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600 Water Street, SW, Washington, DC 20024, USA
Tel: +1.202.484.7170 | Fax: +1.202.488.0754
www.msiworldwide.com

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PREPARED BY:

Ignacio Gómez
Gloria Sanclemente
Fabián Navarrete
Ramón Laborde
Simón Vieira

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EXECUTIVE SUMMARY

This report identifies and assesses on the imminent threats to tropical forests and biodiversity in Colombia, as well as conservation actions underway, to recommend courses of action for USAID. It describes how and to what extent actions proposed in the CDCS address the conservation and sustainable use needs identified.

ASSETS

Colombia is one of the few "mega-diverse" countries in the world. Such mega-biodiversity is closely linked with a high availability (supply) of ecosystems services (including food, clean water, genetic resources, recreational services, flood protection, nutrient cycling and climate regulation, amongst others). Colombia boasts an extensive and well organized system of protected areas to prevent deforestation and protect biodiversity, with 107 National Protected Areas (12% of the nation's territory). Colombia's extraordinary recognition of indigenous autonomous governance and ownership reinforces the successful protection of forest ecosystems and natural resources achieved by indigenous peoples through their traditional knowledge. Currently there are 778 Indigenous Reserves in Colombia, covering 27% of the national continental territory, with a total extension of over 30.5 million hectares.

It also contains high levels of endemism in its agro-biodiversity. The selection, management, and use of crops and animal farms according to traditional knowledge associated to agro-biodiversity, has allowed for the development of growing areas that have increased native biodiversity, supporting new agro-ecological production systems and improving the possibility to grow food products and medicines.

Colombia is a party in over 100 international treaties on environmental and trade-related issues that deal with biodiversity. The main legal reforms on environmental issues in Colombia include the enactment of the Code of Renewable Natural Resources and the Environment (1974); the realignment of state agencies in charge of such resources, namely the National Institute for the Development of Renewable Natural Resources (Inderena) and the autonomous regional corporations (CARs); the inclusion of environmental provisions within the 1991 Constitution; and the passing of Law 99 of 1993, which created the Ministry of the Environment and the National Environmental System. The National Environmental System (SINA) emerged from this framework as a set of norms, guidelines, activities, programs and institutions that allow for the implementation of the general environmental principles contained in the new Constitution.

The current national biodiversity policy is framed under the context of land use management aimed at guaranteeing human settlement, production and consumption activities. Its ecosystem approach provides for an integrated management of land, water and living resources promoting conservation and sustainable use in an equitable way.

Climate change was also included in the policy agenda, while environmental issues were included in agriculture, water and victims related programs. The Government has been working to develop transitional legislation, including minimum requirements to develop REDD+ activities in the country.

The government's economic program focuses on boosting growth and reducing inequality, building on the enhanced security achieved by the previous administration.

CHALLENGES

Large areas of Colombia, particularly those that concentrate economic activities (the Caribbean region, the Andean region and the inter-Andean valleys) have lost their forest cover. The great forest extensions still standing are located in the Amazon, Orinoquía and Pacific regions, very distant from the centers of economic development. Colombia lost 41% of its forests (37.7 million hectares) between 1960 and 1984. The main deforestation hotspots are located in Caquetá-Putumayo, Meta-Guaviare and along the corridor San Jose del Guaviare-Calamar-Miraflores. Land use transformations consist mostly of forestlands into grasslands (56%) and agricultural areas (10%).

According to recent deforestation analyses, the seven main causes of deforestation are: i) expansion of agricultural lands and livestock farms; ii) illicit crops; iii) colonization and community displacement; iv) infrastructure (including everything associated to the energy sector, roads, etc.); v) mining; vi) timber extraction for commercialization or household use (including both legal and illegal extraction); and vii) forest fires. Of these, cattle raising is the main threat, particularly in the Amazon. The second key driver with an impact on biodiversity is the loss of natural habitats to crop cultivation, especially on the Caribbean coast, where the climate is suitable to grow oil palms and other plantation crops.

The main direct threats to biodiversity are: a) changes in land use and occupation and the fragmentation of its ecosystems; b) loss or degradation of native ecosystems and agro-ecosystems; c) introduction and transplant of exotic species; d) contamination; and e) climate change.

Other important direct threats to tropical forests and biodiversity include:

- Commercial timber extraction. Approximately 42% of all timber harvested is illegal. The regions with the highest numbers of threatened timber species are Magdalena, followed by the Chocó-Darién and the western Andean range.
- Invasive species, with 176 species having been identified as introduced, 17 of which are part of the list of the 100 most invasive species on the planet. Waste discharges originating from municipalities are one of the main sources of contamination of superficial waters in the country,
- The effects of climate change on the Colombian biodiversity are not well known. The most sensitive ecosystems are the high mountain ecosystems (high Andean forests, paramus, glaciers and wetlands), dry zones, marine and coastal zones, and islands. Desertification is a problem associated to soil degradation, which is accentuated by climate change.

Important indirect threats include the following:

- Deficiency in the access and quality of information
- Low management capabilities of public institutions
- Availability and criteria to assign financial resources where most needed

- Disjointed economic and sectoral policies
- Absence of effective compliance and enforcement mechanisms
- Low efficiency of planning instruments

Agriculture is responsible for a large percentage of greenhouse gas (GHG) emissions, contributing to almost 40% of total emissions in Colombia during 2010. Promoting appropriate agricultural practices can help protect the soil structure and microorganism communities, reduce erosion, prevent water runoffs and nutrient leaching, making them available for crops.

Drug trafficking has helped to perpetuate Colombia's conflict by providing earnings to both left- and right-wing armed groups. Since 1985, nearly 7 million hectares, 12.9 percent of Colombia's agricultural land, have been seized illegally through a combination of forced displacement and extortion. GOC/FARC peace talks have focused on five agenda items: agrarian reform (including access to land); political participation for FARC members; drug trafficking; reparation for victims of the conflict; and the logistics of ending the armed conflict.

COST-EFFECTIVE ACTIONS TO SUPPORT CONSERVATION

Current restrictions on land-use and boundaries of national forest reserves have constrained land titling initiatives and sustainable livelihoods. This situation is critical since many areas prioritized in post-conflict scenarios are bound with such restrictions. Thus, redefining land-use and property regimes is required in order to provide for property titles to farmers in many critical areas, and improve livelihood possibilities. This requires strengthening of GOC entities to adopt and implement a strategy for reserve lands and protected areas, and the strengthening of municipal governments to plan and implement land-use management including support to regulate specific environmental issues to reorder land zones more effectively.

The sustainable use of biodiversity and ecosystem services should be considered as an opportunity to improve livelihoods of rural populations. The implementation of payment for ecosystem services (PES) initiatives may discourage migration to protected areas and encourage communities to develop sustainable livelihoods taking advantage of improved security in many areas. Additionally, the loss of biodiversity is closely related to the lack of conservation measures in sectoral growth policies. There is a fundamental need for coordination between environmental and sectoral policies. The land-use planning for economic sectors needs to identify and consider impacts on biodiversity. Efficient biodiversity management criteria must be incorporated into productive systems. The mining sector is a critical example. Any strategy to address this issue must aim at improving mining environmental performance.

THE CONSERVATION APPROACH IN CDCS

The CDCS 2014-2018 aims to strengthen Colombia's capacity to implement a sustainable and inclusive peace, consistent with the negotiations now under way in Havana between the GOC and FARC. So far, the parties have reached preliminary agreements on the first two agenda items: agrarian development policy and political participation, which is no small task considering that the land issue and exclusion have been the drivers of the Colombian conflict for over half a century.

Urgent post-conflict economic development requirements will demand additional land for reintegration, demobilization, and compensation activities in rural areas, which will also require harvesting and livelihoods for large populations. The critical unknown is how a peace accord would affect spatial planning and land use. Once an agreement is signed, several regions should no longer be battlegrounds. Local communities are already beginning to prepare local land-use and economic development plans, with potential environmental impacts. For example, there is much discussion of expanding the use of “peasant reserve zones”. Six have already been established (800,000 hectares), with another five (1.5 million hectares) being created. INCODER plans to request from the Ministry of Environment and Sustainable Development the subtraction of an additional 1.5 million has.

Land restitution for returning victims of forced displacement is another challenge, given the millions of internally displaced persons. Several areas have been identified for prioritized restitution. In spite of progress achieved under the premise that the agricultural frontier would be “closed” with a particular concern toward environmental conservation, peace accords will imply further deforestation. Consolidating peace in the countryside will involve not just loans and technical help for small farmers, but a ten-year effort to bring government, roads and development to the countryside. Crucial to the peace accord will be restoring up to 6.6 million hectares of land to its original owners, who were displaced by armed groups.

A peace agreement would likely lead USAID to expand geographically. New areas of intervention identified in the CDCS pose multi-dimensional challenges: while these areas have traditionally had limited state presence, illicit activities, violence and human rights abuses, they are also key areas in terms of biodiversity and ecosystem services. **Thus, how the land is opened up is critical.** Future land intervention should follow planning guidelines to improve the environmental performance of productive and social activities. Additionally, the areas where the proposed CDCS 2014 - 2018 plans to focus present environmental and social restrictions and require special considerations, such as the overlap of National Forest Reserves, protected areas (national and regional), collective territories and indigenous reserves.

A post-conflict scenario will demand additional production to provide for reintegrated and displaced populations, leading to significant environmental impacts. The CDCS should support the design and implementation of alternative and sustainable production systems that generate economic benefits for local communities, while having minimum negative impacts on biodiversity and ecosystem services. It is situation that provides great risk and opportunity.

Payment for Ecosystem Service (PES) schemes provide viable new cooperation opportunities. For example, a new Payment-for-Performance program is being developed by the GOC to support the long-term “Amazon Vision” to achieve zero net deforestation in the Amazon Region by 2020, becoming a national policy for sustainable forest management. USAID could to participate in Amazon Vision 2020 to foster results based on a payment for performance.

Implementation of agroforestry systems and silvopasture schemes in areas of USAID engagement could provide new opportunities for economic and environmental benefits, while minimizing risks.

RECOMMENDATIONS

- A series of aggressive development activities necessitated by the peace process carry the risk of future deforestation. USAID interventions in these new opportunities should strive to apply sustainable development criteria.
- Participate in Amazon Vision, as described above.
- Success in mitigating climate change, consolidating a sustainable State presence and improving the livelihoods of Colombians in forest areas depends on the reform of land use management and land zoning within forest reserves. USAID could support land-use and zoning regulations as a land property strategy aimed at a post-conflict scenario. This should also be complemented with the protection of national parks, the enforcement of environmental regulations, alignment between other sectors and environmental objectives, and strengthened sustainable production value chains.
- There are numerous opportunities for productive projects based on the use of biodiversity and ecosystem services provided by forests. The actions derived from the CDCS should explore such opportunities for cooperation efforts.
- The CDCS could help the GoC design new productive incentives that encourage conservation.
- The CDCS could support the creation of conservation corridors where productive activities are permitted so long as they provide for means of ecological connectivity.
- The CDCS could provide assistance by exploring ways to increase available resources for regional authorities, and technical capacity for environmental management and protection. A particular necessity in forest areas is a rural cadastre, which is currently inexistent.
- The CDCS could provide significant aid to the GoC by promoting a mining formalization strategy. Legal reform could set a framework for formalization as well as measures to strengthen the capacity of informal miners to comply with environmental regulations and implement appropriate extractive practices.
- In the new intervention areas proposed by the CDCS – where biodiversity issues need to be preventively addressed – the CDCS could include activities to identify the ecological structure as a pre-condition for territorial ordering and productive planning.
- Conservation efforts aimed at threatened species has proven to be ineffective. A new approach is required for the protection of threatened ecosystems and groups of species. The CDCS could promote such an approach.
- It is time to seek protection beyond the parks in buffer zones and non-protected areas. The CDCS could promote the use of biodiversity in many regions as a way to improve household incomes in areas of ecological importance.
- Finally, a post conflict scenario will require significant efforts and resources to provide land to a large number of demobilized actors and victims of internal displacement and violence. The CDCS should take preventive measures to avoid additional deforestation, promote projects on carbon sequestration, water services, and other environmental services in these areas.

INTRODUCTION

The Country Development Cooperation Strategy (CDCS) informs assistance planning, budgeting and resource allocation and sets ambitious goals to be achieved in collaboration with other agencies and the host government of Colombia. The CDCS for Colombia for the period 2014-2018 is being currently developed. Under provisions of the U. S. Foreign Assistance Act of 1961, the CDCS must include an analysis of the actions necessary to achieve conservation and sustainable management of tropical forests and biological diversity in Colombia, and the extent to which the actions proposed for support by USAID meet the needs thus identified.

The following report identifies and assesses on the imminent threats to tropical forests and biodiversity as well as conservation actions underway in order to recommend the most appropriate courses of action for USAID. It also describes how and to what extent actions proposed in the CDCS address the conservation and sustainable use needs identified. For this purpose, the assessment team held several meetings with USAID/Colombia technical staff, and other Colombia-based organizations, including the Ministry of Environment and Sustainable Development, and several other agencies to gather relevant information on tropical forest and biodiversity conservation, as well as environmental regulations, and USAID's program goals and objectives under its proposed strategy.

This report summarizes the status of tropical forest and biodiversity conservation in Colombia, and the institutional infrastructure and legal frameworks currently in place to achieve conservation targets; describes conservation actions currently being taken by government, other donors, NGOs, and the private sector; identifies which direct and indirect threats to tropical forests and biodiversity are considered to be of highest priority to control; and considers information from government and private institutions on conservation priorities to define cost-effective actions to promote conservation and sustainable natural resource biodiversity management.

Chapter II provides an overview of the current status of forests and biodiversity conservation in Colombia, provides a general description of the country's main ecosystems, analyses deforestation trends, and provides input on the general status of threatened species. Chapter III provides a general overview of the social, economic and political outlook; and analyzes the institutional, legal and political frameworks affecting conservation of forests and biodiversity in the country. Chapter IV briefly reviews the main government, NGO and donor projects and activities currently under implementation. Chapters V and VI provide an assessment of the main threats to forests and biodiversity and the cost-effective actions required for their conservation in Colombia. Finally, Chapter VII provides an assessment of the conservation approach in the CDCS 2014-2018 currently under construction, providing in-depth analysis of two themes of particular importance for the CDCS: the country's peace process and possible post-conflict scenario, and the new opportunities for sustainable productive projects based on the environment and environmental services provided by the country's forests and biodiversity.

The team of consultants that prepared this report is multidisciplinary and includes experts in biodiversity, forests, environmental policy, legal issues and environmental economics. This report was prepared between February and March of 2014.

OVERVIEW OF THE STATUS OF FORESTS AND BIODIVERSITY IN COLOMBIA

The poor condition of forests and soil (as a result of deforestation) in many developing countries hinders social and economic development. Experts have indicated that situations such as the depletion of water sources, irregularity in water cycles that result in draughts or floods, increasing erosion and the lack of or decreasing sources of subsistence for rural communities from the diverse services provided by forests (such as wood and species with the potential to satisfy basic human needs), corroborate the above statement. According to former Minister of Environment and recognized Colombian environmentalist Manuel Rodríguez, "even those countries with an extensive forest coverage like Colombia are not exempt from this situation. As a result of deforestation, today our country is lacking forests where population is most abundant and where most of the economic activity takes place: the Caribbean region, the Andean region and the inter-Andean valleys"¹ The great extensions of forests still left in the country are mainly located in the Amazon, Orinoquía and Pacific regions where vegetation is abundant but very distant from the centers of economic development.

