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## Tackling Environmental Degradation in Costa Rican Rural Areas through Market-based Instruments

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### Introduction

With this article the author would like to thank Harald Fuhr for his active lecturing on Environment, Climate Change, Public Policy and Governance at different postgraduate programs of the University of Costa Rica. The author, himself, has to express his gratitude to Harald Fuhr for his support and supervision through his doctoral studies funded by DAAD at the Chair of International Politics of University of Potsdam in 2009-2012.

In Costa Rican rural areas, environmental pollution caused by export crops has increased in quantity and quality. After mid-20th Century, such pollution was caused mainly by export products (coffee, banana, sugar cane); but in the first decades of 21th Century, it became even worse with the use, sometimes uncontrolled, of agrochemicals. In the last decades, pollution has also increased to alarming levels in urban zones, due to population growth, accelerated urban development and changes in consumption patterns with consequences to rural areas. Traditional and emerging actors of land use sector are pressing for their demands and agendas at a time political transformations are occurring. A set of policies for the agricultural sector and development of rural territories have been designed. However, there is uncertainty if these policies can tackle environmental degradation.

Costa Rican efforts for environmental conservation and preservation of key strategic ecosystems have been recognized in international academic debates, which draw attention to the environmental commitment of political institutions and the overall perception of the state of the environment from Costa Rican society. These aspects are part of the set of factors associated with conservation practices, which emerged or were intensified in the 1980s (see, for example, Evans 1999; Steinberg 2001; Vivanco 2007). However, these publications lack accuracy when it comes to analyzing the causes and the time at which the environmental commitment to conservation was encouraged, since it seems that changes in the relationship of the Costa Rican population with the environment responded to the political vision of each administration.

Scholars and professionals in the field of ecology and with a strong environmental vocation were the agents of change that promoted the creation of envi-

ronmental organizations in civil society, mostly responding to the awareness on the boom of ecotourism and environmental degradation due to agricultural activities from the 60s and 70s (Evans 1999; García 2002; Amador 2002; Chacón 2007). Moreover, it is presumed that many of the declarations of national parks and protected areas in the late 1970s and 1980s constituted ways to avoid social and political conflicts for new land intended for agricultural production.

What is certain is that the creation of a system of conservation areas and, to some extent, the definition of economic incentives for forestry activities in the 1980s (e.g. reforestation and forest management), promoted the recovery of the forest cover during the last three decades. This shows true commitment to the conservation of ecosystems and biodiversity (i.e. MINAE/PNUMA 2002; MINAE 2018).

However, in this same period, the country developed *pathologies* of environmental degradation due to the urban growth, which are also coupled with the increased consumption of agrochemicals in rural areas in the production of crops for export, such as pineapple, banana, melon, and coffee (Amador 2002; García 2002; MINAE 2018). According to data from Phytosanitary Authorities in 2015 Costa Rica used 10,7 kilograms of chemicals per each cultivable hectare. In addition, rural areas have experienced pollution of watersheds, increased volume of effluents and solid waste with no treatment, partially unplanned urban development, an increased ecological footprint and reduced biocapacity.

In this article, it is argued that despite Costa Rican efforts to reverse deforestation and increase conservation, environmental degradation in rural areas has continued to expand as a result of the demands and agendas of the land use groups (traditional and emerging actors) pressing for their interests, as well as state reform and political changes that have occurred in the last decades. All these elements have come together to generate a public sector that attempts to resolve all these demands by simply avoiding action and concrete policies in order to stop environmental degradation in rural areas.

The article is divided in three sections. The first one describes briefly the situation of environmental degradation in rural areas as a result of recent Costa Rican development patterns. The second introduces the aspirations and demands expressed by key stakeholders in relation to the objectives and scope of policies related to rural areas and current difficulties of the state to manage it. The third section analyzes how market-based instruments in the way Harald Fuhr has described them, can contribute in some measure to achieve an aggregative agenda and deal with environmental degradation in these areas.

