

AGRO-ENVIRONMENTAL AGENDA, CLIMATE CHANGE AND CARBON NEUTRALITY IN THE AGRICULTURE SECTOR OF COSTA RICA. NOVEMBER 2011.

Introduction

According to data from the IPCC contained in the State of the Nation Report (2010), between 2020 and 2080, Latin America will experience sharp increases in temperature, with increases in temperature during the dry season expected to be between 0.4 and 61° C. Additionally, the report indicates that in the case of Costa Rica, predictions reveal that rainfall between 2071 and 2100 will be reduced by 50% in the Northern Pacific Region.

In terms of food security, Montenegro¹ reminds us that countries located in the tropics share the feature of having the majority of their food crop production taking place in the upper limit of the optimal temperature for production. This means that minor increases in the average temperature will result in marked decreases in crop yields. Additionally, the presence of pests and diseases, the threat of biodiversity and changes in bio-physical conditions (variations in the temperature of the atmosphere humidity, rainfall, wind and atmospheric pressure) at different altitudinal levels, are also consequences of the global changes that have been affecting climate (MAG; 2011).

Given the overview of Climate Change that has been analyzed by the international scientific community, and bearing in mind that the country is increasingly vulnerable to hydro-meteorological events, Costa Rica has taken the decision to give a commitment to the local community to combat climate change by signing agreements and protocols, formulating policies and strategies and implementing concrete actions with respect to mitigation and adaptation.

COSTA RICA: A country moving towards a Green Economy.

It is important to highlight the bold step of this small country with respect to the environment, an initiative that began at the end of the seventies with a reversal of the deforestation process, the decision to protect 25% of the national territory and to consider biodiversity as a universal public good.

During the period 2006-2010, during the administration of Arias Sanchez, the program Peace with Nature Initiative PNI, (Iniciative de Paz con la Naturaleza, (IPN) was created, the objective of which was to establish a long term state policy for environmental sustainability. This was followed by the National Climate Change Strategy (ENCC) comprising 5 axes, two straight axes - adaptation and mitigation – and three cross-cutting axes - measurement, capacity development and public awareness and education.

It was within the mitigation axis of the ENCC that the objective of becoming a country free of carbon emissions by 2021, year of the Bicentenary of Independence, was envisioned. The country goal is presented in the Second National Communication (*Segunda Comunicación Nacional*) along with other achievements, such as the increase in forest cover and the expansion of Payment

¹ Montenegro, J. Agriculture and Climate Change. Unpublished, July, 2011.

for Environmental Services (PSA), to include a total of 600,000 hectares (State of the Nation; 2010). This is outlined in the World Convention on Climate Change drafted in Copenhagen, Denmark in 2010. This is a long-term effort, extending beyond 2021, to orient the economy towards “carbon neutrality”, for which the effects of greenhouse gases will have to be mitigated.

The National Inventory of Greenhouse Gases (GHG) prepared in 2005 (IMN; 2009) determined that of the total amount of emissions within the country, agricultural activity contributes 37%. The main gases contribution CO₂-equivalent emissions are Nitric Oxide (N₂O) with 54% contribution and methane (CH₄) with 46% (State of the Nation; 2011), the sources of emission resulting primarily from livestock farming and nitrogen-based fertilization of coffee and pastures.

The United Nations Food and Agriculture Organization (FAO) stated clearly: the agriculture of developing countries must undergo significant transformation in order to respond to the challenges that are linking it to food security and climate change (FAO; 2010). This is the challenge facing the country, not only in terms of its geographical position, level of vulnerability and exposure to climate threats, but because the country has set an ambitious country goal, for which, according to the latest State of the Nation Report, an investment of 7,700 million dollars (80% GDP) will be required to implement the mitigation measures that will be necessary between 2010 and 2030.

State Policy for the Agricultural Sector and Rural Development in Costa Rica 2010-2021.²

In harmony and alignment with the goal of the country to be carbon neutral by 2021, as well as with regional policies and strategies, and convinced that the agricultural sector should contribute to reducing the impacts of Climate Change and reinforce environmental management under the principle of shared responsibility between the government and the Costa Rican society, the Ministry of Agriculture and Livestock (MAG) formulated the State Policy for the Agricultural Sector and Rural Development in Costa Rica 2010-2021, based on a process of consultation and consensus with stakeholders in the agri-food³ sector and the Costa Rican rural environment.

Given the certainty that variability and climate change will increasingly affect productivity, diversity, as well as the quality of primary agricultural production, its transformation and commercialization, the common objective of the Policy is, in this case, to raise the living conditions of the populations tied to the agri-food sector, in a globalized economy, so that they can consolidate inclusive, sustainable and modern development by improving competitiveness, innovation and technological development, management for balanced development of the rural

² Formulated and adapted based on Executive Secretariat for Sectoral Agricultural Planning. ***State Policy for the Agricultural Sector and Rural Development in Costa Rica 2010-2021***, San Jose, 2011, Ministry of Agriculture and Livestock Farming (MAG). ***Plan of Action for Climate Change and Agri-Environmental Management 2011-2014***, San Jose, June 2011.