A. NATURAL FOREST ECOSYSTEMS

1. Geography

Colombia covers an area of 2.070.408 km², of which 55,14% correspond to the continental area and 44,85% to the maritime surface. In the Pacific Ocean, Colombia's maritime area extends over 339.300 km² while in the Caribbean Sea the maritime area covers 589.360 km².² Part of Colombia's geopolitical territory is found offshore. These island territories include the islands of Gorgona and Malpelo in the Pacific Ocean, and San Andrés, Providencia and Santa Catalina in the Caribbean. Colombia is the fourth largest country in South America, seventh in America and 25th in the world. It is the only country in South America that borders both the Pacific Ocean and the Caribbean Sea. Colombia's continental area consists of five natural regions. Spanning the country's interior from southwest to northeast, three mountain chains form part of the Andes Mountains (which extend all the way down the western side of South America). East of the Andean range and covering northeastern Colombia is a highlands region known as the Eastern Plains "*Llanos Orientales*". In the southeast, the rainforests of the Amazon basin spreads across the land. The other two principal natural areas are the Pacific coast (western Colombia) and the Caribbean coast (northwestern Colombia). The country's political division includes 32 departments and 1,122 municipalities.³

¹ Rodríguez, Manuel, **Estado de los Bosques y Desarrollo**, Universidad de los Andes, Bogotá, 2014, <http://manuelrodriguezbecerra.org/estadobo.htm>

²In November 2012 the International Court of Justice in Hague ratified Colombia's sovereignty over the San Andres archipelago, but decreased by more than 50% its possession, dominion and authority over maritime waters in the Caribbean Sea.

³Instituto Geográfico Agustín Codazzi (IGAC), Political Map of Colombia, Bogotá, 2003

2. Ecosystems

According to a 1998 study by the National Environmental System (SINA) institutes and the Agustín Codazzi Geographical Institute, 311 types of ecosystems were identified for Colombia that include areas ranging from natural habitats with little or no transformation (114 natural ecosystems) to highly intervened areas (167 transformed ecosystems) as a result of the continual development of human activities.⁴ Of these ecosystems 27% are in a natural state and 73% show some degree of transformation – as shown in Annex 1, Map A1. A more recent study by the SINA Institutes (2007) with improved resolution and remote sensor technology increased the number and types of ecosystems to 315. See the map of Colombia's continental, coastal and marine biome classification, in Annex No. 1, Map No. A2.⁵

The main ecosystems in Colombia are the humid tropical forests (49,358,834 ha), grasslands (49,358,834 ha) and the mountain forests (11,377,163 ha). Other biomes that occupy a significant area of the national territory are the natural savannas (10,017,163 ha) and secondary vegetation (8,148,154 ha) (MADS, 2012). The main marine and coastal ecosystems (coral reefs, mangroves, marine grasslands, rocky littorals, beaches, estuaries and the recently discovered deep water reefs) support life and productivity along the country's coastline (INVEMAR, 2012). Table 1 shows a simplified classification of the ecosystems into groups. These general coverage categories harbor a wide diversity of ecosystems; a characteristic trait of Colombia that is directly related to high number of species found in the country.

⁴IDEAM, Instituto de Meteorología, Hidrología y Estudios Ambientales (IDEAM), **Ecosistemas continentales, costeros y marinos de Colombia**, IDEAM, IGAC, IAvH, Invemar, Sinchi e IIAP, Bogotá DC, 2007, Pg. 276, +37 hojas cartográficas

⁵ The reference map describes 26 types of climates, defined according to humidity and temperature. Additionally, there are 32 geo-pedologic units, defined according to their geological origins, their gradient and drainage, configuring essential elements of the geology, morph-structure and the resulting soils. The reference map describes 19 land cover types according to Corinne Land Cover classification system. Within these land cover types, nine are related to human transformation and ten are natural, the state of 69% of the national territory. Regarding biomes, 34 are described by the reference map, some of which are zone-biomes, like the tropical wetlands and tropical dry forests, as well as other special biomes related to specific characteristics, such as their relation to the Andean mountain range systems, flooded areas, high salinity areas or rocky areas, with specific connotations according to their location. See Sánchez, Juan Armando, y Madriñán, Santiago, *Ecosistemas Terrestres de Colombia y El Mundo*, en **Biodiversidad, Conservación y Desarrollo**, Universidad de los Andes, Bogotá, 2012, Pg. 98

https://www.academia.edu/1865310/ECOSISTEMAS_TERRESTRES_DE_COLOMBIA_Y_EL_MUNDO

Table No. 1 Main continental, costal and marine ecosystems of Colombia

Ecosystem		Extension (ha) Official management data.	Percentage of the total continental area	Source
Natural Forests	Total Natural Forests	61,246,659	53.7	IDEAM, et.al. 2007
	Dry Forests	201,200	0.2	IDEAM, et.al. 2007
	Humid Tropical Forests	49,358,834	43.3	IDEAM, et.al. 2007
	Mountain Forests	11,377,943	10	IDEAM, et.al. 2007
	Mangroves	308,682	0.3	IDEAM, et.al. 2007
Páramos	1,980,454.06 ¹	2,067,987	1.8	IDEAM, et.al. 2007
Wetlands	3,020,155 ²	2,711,473	2.4	IDEAM, et.al. 2007
Natural savannas		10,017,163	8.8	IDEAM, et.al. 2007
Desert, xerophytic, sub-xerophytic		1,336,816	1.2	IDEAM, et.al. 2007
Glaciers and snowy peaks		8,567	0.01	IDEAM, et.al. 2007
Herbs and bushes		1,374,041	1.2	IDEAM, et.al. 2007
Secondary vegetation		8,148,154	7.1	IDEAM, et.al. 2007
Forest plantations		161,161	0.1	IDEAM, et.al. 2007
Crops		9,346,948	8.2	IDEAM, et.al. 2007
Grasslands		17,313,886	15.2	IDEAM, et.al. 2007
Rocky outcrops		15,709	0.01	IDEAM, et.al. 2007
Urban areas and highly modified areas		300,824	0.3	IDEAM, et.al. 2007
Marine beaches		952,602	n.a.	INVEMAR et.al. 2009
Coral reefs		181,702	n.a.	INVEMAR et.al. 2009
Marine grasslands		43,058	n.a.	INVEMAR et.al. 2009
Rocky littorals		934,779	n.a.	INVEMAR et.al. 2009
Soft sea-beds		4,290,546	n.a.	INVEMAR et.al. 2009
TOTAL CONTINENTAL		114,049,388	100	IDEAM, et.al.

			2007
TOTAL MARINE ECOSYSTEMS	6,402,687	n.a.	

¹Data from the "Atlas de Páramos" (Morales et.al., 2007) according to the Resolución 937 of 2011

² The official number includes the extension of mangroves

n.a.: non-applicable.

Source: MADS (2012), in: IDEAM et.al. (2007)

The forest surface is represented by three great coverage types: natural forests, secondary vegetation and forest plantations. According to IDEAM (2011), the total area covered by natural woodlands including natural forest ecosystems, mangroves and secondary vegetation, is equal to 58,635,323 ha, and represents 51.4% of the continental surface of the country. Forest plantations only cover 0.14% of the continental area. Over 67% of the remnant forest areas are found in the Colombian Amazon under the jurisdiction of two Regional Environmental Authorities: Corpoamazonia and the Corporation for the Sustainable Development of the North and East Amazon (CDA for its Spanish acronym).⁶ See Annex No. 2, Map A3

Table No. 2 Remnant forest surface in Colombia

Coverage Type	Coverage	
	Area (Ha)	Area (%)
Forest	58,653,323	51.4
No Forest	51,645,862	45.3
No Information	3,780,904	3.3
TOTAL	114,174,800	100

Source: MADS, Preparation proposal for REDD- RPP; 8th version, 2013.

The departments that have the greatest areas of natural forests in Colombia are: Amazonas, Caquetá, Guaviare and Vaupés (35,184,675 ha), representing approximately 50% of all the natural forest in the country. Furthermore, the 4,258,870 has of secondary vegetation in Antioquia, Chocó, Cesar, Nariño and Santander represent 53% of the national total.

Colombia started organizing a system of protected areas between 1960 and 1980 to prevent deforestation and protect its biodiversity. Although there are currently 107 National Protected Areas (equivalent to 12% of the nation's territory), the rate of deforestation reached 600,000 hectares per year, equivalent to 37.7 million hectares between 1960 and 1984, representing a total loss of approximately 41.5% of the totality of forests in the country.⁷

⁶Ministerio de Ambiente y Desarrollo Sostenible, Documento de Propuesta de Preparación para REDD- RPP, Versión 8, 2013,

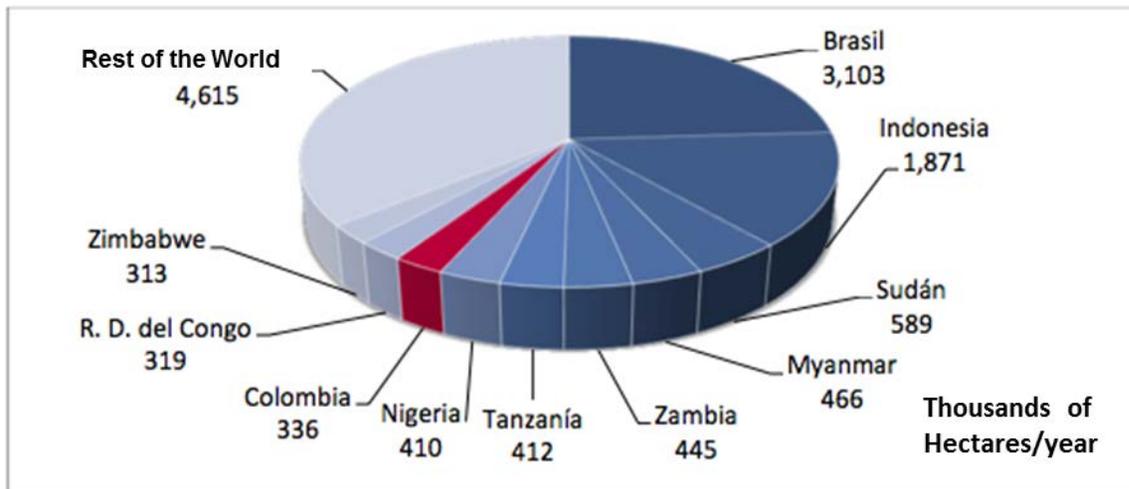
⁷Salazar, Mike Harvey, **Effectiveness of Colombia's Protected Areas in Preventing Evergreen Forest Loss: A Study Using Terra-i Near Real-Time Monitoring System**, Technische Universitat Dresden, Institute of International Forestry and Forest Products, Faculty of Forest, Geo and Hydro Sciences, 2013, Pg. 4

3. Deforestation

Recent studies by the IDEAM established that Colombia's annual average deforestation rate between 1990 and 2010 was 310,349 Ha, suggesting that the protected areas have not been efficient enough to decrease the loss of forests in the country.

Colombia is amongst the developing countries with highest deforestation rates as shown in the following figure:

Figure No. 1 Developing Countries with the Highest Rates of Deforestation



Source:

FAO (2005): Evaluación de los recursos forestales mundiales 2005; and IDEAM (2010): Informe Anual sobre el Estado del Medio Ambiente y los Recursos Naturales Renovables en Colombia, BOSQUES 2009.

The regions of Colombia with largest forest loss between 1990-2012 are the Andean and the Amazon Regions. Approximately 40% of such deforestation occurred in the Amazon and 32% in the Andean regions, with a total forest loss of 6,206,984 ha (5.4% of the national surface) over a twenty-two-year period. The Departments of Caqueta, Guaviare, Putumayo, Meta, Amazonas, Guainia and Vaupes concentrate 47% of the country's deforestation for that period, while four departments (Caqueta, Putumayo, Meta and Guaviare) concentrate 86% of deforestation in the Amazon Region. The main hotspots are located in Caqueta-Putumayo, Meta-Guaviare and along the corridor San Jose del Guaviare-Calamar-Miraflores. Approximately 41% of the loss of natural forest in the country occurred in the jurisdiction of three Regional Autonomous Corporations: Corpoamazonia (Caquetá, Putumayo, Amazonas); Cormacarena (Meta) and CDA (Guanía, Gauviare, Vaupés), respectively. The Caribbean region currently has the least remnant forest surface cover and is the region where the greatest percentage of forest has been lost, particularly tropical dry forest. (See Annex No. 2, Map. A4)

The rate of deforestation in Colombia is mainly the result of the transformation of forestlands into grasslands (56%) and agricultural areas (10%).

Table No. 3 National and regional deforestation between 1990 and 2010

Indicator	Natural Region					Total
	Pacific	Orinoquia	Caribbean	Andes	Amazonia	
Forest 2010	5,532,653	2,067,373	1,643,961	10,035,659	39,355,677	58,635,323
Deforestation (ha)	554,635	522,487	910,373	1,981,968	2,237,521	6,206,984
% Lost Forest	10,6	22,4	38,4	15,8	5,3	9,6
Deforestation annual average (ha)	27,732	26,124	45,519	99,098	111,876	310,349
% Lost Forest annual average	0,53	1,12	1,92	0,79	0,27	0,48

Source. (MADS, 2013, p. 87)

It is well known that some of the main pressures on forests and most important drivers of deforestation are: i) increasing the agricultural frontier and sowing of illicit crops; ii) colonization/displacement of local communities; iii) infrastructure (including associated activities, such as energy generation and road building, amongst others); iv) mining; v) wood extraction for commercial or personal use (including legal and illegal extraction); and vi) forest fires. All of the above show historic and regional variations according to specific circumstances.

Considering the temporal aspect, for example, although 75% of deforestation is related to the expansion of the agricultural frontier and colonization, recently these two factors are closely linked to the establishment and destruction of illegal crops in regions such as Putumayo, Guaviare, Caquetá and Meta. In these regions, the loss of a few hectares of forest promotes the establishment of new communities that start developing minor productive agricultural activities, which in turn add up to a significant increase in degradation and deforestation in the region.

