two groups, which have monopolized their respective energies during the last years, as for example during the strong opposition around the adoption of Free Trade agreement with USA in the 2006-2007. But, for both categories, their “mental models” are still basically productive-oriented and do not integrated environmental perspectives, whereas emerging groups has been developing with a new mental model in which agricultural production and environment are intrinsically linked.

4.4. Balance of power

Finally, the balance of power and dynamics of movement of representation of interest enables to identify a last explicative factor of this path dependency. Although groups of organizations with environmental-oriented “mental model”, exist, the national agricultural agenda is poorly reflecting these orientations. This reflected first the asymmetric balance of power between traditional and emerging categories of actors. As the former have developed more relationship with public institutions and have consolidated coordinated representations such as CNAA, or *Corporation*, the emerging actors consist in multiple groups with different sensibility but without a large coordination unit or emerging coordination structure. Whereas these organizations shared the same social base with the traditional representatives’ organizations of small and medium farmers, any coordination between them has been put effectively in practice. The subsequent atomization of the interest representation of small and medium farmers led to reduce their global influence of this category of producers in global agricultural policy agenda.

Conclusion

The paradox of the low integration of environmental issue and especially CC in the agricultural sector policies appears as a case of path dependency that is rooted in 4 elements: 1) the change of institutional framework in late 80s-early 90s that separated the responsibility of the management of rural areas between the MAG in charge of agricultural productive land and the MINAE in charge of forestry and conservation area, and the adoption in the same period of a global liberal policy referential which led to a dichotomy between agricultural and environmental policy referential; 2) the diversity and conflictive interests among representative actors of the agricultural sector, 3) the limited integration of the environmental issues in the mental model of the leading representatives of agricultural sector; 4) the asymmetry of power between the traditional and emerging organizations, which led to the dominance of actors supporting a market and productive oriented model, with a conflicting environmental performance.

Nevertheless, the panorama is recently changing with the raise of CC issue in the Costa Rican society, the integration of CC in the global policy referential and

the blossoming of initiatives that integrate of environmental or CC issue in agriculture production. However, these initiatives are still limited due to 1) the poor integration in the national leading agricultural leaders mental model of environmental issues, 2) limited access to funds and the lack of conducive institutional environment, and 3) the lack of coordination and connections between the different initiatives. Moreover, divergent visions regarding environment integration in agriculture is contributing to widening the gap between the traditional national representative leader's organisations, and the enterprises and local organizations they represent. Emerging national organizations supporting a more integrated vision of agriculture are then developing but they still have a limited power of incidence on agricultural agenda.

To face this situation and resolve this paradox, we argue for 1) the design of a specific national strategy of CC for agriculture, 2) the systematic integration of CC in specific policy document of agricultural sector, and 3) the construction of an agro-environmental agenda that takes into account the existing initiatives. These two actions can effectively allow the integration of stakeholders from both agricultural and environmental sectors and might contribute to integrate CC issue in the cognitive framework of traditional leaders of agricultural organizations and institutions. Moreover, it may help to create the necessary dialogue between the national representatives and the local organizations, as well as between traditional and emerging representative organizations to consolidate a progressively global agricultural agenda which include environmental and CC issue in agricultural sector.