### **Environmental Degradation in Rural Areas**

Costa Rican rural areas are among the territories with the highest natural diversity on the planet. However, they are also extremely vulnerable: highly irregular to-

pography, high precipitation, tropical temperatures, and the intense seismic activity are natural phenomena that have a significant impact on soils, ecosystems and production systems (Valerio 1999; García/Gálvez 2002; Vargas 2014). Furthermore, a growing population density (in regard to arable land), highly concentrated on rural and semi-urban zones, significant disparities in resource access, and an export economy still based on slightly transformed natural resources (basically, agricultural products and less in timber) cause strong environmental deterioration (Amador 2002; Fernandez 2004; Avendaño 2005).

Studies based on recent satellite images with a high resolution (mainly from the second half of the 2010s) and careful field surveys indicate that the main soil use in Costa Rica is still agricultural on 35 % of the territory (CIA, 2016). If we add 10-15 % of the rural territory covered with human settlements according this source, it can be concluded that almost half of Costa Rica is strongly impacted by human activity and covered with agro-ecosystems with human settlements. In addition, the results of the last agropecuary census conducted in 2014 showed that, despite the reduction of areas dedicated to agriculture and livestock production, in comparison to 1984, still 22 % of Costa Rican territory has a form of agriculture or agropecuary productive activity (excluding subsistence family agriculture) and around 18 % of the continental territory is occupied by farms and agriculture parcels.

The coastline of Costa Rica is the second longest in Central America, after Panama: with 1,466 kilometers, of which 85.5 % is located on the Pacific coast (MINAE/PNUMA 2002). On the Pacific coast, agricultural systems account for 12,629 km<sup>2</sup> of the coastal zone and 78.5 % of the total area (MINAE/PNUMA 2002). The main activities are rice, sugarcane, and cantaloupe production, as well as beef cattle-raising. The resulting soil erosion, and fertilizer and pesticide pollution are very intensive and have had major impacts on the waters in the Gulf of Nicoya, one of the main fishing zones in the country that has also been affected by household and industrial wastewaters from the metropolitan area of San José (MINAE 2018). The entire coast line (with the exception of Corcovado and other protected areas) is affected as well by the impact of the growing industrial tourist infrastructure (Meza 2001; García 2002).

In the Caribbean, agricultural systems also dominate the landscape, though to a lesser extent with 2,115 km<sup>2</sup> which account for 55.9 % of the coastal zone of that coastline, followed by perennial broadleaf forests with 978 km<sup>2</sup> (25.8 %), swamps and waterlogged or swampy forests (with 8,5 and 8,0 %, respectively) (MINAE/PNUMA 2002). The main activities destroying or degrading natural formations on this coast are banana agriculture (with a high impact on the coastal canals of Tortuguero in the north, and coral reefs in the south on the coast of the valleys of Sixaola and La Estrella), illegal tree cutting in the south and household and industrial wastewater pollution (particularly resulting from oil transportation) in Puerto Limón (MINAE 2018). Southern coasts are also affected by the

impact of the growing tourist infrastructure and semi-urban waste production (Valerio1999; García 2002).

Major rivers like Tárcoles in the Pacific basin are greatly polluted by waste water from industries and households from urban areas, most of them concentrated on the Central American Pacific slope. However, small and middle size watersheds, both in the Caribbean and Pacific, but mainly in the Pacific, are polluted by agricultural waste. Underground water is also affected by the infiltration of untreated agrochemicals and household wastewater. This is, for example, the case of the aquifers in urban areas such as San José. In general, there is an alarming rate of contamination and destruction of watersheds and water environments in Costa Rica caused by sewage dumping, the deposit of household waste, and agricultural waste (OPS 2003; Castillo, et al. 2012; Semanario Universidad 2015; MINA 2018).

Likewise, deterioration in the quality of both water and soils in human settlements – a particularly serious problem in the metropolitan area in Costa Rica – has expanded to rural areas (both Pacific and Caribbean) as a result of the growing demand for water consumption, a lack of implementation of adequate policies on waste management, and the use of polluting technologies in transportation and industry. The use of land for agricultural and rural development purposes is mostly concentrated on Costa Rican rural areas in which local governments lack control and have few regulation capabilities for ordinary waste despite it is part of its competences and responsibilities (CGR-CR2016). The situation might be even worse concerning agricultural waste in these municipalities; nevertheless, there is no estimations or research on this topic.