Agricultural land use in the country is developed in 4.9 million hectares that are intended for crop sowing and 38.6 million hectares intended for cattle ranching. However, since only 19.3 million of these hectares are actually appropriate for cattle ranching, the 2019 Strategic Livestock Plan has as its objective to "give back to nature 10 million hectares through the development of environmentally sustainable strategies". (MADS, 2013, p. 73)

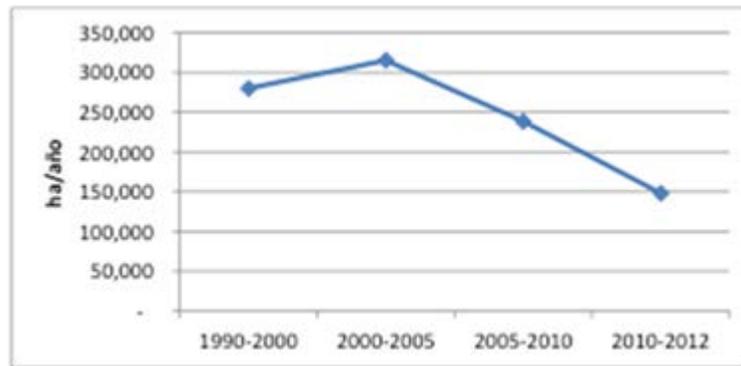
Out of the almost 5 million hectares dedicated to agriculture, in 2009 there were 68,025 ha of coca crops planted after logging primary forests with high biodiversity. Furthermore, it is estimated that 575,393 ha were at some point cultivated with coca plants between 2001 and 2010. Out of these, 222,639 ha were initially covered by forests (SIMCI, 2010), evidencing how the illegal use of land has significant impacts on Colombia's forest coverage.

Illegal mining has also been identified as a mayor deforestation driver in recent years, particularly in the Pacific, Amazon and Magdalena Medio regions. Mineral exploitation is counted as one of the economic development activities that generate the highest pressures on forests. Information from the MADS indicates that 56% of the zones of protected forest reserves, 15% of forest reserves established by Law 2nd of 1959 and almost 34% of the regional national parks could be affected by mining project requests. If all of these requests succeed, the most affected regions would be the Andean, Caribbean and Pacific regions, followed by the Amazon and Orinoquia.

The average annual rate of deforestation in Colombia shows a significant decrease in recent years. It went from 315,120 ha/year in the period 2000-2005 to 238,361 ha/year in 2005-2010, to 147,647 ha/year in the latest measurement for the period 2010-2012. Such behavior, which is

shown in the following figure, has not been officially explained. However, the decreasing deforestation trend in Colombia could be explained mostly by two key deforestation drivers: illicit crops and cattle ranching.

Figure No. 2 Average Rate of Deforestation Colombia 1990-2012



Source: IavH, IDEAM, IIAP, INVEMAR, SINCHI, 2012, Press Release, IDEAM, 2013

Illicit crops in Colombia increased constantly between 1994-2002, while it decreased in 2002-2012 due to aerial spraying, substitution policies, and actions against illegal armed groups.⁸ Approximately 39% of the area occupied by coca crops extends over ten municipalities that actually concentrate current deforestation hotspots. Approximately 35% of the new coca crops identified each year (21,634 has) have replaced primary forests of high biodiversity (SIMCI, 2011).

On the other hand, cattle stock increased constantly between 1990-2006 and stagnated between 2007-2012, due to terms of trade in international markets. Cattle ranching occupies 38% of the country's total surface, and has expanded from 14 to 38 million has in the last 50 years, mostly at the expense of natural forests. The average density is currently less than one head of cattle per hectare.

B. BIODIVERSITY CONTEXT, THREATENED AND ENDANGERED SPECIES

⁸In 1992, Colombia produced 13 percent of the world's cocaine, but by 2000, its cartels gained a strangle-hold on the world's cocaine processing, at 70-80 percent of total production and distribution worldwide. The coca crops in Colombia went from 362,000 acres estimated in 2001 to approximately 155,000 acres in 2010, mainly due to massive eradication measures largely sponsored by the U.S. Government. The estimated total area under cultivation in 2011 stood at three quarters of the level in 1990. During those years, Plan Colombia funneled \$7 billion in aid to fight drugs and terrorism in the country. United Nations Office on Drugs and Crime, **World Drug Report 2013**, UNODC, Vienna, New York, 2013, Pg. 37, http://www.unodc.org/unodc/secured/wdr/wdr2013/World_Drug_Report_2013.pdf

1. Biodiversity context and trends

Biodiversity is considered as the variation of life forms and is represented by genetic, population, species and ecosystem diversity. Colombia has a continental area of 114,174,800 has and approximately 3,531 km of coastlines on both the Pacific Ocean and the Caribbean Sea, which provide another 892,102 km² of territorial waters (IDEAM et al., 2007). Colombia is considered as one of the few "mega-diverse" countries in the world because 10% of the globe's biodiversity can be found within its territory. Such mega-biodiversity is closely linked with a high availability (supply) of ecosystems services (including food, clean water, genetic resources, recreational services, flood protection, nutrient cycling and climate regulation, amongst others) constituting an important comparative advantage and key component of the country's natural capital. Such capital must be conserved and used in a sustainable way to support the well-being of the Colombian people and the country's economic growth.

The transformation of natural ecosystems as a result of human activities is one of the main causes of biodiversity loss. However, according to the 2010 report on the State of the Environment and the Natural Renewable Resources,⁹ the transformation of natural ecosystems does not always take place on an entire territory, but it often occurs on partial areas that result in fragmented ecosystems with remnant natural vegetation. The Alexander von Humboldt Research Institute (IAvH) has calculated that 33% of the areas with natural vegetation within their biomes have been transformed. This represents a significantly large area, considering that the country expects the pressure on natural resources to increase in the next few years as a result of the economic development required for the post-conflict scenario.

A major threat to Colombia's biodiversity is loss of habitat. Change in ecosystems' area is a key indicator of the threat to biodiversity. The total area of natural ecosystem that has been transformed in Colombia is 31% (IDEAM et al., 2007), although some earlier estimates were as high as 52% (MADS, 2012). At the regional level, the highest levels of transformation were recorded in the Andes ($\geq 60\%$) and Caribbean (72%) (MADS, 2012). Although data exists, they are incomplete regarding changes in wetlands, the high Andean moors (called Paramus), and savannas. Colombia is currently working on recording more precise data. However, existing information indicates a conversion rate of 50,000 ha/year for tropical savannas and that the 24% of Colombian Paramus (463.929 ha), was transformed through agricultural, cattle pastures and mining activities (mainly in the Andean Region) (MADS, 2012). With respect to coastal and marine ecosystems, INVEMAR (2009) reports a net loss of 12,191 ha of mangroves (principally in the Pacific Region), representing 4% of the existing cover in this year. Equally, Invemar (2013), reports an extension of 267,858 ha of mangrove ecosystems, 290,000 ha of coral reefs and 43,000 ha of seagrasses.

After signing the United Nations Convention on Biological Diversity (adopted through Law 1656 of 1994), Colombia acquired certain commitments, which are compatible with the use of biodiversity for its economic development. For this reason, the country has prioritized biodiversity policies (which will be discussed later in this document) that not only focus on its conservation but also on its possible uses and value. The Alexander von Humboldt Research

⁹Ministerio de Ambiente y Desarrollo Sostenible, Informe del Estado del Medio Ambiente y de los Recursos Naturales Renovables, 2010, MADS, Bogota, Septiembre de 2011

Institute (IAvH) has developed methodologies for ecological characterization used to produce biodiversity inventories that play an important role in the country's scientific and academic development. Research at the Institute has also helped explain the complex biological interactions that take place within threatened ecosystems and biogeographic regions in Colombia, such as the tropical dry forest in the Caribbean region.

The current national biodiversity policy aims to "integrally manage biodiversity and its ecosystem services under a scenario of changing socio-ecologic systems, while promoting social and sectoral co-responsibility towards conservation actions and establishing biodiversity and its ecosystem services as public values."¹⁰ This policy recognizes ecosystem services as the bridge between biodiversity and human society. For this reason, actions aimed at conserving biodiversity are proposed under the context of an environmental planning process (Law 99/93), where biodiversity is the main structural element of land use management as it guarantees the supply of all ecosystem services required for the development and sustainability of human productive, extractive, settlement and consumptive activities.

2. Threatened Species

Threatened species are used as indicators of biodiversity pressures throughout the world. The categories and criteria used by the International Union for Conservation of Nature (IUCN) are the starting point for the classification of species according to their degree and type of threat of extinction (IAvH et al., 2011). In relative terms, only a small part of Colombia's biodiversity is actually threatened. However, the above statement should not be considered as a final conclusion because it partly results from the fact that the number of species in the country is very high and most of them have not been properly studied.

In Colombia, according to Resolution 383 of the Ministry of Environment, there are currently 377 threatened animal species. Mammals are the group with the highest percentage of threatened species with 9% (43 species), followed by amphibians with 7% (48 species) and birds with 6% (112 species). All other groups are below 5% (Figure No. 3).

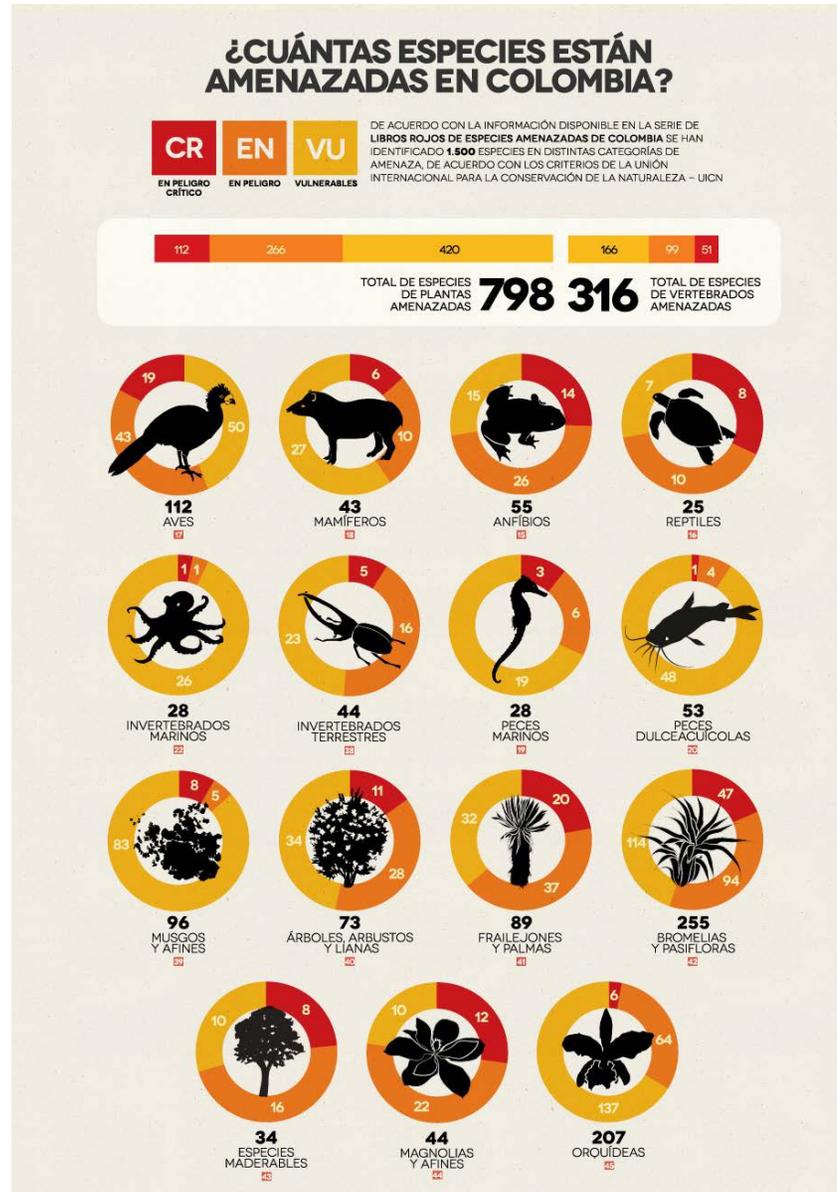
The departments with the highest number of threatened species are: Antioquia (162), Santander (72), Chocó (69), Boyacá and Cundinamarca (59) (IAvH et al., 2011). Additionally, during the last 50 years, the extinction of at least three Colombian endemic species has been proved: the seal *Monachus tropicalis*, the bird *Podiceps andinus* and the fish *Rhizosomichthys totae* (MADS, 2012).

Concerning threatened vegetation, a total of 798 species is considered to be under some type of risk category. Some 96 bryophyte species (5.4%) are believed to be under some type of risk, and of these, 49 species (38 mosses and 11 liverworts) are endemic to Colombia (Linares y Uribe, 2002). Furthermore, out of the 523 phanerogam species evaluated by Calderón et al. (2002 and 2005), 159 are threatened, and although these groups represent almost 2% of the countries vegetation, they grow in different environments and are subject to different types and degrees of pressure. With respect to timber trees, out of 50 species evaluated by Cárdenas and Salinas

¹⁰ Ministerio de Ambiente y Desarrollo Sostenible, **Política Nacional para la Gestión Integral de la Biodiversidad y los Servicios Ecosistémicos (PNGIBSE)**, MADS, Bogotá, 2012, Pg. 8

(2007), 34 of these are under some type of risk, 15 species are listed as threatened (TS), 10 species are at critical risk (CR) and 9 are vulnerable (VU).

Figure No. 3 Threatened Species of Colombia

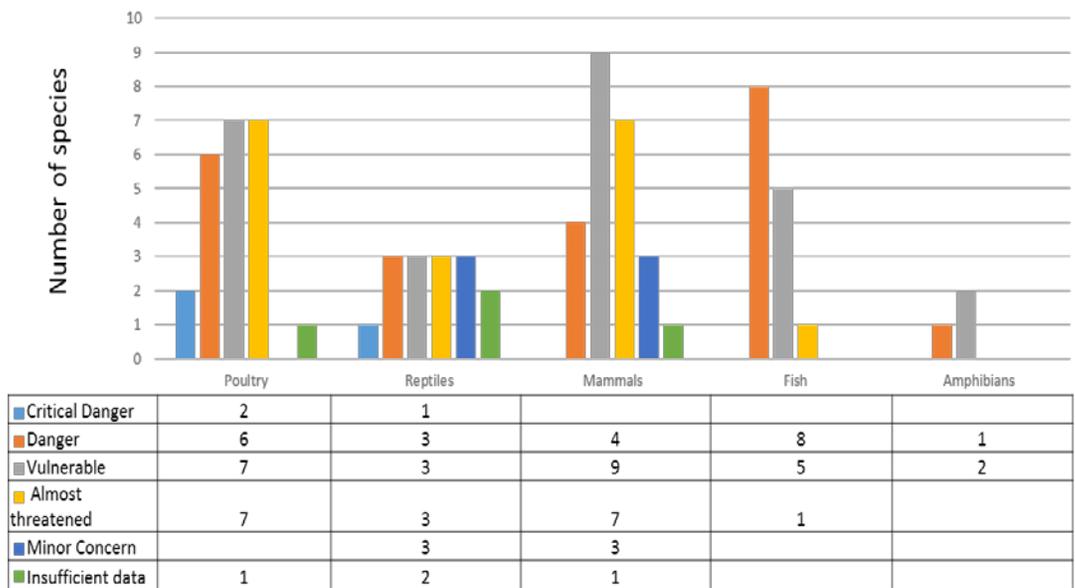


Source: <http://www.sibcolombia.net/web/sib/cifras#amenazadas>.

a. Threatened Species of the Amazon

There are 6,249 registered plant species in the Colombian Amazon region, while its animal diversity is distributed amongst 674 bird species, 158 amphibians (118 of which are endemic), 195 reptiles (one endemic), 212 mammals and 753 fish species. According to the country's animal red books, there are 79 species in this region that are threatened: 24 mammals, 23 birds, 15 reptiles, 3 amphibians and 14 fish species (Banco de Occidente, 2008). There are 51 species within the Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) categories, where birds are the most affected group (15 species), followed by mammals and fishes (13 species) (SINCHI, 2007).