³ For the purposes of the policy, the agri-food sector covers activities which include; primary production, processing and commercialization processes which add value to agricultural, fishery, aquacultural and livestock products, as well as other products from the sea that are food and non-food products, in addition to production and trade in inputs, goods, and services related to these activities.

territories and of the measures aimed at adaptation and mitigation of climate change and environmental management that is supported by an efficient and effective collaboration between the public and private institutional framework, incorporates factors related to climate change and agro-environmental management.

The Policy is structured as four integrated and inter-related pillars: i) competitiveness; ii) innovation and development; iii) management of rural territories and family agriculture, iv) climate change and environmental management. The two cross-cutting axes of the policy are: Management and Institutional Alignment. Within the fourth pillar, *climate change and agricultural management*, there are four strategic areas defined as follows: variability and climate change, agro-biodiversity, clean production and sustainable management of lands and other natural resources.

The 2011-2014 Plan of Action for Climate Change and Environmental Management was drawn up based on the need to make the sectoral policy operative, and the demands of the sector for a pathway towards reducing vulnerability to climatic events and to strengthening the resilience of producers and the productive infrastructure.

In keeping with the Policy, the plan of action, in its component *Mitigation of the Effects of Climate Change*, under the strategic area *Variability and Climate Change*, proposes to reduce the emission of greenhouse gases (GHG) to a level that ensures that the agricultural sector can contribute effectively to achieving the country objective. The other components of this strategic area are: Integrated Risk Management, Adaptation to the Effects of Climate Change; Knowledge Management and Strengthening of Capacities for Climate Change and, finally, Compensation for Sustainable Production as a Mitigation Strategy and Adaptation to Climate Change.

Undoubtedly, all the components listed above are necessary in order to achieve the objective outlined in the fourth pillar "Climate Change and Environmental Management", which is aimed at promoting the inter-sectoral efforts to mitigate, adapt to climate change and reduce the risks associated with extreme climatic and meteorological phenomena. This is considered to be a global phenomenon that will affect Costa Rican agriculture as a whole, as well as other economic activities taking place in the rural areas.

Among the instruments chosen to achieve the objectives are the following: regional and local integrated risk management plans; design and execution of a programme for agricultural land use planning; development of sectoral and intersectoral programs that are in keeping with the National Climate Change Strategy; consolidation of an integrated system of phytosanitary and zoosanitary prevention, formulation of a national agricultural plan for climate change mitigation, implementation of a program for generation and use of information and strengthening of capacities for the processes of prevention, mitigation and adaptation to climate change and variability, as well as creation of a programme of compensation for sustainable production as a strategy for mitigation and adaptation to climate change, based on the promotion of sustainable production initiatives with an eco-systemic focus (soil and other resources).

In order to achieve competitive, sustainable, balanced and inclusive agriculture, one that will drive agro-environmental management and withstand variability and climate change, the sector is faced with three challenges considered as elements to be overcome via the Policy: i) Achieve sustainability in the productive processes, ii) Adapt the productive processes to the new conditions caused by variability and climate change and iii) Mitigate climate change by adjusting production practices to reduce greenhouse gas emissions and the carbon footprint of each item, promote activities that counteract the emission of these gases and prevent contamination by developing clean production processes.

Likewise, in order to promote transformation with respect to Climate Change and environmental management, the context offers opportunities for the sector. Firstly, it offers agricultural development that is in harmony with the environment, which allows products that are differentiated and priced higher to be placed in local and international markets, development of eco-tourism activities and advantage through payment for environmental services. In the second instance, it is expected that in the near future, the markets will make demands with respect to the generation of carbon in the productive processes, and that consumers are going to prefer those products with the lowest carbon content. This means that productive activities will need to reduce emissions per unit of product in order to remain in international markets.

Progress towards compliance with the agro-environmental agenda and carbon neutrality.

As a country, achieving carbon neutrality presents complex challenges: to provide a budget for formulating policies, plans and strategies; attracting external funding; a change in the planning culture (goal: carbon neutrality): planning and defining investment in development while taking climate change and risk management into account; coordination and integration with institutional policies and with the skills of multiple institutions; large investments, both in the public and the private sector; as well as a cultural change in order to understand that the topic of climate change and the country objective require a shared responsibility (from the producer/consumer), the public/private sector, central government/local government, the State/society, as well as the persons offering/demanding services, etc.).