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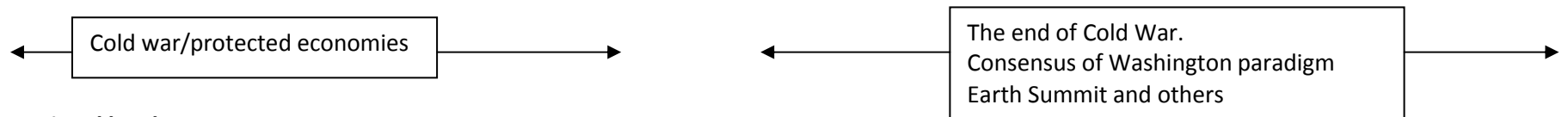
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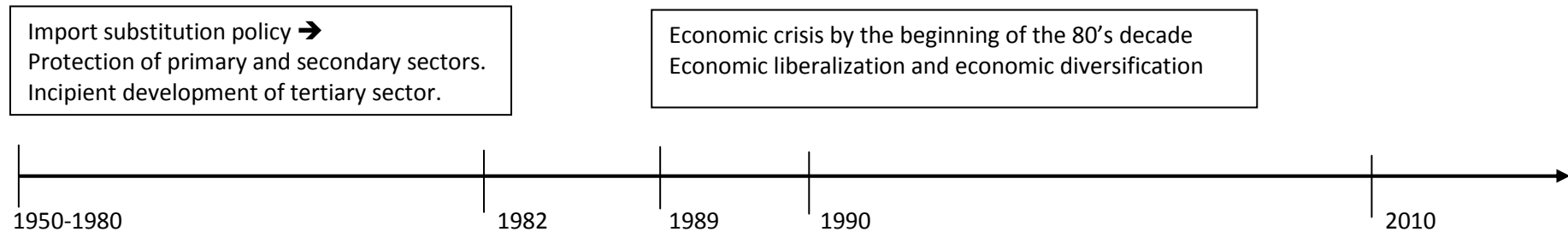
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Fig 1: The referential change for the agricultural and environmental agendas in Costa Rica. Period 1950-2010

International / Regional level:

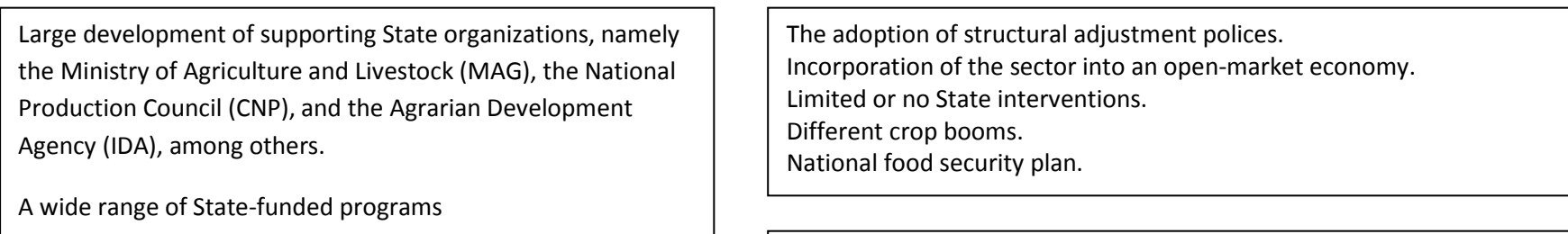


National level:



National sector levels:

Agriculture



Environment

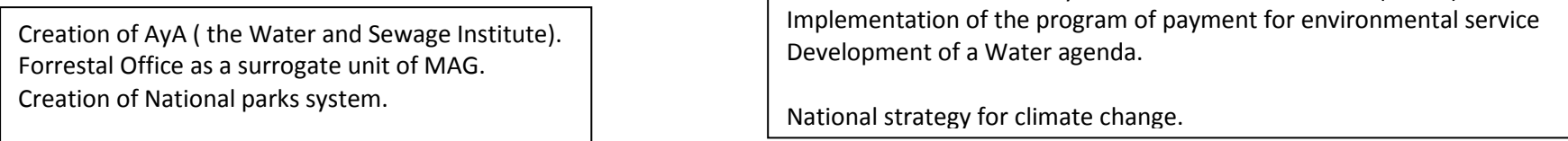


Figure 2: National agendas and programs of agricultural and environmental public institutions in Costa Rica (1995-2010)

Sector	Leading public institutions	Institutional agenda	Programs including CC perspective
Agricultural and animal husbandry sector	MAG, SEPSA, DSEORA	1995-2010 : Negotiation of Free trade agreement (Chili, Canada, USA, China, EU)- with Procomer; Promotion of agro-export and competitiveness (agenda of competitiveness 2007 : National Plan for Food (PNA)*	2004: Agro-environmental technical cooperation agenda (ACT) with MINAE 2005: sustainable agricultural production program (PFAS) 2006: Law on promotion of organic agriculture
Environmental sector	MINAE, SINAC, National Parks and conservation area	conservation sector: 1996: National plan of environmental policy; biodiversity law; 1999: national strategy for conservation of biodiversity, 2001: ECOSOS and the strategy for conservation and sustainable development of the swamp area: 2005: national strategy for environment (ENA)	
	MINAE, FONAFIFO	forestry agenda and climate change (till 2007) International agreement - 1992: earth summit; 1997 Kyoto protocol, etc... National policy and events - 1995: creation of office of co execution of Kyoto protocol (OCIC) - 1996 : 4 th law on forestry / creation of Fonafifo - 1997: obtention of international fund from C compensation	1996 : PES program (integrating mitigation of carbon emission through reforestation and forest conservation) 2002 : development of Certificate for environmental services (CSA) creating a market for C compensation for national enterprises
	MINAE, Water department	water sector : revision of water law 2006 : setting of new tariffs of water user	2007: Integration of water tariffs to maintain forest (Sinac and Fonafifo)
	MINAE, National direction of CC	Climate change (from 2007): 2007 National Strategy for Climate Change (ENCC)	