Figure No. 4. Number of animal species threatened in the Colombian Amazon region



Source: Sinchi, 2007.

In this region the vertebrate fauna is highly impacted by human activities, such as the transformation of habitats and ecosystems, the increasing rates of animal exploitation for commercial and personal use (e.g the green guacamaya *Ara militaris*, the paroquet *Touit stictopectera*, and the monkey *Hypopyrrhus pyrohypogaster*), and the introduction of invasive exotic species amongst others. Many bird species have been affected by the degradation of wetlands (e.g. these three species of ducks *Netta erythrophthalma*, *Anas georgica* and *Anas cyanoptera*) and the destruction of forests (such as the two species of eagles *Harpyhaliaetus solitarius* and *Oroaestus isidori*).

Threatened aquatic and terrestrial mammals such as the Amazon manatee (*Trichechus inunguis*), the tapir (*Tapirus terrestris*, *Tapirus pinchaque*), the giant armadillo (*Priodontes maximus*) the palm ant eater (*Myrmecophaga tridactyla*), as well as some turtle species (*Geochelone denticulata*, *Rhinemys rufipes*, *Podocnemis erythrocephala*, *Podocnemis expansa*) and their eggs, are hunted by the local rural and indigenous communities, evidencing the non-sustainable use of the species (Trujillo et al., 2008; Sinchi, 2007). Another example of this is the black caiman (*Melanosuchus niger*), which is not hunted for its skin but to sell the meat of its tail after salting it and taking it to the local markets as fish meat in certain zones of the Amazon (Trujillo et al., 2008).

Additionally, the pink dolphin (*Inia geoffrensis geoffrensis*), the gray dolphin (*Sotalia fluviatilis*) and the giant otter (*Pteronura brasiliensis*) are highly threatened because local communities consider them important competitors for commercial fishing resources. It should be noted that commercial fishing in this region of the country is already overexploiting its resources by frequently capturing fish under the regulatory size (median reproductive size), generating a lack of commercially important species like the *Brachyplatystoma filamentosum* which are being replaced by other less economically valuable ones such as the *Calophysus macropterus* (Sinchi, 2007). Furthermore, fishing nets are also deadly traps for animals such as the Black Caiman (*M. niger*), dolphins and manatees.

The non-sustainable use of resources in the Amazon is an important threat, more so when subsistence hunting is illegal as it often takes place within protected areas (National Natural Parks) where this activity is prohibited (Rodriguez et al., 2006).

In the Amazon region, the following timber species are under some type of threat: the rose wood (*Aniba rosaeodora*) is classified as critically endangered (CR); the cedar (*Cedrela odorata*), the ceiba toluá (*Pachira quinata*) and the *Ocotea quixos* are endangered (EN) and the *Ceiba samauma* is registered in the timber red book as vulnerable (VU)¹¹.

The municipalities in the Amazon region with the highest number of threatened species are: Mirití-Paraná, Puerto Santander and Tarapacá (in the Amazon), Solano (Caquetá), La Macarena and La Uribe (Meta) and Mocoa (Putumayo). Map No. A5 shows the distribution by category of the threatened species in each of the region's municipalities. (See Annex No. 3, Map No. A5)

Murcia et al., (2010) reported in their research that the area deforested between 2002 and 2007, represents 1.6% of the Colombian Amazon. The forests in this area were transformed into grasslands (59.4%), fragmented forests (22.4%), and secondary vegetation (15.1%). The same research found that the departments with the highest deforestation rates are: Caquetá, Meta, Guaviare and Putumayo. During this same period, 524.6 Km² suffered forest degradation. The increase in grassland coverage as a result of cattle production in the region was 10,141 Km² (2.1% of the total area). The transformation of these areas evidences strong human pressures on forests, mainly over the border between the departments of Caquetá and Meta, and in the intervention zone of Guaviare, which coincides with the Northwestern pressure arch on the Colombian Amazon (See Annex No. 3, Map No. A6).

¹¹ Taken from <http://siatac.co/web/guest/productos/especiesamenazadas/maderables>.

C. AGRICULTURAL BIODIVERSITY AND ECOSYSTEM SERVICES

Agriculture has been a historic engine of economic development in Colombia, contributing 9% of GDP, 21% of total exports, and generating 19% of the country's employment (Vélez et.al., 2011). Colombia's geographic location, its high availability of hydric resources, its heterogeneous environments, varied topography, and other biophysical characteristics make agriculture a key sector for national development. In 2009, the agricultural area was estimated in approximately 3.4 million has (Velez et.al., 2011)

Cattle raising represents 3% of the GDP in Colombia. According to the National Agricultural Survey, there are over 39 million has dedicated to cattle raising (23.5 million heads of cattle) although only half of this area (53.8%) is actually apt for such use.

In this context, agro-ecosystems are gaining importance as key for the conservation of species. Likewise, biodiversity is gaining importance as key for the survival of people and their productive systems. Indeed, many of Colombia's productive systems depend completely on the services offered by the ecosystems in which they are built. The importance of such dependency is related to optimizing global agricultural production for an increasing population and demand.

Not long ago, the relationship between agriculture and the conservation of ecosystems and biodiversity was thought as one based on competition for resources and space. However, these irreconcilable opponents are today paradoxically bonded together with strong ties. It is virtually impossible to conserve biodiversity at the margins of today's agricultural landscapes. The percentage of terrestrial land covered by agriculture (crops and pastures) has increased to cover approximately 50% of the habitable land. The agricultural surface of the Earth has increased 21% in developing countries since 1960, and agro-ecosystems have the capacity to transform the surface with irreversible consequences.¹²

The agricultural systems have the capacity to directly and indirectly affect the environment and ecosystem services at different scales. At a local scale, individual farms affect the quality of water, the nutrient cycle, micro-weather controls, and the visual quality of landscapes. At regional and global scales, agriculture affects the quality and availability of hydrological resources, biodiversity conservation, and carbon sequestration. Agriculture is thus of crucial importance, both to provide food for a growing world population and for the urgent need for it to incorporate mitigating measures for its environmental impacts. Agriculture is at the break-point of tensions between possibly competing models of rural development and biodiversity conservation.

The ecosystem approach is a strategy for integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the

¹²Gómez, C. y J. M. Díaz (Eds.), **Agroecosistemas beneficiosos para las especies migratorias de Colombia**, Informe final del Convenio 044 del 2012 entre SELVA: Investigación para la Conservación en el Neotrópico y la UPRA (Unidad de Planificación de Tierras Rurales, Adecuación de Tierras y Usos Agropecuarios) del Ministerio de Agricultura y Desarrollo Rural, Bogotá, 2012., 165 pgs., http://avesmigratoriascolombia.files.wordpress.com/2013/02/selva-2012_agroecosistemas-beneficiosos-para-especies-migratorias.pdf

application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential processes, functions and interactions among organisms and their environment. It was adopted by different conventions and international agreements, such as the Convention of Biological Diversity (CBD), and aims at: i) conservation; ii) sustainable use; and iii) a fair and equitable distribution of the goods and services provided by biodiversity. The ecosystem approach promotes the strengthening of the interaction between protected areas and the supporting matrix, the creation of biological corridors and striving for protection goals for natural areas. Those targets include to effectively protect at least 10% of each type of habitat for 2015, and to manage at least 30% of all agricultural lands in the world under some form of protection for natural cover.

The current concern for the sustainability of agriculture is huge. Agricultural systems are faced with an evident contradiction between the challenges of increasing agricultural production while at the same time protecting the ecosystems' capacity to produce environmental services. Technological developments and agricultural practices should be aimed at minimizing the adverse effects on the environment for agricultural systems traditionally concentrated in maximizing productivity and profit in food (and energy) production.

1. Biodiversity in Agricultural Ecosystems

According to the Convention on Biological Diversity (CBD) Manual, agricultural biodiversity could be summarized as all the components of biological diversity that constitute the agro-ecosystems. That is, all the different animal, plant and microorganism species and their genetic variability, at all the levels of hierarchical organization necessary to maintain their functions, structures and processes. Agricultural biodiversity provides a number of key ecosystem services (González, 2002):

- Nutrient cycles, organic matter decomposition and maintenance of soil fertility.
- Plague and disease control.
- Pollination.
- Maintenance and improvement of local wildlife, habitats and landscapes.
- Water cycle regulation.
- Erosion control.
- Climate and carbon regulation.

In Colombia, there is no registry of the number of varieties and wildlife relatives that are used or could be used for the production of food and/or raw materials of commercial interest. However, the country has high levels of agro-biodiversity endemism, including: cocoa plants, at least 40 types Amazon chili peppers, 60 varieties of tuber crops, 23 local varieties of corn and a high diversity of fruit trees, medicinal plants and palms used by local communities (PNUD, 2010). With respect to local animal breeds, there are no consolidated registers either, but there are 9 local cattle breeds (Corpoica, 2007), 26 local fowl breeds, 5 breeds of pigs, 5 goat breeds and 11 sheep breeds (Angarita, 2005, Gobernación del Valle del Cauca, 2010 y ANCO, 2010).

The selection, management and use of crops and animal farms according to traditional knowledge associated with agro-biodiversity has allowed for the development of growing areas

that have increased native biodiversity, supporting new agro-ecological production systems adapted to diverse environmental conditions and enhancing availability of food products and medicines (PNUD, 2010). However, local agro-biodiversity is not considered in the country's great biodiversity inventories. The conservation of wide crop varieties, local breeds, wildlife relatives and domesticated species is done by *in situ* germplasm banks (MADS, 2012). Some of the most important institutes in charge of this task are the Instituto Mayor Campesino de Buga, in association with the Instituto de Estudios Ambientales para el Desarrollo Sostenible (IDEADES); the Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria (CIPAV); the Asociación de Productores Alternativos de San Andrés de Sotavento, and the Organización Indígena de Antioquia (González, 2002). However, these initiatives that seek to conserve local agro-biodiversity and their associated traditional practices seem to be isolated, limited to local programs with specific communities. They are not part of a national policy.

One of the greatest challenges of humanity for the 21st century is to meet the constantly increasing global food needs while simultaneously decreasing agriculture's environmental footprint (Foley et al., 2011 in Selva, 2012). Vast challenges and great opportunities lie ahead in integrating agricultural and conservation agendas (Scherr & McNeely, 2008 in Selva, 2012).

Agricultural systems must increase productivity while implementing changes to improve use of the goods and services provided by ecosystems without disrupting them and even improving their flow. We must transition to sustainable agricultural systems that minimize negative environmental effects (considering environment as a fundamental asset for agriculture) and improve food productivity while producing positive secondary effects on environmental services and, most importantly, being accessible to and efficient for farmers (Pretty, 2008 in Selva 2012).

2. Ecosystem Services in agricultural landscapes

Agro-ecosystems, as ecological systems that have been transformed by human action, both depend on and provide ecosystem services, depending on the analytic perspective. This way, there is a close relationship between agricultural systems, biodiversity and ecosystem services.

Ecosystem services can be grouped into four types, depending on the functions and benefits they represent for human beings:¹³

- Provision. Goods obtained from ecosystems such as food, fiber, wood, water, soil, genetic resources, skins, pets, among others.
- Regulation. Benefits derived from the regulation of ecosystem processes. For instance, quality of air, climatic and hydrological regulation, erosion control, risk mitigation, disease control (magnitude and frequency), biological control, waste treatment (by filtration and decomposition of organic waste), and pollination are included in this category, among others.
- Support. Ecosystem processes and structures required for the provision of other ecosystem services. Among these are primary production (solar energy), soil formation,

¹³ Millenium Ecosystem Assessment (MEA), **Ecosystems and Human Well-Being**, Synthesis, Washington DC, 2005, Pg.

oxygen production, soil retention, nutrient and water cycles. Some human effects derived from supporting services are indirect, or their occurrence takes very long periods of time. Others are perceived over more immediately.

- Cultural. Non-material benefits obtained from ecosystems, which enable spiritual enrichment and growth, scenic beauty, artistic and intellectual inspiration, cognitive development, reflection, recreation, and esthetic experiences.

Ecosystem services are generally independent from one another, with complex interrelationships. Agriculture, on one hand provides services (production of food, fibres and bio-energy), while regulation services are being lost on the other (water purification, carbon capture and soil maintenance, Power, 2010 en Selva, 2012). Every agricultural, fishing and forest utilization activity as well as all the productive transformations derived from these, require a wide variety of ecosystem services. Among these services we find the genetic diversity maintenance (diversity of species and varieties) which is essential for crops and animal raising; nutrient cycles (nitrogen, phosphorous, etc); biological control of plagues and diseases; water regulation; soil fertility; erosion control and sediment retention; and ecological processes such as pollination and seed dispersal.

Furthermore, agriculture also provides ecosystem services to humans. Although traditionally this activity has been seen as a source of provisioning goods (food, fibres, etc.), recently it has been acknowledged that it also contributes to some other ecosystem services including support, regulation and cultural services (Power 2010 en Selva, 2012). However, the provision of these services highly depends on the way that agricultural systems are managed.

Agriculture is responsible for a large percentage of greenhouse gas (GHG) emissions globally (IPCC, 2001). According to the IDEAM, agriculture in Colombia contributed almost 40% of all emissions during 2010. This percentage is even greater if we consider an additional 14.45% resulting from emissions generated by land use changes and indirect cattle ranching activities (MADS, 2012). Since in most of the cases it is impossible to reduce emission to zero, it is of great importance to adopt practices that help reduce these emissions. Agricultural practices can effectively reduce or compensate for GHG emissions through a variety of mechanisms: a) emission reductions (through environmental management); b) increase of carbon capture and storage (agro forestry and silvopasture schemes); and c) avoiding leaks and displacement of emissions (using residues as sources of energy).

Some agricultural practices help protect the soil structure and microorganism communities, reduce erosion, prevent water runoffs and nutrient leaching, making them available for crops. Conservation tillage techniques as well as the sowing of cover and associated crops, and the use of green fertilizers, helps to fix organic matter in the soil, increases humidity retention and improves nutrient availability for crops (Power, 2010 in Selva, 2012).

Additionally, water availability in agro-ecosystems depends not only on the infiltration and flow, but also on retention of humidity by the soil, which is another type of environmental service. This type of storage is regulated by the vegetation cover, organic matter in the soil and the actions of existing biotic communities (such as bacteria, fungi, earthworms, etc.). Adequate water management can considerably improve the availability of resources for agricultural systems. For example, changing tillage practices and the use of cover crops can reduce evaporation by 35% to 50%. Harvesting rain water, and storing it in adequate conditions will

allow farmers to access water sources during periods of draught, recovering up to 50% of the water that is generally lost in the system (Power, 2010 in Selva 2012).