As far as the agricultural sector is concerned, there are already significant efforts from various sectors that have taken the decision to begin to contribute to solving the problem. For some, carbon neutrality has begun to be attractive given the demand for goods and services that are carbon neutral and environmentally friendly. Two cases that may be highlighted are the Tropical Agricultural Research and Higher Education Center (CATIE), an academic and scientific institution that has developed a forest grazing program to reduce emissions from livestock farming; Dole, which has implemented an integrated program for its export activities and farming operations to reduce emissions, optimizing the use of fertilizers and reducing the use of refrigerants. These are two experiments which can now provide knowledge and practice in how to transform two agro-productive sectors with respect to the challenges posed by variability and climate change in the face of the unavoidable responsibility to maintain food security. Additionally, LAICA (Liga Agrícola

Industrial de la Caña de Azúcar), CORBANA (Cooperación Bananera Nacional), ICFE (Instituto del Café de Costa Rica), have developed programs jointly with the Ministry of Agriculture and the INTA for measurement and reduction of gases.

The efforts to achieve carbon neutrality and mitigate the impact of climate change are complemented by those which since the 1980s, have driven the agricultural sector to align its environmental policies with agri-food and agro-environmental policies. Of particular relevance is the Programme for the Promotion of Sustainable Production and the promotion of organic production, with their innovative activities aimed at maximizing efficiency in agriculture production systems, conserving environmental conditions and their efforts to reduce dependence of production systems on sources of greenhouse gas emissions (GHG).⁴

The livestock sector (meat and milk) and the coffee sector, have been two of the sectors that have made the most effort and have received the greatest support from the programme for the promotion of productive agricultural production via initiatives such as the incorporation of environmental improvements in the coffee micro-plant; treatment of coffee syrups: strengthening of sustainable production on livestock farms or implementation of agro-productive systems on livestock farms. Today, the agricultural sector and the country can say that significant experience has been invested in new opportunities that the market has generated as a mechanism for dealing with the demands linked to climate change. In this regard, the country has been able to develop methodologies and techniques that can be utilized today with economic rationality for providing incentives towards mitigation of GMG and adaptation to climate change.⁵

In order to determine the technical response that different agricultural sectors are developing to deal with the challenges that agriculture and food security are presenting in a context of variability and climate change, the Ministry of Agriculture and Livestock Farming (MAG) has documented three experiments, as an analytical exercise, that can serve as inputs into other productive sectors, and which illustrate the progress being made in the agricultural policy by different productive sectors and stakeholders.

In addition to being based on three different sectors (pineapple, sugarcane and rice) the cases represent different forms of economic organization grouped according to whether they are producing, processing or trading (private companies; cooperatives; transnationals, and a variety of other structures); diversity of alliances as well as the factors that motivated them to modify their form and model of production and the technologies and strategies that they have been using. The importance of this diversity responds not only to the fact that the climate change is forcing everyone within the sector to change, but also to the fact that regardless of the sector, there is a political commitment from the sector itself to move beyond that unsustainable

⁴ Executive Secretariat for Sectoral Agricultural Planning. ***State Policy for the Agricultural Sector and Rural Development in Costa Rica 2010-2021***, San Jose, 2011.

⁵ Idem.

production model that tended to have a negative impact on the environment, health and the security of the communities.

The first case is COOPEDOTA R.L., a coffee producers cooperative which this year obtained international certification for carbon-neutral coffee, the first in the world to obtain this certification. The second case is that of Grupo Pelon, the agro-industrial rice company, which also obtained certification as being carbon neutral. Finally, the National Platform for Responsible Pine Production and Trading in Costa Rica is a process that brought together many stakeholders and sectors and whose objective is to use, as a mechanism for dialogue, a platform for instituting the productive model for pine in areas where it will be socially, economically and environmentally sustainable for those involved in the production and marketing chain.

The first Carbon Neutral coffee in the world: the case of COOPEDOTA LTD.⁶

On March 14, 2011, the coffee growers cooperative of Dota, Coopedota Ltd., announced that it had achieved carbon neutral certification for its coffee, making it the first carbon neutral coffee in the world, with the support of COOPEDOTA Ltd.

Founded in 1960 by 96 producers, the coffee growers cooperative of Dota (COOPEDOTA Ltd.) today brings together 800 coffee growers in the Los Santos area and produces one of the highest export-quality coffees, with the U.S., Germany and Japan being its main export markets. On average, production has been as high as 500,000 pounds per year.

In keeping with their country goal of being carbon neutral by 2021, COOPEDOTA decided to commit to obtaining its certification from the highest authority, Carbon Clear, by using the most credible carbon neutral standard in the world, the *PAS 2060 of the British Standards Institution*, the only international standard that certifies products as carbon neutral and which is committed to reducing emissions.

Environmental management

Located in the Los Santos zone, where 80% of the land is within the category of forestry reserve, Coopedota R.L. decided in 1998 to commit to reducing the impact of coffee-growing activities on the environment with different energy-efficiency activities such as eliminating the disposal of wastewater into bodies of water by using all the water from the coffee-producing process as fertilizer for fodder in the dairy pastures; reducing the water footprint by more than 80%, collecting 90% of total residue through a community recycling programme in agreement with the local government and using residual biomass as fuel for drying coffee.

⁶ With the cooperation of COOPEDOTA, LTD.