NB: *: in PNA document, CC is mentioned but in a marginal way

Source: Authors

Fig 3a: Characteristics of main types of actors of agricultural sectors in Costa Rica. 2010 (“Traditional” agricultural actors)

	Types of actors	Representatives organizations (at national level)	types of affiliates	Goals and functions	principal agenda and orientations	Influence on agricultural agenda	relationships with government
Traditional agricultural actors	Business agriculture and agro-industry representation (<i>Camaras</i>)	CNAA, national "chambers" of diverse products (Canapep, milk producers, ...)	medium and large scale agri-business enterprises	- promotion of agro-exportation - representation of interests of agribusiness enterprises	- Negotiation of free trade agreements (pro-free trade), - Negotiation of national regulation framework affecting negatively competitiveness - competitiveness oriented agenda	- High influence on sector - Fair on national agenda	Good : official reference for the government in sector policy building
	Inter-professional representations (<i>corporaciones</i>)	Icafe, Corbana, Laica Corfoga, Conarroz, Corpohorti,	(small and large) producers and processing enterprise + state	- promotion and representation of the specific commodity sector - management and regulation design of the specific sector - research and technical support	- Negotiation of free trade agreement (pro-protection or pro-free trade according to products), - competitiveness oriented agenda	- Fair to High influence on sector and specific products, - fair on national agenda	Good: official sector reference for the government in specific product policy building
	Cooperative movement	Conacoop, Cooperatives of different sectors (Coopedospinos, coocafe,...)	local cooperatives and cooperative members	- defense and promotion of cooperative farmers and local cooperatives, - promotion of cooperativism principles	Negotiation of terms of free trade agreement (pro-protection) - Competiveness oriented and prone to social oriented agenda	Fair, differentiated according to products	Good to fair: According to products
	National small and medium farmers syndical organizations	UPA Nacional, MNC, UNAG, Alianza Campesina,	small and medium farmers and their local organizations	- defense and representation of small and medium farmers interests - policy incidence	- opposition to deregulation and free trade agreements, - promotion of small scale agriculture through better access to land and means of production - pro-poor and food security or sovereignty oriented agenda	- limited to very limited, - sporadic	Bad to fair: conflictive to some sporadic consultation process

Source : authors

Fig 3b: Characteristics of main types of actors of agricultural sectors in Costa Rica. 2010. (“Emerging” actors)

	Types of actors	Representatives organizations (at national level)	types of affiliates	Goals and functions	principal agenda and orientations	influence on agricultural agenda	relationship with government
emerging agricultural and rural actors	Agro-ecologist agriculture representatives	organic agriculture: MAOCO, CEDECO, Agro-forestry : ACICAFOC, JUNAFORCA	organic farmers and their organizations; traditional agro-forestry (indigenous) agriculture	- promotion of agro-ecological agriculture (organic farming, agro forestry system) - representation of interests and supports services to organic and agro-forestry farmers and their local organizations	- development of specific institutional support to organic and agro forestry system	medium influence on very specific thematic	- limited to fair - consulted on specific issue
	Rural development representatives	Agro-tourism: ACTUAR, (small and medium agribusiness,...) CMC, ANAMAR	rural dwellers and/or their community	- Promotion of local economic activities linked with agriculture (rural community tourism, local small processing,...) - Representation of interests and direct supports to local organizations	- development of specific institutional support - pro-poor, small business oriented agenda	- limited to very limited, - fair on specific thematic	- Limited - Consulted on specific issue
	Specific groups representatives	women oriented: CMC, ANAMAR, indigenous: ACICAFOC, MNI	women and indigenous and their local organizations	- Representation specific interests of their groups / policy incidence - supports services to their groups	- recognition of specific rights of their groups - promotion of specific programs dedicated to their groups	- limited to fair influence - fair on thematic	- limited to very limited - Consulted on specific issue
	Conservationists	FECON, Ecoceiba, Aprefloflas,...	rural and urban dwellers, local associations	- Defense of natural species and habitat - Denunciation of environmental problems and policy influence	- negotiation of environmental laws and programs - pro-conservations	very limited	- Very limited -mainly conflictive