3. Migratory Species

A good indicator of the health of ecosystems is the rate of migratory species found over a given territory. The conservation of these kinds of species depends on the food provided by ecosystems much larger than those provided by protected areas. Thus, the bond between agro-ecosystems and biodiversity becomes particularly strong in the case of migratory species. Given their capacity to move continental distances, and their unique skills as locators of unevenly distributed resources, migratory species are the first to disappear with radical implementation of mono-crop transformations. The implementation of modern agricultural systems of production should integrate a conservational approach in the discussions of productivity and profit. If the mitigation of impacts produced by current agricultural systems provides for sufficient resources for migratory species to survive, then those systems are better able to provide for the conservation of biodiversity at a sustainable pace. At the same time, those same characteristics of migratory species mentioned above make them the best allies of agriculture. Their particular habits, ranging from arboreal to aquatic, along the varied groups of fauna, provide almost all the ecosystem services defined to date.¹⁴

The rate at which migratory species are threatened, according to IUCN categories, have been documented for approximately five decades. Current data show decreasing population of certain key species, which is a worrisome sign. The health of agro-ecosystems depends on the continuity of environmental services provided by them. Migratory species play a special role in the provision of those services. Their spacious areas of distribution and their varied needs along their life cycles, make them perfect as indicators to measure the impacts of environmental changes at regional, national and hemispheric scales.

¹⁴Ibid.

OVERVIEW OF THE SOCIAL, ECONOMIC AND POLITICAL CONTEXT

A. SOCIAL POLITICAL AND ECONOMIC OUTLOOK

1. Economic Outlook

Significant reforms have been implemented since the beginning of the 1990s, aimed at modernizing the economy and achieving rapid and sustainable growth. Macroeconomic stability has been achieved with prudent fiscal management, inflation targeting and a flexible exchange rate. Together with an improved security situation, the country's substantial resource potential, and its commitment to stability have helped attract foreign direct investment (FDI) and financial capital flows.

Liberalization in the 1990s boosted growth to an average of almost 5% per year in 1992–1995, but in 1999 Colombia was hit by the first economic recession in more than 60 years. The official unemployment rate more than doubled, to over 20% at the end of the decade. Under President Uribe's economic and security policies and favorable international conditions, business and consumer confidence recovered, raising average annual growth to 4.6% in 2003–2005, which led to a fall in the unemployment rate to around 4%. Colombia's GDP increased 5.9% in 2011 compared to the previous year, according to the government statistics agency, DANE. This is the biggest increase since 2007, when the economy grew 6.9%, the highest growth in the prior ten years, and a significant improvement on the decade's lowest growth figure of 1.7% in 2001 and 2009.

According to the Central Bank, Colombia's productive activity showed a moderate growth trend in the second half of 2012, which extended into the first half of 2013, after following a contraction in manufacturing growth and a slowdown in the mining sector. Mining, one of the key sectors, suffered a series of blows in the first half of 2013, ranging from labor strikes to falling international prices. Manufacturing also experienced negative developments, hindered by rising external competition and an overvalued exchange rate.¹⁵ In April 2013, the government introduced a package of countercyclical foreign-exchange, tax and sector-specific policy measures to jump-start the economy that seem to have helped to offset a weaker external environment and volatile consumer confidence. It sped up public spending on a few key projects, particularly a very ambitious housing scheme. The effects of this stimulus have been positive. By the first half of 2013 there was evidence of a positive shift in trend, with aggregate output growing by 3.4% in that period. Colombia is now growing close to its potential rate again, with the latest available data showing a 5.1% year on year GDP growth in the third quarter.¹⁶

Unemployment is at an all-time low and inflation is under control. The central bank's inflation target range for 2013 was between 2% and 4%, with a specific target of 3%, the same as for 2012. As of year-end of 2013, annual inflation stood at 1.94%, below the target range, mainly as

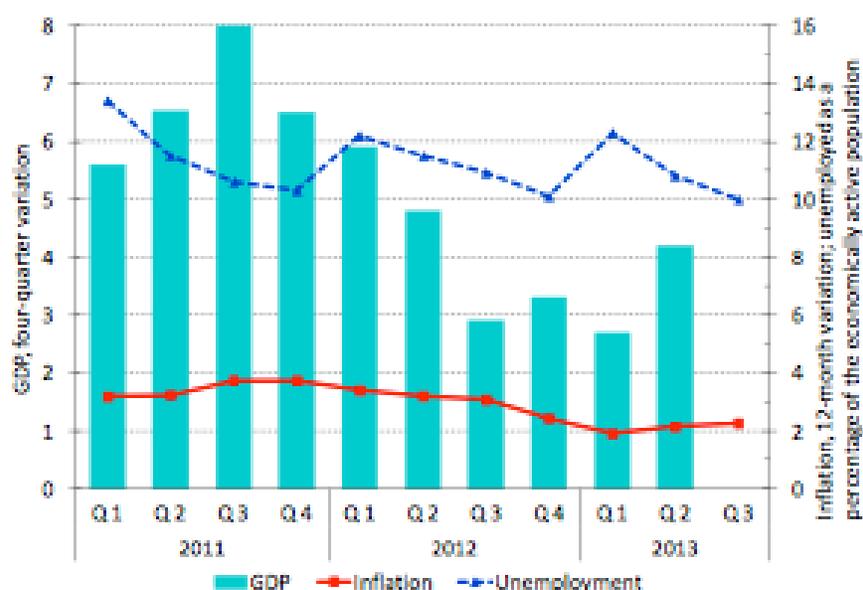
¹⁵Banco de la República, **Informe de la Junta Directiva al Congreso de la República**, Bogotá, Julio de 2013, Pgs. 43-48, available online at: http://www.banrep.gov.co/sites/default/files/publicaciones/archivos/ijd_jul_2013.pdf

¹⁶ECLAC, **Preliminary Overview of the Economies of Latin America and the Caribbean, Colombia**, Santiago, 2013, available online at: <http://www.eclac.cl/publicaciones/xml/1/51821/BPI-Colombia.pdf>

a result of lower variations in food prices caused by the excess in supply of agricultural products after the nationwide strike and other peasant farmer demonstrations in late August and early September. The government has kept the same inflation target range for 2014.

Economic performance has gone hand-in-hand with a reduction in unemployment and growth in wages. The unemployment rate was 9.64% between January and December, down from the previous year (10.38%). This positive performance was partly attributable to the First-Time Employment Act and the tax reform passed in late 2012, which aimed to drive down the costs associated with formal employment, chiefly parafiscal contributions. The recently established Public Employment Service also aims to build on this progress by helping to match labor-market supply to demand. However, the main structural problems remain: high levels of public debt, persistent fiscal imbalances, corruption fuelled by the drugs trade, and high poverty levels.

Figure No. 5 Colombian GDP, Inflation and Unemployment 2011-2013



Source: Economic Commission for Latin America and the Caribbean

Colombia is currently an upper middle-income country and is considered part of the “emerging market economies” group. However, GDP per capita remains well below OECD levels. The per capita GDP grew 4.5% during 2011, reaching US\$ 7,209.2.¹⁷

The government’s economic program focuses on boosting growth and reducing inequality, building on the enhanced security achieved by the previous administration.¹⁸ The task is

¹⁷Colombia’s GDP per capita is comparatively larger than that of Brazil, Venezuela, Argentina, Panama and Uruguay, but lower than that of Chile or Mexico. Brazil: UD\$ 5.609,8; Venezuela: UD\$ 6.010,1; Argentina: UD\$ 6.228,7; Panama: UD\$ 6.600,8; Uruguay: UD\$ 6.967,0; Chile: UD\$ 8.095,7; Mexico: UD\$ 8.312,8 (constant prices 2005). See Economic Commission for Latin America and the Caribbean (ECLAC), **Statistical Yearbook 2012**, available online at: <http://www.cepal.org/publicaciones/xml/2/48862/AnuarioEstadistico2012.pdf>

complicated by the expected resource boom (oil, coal, and potentially gold discoveries) and related large capital inflows that led to an appreciation of the real exchange rate until year-end of 2013 (this trend has began to reverse in the first months of 2014 due to weaker emerging economies exposed to sudden capital flight). Against this background, the Santos administration is emphasizing agriculture, mining and knowledge-intensive services as engines of growth, in which Colombia is considered to have comparative advantages. Prudent fiscal, monetary and financial policies under a flexible exchange rate regime will continue. Fiscal discipline and the challenges of expected higher resource revenues are being supported by the implementation of a fiscal rule that provides mechanisms to deal with the next oil boom, promoting debt sustainability and responsibility in public expenditure.¹⁹

A royalty reform has been passed which distributes part of mining-related revenues to all regions and to innovation.²⁰To increase investment, the government has taken measures to improve conditions for domestic savings and foreign direct investment (FDI). Security improvements and a more stable economy have attracted FDI, which more than doubled in five years from roughly \$6.5 billion in 2006 to more than \$14 billion in 2011, largely in the oil, manufacturing and mining sectors.

Regarding labor market policies, the government has sought to simplify current hiring schemes, tackle unemployment among vulnerable populations, and combat informality with three main programs: Employment in Action “*Empleo en Acción*” which targets the most vulnerable sectors, Youth in Action “*Jóvenes en acción*”, which allows low-skilled workers to access educational programs and training, and Women in Action “*Mujeres en Acción*” which seeks to reduce gender discrimination at the workplace and boost female labor participation.²¹

¹⁸President Juan Manuel Santos took office in August 2010 with strong support in both legislative chambers. His program seeks to build on the achievements of the previous Uribe administration, but shifts the focus from security to equitable growth on five main pillars: infrastructure, housing, agriculture, mining industries, and innovation. The program aims to raise average annual growth above 6% over the next decade, promote job creation and higher labour productivity growth (2%), and increase domestic investment from 23 to 35% of GDP. See Departamento Nacional de Planeación, **Plan Nacional de Desarrollo 2010-2014, Prosperidad para Todos**, DNP, Bogotá, 2010, available online at: <http://www.dnp.gov.co/LinkClick.aspx?fileticket=J7HM rzUQfxY%3d&tabid=1238>

¹⁹Congress approved a structural budget balance rule for the central government in June 2011. The fiscal rule sets a path that lowers the structural deficit to 2.3 percent of GDP by 2014 and provides a ceiling of 1 percent of GDP effective in 2022. The rule allows for fiscal expansion when the expected output growth rate is at least 2 percentage points lower than the long-term rate and creates a sovereign wealth fund. For detailed information on the country’s fiscal policy and fiscal rule See Ministerio de Hacienda y Crédito Público, **Estrategia Económica y Fiscal 2010-2014**, Bogotá, Noviembre de 2010, Pg. 30, available online at:

http://www.irc.gov.co/portal/page/portal/irc/es/infofiscal/EEF201014_0.pdf

²⁰See The Prospect Group, **Interview with Tomás González, Colombian Vice Minister of Energy**, October 2012, available online at: <http://www.theprospectgroup.com/executivefocus/profile/tomas-gonzalez-estrada-vice-minister-of-energy-colombia-22/8986/>

²¹See Organization for Economic Cooperation and Development (OECD), **Colombia Economic Assessment**, Paris, September 2010, Pg. 9, available online at:

<http://www.oecd.org/economy/economicsurveysandcountrysurveillance/46797800.pdf>

2. Poverty

In 2010, the Government of Colombia adopted a pioneering new poverty-reduction strategy, the first national poverty reduction plan to use the Alkire-Foster method for measuring multidimensional poverty.²² Within the country's National Development Plan (2010-2014), the strategy set a goal to reduce the population living in multidimensional poverty from 35% (2008) to 22.5% (2014). Since the launching of this strategy, a 3.1% decrease was observed with national poverty reaching 34.2% in 2011.²³

Overall, Colombia ranked 87 out of 187 on the 2011 Human Development Index (HDI).²⁴ According to the UNDP's measure of poverty, 6.4% of Colombians are vulnerable to poverty, and 1.1% lives in severe poverty. An estimated 2.4% of the population lives without water, 2.6% without adequate sanitation, and 3.6% without modern fuels. The breach of poverty between the population of the 13 main metropolitan areas and the population living outside of main municipalities registered 29 points in 2002 and 33.7 in 2009. This means that the rate at which poverty decreased in rural populations is much lower. Although incidence of poverty decreased from 53.7 percent to 45.5 percent between 2002 and 2009, the absolute number of poor is still high (almost 20 million people) and poverty reduction in Latin America has been more significant than in Colombia.²⁵

Table 4 summarizes an analysis of compliance with the Millennium Development Goals (MDG) in the Human Development Report 2011. There are still significant gaps between the rich and the poor in Colombia, but also between regions, mainly the countryside and the cities.²⁶

²²The Alkire Foster method was developed by the Oxford Poverty & Human Development Initiative of the Department of International Development of the University of Oxford. This new method for measuring multidimensional poverty includes identifying "who is poor" by considering the range of deprivations they suffer, and aggregating that information to reflect societal poverty in a way that is robust and which can be disaggregated. See OPHI, Alkire Foster Method, University of Oxford, available online at: <http://www.ophi.org.uk/research/multidimensional-poverty/alkire-foster-method/>

²³According to this methodology, the Poverty rate in Colombia is 34.1% for the whole country but 46% for the rural population. See Departamento Nacional de Estadística (DANE), **Pobreza Monetaria y Multidimensional en Colombia 2011**, Boletín de Prensa, Bogotá, 2011, Pg. 7, available online at: http://www.dane.gov.co/files/investigaciones/condiciones_vida/pobreza/boletin_pobreza_2011.pdf

²⁴UNDP's Human Development Report introduced the Human Development Index (HDI) in 1990 as an alternative to conventional measures of national development, such as level of income and the rate of economic growth. The HDI represents a push for a broader definition of well-being and provides a composite measure of three basic dimensions of human development: health, education and income. The Human Development Index for Colombia increased from 0.78 in 2000 to 0.84 in 2010. See PNUD, 2011, Op.cit.

²⁵See UNDP 2011, Op.cit.Pg.32

²⁶Ibíd. Pg.33

Table No. 4The MDG by groups of municipalities according to average rurality index

Categories	Number of poor by UBN (Unsatisfied Basic Needs) index.(total)	Average Rate of Basic education coverage.(2009)	Rate of violence against women per 100,000 women.	Children Mortality under 5 years of age per 100,000 born alive 2008.	Institutional Birth attention 2008.	HIV mortality rate per 100,000	Houseolds in qualitative déficit 2005.
Urban Centers	33.4%	74.4%	17.2%	19.4%	91%	3.7%	35.1%
Intermedium Centers	50.1%	58.1%	10.6%	21.1%	85%	1.9%	54.2%
Rural Municipalities	74.7%	27.5%	9%	39%	72.5%	2.6%	61.9%

Source: UNDP, Human Development Report 2011

The Unsatisfied Basic Needs (UBN) indicator for rural municipalities doubles that of urban centers, and is a result of the lack of adequate household income, lack of access to public utilities, low scholarly rates and scant probabilities to generate income from a permanent and dignifying job. There's a general inverse relationship between rurality living and the attainment of Millennium Development Goals in the rural departments of Amazonas, Arauca, Caqueta, Casanare, Choco, Guaviare, La Guajira, Putumayo, Vaupes and Vichada.

The new poverty reduction plan suggests the Colombian government is recognizing, for the first time, the need to attack inequality at the same time as absolute poverty. In previous plans, the term equality appeared to be blacklisted. Now it is an upfront target. Colombia's Gini rating, which measures income inequality, has worsened despite rapid growth (0.545 for 2011), while other Latin American countries have improved.²⁷ Colombia is now one of the most unequal countries in Latin America. Inequality is at the heart of violent conflict and remains the greatest barrier to social cohesion. Progressive policies on wealth redistribution are a far swifter way to reduce poverty than simply relying on economic growth. The prioritization of equality by the Santos administration is, therefore, to be welcomed.