Coffee is the crop in the country that is most vulnerable to climate changes, to which the farms are neither resistant nor resilient, which directly affects production security, increases the incidence of pests and diseases resulting from excessive rainfall such as the coffee berry borer, rooster's eye and "roya". In 2010, roya affected the coffee-production sector, generating losses of 108,000 bushels of pergamino coffee during the passage of Hurricane Thomas. Water deficiency also caused alterations in the flowering and maturation patterns.

Within the local context, COOPEDOTA is the socio-economic engine of the region; nevertheless, it faces the challenge of continuing to produce coffee under different climatic conditions. In order to achieve production, it has taken adaptation and mitigation actions by promoting *climate smart agriculture*⁷ on its farms in order to increase resilience, reduce vulnerability and greenhouse gas emissions. COOPEDOTA decided to commit to being a part of the solution to climate changes, given that the sector represents 10% of GHG, according to 2005 data.

The road towards carbon neutrality

The five-step route implies: analysis of the initial state, assessment of the carbon footprint, identification of the risks and opportunities, and defining the communication strategy. For the purposes of certification, the carbon footprint of the 2010-2011 crop was certified.

The sources of greenhouse gas emissions were identified for the entire life cycle of the coffee in order to assess the tonnages of CO₂ generated over a given period of time. The scope of the measurement implies assessment of the emissions from the farm (application of nitrogen-rich fertilizers); the benefits (consumption of thermal energy for processing); transportation of the product to the port in the case of coffee for export; and in the case of roasted coffee, the processes that require energy consumption in the roasting machine; transportation with respect to local and consumer distribution to the point of sale, and finally preparation and disposal of the residue by the end user. In total, 20,000 bushels of gold standard coffee were certified for export and 500 bushels for local consumption. The export coffee measured 1,800 tCO₂e and the local grande coffee, 69 tCO₂e.

In conjunction with Carbon Clear, COOPEDOTA developed a strategy for mitigation and adaptation actions in order to comply with the annual commitment to reduce emissions based on the following:

⁷Climatically intelligent agriculture is agriculture that increases, in a sustainable manner, productivity, resilience, (adaptation), reduces/eliminates GHG (mitigation) and strengthens the achievement of national goals for development and food security. In: www.fao.org/docrep/013/i1881s/i1881s00.pdf

1. **Educate producers to use fertilizers more efficiently on farms:** In terms of sources of emissions, 90% of the sources were generated through the application of nitrogen-rich fertilizers.
2. **Develop 180 plots to evaluate the use of the most efficient fertilization techniques.** Given that they are the main source of emissions, the experimental plots will be established with the understanding that the producer is able to reduce emissions and operating costs on the farm.
3. **Change the packaging of the coffee so that it is 100% bio-degradable.**
4. **Involve the coffee buyers.** Carbon neutrality is an opportunity to support the coffee grower with respect to the transfer of technology, funding and capacity-building so that the production from the farms are more secure and resistant to climatic events.
5. **Energy efficiency:** Currently, 8.5 Kwh of energy is used to produce 1 bushel of gold-standard coffee, which is 5 points less than the national average (13.5 Kwh per bushel processed). Several decisions were taken in order to attain these levels. With respect to wood consumption as fuel, 95% of wood was substituted primarily by husks and dried coffee trash; the drying process was automated and energy efficiency was increased by 90%. Specifically with regard to energy consumption at the factory, studies were carried out on loads and consumption distribution; micro-plants were set up for small loads of coffee and an energy-management programme was developed.

As a final step, 1,900 tonnes of residual CO₂e were compensated with voluntary carbon credits from Brazil and India, given that in Costa Rica there are no internationally certified projects, which represents a great opportunity to implement projects that will provide credits to the country.

Carbon neutrality: an irreversible and forward-thinking decision.

The COOPEDOTA innovation cannot be stopped. Currently, the focus is on two different research projects for the production of bio-ethanol and energy co-generation. The first case consists of fermentation of waste water from the factories to produce 2000 litres/day of bio-ethanol fuel. The second case involved gassing the husk and pulp of the coffee to produce 50 Kw/hour. Evidently, these are additional efforts implemented by the local agricultural sector to mitigate the impact of climate change and they are tied to Costa Rica's achievement of carbon neutral status by 2021.

Although carbon neutrality poses major challenges for the cooperative, the topic is considered as an opportunity to use resources efficiently, innovate sustainable processes towards a green economy within the concept of a climatically intelligent agriculture.

In terms of challenges, risk management as a result of weather-related events continues to be a major concern. The coffee farmer, despite the resistance that he might encounter, must continue to adapt his productive way of life to make it less vulnerable and more resilient to different climatic events. The amount of coffee and its quality in the medium and long term continues to be a matter to be resolved.

Coffee is a sector that supports many persons within the country, providing environmental, social and economic benefits to the production zones. For COOPEDOTA, the future lies in the development of climatically intelligent forms: efficient use of fertilizers; varieties and plants that are more resistant to extreme rainfall changes; water shortage and temperatures; shade management; non-use of herbicides or excessive use of agro-chemical and finally, soil management.