Sources: Authors

Figure 4 : Perception and position of agricultural actors on environmental issues

	Actors types	Dominant perception of environmental issue		Position on environmental issue and agenda	importance of environmental in their agenda
Traditional agricultural actors	Business agriculture and agro-industry representation (<i>Camaras</i>)	balanced to negative	Environment as a restriction to competitiveness of agricultural sector	Negative – defensive position	Marginal to very marginal, some recent consideration
	Inter-professional representations (<i>corporaciones</i>)	balanced to negative	Environment as a restriction to competitiveness of agricultural sector	Neutral to negative – mainly defensive position	Marginal, some recent consideration
	Cooperative movement	balanced to positive	Environment as a restriction to competitiveness, or as a additional constraints to producers	Neutral to negative – mainly defensive position	Marginal, some recent consideration
	National small and medium farmers syndical organizations	balanced to positive	Environment as an additional constraints for small scale farmers Environment as a necessity, as a way of life for small scale farmers production model	Negative to positive according to organizations Defensive to proactive in specific theme according organizations	Marginal to very marginal interest
Emerging agricultural and rural actors	Agro-ecologist agriculture representatives	positive	Environment as necessity Environmental as an opportunity to generate economic activities	Positive – proactive position	Central
	Rural development representatives	positive	Environment as a necessity Environmental as an opportunity to generate economic activities	Neutral to positive – proactive position	Central
	Specific groups representatives	positive	Environment as a citizen necessity Environment as part of the traditional value	Positive – proactive position	Marginal to central
	Conservationists	positive	Environment as a citizen necessity	Negative – proactive position	Central

Sources: Authors

Figure 5: initiatives from agricultural actors regarding environmental issue and CC

	Actors types	Initiatives to promote environmental and CC integration in agricultural sector
Traditional agricultural actors	Business agriculture and agro-industry representation (<i>Camaras</i>)	CNAA: creation of a environmental committee to discuss environmental law proposals Initiatives of some agribusiness enterprises in eco-friendly certification and carbon balance studies
	Inter-professional representations (<i>corporaciones</i>)	Icafe: support to reforms of processing units (energy and water use and pollution reduction); Corfoga: pilot project of specific PES for Sylvo-pastoril system and negotiation of institutionalization of PES for Sustainable cattle raising.
	Cooperative movement	Coocafe – forestal coffee foundation: promotion of adoption of eco-friendly label certification promotion, promotion of specific PES mechanism for coffee agro-forestry system (with Icafe); Dos Pinos: promotion of Environmental Friendly Practices for milk suppliers
	National small and medium farmers syndical organizations	MNC: participation to biodiversity law, negotiation of PSA fonafifo UNAG: training on environmental issue,
Emerging agricultural and rural actors	Agro-ecologist agriculture representatives	MAOCO: elaboration of the law to support to organic agriculture and promotion of compensation mechanisms for environmental benefit (RBA) with MAG; CEDECO: compensation mechanism for C sequestration in soil (CambiO2); Junaforca: negotiation PSA modality for tree planting in agro-forestry system; Acicafoc: development of specific compensation for Environmental Services Projects
	Rural development representatives	ACTUAR promotion of a agro-tourism agenda
	Specific groups representatives	MNI and ACICAFOC; negotiation of specific modality for PSA access to indigenous peoples
	Conservationists	Fecon,... : Denunciation of environmental iton Negociation of PES modalities Bandera ecologica, carbon neutral : promotion of technology for C emission reduction toward rural peoples

Source : authors