All this shows that the commitment of the population is not enough to ensure that the country has developed actions in rural areas toward sustainability. One factor behind public inaction is the increasing number of aspirations and demands expressed by key stakeholders in relation to the objectives and scope of policies related to rural areas in the last decade.

### **Multi-actor Clashes in Relation to Land Use in Rural Areas**

Before the regional crisis of the 80's, Costa Rica achieved a strong system of higher education in relation to the Latin American region. This was a product of a robust welfare state, and a strong system of free public education. In the 1970s, there was already a public university system based on four institutions (UCR, UNA, UNED, TEC). In the 80's, the country actively accommodated regional educational institutions (CATIE, INCAE, Earth University and University for Peace), which have contributed to the generation of social and political aspirations in relation to land use, most of them balancing agricultural production, environmental conservation, and slowing environmental degradation in rural areas.

Many of their graduates have entered the Costa Rican production sector, as well as civil, international, and other social and interest organizations. To a lesser extent, graduates have become part of the state bureaucracy and public service associated with land use. These have, however, been weakened by the reduction of public resources, due to the economic crisis in the 80's and the labor mobility programs generated by the structural adjustment programs during the 90's.

At this time, several civil organizations dedicated to the environment and conservation were created to defend indigenous people and poor farmers, reappraise the agricultural production and the natural heritage, and protect biodiversity. Many of these organizations were supported by intergovernmental organizations such as UNDP, UNEP, ILO and other branches of the United Nations. Unlike its Central American neighbors, some social movements for the promotion of collective actions aimed at vindicating human rights, while defending the conservation victories, were born in Costa Rica.

In a similar way, productive actors began to come together to form interest and pressure groups on land use policies related to rural areas. The first of these groups were the exporters of large-scale agricultural products, such as pineapple, melon, banana, coffee and to a lesser extent, flowers and decorative plants.

Likewise, there are no precise statistics on the contribution of agricultural exporters to the GDP. However, by 2016 the agricultural, livestock, forestry and fishing exports together represented close to 12 % of the total. Another impact already mentioned was the substantial increase in the use of agrochemicals to maintain exports production and the food supply for Costa Ricans. Compared to other countries in the region, the neo-exporters are not organically organized; some of them belong to small producer chambers, even in the food industry. Elsewhere, this guild has extensive capabilities for advocacy and government lobbying.

Another sector with extensive growth during the 80's and 90's was the tourist industry. This is a diverse industry that sought to capitalize on the collective investment to safeguard large extensions of land for ecosystem conservation. It should be emphasized that the condition of *diversity* of the sector includes sun and beach tourism companies, rural community models, sustainable farm-management models, and boutique hospitality initiatives. Recent estimations suggest that by 2016, tourism represented 5.2 % of Costa Rica's GDP—that is to say, the second income generator. In organizational terms, this is a little structured industry. In fact, small and medium entrepreneurs are gathered into three chambers while the large international chains operate on their own.

A group of urban developers and people working on housing infrastructure emerged during the 80's, in response to credit programs promoted mainly by the public banks to provide housing for the middle and working class. During the 90's, this industry was strengthened, and in the early 21<sup>st</sup> century became one of the most dynamic in the Costa Rican economy. The Great Metropolitan Area, though not exclusively, became the main petitioner of land for building houses

and condominiums. This brought about the transformation of agricultural lands to housing developments. This tendency was known as *from coffee plantation to condominium*. This phenomenon extended to rural areas, in particular around the pacific coast where wealthy families attempted to buy beach houses for weekends and holidays.

The absence of sustained policies in the public administration and regulatory institutions have allowed this industry to profit from the lack of regulatory plans and territory planning tools at the local government level. Even though social research is quite incipient, there are enough elements to state that this industry has a substantial influence over the national political elite, and enough resources to lobby for their interests at various levels of the public administration.