In terms of the lessons learned, COOPEDOTA considers that the coffee sector is creating a national transformation via its mitigation and adaptation plan. Were it not for this plan, few farms throughout the country could continue to produce coffee under the present conditions of variability and climate change. Costa Rica has the opportunity to develop a green economy with the agricultural sector, and carbon neutrality can be the first of many other necessary steps.

The Pelon Group (Grupo Pelon): first agro-industrial company in the country to achieve Carbon Neutral Certification.⁸

Located in the province of Guanacaste, in the northern part of the country, in the Tempisque river basin, the Pelon Group is a private Costa Rican family-owned enterprise founded in 1948. With 700 employees, it is one of the most developed agro-industries in the local rice and agri-food sector, and the first to achieve carbon-neutral certification, awarded by the Carbon Neutral Unit at Earth University (Agriculture School for the Humid Tropical Region).

Although rice is its main productive activity, there are also other areas of production such as fish farming, pig rearing as well as production of spices and foods. As a conglomerate of several companies, the Pelon Group is involved in agricultural, industrial and commercial activities. The agricultural industry, under the trade name *Pelon de la Bajura*, is involved in rice production. Of a total of 3500 hectares, 3500 are devoted to rice production. By sowing at three different periods of the year, a total of 8,000 hectares of paddy rice is obtained annually. The *Compañía Arrocera Industrial* is the industrial division for the processing of rice. Because it is the largest in the country, it produces 80,000 metric tons of rice annually, equivalent to 25% of local production. Finally, Tio Pelon trades in rice and other products through a third company, *Distribuidora de Alimentos y Logística DISAL*.

The environment: an institutionalized commitment.

Aware that the current climatic conditions and their impact on the livelihoods and populations are a result of the damage that human beings have done to the planet, the senior executives of the Pelon Group took the decision to modify their objectives, to begin to implement policies to improve the sustainable development plans that are most environmentally-friendly, and which are likely to mitigate the impact of climate change. Given that this is a sector that has been repeatedly impacted both by excessive rainfall and by lack of rainfall, one of the lessons learned by the Pelon

⁸ With the collaboration of Luis Delgado Lobo, Project and Processing Engineer. Compañía Arrocera Industrial. S.A.

Group in this process is that environmental commitment must filter down from the highest levels of the organization.

As one of the main actions, the company outlines its environmental policy as follows: *“To produce, process and trade food products with a commitment to reducing the impact on the environment of our products, through innovation, efficiency in the use of resources and the environmental culture of our collaborators.”* Currently, the company is carrying out its environmental mission through electricity generation from biomass, electricity generation from biogas and through Carbon Neutral Certification.

Under the theme ***“Do not leave for 2021 what you can do today”***⁹ in reference to the country’s goal of being Carbon Neutral by 2021, the Pelon Group has invited the entire country to make a small contribution, as they themselves have done in achieving carbon neutral status, in order to preserve the environment, achieve the country goal and create a better world.

As required by any process aimed at achieving carbon neutrality, measurement of emissions was done in four large areas: agriculture, machinery, processing and distribution. The first assessment was done in 2009 and a total of 36,763 Ton CO₂e were obtained, a figure similar to the one obtained the following year.¹⁰

Agriculture has been identified as the area that is the main source of emissions. With 79% of total emissions recorded, the primary source of these emissions is paddy rice production, which releases methane into the atmosphere; likewise the use of fertilizers, fumigation and slash burning all produce emissions. With respect to the other processes, the area of machinery is responsible for 15%, industrial processes 4%, and distribution 2%. These last three areas are responsible for significant use of lubricants and fuels, with the industrial processes adding the use of refrigerants.

As a follow-up step to measurement, the reduction plan was formulated, which focused on achieving greater energy efficiency while protecting the environment. The following are the strategic actions that were taken:

- **Electricity generation through the use of biomass:** In order to supplement its own energy consumption, the company decided in 2008 to construct a biomass plant using rice husks as fuel. Ash, which is a bi-product of the combustion process, is used as fertilizer in the rice fields. That is why, since that period, Packages of *Tio Pelon* rice bear a green seal indicating that the product was processed with renewable energy.

The nominal capacity of the energy generation system is 1500 kw/hour. However, with respect to rice, the entire process consumes less, which enables beans to be taken to Guanacaste to use the excess energy. The plant operates seven days per week, 24 hours

⁹ Theme used by the Pelon Group in presenting its carbon neutrality and pro-environment efforts.

¹⁰ At the time of compilation of this information, although the data with respect to total emissions for 2010 was available, protocol requires that this data not yet be made public.

per day and is only shut down for maintenance. It is the first of its kind in Central America and represents annual energy savings of about US \$500,000.