3. Political Outlook

The deep political divisions shaping Colombia's modern development have strong historical roots, emerging shortly after independence from Spain. The political tension between the conservative right and progressive left came to a head in La Violencia (1948-1958), a period during which an estimated 250,000 people died. La Violencia was resolved by the formation of a National Front in which the two main political parties, the Liberal and Conservative Parties, agreed to rotate the presidency and share cabinet positions, which continued until 1974.

²⁷ECLAC, 2012, Op.cit., Pg. 70

During the 1960s, several guerrilla groups emerged, due to continued social, economic and political problems, including the Fuerzas Armadas Revolucionarias de Colombia (FARC), the now demobilised M-19, the Ejército Nacional de Liberación (ELN), the Ejército Popular de Liberación (EPL) and the indigenous-based group Quintin Lame. The FARC and the smaller ELN emerged as the major guerrilla groups, both of which have largely lost their ideological struggle, and now kidnap for ransom, commit serious human rights violations, and carry out terrorist activities.

Drug trafficking has helped to perpetuate Colombia's conflict by providing earnings to both left- and right-wing armed groups. Right-wing paramilitary groups, coordinated by the United Self-Defense Forces of Colombia (AUC), which disbanded in 2006 after most of their members demobilized, were accused of gross human rights abuses and collusion with the Colombian Armed Forces in their fight against the FARC and ELN. Since 1985, nearly 7 million hectares, 12.9 percent of Colombia's agricultural land, have been seized illegally through a combination of forced displacement and extortion. What's more, the FARC is not the worst offender. Most of the theft in Colombia was perpetrated by the rebels' enemy, the right wing paramilitaries. All three groups (the FARC, ELN, and AUC) were designated Foreign Terrorist Organizations by the U.S. government in the late 1990's.

In February 2002, a three-year peace process in Colombia came to an end with President Andrés Pastrana's decision to retake the demilitarized zone ceded to rebel forces in 1998 as a safe haven for peace talks. With this decision, Colombia returned to full-scale armed conflict, continuing a decades-long cycle of violence. With the end of the peace talks, both the Clinton and the Bush administrations provided substantial military aid to Colombia consisting of assistance to the Colombian military and police forces to halt the drug trade. Between 2000 and 2012, the U.S. Congress appropriated more than \$8 billion in assistance to carry out Plan Colombia and its follow-on strategies. It fostered progress in reestablishing government control over much of its territory, reducing drug trafficking and terrorist activities, and reducing poverty.

Violent crime and kidnappings, while still high, reduced significantly under President Uribe, who won the 2002 elections. Under the "law on peace and justice", negotiations with the main right-wing paramilitary groups led to over 40,000 paramilitaries demobilizing and giving up their arms, although some right wing groups consolidated their membership and continue to be involved in organized crime. New illegally armed groups, including criminal bands, some of which include re-armed paramilitaries, are now a significant challenge in cities and towns.

Under Uribe, FARC control the Colombian countryside diminished. A 2008 raid by elite Colombian troops released 15 more long-term hostages, including the former Senator, Ingrid Betancourt, and three American contractors. The raid was a significant blow to the FARC, as Betancourt and the U.S. hostages were a powerful bargaining tool. In the same year, FARC leader Manuel Marulanda died from a heart attack and a controversial incursion into Ecuador by Colombian forces resulted in the death of senior FARC figure Raul Reyes.

Following the March 2010 congressional election, the U Party (*Partido de la U*), Conservative Party, Liberal Party and *Cambio Radical* voted with the government. The *Partido de Integración Nacional* (PIN) on the far-right, the Green Party (*Partido Verde*) was independent and the *Polo Democrático Alternativo* representing the left. The historical dominance of the main traditional parties, the Liberal Party and the Conservative Party, has been fading since the early 2000s, and the Partido de La U became the majority political force after the March 2010 legislative

elections. President, Juan Manuel Santos, began his four-year mandate in August 2010, after his broad "National Unity" coalition gave him almost 90% of the votes in the bicameral Congress (legislature), which consists of a 166-member Chamber of Representatives (the lower house) and a 102-member Senate (the upper house).

The coalition has displayed significant discipline, voting according to the executive's plans. This reflects President Santos's abilities as a negotiator and power-broker. The coalition is likely to remain in place until the May 2014 presidential election, but parties will run independently at the March 2014 legislative poll. The leftist *Polo Democrático Alternativo* (PDA)—which has been weakened by significant defeats in the October 2011 regional election and corruption cases involving its leadership—is the only opposition to the Santos government in the legislature.

President Juan Manuel Santos has generally enjoyed widespread approval for his handling of the economy, international relations and the fight against corruption and insurgency. While Santos has maintained his predecessor's (Uribe) tough stance on security and strong ties with the U.S., he has also focused on an agenda of social and economic reform. Negotiations for an end to the 50-year conflict with the FARC guerrilla group have been the key domestic agenda in the second half of the government's term.

Peace talks between the FARC and the Colombian government commenced in Havana, Cuba, in November 2012. The negotiations focus on five agenda items: agrarian reform (including access to land); political participation for FARC members; drug trafficking; reparation for victims of the conflict; and the logistics of ending the armed conflict. The government and the FARC announced in May 2013 that an agreement had been reached on agrarian reform, which included a land fund to redistribute illegally held or underused land to displaced people. Negotiations continue, with varying degrees of optimism on a successful outcome.

B. PARTICIPATION IN INTERNATIONAL TREATIES AFFECTING FORESTS AND BIODIVERSITY

The issue of the environment is important for Colombia's foreign policy. Since the Summit of Rio de Janeiro in 1992, Colombia's international position in this field has become progressively stronger. Colombia has played an important role in international negotiations in the environmental field, and has made significant advancements in demonstrating to the international community that it has a clear commitment to the preservation and protection of the environment, including renewable and non-renewable natural resources. While the country values the state's sovereignty in the definition of priorities, it also supports the principle of common but differentiated responsibility, as a guiding principle in environmental international commitments.

Colombia is a party to over 100 international treaties on environmental and trade related issues that in some way or another deal with biodiversity. Below follows a brief explanation of some of the most relevant international treaties for the conservation of forests and biodiversity to which Colombia is a party. For a full list of these treaties, please see Annex No. 4.

1. Convention on International Trade on Endangered Species(CITES)

CITES is an intergovernmental agreement with the aim of ensuring that international trade in species of wild animals and plants does not threaten their survival. Under CITES, species are

listed in Appendices according to their conservation status. In addition, listed species must meet the test that trade is at least in part contributing to their decline. Appendix I species, for which there is no international trade permitted, are "threatened with extinction." Appendix II species are "not necessarily threatened with extinction," but may become so unless trade is strictly regulated. Regulation usually consists of a requirement for documentation from the country of export, monitoring of imports and, in some cases, export quotas. Imports from countries which are not CITES members still require what is called "CITES-equivalent documentation." Appendix III includes all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the cooperation of other Parties in the control of trade.

Colombia's participation in CITES provides for international cooperation for the protection of certain species of wild fauna and flora against over-exploitation through international trade. Colombia ratified the convention and entered into national legislation under Law 17 of 1981.

2. International Tropical Timber Agreement (ITTA)

The International Tropical Timber Agreement (ITTA) was drafted to ensure that by the year 2000 exports of tropical timber originated from sustainably managed sources and to establish a fund to assist tropical timber producers to reach this objective. International Tropical Timber Organization (ITTO) operates under this treaty, which entered into force on 7 December 2011, superseding the ITTA of 1994. Colombia ratified the ITTA in 1989 and again in 2013.

3. Convention on Biological Diversity (CBD)

The CBD is a global agreement on the conservation, sustainable use and equitable benefit sharing of biological diversity that seeks to conserve biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of the genetic resources. It was created and adopted by governments at the 1992 Earth Summit in Rio de Janeiro, when world leaders agreed on a comprehensive strategy for "sustainable development" to meet current needs while ensuring a living planet for future generations. The CBD sets out commitments for maintaining the world's biodiversity. Colombia ratified the convention through Law 165 of 1994.

4. United Nations Framework Convention on Climate Change (UNFCCC)

In 1992, a group of countries joined the UNFCCC to consider how to limit global temperature increases, the resulting climate change, and to cope with its negative impacts. By 1995, member countries launched negotiations to strengthen the global response to climate change, and, two years later, adopted the Kyoto Protocol, which legally binds developed countries to emission reduction targets. The Protocol's first commitment period started in 2008 and ended in 2012. The second commitment period began on 1 January 2013 and will end in 2020.

Parties to the Convention must submit national reports on implementation of the Convention. Colombia ratified the UNFCCC through Law 164 of 1994.

5. Convention on Wetlands of International Importance (RAMSAR)

RAMSAR is the only global environmental wetlands treaty. It provides the framework for national action and international cooperation for the conservation and wise use of wetlands and

their resources. Colombia ratified the Ramsar Convention through Law 357 of 1997 and has five sites designated as wetlands of international importance, with a surface area of 458,525 has.

C. INSTITUTIONS, POLICIES AND LAWS AFFECTING CONSERVATION

1. Legal Framework

The Code of Natural Resources (Law 2811 of 1974), provides for the value of natural resources from a sustainable development perspective. It regulated atmosphere and airspace resources, water, soil, terrestrial flora and fauna, and hydrologic resources, but it did so in a fragmented manner and didn't provide for the management and protection of ecosystems. It was not until the 1991 Political Constitution and Law 99 of 1993 were enacted that environmental governance in Colombia gained impetus. The agreements and commitments of the 1992 Rio de Janeiro Summit on Environment and Development, created a new institutional framework for the Colombian environmental sector. The National Environmental System (SINA) emerged as a set of norms, guidelines, activities, programs and institutions that allow for the implementation of the general environmental principles contained in the new Constitution.

With a new system of Protected Areas in place and the political will of the Colombian government of the early 1980s, the country sought a new paradigm for conservation based on indigenous knowledge.²⁸ In 1989, President Virgilio Barco recognized ownership of indigenous communities over 30% of the Colombian Amazon and other territories. Such policy was implemented based on the precepts that indigenous lands are guarantees that the territory of indigenous peoples and Afro-Colombians is non-transferable, and remains permanently as collective property.

The recognition of indigenous ownership of land and resources rested in the spirit of a multi-cultural nation. The Political Constitution of 1991 provided not only for territorial rights but also for indigenous autonomous governance within the Government's political administrative structure.²⁹ The 1991 Constitution recognized Colombia's "*pluri-ethnicity*" and "*multi-culturality*", characteristics closely linked with the country's "*mega-diversity*". Such recognition reinforced the successful protection of forest ecosystems and natural resources achieved by indigenous peoples through their traditional knowledge. As a result, Colombia's pioneering legislation on Indigenous rights and the management of traditional lands is currently considered one of the most advanced in Latin America.

²⁸ "Over thirty years ago, there was a marked division between biology and anthropology. Fortunately, today it is recognized that the loss of cultures is closely related to the loss of species". Davis, Wade, *Los Buscadores de Camino*, in Arias, Eduardo, **Año Internacional de la Biodiversidad, Retos y Oportunidades Hacia el 2020**, IAvH, Ecopetrol, Bogotá, 2011, Pg. 25

²⁹ Brackelaire, Vincent y von Hildebrand, Martín, **Guardianes de la Selva, Gobernabilidad y autonomía en la Amazonía colombiana**, Fundación Gaia Amazonas, Bogotá, 2012, Pgs. 11-17

Article 79 of the 1991 Constitution provided for the right to have a healthy environment. The Constitution states that property has a social and ecological function (article 58) and that the State has the duty to prevent and control the factors of environmental deterioration, impose sanctions and require the reparation of damage to the environment (article 80). Article 333 incorporates the possibility of limiting economic activities if required by social interest, the environment and the cultural heritage of the nation. The Constitution recognizes Afro-Colombians and indigenous peoples' right to free, prior and informed consent (FPIC) before the implementation or approval of any legislation, administrative measures, public policy or economic/infrastructure projects that would potentially affect them.

Law 99 of 1993, created the Ministry of Environment, placing it in charge of environmental management and conservation and created the National Environmental System (SINA) and required planning of environmental management projects, which became subject to environmental licensing procedures as pre-requisite for implementation.

Law 388 of 1997, required municipal and district authorities to prepare territorial ordering plans. Law 1333 of 2009 established procedures for environmental sanctions. Decree 2370 of 2009 provided for planning tools to be used by research institutes under the Ministry of Environment. Decree 2372 of 2010, regulated previous laws (Law 2811 of 1974, Law 99 of 1993, Law 165 of 1994, and Law 216 of 2003) on the National System of Protected Areas and its management categories. Law 1444 replaced the previous Ministry of Environment, Housing and Territorial Development with the new Ministry of Environment and Sustainable Development. Law 1450 of 2011 approved the country's National Development Plan 2010-2014; while Decree 3570 modified the objectives and structure of the Ministry of Environment and Sustainable Development. Decree 3572 of 2011 created a Special Administrative Unit for the National Natural Parks System. Decree 3573 of 2011 created the national Environmental Licenses Authority (ANLA).

Colombia's environmental policies were then faced with new challenges to biodiversity and people's wellbeing from global changes. Today, climate change has been included in the policy agenda; and environmental issues have been included in agriculture, water and victims programs. A mining boom sparked intense debate on the related environmental risks.

The Government is working to develop transitional legislation, including minimum requirements to develop REDD+ activities in the country; the obligation to conduct a national registry, including voluntary projects to avoid double counting; and regulation for prior consultation for REDD+ activities. IDEAM now has a platform to register projects, but is still under development and is a voluntary process.

Several resolutions enacted in the 2000s have been adopted by the Ministry of Environment to complement the implementation of Law 99. There are currently a number of regulations regarding soil, protected areas, water, mining and agriculture. Although those legal instruments have not sufficed to effectively protect and conserve various important ecosystems, such as Paramo, currently under threat, a deficient legal regime in the protection of areas of ecological importance has not been the main problem. The absence of effective compliance and enforcement mechanisms to ensure successful implementation has instead been the most important issue to solve in Colombia. Effective law implementation and enforcement depends largely on the actions of national, regional and local environmental authorities to apply norms when making decisions and designing plans for key ecosystems and conservation.

2. National Policies

In 1994, CONPES Document No. 2750 provided the first attempt to include sustainable use of forests, conservation and sustainable economic development in a national policy. CONPES Policy Document No. 2834 (1996) produced the country's first forestry policy. The National Biodiversity Policy (1996) promoted conservation, knowledge and sustainable use of biodiversity, and the fair and equitable distribution of benefits derived from the use of knowledge, innovation and practices associated with the scientific, industrial and local communities.

The Environmental Management of Wild Fauna Policy (1997) generated the conditions for sustainable use, conservation of biodiversity, promotion of alternatives to traditional socio-economic development, and sought to conserve natural populations and ecosystems.