*Table 1: Aspirations and demands expressed by key stakeholders in relation to the objectives and scope of policies related to rural areas (2016-2018)*

Sector	Stakeholder	Aspirations and demands
Monoculture producers and exporters	-National Chamber of Producers and Exporters of pineapple -National Banana Corporation -National Chamber of Coffee Exporters -National Chamber of Palm Producers -National Chamber of Agriculture and Agribusiness	- Rate exchange stability - Updating of NAMAs <sup>1</sup> - Problems with the National Phytosanitary Service - Support to deal with climate extreme conditions - Actions to confront rising transportation costs - Joining efforts to create origin seals - Actions to deal with variations in the international market and increase competitiveness
Small and medium agriculture producers	-Union of Small and Medium Farmers -National Council of Cooperatives -Union of Independent Producers	- Import of staples is suspended - Promotion of farmers markets - Training in production technologies - Incentives for sustainable cattle managing - Reducing water springs protection area - Access to credit and soft loans - Funds for agricultural development

<sup>1</sup> *Nationally appropriate mitigation actions*

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Sector	Stakeholder	Aspirations and demands
Forest industry and forest owners	Costa Rican Forest Chamber	<ul style="list-style-type: none"> <li>- Cope with wood deficit</li> <li>- Promote genetic improvement and supply of forest seeds</li> <li>- PES scheme review</li> </ul>
Environmental movement	<ul style="list-style-type: none"> <li>- Costa Rican Federation for Environment Conservation</li> <li>- Friends of the Earth - Costa Rica</li> <li>- Wild Flora y Fauna Preserving Association</li> </ul>	<ul style="list-style-type: none"> <li>- Limitation and/or ban of GM products</li> <li>- Consolidation of SINAC</li> <li>- Funds for surveillance in conservation areas</li> <li>- Opening pits for extracting sand and/or gravel is suspended</li> <li>- Promote organic production and sustainable farms</li> <li>- Replace the massive use of agrochemicals</li> <li>- Stop the expansion of monoculture areas</li> </ul>
Tourism and hospitality	<ul style="list-style-type: none"> <li>- Tourism National Chamber</li> <li>- Costa Rican Hospitality Chamber</li> <li>- Ecotourism and Sustainable Tourism National Chamber</li> </ul>	<ul style="list-style-type: none"> <li>- Define a country-attraction strategy based on the ecological component</li> <li>- Consolidation of SINAC</li> <li>- Building new airports</li> <li>- Creation of parking areas on beaches and conservation areas</li> <li>- Exchange rate stability</li> </ul>
Urban developers	<ul style="list-style-type: none"> <li>- Costa Rican Chamber of Construction</li> <li>- Federated College of Engineers and Architects</li> </ul>	<ul style="list-style-type: none"> <li>- Reduction of red tape</li> <li>- Reduction of time required by SETENA</li> <li>- Efficiency of municipal procedures</li> <li>- Scope of environmental impact assessments</li> <li>- Characteristics and restrictions of regulatory plans</li> <li>- Extension of the Great Metropolitan Area Ring</li> </ul>

Source: Database of 42 news articles digitally registered for this purpose.

Similarly, other sectors and stakeholders – like importers of goods, private and public credit companies, the food industry and the private transportation industry– have indirectly influenced the actions and policies associated with land use in rural areas. Additionally, traditional sectors that in other countries in Central America have a strong capacity to influence public institutions related to land

use, are not that highly powerful in Costa Rica. Among them, forestry companies, meat producers and private energy producers.

These changes have allowed the emergence of diverse aspirations and demands of stakeholders in relation to the objectives and scope of actions and policies associated to land use in rural areas (Table 1). Also, synergies among stakeholders of Costa Rican development and the role of land use in such development have evolved. At the same time, clashes are more frequent and serious, and the margin of action and containment of the State and its institutions is increasingly low. As a result, the Constitutional Court and Small Claims Courts are more frequently used to resolve disagreements that historically were settled by other political powers, especially the Executive. For example, during 2014-2016 the Constitutional Court resolved around 32 cases related to land use conflicts between communities, tourist companies and urban developers.