- **Energy generation from biogas.** By using pig feaces as fuel, they built the largest biodigester with the highest energy generation capacity in the country. The Costa Rican Electricity Institute (Instituto Costarricense de Electricidad) has contributed to this effort. With a nominal generating capacity of 60 Kw/hr, the biodigester is meeting the goal of energy self-sufficiency, by generating sufficient energy to keep the pig farm running (45 kw/hr).
- **Substitution by high efficiency machinery:** the fleet of tractors and machinery for some 120 teams were replaced by another that is highly energy efficient and therefore, less polluting.
- **Recycling program:** a re-cycling program for solid waste was implemented in the company. This program collected in 2010 nearly 32,000 kg of material ranging from glass to plastic and paper.
- **Management system:** An entire system of coherent management with a defined strategy that ensures that the process is maintained and that there is constant balance between the emissions and what can be removed. Years earlier, the company had obtained certification, guaranteeing fulfillment of the standards of quality and productivity in all its processes, which meant that a large step had been taken in moving this management system forward.

In keeping with its environmental commitment, the herds of livestock were slowly reduced over time and areas were freed up that had been devoted to livestock rearing and reforested - in total, 3,343 hectares, a portion of which was placed under the Payment for Environmental Services (PES) scheme for restoration and protection. Nevertheless, once it was decided to invest in carbon neutrality, the service was cancelled and the entire acreage under different categories (woodlands, restoration, plantations of teak wood and pochote (*Bombacopsis quinata*), became a part of the strategy to implement the third phase of the process, compensation, in which these 3,343 acres were used to mitigate the emissions that could not be reduced. At the end of the entire process, 41,644 TCO₂e were removed, representing 4,881 TCO₂e more than expected.

This is the reason why, in February of this year, the Pelon Group was able to certify all its processes (agricultural, industrial and comercial) via the international standard, ISO 14064. As stated by the company itself, it was a process from which many important lessons were learned, including the following: In any large company, there are good opportunities to generate environmental projects; environmentally friendly projects also have economic

benefits; the sense of ownership that the workers feel increases with the implementation of environmental projects, and awareness within the organization is paramount.

For this company, the great challenge continues to be the consumer. With its theme **“Let us make our small contribution to preserving the environment... make your contribution towards a better world”**, the company is raising awareness so that the consumer will contribute or begin to contribute actively to this process.

The vision for the future

The Pelon Group wants to be known as the the “Never before” company, which, in the words of Mr. Gonzalez, Vice-President of the Board of Directors, means *“(...) never before in Central America has electricity been generated from rice husk, never before on a Costa Rican pig farm has a biogas plant been installed with such a high energy capacity, never before has an agro-industrial company achieved carbon neutrality by following a formal methodology guided by EARTH University”*.

The company wants to extend the green expansion that it has initiated to other activities and companies in the Pelon Group. The current biomass plant will be transferred to another processing plant outside of the country, as another plant with greater generating capacity is planned for construction (2.5 megawatts). Additionally, studies are underway with respect to speed profiles aimed at venturing into a wind-generation project To take innovation even further, experimental activities are being carried out to generate biodiesel from the coyol (*Acrocomia aculeata*), one of the types of palms that are most abundant on the plains of Guanacaste, which will allow its carbon footprint to be reduced within 6 years, since the palm requires 5 years before producing its first harvest. In total, 100 hectares are expected to be sown.

With the new projects outlined, it is possible that the Pelon Group will soon be the “Never before...” company, given its many other proposals and actions aimed at dealing with climate change from the point of view of adaptation and mitigation.

The National Platform for Responsible Production and Marketing of Pineapple in Costa Rica¹¹

¿What is the nature of the Platform?¹²

¹¹ With the support of Bernardo Vargas, Coordinator, National Platform for Responsible Production and Marketing of Pineapple in Costa Rica. United Nations Development.

¹² Taken and adapted from: United Nations Development Programme. Development of a National Platform for Responsible Pineapple Production and Marketing in Costa Rica. Methodological Proposal. June 26, 2011. In: www.greencommodities.org/images/stories/PDF/PP-Metodologia-110627_2.pdf

The National Platform for Responsible Production and Marketing of Pineapple in Costa Rica consists of a planned intervention to design a model for the responsible production and marketing of pineapple, managed and sustained from a platform in which all stakeholders will participate actively throughout the value chain of this product at the national and international level.

The aim of the Project is to reduce the negative environmental and social impacts of the production of pineapple in Costa Rica and to place this economic activity within a model of sustainable development for the country.

The origin of the Platform is based on the constant criticisms that have been levelled at the pineapple-producing sector as a result of the negative impacts that its production model has had on the environment, the communities that surround the plantations, on the workers, with the conflict reaching the pineapple-consuming countries.

The topics that have been the most controversial and confrontational are related to contamination of water destined for human consumption and the impacts on the health of the communities surrounding the plantations as a result of the use of agro-chemicals; problems relating to occupational health; the impact on biodiversity; irregularities in the employment of workers; limits on the freedom of association of the workers and lack of compliance with requirements and procedures on the part of the farms.