The National Environmental Policy for the development of maritime, coastal and in-land areas of Colombia (CONPES Document No. 3164 of 2002) promotes the sustainable development of seas, coastlines and continental areas, by integrating management activities. It seeks to improve quality of life for Colombians, and promote a harmonious inter-operation between productive activities and conservation activities in the country's ecosystems.

A National Policy for Inland Wetlands (2001) promotes the conservation and rational use of these special ecosystems by obtaining and maintaining ecological, economic and socio-cultural benefits from such ecosystems.

An Urban Environmental Management Policy (2008) established guidelines for sustainable management of urban areas by defining the roles and scope of various actors involved in urban environmental sustainability and harmonizing management and sectoral policies. It strengthened areas for citizens' participation and inter-institutional coordination by acknowledging regional diversity and differences between types of urban areas.

CONPES No. 3582 of 2009 established the National Policy for the Promotion of Research and Innovation, which facilitates biodiversity knowledge as an instrument for development to promote growth and reduce inequality through sustainable use.

The National policy for Integral Management of Water Resources (2009) promoted the sustainability of water resources by promoting efficient and effective use and distribution and acknowledging territorial ordering key for conserving the ecosystems that regulate water.

CONPES Policy Document No. 3680 of 2010 provided guidelines to advance SINA consolidation, established the National Environmental Council to coordinate inter-sectoral policies, plans and programs for environmental protection and management of natural resources and to advise the GOC on the formulation of environmental policies.

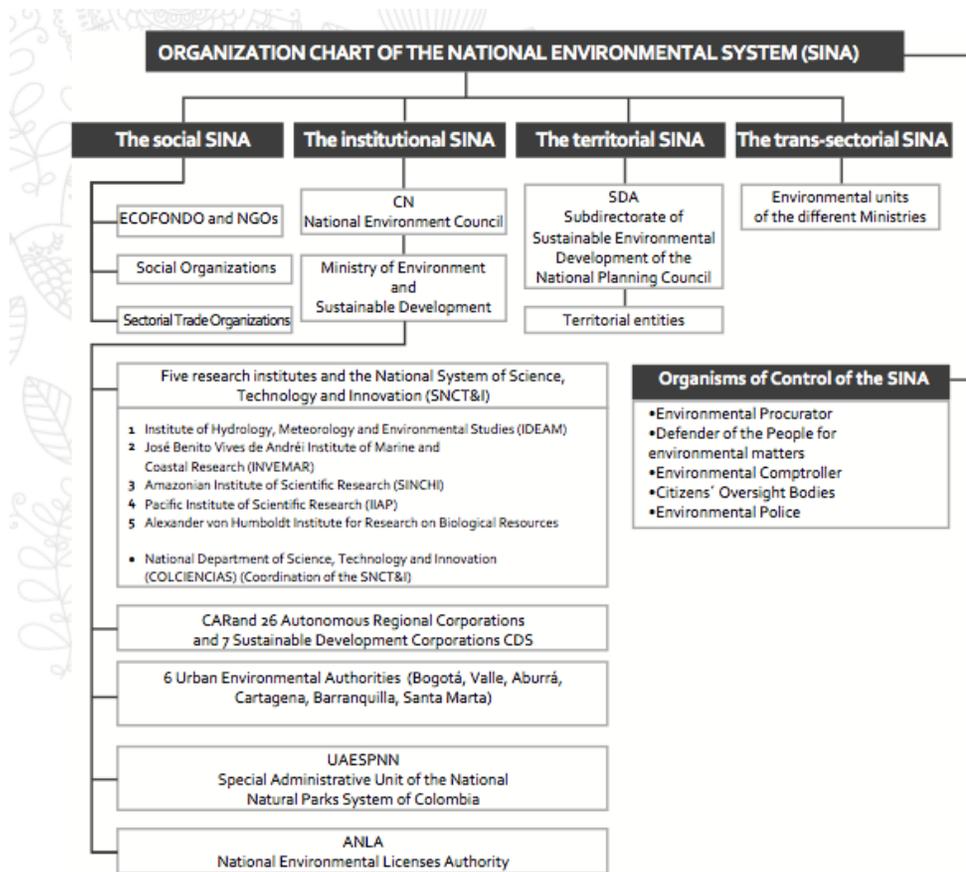
The Policy for Sustainable Production and Consumption (2010) strives to change Colombian production and consumption patterns to improve business competitiveness and social welfare.

The 2011 Climate Change Policy (through CONPES document 3700, not yet implemented), acknowledges climate change in Colombia as an economic and social development problem, and seeks to encourage the regions and territorial authorities to integrate climate change into their

planning processes.³⁰ It creates the a National Climate Change System (NCCS) to promote the inclusion of climate variables in the decision-making processes of authorities, sectors and territories to reduce the country's vulnerability and contribute to future sustainable development through inter-sectoral articulation mechanisms. Their collective mission is to communicate and fund climate change initiatives.

Figure No. 6 Structure of the National Environmental System (SINA)

³⁰According to CONPES Document 3700, the current colombian institutional framework is not capable of facing the challenges and taking advantage of the opportunities posed by climate change, in a way that links productive sectors with regional authorities and local communities. Consejo Nacional de Política Económica y Social (CONPES), **Estrategia Nacional para la Articulación de Políticas y Acciones en Materia de Cambio Climático**, Documento de Política No. 3700, Departamento Nacional de Planeación, Bogotá, Julio de 2011, pág. 23, <http://www.dnp.gov.co/LinkClick.aspx?fileticket=2yrDLdRTUKY%3D&tabid=1260>.



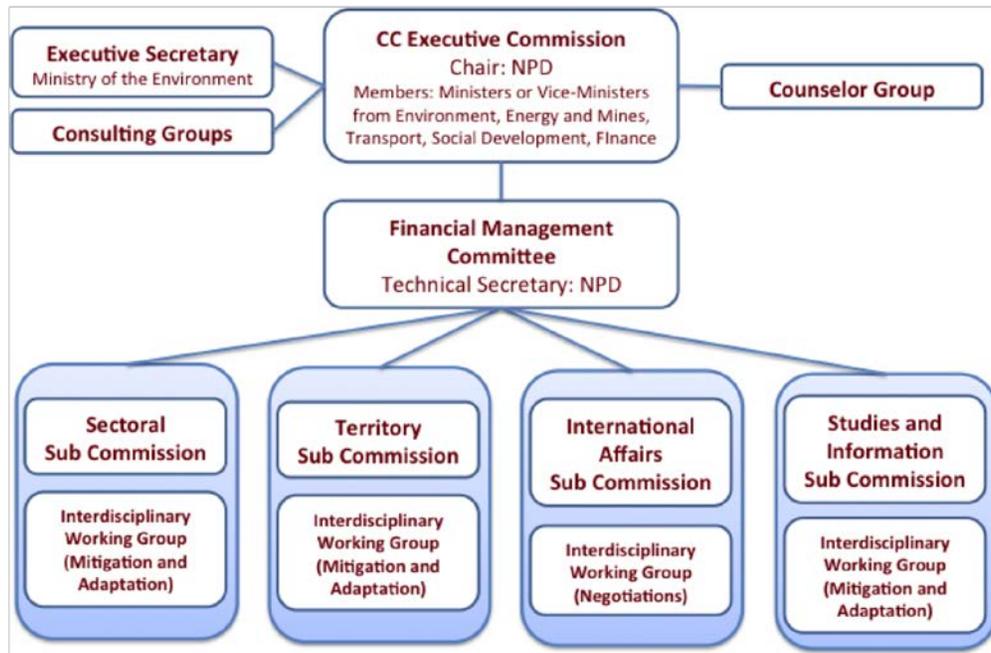
Source: Ministry of Environment and Sustainable Development, National Policy for the Integral Management of Biodiversity and its Ecosystem Services, MADS, 2012

As depicted in Figure 7, NCCS consists of an executive climate change commission that will coordinate 10 ministries under the leadership of the National Planning Department.³¹ NCCS will coordinate 10 ministries at the political level, with an Executive Committee composed of all ministers. The system is based on sub-commissions focusing on sectoral, territorial (which includes local government), and international issues, as well as information management. Non-governmental actors (civil society and academia) will be involved through advisory groups.³²

Figure No. 7 National Climate Change System

³¹The commission will be integrated by the Ministers or Viceministers of agriculture, mines and energy, transportation, social protection, foreign relations, environment and sustainable development, household and territory, finance and public credit; the director of risk management; the coordinator of the Disaster Risk Prevention and Attention System; and the subdirector of the National Planning Department, who will preside. The consulting group will be integrated by the directors of research institutes linked with the ministries of environment, social protection, and Agriculture; the director of Colciencias, the director of the National Parks Unit, the director of DANE; and economic associations, industrialists, scholars, the civil society, the communities, ethnic minorities and environmental protection organizations.

³² Ibid.



Source: CONPES 3700

The NCCS will be integrated with the National System for Disaster Risk Prevention and Attention, through the risk management directorate; with the National Climate Change Adaptation Plan; the Colombian Low-Carbon Development Strategy; the National Strategy for Reduction of Emissions from Deforestation and Degradation (REDD+); and the Strategy for Financial Protection Against Disasters. The various sub commissions will contain working groups to provide for inclusion of climate change issues within public decision-making and regulations of all sectors at different territorial levels. Mitigation and adaptation strategies will be developed within the sectoral and territorial policy instruments. The Territory Sub-commission will coordinate regional participation through the climate change regional nodes, the development of territorial adaptation plans, and the REDD group. The Sectoral Sub-commission will produce sectoral adaptation plans and coordinate the Colombian Low Carbon Development Strategy (LCDS).

3. National Programs

Between 2001-2006, several national programs for the conservation of species were implemented (*Tremarctos omatus*, *Genus Tapirus*, *Crocodylus intermedius*, marine and continental turtles “totuga icotea”, the Andean condor, sharks, sting-rays, the ghost shark and the grey Titi monkey). In 2002, the Program for the Sustainable Management, Use, and Conservation of Mangrove ecosystems undertook actions towards sustainability in this strategic ecosystem. By securing direct participation of communities linked to mangrove forests, this program regards them as spaces for livelihoods, conservation and restoration. The program also aims to develop alternative production systems for mangrove ecosystems, ones that are socially, economically, and ecologically sound. The Program for Sustainable Management of the

Colombian Highland Ecosystems was also implemented in 2002. Such program guides environmental management of high-mountain ecosystems “paramo” at the national, regional and local levels. It provides for sustainable management and restoration through knowledge sharing on the structure, and functions of “paramo” ecosystems, its ecological restoration requirements, its hydrological potentialities, environmental planning requirements, sustainable use, and direct participation of communities associated with such ecosystems.

4. National Plans

The National Plan for Forestry Development was promulgated in 2000, to establish a strategic framework for incorporating the forestry sector into national development. The Plan promoted competitiveness of timber and non-timber forest product categories in national and international markets. In 2002, a National Plan for the Prevention of Forest Fires and Restoration of Affected Areas was promulgated. This plan established guidelines for the prevention and control of forest fires and restoration of affected areas. It sought to mitigate the impacts of forest fires by strengthening national, regional and local organizations with the promotion of short, medium, and long-term programs.

The 2004 Action Plan for the National Campaign Against Desertification and Drought, promoted actions against land degradation and desertification. The plan also promoted sustainable management of dry ecosystems with practical measures for prevention, and reversal of degrading processes. In 2005, various Regional Biodiversity Action Plans were implemented for the Orinoco and Southern Amazon basins, and for the Valle del Cauca, Quindio, Nariño, Norte de Santander and Sucre regions. Finally, in 2009, a National Plan for Migratory Species was implemented, promoting actions for the conservation and sustainable management of Colombia’s migratory species.

5. National Strategies

The National Strategy for the Prevention and Control of Illegal Trafficking of Wild Species was promulgated in 2002. It was aimed at identifying, prioritizing, guiding, coordinating and carrying out actions to reduce illegal trafficking of wild species. It also aims at the creation of sustainable productive alternatives to illegal trafficking, based on effective links between institutions and other actors directly or indirectly involved in environmental degradation and damage. This strategy was followed by a National Strategy for the Prevention and Control of Illegal Trafficking in wild sloth species, promulgated in 2008. It identified, prioritized, articulated and carried out actions to reduce this sort of illegal activity, and sought legal alternatives.

The 2010 National Strategy for the Prevention, Control and Monitoring of Forestry Activities articulated legal, financial, administrative and operational components of the processes of prevention, control and surveillance of timber use, transport, transformation and commercialization. It coordinated management among environmental authorities and promoted active participation of various actors in the productive forestry chain.

6. The National Development Plan 2010-2014

Colombia's National Development Plan is the framework for government policies and the Government roadmap to which it is held accountable before Congress and citizens. This Plan is

the result of consultations with civil society through the National Planning Council. The current NDP (2010-2014), entitled “Prosperity for All”, sets forth the national purposes and objectives for the country’s economic, social and environmental policies.

On biodiversity, the NDP 2010-2014 promotes actions to strengthen the protection and renewal of biodiversity and ecosystem services, deal with the risks of biodiversity and ecosystem services loss, and strengthen the sustainable use of biodiversity for improved competitiveness and economic growth.

The NDP 2010-2014 established 7 goals on biodiversity and ecosystem services. These are: 1) to regulate and delimit a total of 27,097,828 hectares of forest reserves (Law 2 of 1959); 2) to update the map of continental, coastal and maritime ecosystems; 3) to regulate and delimit 15,000,000 hectares of forest areas adopted by administrative decisions; 4) to delimit 1,186,343 hectares of “paramo” ecosystems at a scale of 1:25,000 (from a 1:250,000 scale available in 2010); 5) to formulate a national policy for hydro-biologic resources; 6) to restore or rehabilitate 90,000 hectares for protection purposes; and 7) to incorporate 3,000,000 hectares of new areas into the National System of Protected Areas.

The NDP 2010-2014 also has the following goals on environmental management of water resources: adopt an updated plan to regulate the use of 220 municipalities affected by floods during the previous rainy season; adopt strategic plans for the country’s five major basins; and regulate the use and management plans under the new legal framework for basin regulations.

On environmental, sectoral and urban management, the NDP 2010-2014 promotes a reduction of national energy consumption/GDP ratio (energy intensity); a reduction of mercury use in mining processes (in five projects identified by the Ministry of Housing, City and Territory); the application of environmental licensing requirements on projects, civil works or activities under the jurisdiction of the Ministry of the Environment; the joint-implementation of sectoral environmental action plans with the Ministries of Transportation, Agriculture and Rural Development, Housing, City and Territory, Mines and Energy; and the prioritization of a number of gold mining areas for the control of illegal mining. The NDP also established various environmental offices in the Ministries of Housing, City and Territory, Transportation, Agriculture and Urban Development, Mines and Energy. Additional measures contemplate compliance mechanisms for air quality standards; the promotion of a vehicle fleet with technologies suitable for the current available fuels; environmental assessments for prioritized economic sectors (housing, infrastructure, agriculture and mining); and establishing a Colombian technical standard for obtaining a sustainable construction environmental seal.