### **The Relevance of Market Instruments**

Harald Fuhr argues that during the last decade Costa Rica has experienced an outburst of initiatives of different natures (legal, political, institutional, and programmatic) regarding the environment and sustainable development, which place it among the group of leading countries worldwide. However, there is still much to be done. Fuhr makes his case for the relevance and potentialities of market instruments to deal in part with the problems detailed in the last sections (Fuhr et al. 2007; Fuhr et al. 2018). The following comments in specific for Costa Rica originate from a set of conferences held by Harald Fuhr between 2007 and 2017 (see Reference section).

According to Fuhr, during the last decade, several important economic instruments have been developed with the purpose of influencing the activities, practices, and strategies performed by companies and organizations which use natural resources directly or whose activities have a significant impact on the environment. These market instruments were first discussed from the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 to complement the initiatives of government commitments, which would not guarantee by themselves the reduction of the accelerated environmental degradation taking place on the planet. Therefore, by the mid-1990s commercial certification programs and payment for environmental services were first promoted.

First, Harald Fuhr claims that commercial certification models allow companies, organizations and institutions to show that their productive practices go hand in hand with the environment or at least, have a minimum impact over it. In general, commercial certification consists of a series of standards which the certifiable agency has been following or commits to follow, a number of field trips to determine the level of compliance with the aforementioned standards,

the issuance of a certificate of conformance, and lastly, different monitoring visits. The certificate guarantees that the company will commit to the previously established environmental standards and provides relevant information to its customers.

In this sense, Fuhr believes that commercial certificates can provide the companies and organizations with different types of advantages. In economic terms, the certificate can be seen as a marketing tool because by using the approval seals (ecolabels), the company can guarantee the consumer that the manufacturing of its products or its services respond to good environmental practices. In social terms, the certificate can be used as a communication or public relations instrument to inform society about environmental values and ethical principles related to the company's respect for nature and environmental preservation.

For Fuhr, Costa Rica must continue promoting this kind of certification making connection with the main drivers of pollution and environmental degradation in rural areas. For example, Costa Rica can take new advantages from the field of forestry certification complementing the efforts made in the PES programs. In addition, Fuhr thinks that the country must continue to encourage a reasonable amount of organic agriculture and certify traditional agriculture. For the first, the purpose of the organic certification programs is to give a certifying organization or agency, usually accredited by state agencies or international certifiers, the possibility of communicating through a certificate that the production, processing, and marketing of a product identified as *organic*, have been carried out under adequate standards. For certifying *traditional* agriculture, Fuhr points out that at least there can be developed standards which respond to different criteria such as sustainable use of natural resources, respect for the human dignity of farmers, and an efficient agricultural production. Ecologically speaking, both schemes of certification can cause that agriculture assumes there is respect for natural equilibrium. Therefore, it can promote the elimination of synthetic agrochemicals, the protection of renewable resources, reduction of the use of non-renewable resources, etc.

Second, during the last years, tourism has constituted one of the industries with the greatest development in Costa Rica. Fuhr recognizes that *Eco-tourism* has attracted foreign investment to Costa Rica and has become one of its strongest foreign currency generators. However, the sole desire to bring in more revenue also brings an inadequate management of natural areas, reflected in the pollution generated by the tourism industry, the uncontrolled disturbance of wildlife, and the overuse of natural landscapes. In this sense, Fuhr emphasizes that laws and regulations in this sector are usually disrespected either due to cultural patterns, the lack of control mechanisms surrounding this activity, and the lack of attention from pertinent authorities.

A recent, worldwide alternative to these regulations is the sustainable tourism certification, which seeks to reward tourism operators which truly implement the principles of sustainable development and encourage continuous improve-

ment. According to Fuhr the program of Sustainable Tourism Certification, which has been implemented in Costa Rica, must be improved in order to make known to tourists what they are paying for. Nevertheless, national authority must enforce laws and regulations, which is not cheap due to the size of the Costa Rican tourist industry.

Finally, Fuhr recognizes that the characteristic of the Payment for Environmental Services (PES) programs in Costa Rica is that they impact different environmental agendas. However, they specialize in a type of service linked to a natural resource in particular. For the last decades, the emphasis was on watershed management or water sources and multiple uses of biodiversity. Relatively few programs have been developed to establish carbon sinks and exploit scenic beauty; however, as multilateral environmental agreements such as the Paris Agreement gain more importance, everything related to carbon would become more and more important. In general, Fuhr points out the relevance of promoting policies and lines of action for Costa Rica, with the common strategies of the agricultural, energy and forestry sectors and regarding subjects related to reduction of emissions and climatic change.