In this context of criticism and conflict, the “Green Commodities Facility”, an initiative of the United Nations Development Programme (UNDP), which was concerned about the conflict, proposed to the Government of Costa Rica that a National Platform for Pineapple be created with the following objectives: To define a responsible production and marketing model for pineapple that would be managed in a responsible manner and agreed to by the majority of sector participants; to articulate multi-sectoral actions in a joint National Strategy to reduce negative impacts and increase the environmental and social benefits of this crop, as well as mobilize additional resources for instituting a responsible production and marketing strategy for pineapple in Costa Rica. Of necessity, dialogue should be the main and permanent instrument to achieve this joint project within two years.

With financial support from the Interchurch Organization for Development Cooperation (ICCO) of the Netherlands, the Platform has established a governing body comprising the Vice-President of the Republic, the United Nations Development Programme (UNDP), the Ministry of Agriculture and Livestock Farming of Costa Rica (MAG) and the Ministry of the Environment, Energy and Telecommunications (MINAET). Execution and follow-up are done through the National Coordinating Body, with logistical support from MAG and MINAET and administrative support from UNDP.

General Principles of the Platform

The National Platform for Responsible Production and Marketing of Pineapple in Costa Rica a) Must consider that agricultural production is a national responsibility and a cross-cutting theme within the processes of sustainable development b) It will use the participatory process to facilitate the contribution of various sectors, their diverse perspectives and actions, and be based on existing systems and mechanisms; c) It will induce positive changes through concerted and coordinated efforts, particularly in the processes related to public policies, planning, administration and decision-making; d) it will promote the implementation, adaptation and ownership of the model for responsible production and marketing of pineapple by the different sectors involved and affected by the expansion of pineapple production.

¿Who does the Platform bring together?

The Platform has invited participation from all the sectors and stakeholders who have established a working link with the pineapple-producing sector in an effort to improve the performance of the sector. To date, the call has attracted approximately 150 persons, who are, among others, representatives of the following stakeholders and sectors:

- State institutions: MINAET, MAG, and their dependents linked to the sector
- Producers: The National Chamber of Producers and Exporters of Pineapple (CANAPEP); companies and producers who participate directly; international traders (Del Monte, Dole, Chiquita, Fyffes)
- Supermarkets: Wal-mart and TESCO.
- Non-governmental organizations: FOREST TRENDS, ECO AGRICULTURE PARTNERS, COSA; Fundación Cordillera Volcánica Central (FUNDECOR); Fundecooperación para el Desarrollo Sostenible (FUNDECOOPERACIÓN);
- Importers: EOSTA (HOL) TASTE (HOL)
- Certification bodies: Rain Forest Alliance, Global Gap.
- Unions: Sindicato de Trabajadores de Plantaciones Agrícolas (SITRAP); Sindicato de Trabajadores Agrícolas, Ganaderos y Anexos de Heredia (SITAGAH) y SITRAPIFRUT.
- Universities: University of Costa Rica; EARTH University, Centro Internacional de Política Económica para el Desarrollo Sostenible- Universidad Nacional (CINPE-UNA), Tropical Agricultural Research and Higher Education Center (CATIE).
- Others: Regional Unit for Technical Assistance (RUTA)-Estrategia Regional Agroalimentaria y de Salud (ERAS); Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

- Banks: Central American Bank for Economic Integration (CABEI), Inter-American Development Bank (IDB), CAMBIO Project.

Structure and mechanisms for dialogue on the Platform

The Platform has created an operational structure and a mechanism for facilitating dialogue. In addition to the plenary sessions and discussion forums where controversial topics are discussed, Working Groups have been established as entities that are responsible for analyzing and discussing specific topics relating to the issue, and proposing activities, goals, indicators and plans of action for each topic.

The proposed Working Groups are: a) Taxation and Compliance with Legislation; b) Economic Incentives I; Market Incentives; c) Economic Incentives II: Responsible Financing; d) Territorial Management; e) Extension Services I: Control of Agrochemicals; e) Extensión Services II: Soil Conservation; f) Buyers' Requirements and g) International Alliances. Although most of the groups have begun their work, others such as Territorial Management and Extension Services are yet to commence their work.

Following the first call, the need to create a separate Working Group to deal with the topic of workers and communities was identified. With respect to the workers, the objective is to motivate and encourage dialogue on topics of interest to workers and to institutions that are competent in dealing with employee-employer affairs. With respect to the communities, the aim is to strengthen and facilitate, in a more assertive manner, community participation in matters of interest to them and to encourage their participation in each of the Working Groups.

In order to achieve a more integrated focus, the proposed methodology provides for each group to consider, in its analysis and planning, four cross-cutting axes: biodiversity, communities, workers and water.