In this sense, the cross-sectional nature of the subjects must be discussed. For Fuhr, it is clear that the concept proposed is that of an aggregate agenda, where agricultural issues are added to environmental ones, but an effort has been made to identify areas where there are common concerns, in order to try to find solutions of the same nature, even thinking about the need to incorporate other sectors of the local dialogue (trade, production, energy). Competitiveness must be part of this equation as well. According to Fuhr this approach can help to partly solve the problems described in sections above.

The current government (2014-2018) has designed a set of policies for the agricultural sector and development of rural territories. These policies are developed under two strategic sectorial objectives aimed at achieving the development of local economies and their connection to the national economy: i) creation and strengthening of associative organizations, and ii) development and execution of value-added productive projects that enable improvement of the organized groups socioeconomic conditions (SEPSA/MAG 2015). Strong synergies with the adaptation and mitigation of agriculture to climate change, mainly by promoting good agricultural and business practices and climate-smart technology in agricultural production systems, are also boosted. However, there is a lack of concrete actions to reduce agriculture waste and the promotion of sustainable agriculture systems.

The carbon-neutral program came about through a government initiative to create a national strategy for climate change. This Program known as PPCN 2.0 (Programa País de Carbono Neutralidad 2.0) will seek to establish an eco-competitive, low-emissions model with zero impacts on the climate. However, this program involves other sectors in addition to land-use, especially the energy sector. This program seeks to take advantage of the production of clean energies,

payments for environmental services (PES), and ecosystem conservation. Yet it also covers few specific actions for agricultural, forestry and protected areas.

Nevertheless, to comply with these policies, following Fuhr's thought it will be crucial to define a joint strategy between the public-private sectors in the next years. This way, the promotion of green businesses and PES for environmentally friendly products will become a priority. This means establishing alliances with the national banking system to strengthen the carbon-neutral program, mainly to allow certification of productive activities that mitigate greenhouse gas emissions. Reduction of agriculture waste and agrochemicals dependency may play a role in these activities as well; however, these variables still need to be clarified.

### Conclusion

During the 1986-2016 period, Costa Rica experienced an accelerated series of transformations that impacted the political and economic areas and the public administration. In parallel, these changes in combination with other external factors have a great influence on land use in rural areas, which have undergone a series of reorganizations to adapt to the new society requirements.

In the agricultural and agro-industrial production sub-sectors, the legislation is contradictory, inconsistent, and unlikely to materialize in effective long-term public policies. In consequence, neither productive activities publicly regulated with potential for wealth generation are promoted nor are illegal productive activities controlled (i.e. illegal logging, overuse of agrochemicals, productive lands used as waste landfills).

The state as it developed in Costa Rica aims at inclusively addressing the demands and aspirations previously mentioned (see section 3). This principle of inclusivity and participation has generated, at the same time, a public service with strong nuances of *clientelism* regarding rural development and land use policies. This is accompanied by the weaknesses of the political system and political parties. The demands of some actors have been addressed expeditiously, while those of others have not. Actors who demand concrete actions leading to the reduction of environmental degradation and agriculture waste form part of the latter.

Besides, as highlighted in the third section, those changes and reorganizations resulted in the reconstitution of stakeholders and lobbyists traditionally interested in land use. At the same time, new stakeholders and lobbyists, with their own agendas, have emerged, with the consequence that the new demands have sometimes given way to synergies, while others, to confrontations.

In summary, the study's timeframe has gone through a redefinition of characteristics, scopes and margins of the Costa Rican state. Due to the confluence and permanence of aspirations particular to early socioeconomic development stages, Costa Rica has established a state with limited human and financial resources. This does not bode well, since a strong vocation towards participatory organiza-

tion for the settling of policies related to the use of land is required. In this context, Harald Fuhr's recommendations to strengthen market instruments in combination with adapting public governance can constitute a *way out* of the complex situation.

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