After only four months, the following lessons have been identified as learnt:

- **Continue to perfect the design of the process:** It is important to take the time to design in detail the method for dealing with the proposed topics for each Working Group (WG), evaluate the levels of technical complexity and do an initial profile of the members based on each stakeholder, so as to establish a group to lead the process of discussion and analysis in each WG.
- **Pay attention to the discussion process:** Anticipate the courses of action both in the WG and in the plenary. This is particularly important for topics related to communities and workers where perceptions are determined by value judgements, in some instances exacerbated, based on specific experiences.

- **Facilitation strategy:** In addition to the process, it is important to have a clear idea of the dialogue-facilitation process. Facilitators who are working with the Working Group must be prepared, and ideally should be trained in the Project.

As the process matures and begins to bear fruit, the Platform faces various challenges:

- Insofar as the process is measured in part by acute conflicts and confrontations, the call has become a real challenge in that players have to be included according to their interests (mainly confrontational). Consequently, this has required the definition of organizational and group planning strategies that will adequately motivate and channel the participation of all the sectors and players for achieving the very objectives of the Platform.
- To maintain the flow of communication, openness and information in order to foster trust in the process, in addition to ownership of the process on the part of those who have decided to contribute and participate.
- Succeed in encouraging participation by communities and other affected sectors that have not yet participated.

Final remarks:

- National institutional framework
- Costa Rica's experience in environmental issues
- Evolution of the urban and productive agenda.
- Appropriation and inclusion of the topic on the agenda of the agricultural sector (policies and concrete actions).
- Climate change is a developmental problem and as such, must be included in developmental planning and investment and approached in coordination with efforts to manage disaster risk management.
- The agricultural sector in Costa Rica, in collaboration with the players in the sector, and bearing in mind the challenges and opportunities, has outlined the strategic areas and the path to follow in creating and strengthening the instruments for achieving, by 2021, the sectoral objectives that have been outlined by the sector and the country with respect to climate change and environmental management.
- With a long-term vision and a country objective, the agricultural sector has established a sectoral policy for 2021 with clear guidelines and strategies focused on the country objective of achieving carbon neutrality and strengthening agro-environmental management.
- It is imperative that the agricultural policy, under its pillar Climate Change and Agro-environmental Management, specifically in the strategic area, variability and climate change, move forward in the design and implementation of its planning instruments but above all, in its program and creation of new mechanisms that allow for the sustainable use of natural resources and implementation of new initiatives aimed at reducing the greenhouse gases emanating from the agricultural sector.
- The consequences of the last hydro-meteorological activities on the agricultural sector highlight the fact that the sector is still facing serious conditions of vulnerability to climate events. Both the Pelon Group and COOPEDOTA are aware of the need to commit to transforming their productive model to one that is more sustainable from an agro-environmental point of view and which tends to minimize its carbon footprint.
- The agricultural sector in Costa Rica is responding with creativity and ingenuity to the inevitable transformation that the sector must undergo in order to achieve the challenge posed by climate change – food security.
- In the face of the financial challenge presented by mitigation and carbon neutrality, the alliances and articulation of synergies between multiple players and sectors are guidelines

to follow to democratize the possibility of transforming the agriculture of the small and medium-sized producers in the agri-food sector.

- Once again, it has been shown that mitigation and adaptation are different sides of the same coin.
- The reduction of emissions through alternative processes has brought about innovation and technical-industrial development in the agroindustries.
- Participation and appropriation by those directly affected by environmental degradation, disasters and climate change continues to pose a challenge for the different processes.
- Whether from the perspective of the private company, a cooperative or stakeholder platform, there are ways to contribute to mitigating the impact of climate change.

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ACRONYMS

CABEI: Central American Bank for Economic Integration

IDB: Inter-American Development Bank

CATIE: Tropical Agricultural Research and Higher Education Center

CINPE-UNA: Centro Internacional de Política Económica para el Desarrollo Sostenible- Universidad Nacional

COOPEDOTA R.L.: Cooperativa de Caficultores de Dota R.L.

ENCC: National Strategy for Climate Change

ERAS: Regional Unit for Technical Assistance (RUTA)-Regional Agro-Environmental and Health Strategy

EARTH: Agricultural School for the Humid Tropical Region

FAO: United Nations Food and Agriculture Organization

FUNDECOOPERACIÓN: Fundecooperación para el Desarrollo Sostenible

FUNDECOR: Fundación Cordillera Volcánica Central

GHG: Greenhouse Gases

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

WG: Working Group

IMN: National Meteorological Institute

IPCC: Intergovernmental Panel on Climate Change

IPN: Peace with Nature Initiative (Iniciativa de Paz con la Naturaleza)

ISO: International Organization for Standardization

MAG: Ministry of Agriculture and Livestock

MINAET: Ministry of the Environment, Energy and Telecommunications

GNP: Gross national product

UNDP: United Nations Development Programme

PSA: Payment for Environmental Services

SITAGAH: Sindicato de Trabajadores Agrícolas, Ganaderos y Anexos de Heredia

SITRAP: Sindicatos de Trabajadores de Plantaciones Agrícolas

TM: Metric tons