Finally, the NDP 2010-2014 promoted four strategies to face the impacts of climate change: cope with climate change adaptation with a National Climate Change Adaptation Plan; provide GHG mitigation alternatives with the Colombian Low Carbon Development Strategy; contribute to forest conservation with the National Reduction of Emissions from Deforestation and Degradation REDD+ Strategy; and contribute with tools to face extreme weather events with the Strategy of Financial Protection Against Disasters.

a. The National Climate Change Adaptation Plan (NCCAP)

Colombia's NCCAP has the following strategic lines of action: 1) to increase awareness of climate change; incorporate climate change adaptation into school curricula, socialize the conceptual framework in sectors and territories and develop a communications strategy for the NCCAP; 2) to generate information and knowledge for risk measurement; 3) to plan the use of territory; 4) to implement specific adaptation projects; and 5) to strengthen the capacity to react.

The NCCAP agenda is programmed for the period 2012-2014. Currently the conceptual and methodological phases are being developed with the objective to produce methodological input and guidelines for climate change adaptation, including the following issues:

- ABC: Adaptation Conceptual Basis (document finished and socialized)
- Inputs for the formulation of roadmaps
- Methodology to prioritize identified adaptation measures
- Guidelines to incorporate climate change in Territorial Planning
- Protocols to measure climate risk
- CONPES on methodology for adaptation plans

The National Planning Department (NPD) has finished and published the plan's conceptual basis for adaptation. The subsequent phases of the NCCAP consist of a follow-up plan; the implementation of measures; and activities on monitoring, reporting and verification.

The NPD is producing roadmaps and methodologies to prioritize adaptation measures, guidelines to incorporate climate change into territorial planning and protocols to measures climate risks.

b. The Colombian Low Carbon Development Strategy (CLCDS)

The Colombian Low-Carbon Development Strategy is a long-term initiative currently under construction that seeks to identify potential GHG mitigation alternatives, measures and appropriate projects from the various sectors without affecting the long-term growth trend of the Colombian economy. It has the following structure:

- Identify and formulate low-carbon development alternatives: a) construction of future emission scenarios; b) identification and prioritization of mitigation alternatives; c) construction of abatement cost curves.
- Design and implement policies, plans and measures: a) formulation of sectoral action plans; b) design low-carbon policies and measures; c) implementation of National Appropriate Mitigation Actions (NAMAs).
- Design and construction of a monitoring, verification and reporting system: a) institutional arrangements; b) development of methodologies and construction of a platform for monitoring, verification and report of mitigation actions.
- Capacity building: a) capacity building and institutional strengthening for the public and private sectors; b) training, outreach and technology transfer.
- Platform for communication and cooperation: a) Program for communication of results and knowledge outreach; b) platform for international cooperation.

The CLCDS is currently developing its first component consisting of building marginal abatement cost curves for the transportation, waste, mining, energy and agricultural sectors. It is framed under the institutional arrangements provided by CONPES 3700, which provides for

high-level commitments from sectoral authorities. The Ministry of Environment and Sustainable Development has provided for direct links with other ministries for the design of sectoral mitigation strategies. It also counts with technical and financial support from various sources: national government, USA (LEDS), Germany (GIZ, WRI), EU-UNDP, MAPS, CCAP, Partnership for Market Readiness, IADB, World Bank.

c. The Strategy for Financial Protection Against Disasters

Colombia has been one of the countries most affected by extreme events and disasters. In the aftermath of the latest La Niña event, natural disaster risk management moved to the top on the Colombian political agenda. Through the development of plans from previous administrations (2006-2010 and 2010-2014), the reduction of the fiscal vulnerability of the state has been considered to involve risk retention and transference mechanisms.

Law 1450 of 2011, which approved the latest development plan, assigned the Ministry of Finance to design a strategy for natural disaster risk prevention and insurance.³³ This strategy is aligned with the national policy on disaster risk management and the National System for Disaster Risk Prevention, according to Law 1523 of April 2012 and the National Disaster Risk Prevention Fund. Likewise, the strategy is aligned with the National Disaster Risk Management Unit under the Presidency's Administrative Department, created by the Decree 4147 of 2012.

The strategy seeks to increase the financial response capacity of the Colombian government in the aftermath of natural disasters, while protecting its long-term fiscal balance. Various aspects of emergency financing are analyzed, including the types of instruments available, their relative costs and disbursement speeds, and how these can be combined to provide cost-effective financing for the different phases that follow a disaster. The government is better served by retaining most of its natural disaster risk while using risk transfer mechanisms to manage the excess volatility of the budgets or access immediate liquidity after a disaster. The risk retention and transference instruments allow the State to obtain maximum coverage at a minimum cost.

d. The National Strategy for the Reduction of Emissions from Deforestation and Degradation (ENREDD+)

The implementation of a national strategy to develop REDD+ mechanisms requires broad participation of institutions, productive sectors and local actors. Due to the nature of deforestation causes in the country, its control cannot be left to political decisions, environmental programs, or coordination with other sectoral plans. An inter-institutional and inter-sectoral system is required to implement policies, plans and programs aimed at reducing deforestation and maintaining ecosystem integrity to guarantee environmental services.³⁴

³³Ministerio de Hacienda y Crédito Público, **Estrategia Financiera para disminuir la vulnerabilidad fiscal del estado ante la ocurrencia de un desastre natural**, Bogotá, 2012.

³⁴ Ministerio de Ambiente y Desarrollo Sostenible, **Preparación de la Estrategia Nacional de Reducción de Emisiones por Degradación y Deforestación ENREDD**, Bogotá, Junio de 2012, disponible online en: http://www.minambiente.gov.co/documentos/DocumentosGestion/cambio_climatico/reed/documentos_interes/250712_folleto_02_redd.pdf

For the preparation of ENREDD+ a Preparation Proposal Report (R-PP) has been designed. It consists of a roadmap to avoid forest degradation, conserve forest carbon sinks, provide sustainable management of woods and improve forest carbon inventories. The strategy indicates the activities that can be performed and provides guidelines on how to implement such activities and the resources required. It describes the social, economic and environmental factors related to forests and climate change. It aims to prepare for future REDD+ mechanisms and reflects contributions of several groups of actors involved in the national REDD+ strategy.

To prepare the R-PP, an early dialogue was conducted between 2010 and September 2011 through 20 events including 280 organizations, and 700 people from indigenous, afro-Colombian, peasant, NGO, and productive sectors; regional authorities, ministries and the ombudsman office. ENREDD+ is part of the climate change actions of the National Development Plan 2010-2014. For its preparation, several actions are being sought through the Cooperative Fund for Carbon in Forests (FCPF), the United Nations REDD+ program, international and national cooperation. In October 2011, the Government of Colombia presented the proposal for REDD+ preparation to the FCPF. The fund authorized a US\$3.6 million dollar grant to support REDD+ preparedness. The World Bank will be the executing partner of the FCPF in Colombia. The grant agreement is awaiting formal signature.

With the objective of improved coherence, the strategy is expected to remain aligned with the National Development Plan 2010-2014; the National Plan for Forest Development; and the National Biodiversity and Ecosystem Services Policy (PNGIBSE).

7. The Policy for Integral Management of Biodiversity and Ecosystem Services (PNGIBSE)

The Colombian "*Política Nacional para la Gestión Integral de la Biodiversidad y sus Servicios Ecosistémicos (PNGIBSE)*", launched on 28 July 2012, promotes a new way of addressing biodiversity in the country, oriented to integrated management of biodiversity and the ecosystem services it provides, with the view to maintaining and increasing the resilience of socio-ecological systems at the national, regional, local and trans-boundary levels. The policy is considered fundamental to national development processes and serves as the strategic and conceptual framework for all existing and future environmental instruments related to biodiversity as well as the basis for inter-sectoral coordination of activities.

The PNGIBSE provides for the basis for preservation of natural resources and ecosystems. By 2050, the policy aims to achieve a society where biodiversity is valued, preserved, restored and wisely used. The policy maintains and improves the resilience of socio-ecological systems. It also provides guidance on the sustainable use and occupation of national, regional and local territory through concerted action between the state, industry and civil society.

In August 2012, the Ministry of Environment and Sustainable Development launched the Compensation Scheme for the Loss of Biodiversity with the technical support of The Nature Conservancy (TNC), the World Bank, World Wildlife Fund (WWF) and Conservation International (CI).” The scheme outlines rules to operators in a wide range of sectors (mining, hydrocarbons, infrastructure, utilities and maritime) on how they should redress their impact on biodiversity where it cannot be avoided. The rules enhance protection mechanisms for national parks and promote the reparation of affected ecosystems.

D. THE NATIONAL PROTECTED AREAS SYSTEM

Protected areas constitute one of the main tools for biodiversity conservation. They contribute to the conservation of species and the preservation of key ecosystem processes crucial for the survival of all living beings, including humans and their productive systems.³⁵ Over the past 20 years, the region has expanded the coverage of protected areas, while setting financial mechanisms to support them, doubling the terrestrial area under protected areas.³⁶ Nevertheless, regional governments allocate to protected areas just 1 percent of national environmental budgets, which amounts to approximately \$1.18 per hectare of protected area.³⁷

In Colombia, protected areas of various categories (including 51 national natural parks) account for 21 percent of Colombia's territory and 16 percent of its territorial waters below 12 nautical miles.³⁸ However, land use change pressures from expanding agriculture, mineral and fossil fuel exploitation, and forest degradation for local consumption are challenging Colombia's conservation efforts. The GOC has a range of approaches to these challenges, including expanding areas with improved natural resource management through conservation mosaics.³⁹

In 2011, the National Natural Parks Unit produced a diagnosis of the policies, procedures and regulations for land management in National Parks and other Protected Areas. This policy document recognizes that occupation, use and ownership of the land and natural resources inside Protected Areas is critical for proper planning, and effective management of Protected Areas that constitute the Colombian Natural Parks System.

According to the World Conservation Union (IUCN), Protective Areas (PAs) are areas of land or sea dedicated by law or tradition to, and managed for, the protection or other effective means of biodiversity and associated ecosystem services and cultural values.⁴⁰ They are recognized as the backbone for in situ biodiversity conservation. PAs in Colombia are classified under the categories identified by IUCN: Categories I to VI include areas from the Colombian Natural

³⁵ UNEP, Convention on Biological Diversity, Seventh Conference of the Parties, Decision VII.28, 2004, <http://www.cbd.int/doc/decisions/cop-07/cop-07-dec-28-en.doc>

³⁶ World Bank, **Expanding Financing for Biodiversity and Conservation, Experiences from Latin America and the Caribbean**, World Bank, Washington DC, 2012, Pg. 5,

<http://www.worldbank.org/content/dam/Worldbank/document/LAC-Biodiversity-Finance.pdf>

³⁷ Ibid., Pg. 6

³⁸ IUCN, World Commission on Protected Areas and UNEP, World Conservation Monitoring Centre, World Database on Protected Areas, http://www.unep-wcmc.org/world-database-on-protected-areas-wdpa_76.html

³⁹ "Conservation mosaics, as applied in Colombia, is a territorial management approach that relies on social participation and community decision making to build land use planning and management that complements the system of national natural parks and surrounding areas. The approach recognizes that protected areas are vital for conserving the world's biodiversity, but that dealing with land use pressures outside the protected areas is critical for the long-term existence of endangered species and the connectivity that enhances genetic diversity and ecosystem functions." World Bank, 2012, Op.cit., Pg. 9

⁴⁰ Bastian Bertzky, Colleen Corrigan, James Kemsey, Siobhan Kenney, Corinna Ravilious, Charles Besançon and Neil Burgess, **Protected Planet Report 2012: Tracking progress towards global targets for protected areas**, IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK, 2012, http://www.unep-wcmc.org/medialibrary/2012/09/14/eb3bb854/PPR2012_en.pdf

National Parks (categories I to IV), the National Protected Forest Reserves system (category VI) and indigenous reserves (IRs), which are sometimes categorized as IUCN categories V and VI (See Annex No. 5, Table A1).

Between 1960 and 1980, Colombia began to build a network of PAs to combat deforestation and protect biodiversity. Although there are currently 107 National PAs in Colombia (12% of the national's territory), deforestation reached rates of 600.000 hectares per year, accounting for 37.7 million ha of forest lost between 1960 and 1984; a loss of 41.5% of all forested areas.⁴¹ As mentioned above, recent estimates by the IDEAM, calculate annual deforestation at 310.349 ha per year, which suggests that PAs have not been sufficiently effective in reducing forest clearing.

Salazar et. al. (2013) used remotely sensed data across Colombia's tropical forests to examine the impact of PAs in conserving forest cover. His study provides insight at national levels on the effectiveness of the PA network as forest cover changed. The total forest cover area lost between 2005 and 2011 comprised 1.1% nationwide and 0.3% of the PA network, equivalent to 57.000 ha. Inside PAs, loss of forest occurred in 20% of those located in the category II—IV, 9% in the VI and 55% in the IRs, while 23%, 11 % and 60 %, experienced lost outside, respectively. Moreover, he identified four effectiveness categories: very- satisfactory, satisfactory, dissatisfactory and very-dissatisfactory. More than 50% of PAs were effective, described as satisfactory and very-satisfactory protection level. Particularly, strict PA's (categories II-IV) were found more effective than multiple-use PA's (categories VI-IRCC). (See Annex No. 6, Map A7)⁴²

The locations which make up Colombia's National Protected Areas System can be classified into three categories on the basis of IUCN level of protection they afford to the natural habitats, excluding marine PAs: Natural National Parks, Protective Forest Reserves and Indigenous Reserves.

1. Natural National Parks

Colombia's National Natural Park System consists of 58 protected areas that cover an area of over 14.2 million hectares, representing more than 11.4% of the total national territory. The system's protected areas are classified within IUCN Categories II – IV, and are divided into 5 different types according to the conservation objectives of each location:

National Natural Parks (NNP): These are the most common type of protected areas, characterized by having an extension large enough to allow for the auto-regulation of ecological processes, where the local ecosystems have not been significantly altered by human actions and

⁴¹Salazar, Mike Harvey, **Effectiveness of Colombia's Protected Areas in Preventing Evergreen Forest Loss: A Study Using Terra-i Near Real-Time Monitoring System**, Technische Universitat Dresden, Institute of International Forestry and Forest Products, Faculty of Forest, Geo and Hydro Sciences, 2013, Pg. 4

⁴²Salazar evaluates the effectiveness of 80 Colombia Protected Areas (PAs) in preventing forest loss under three forest conservation management strategies: 22/II—IV, 10/VI IUCN categories and 48/IRs. The study mapped annual forest cover change from 2005 to 2011 using near real-time remote sensing Terra-i (250 m resolution) joined to GlobCover 2005 (300 m resolution) inside and in a 10-km buffer outside the PAs. He used GlobCover re-classified to identify the extent of evergreen forest cover as base map. Based on these data he developed an effectiveness index including percentage of loss inside PAs, the comparison of loss inside and outside PAs, annual rate of loss inside PAs and the comparison of annual rate of loss inside and outside PAs.

where plant and animal species, geomorphological structures and cultural traditions have an important role in the nation's recreational, scientific, intellectual, aesthetic and development. There are currently 43 NNPs in Colombia.

Fauna and Flora Sanctuaries (FFS): These are areas dedicated to the conservation of wild animal and plant communities that represent an important and unique source of genetic resources for the country. There are currently 11 FFSs in Colombia.

National Natural Reserves (NNR): These protected areas are located in zones where plant and animal species, as well as some inorganic elements are found in a state of primitive conditions. Given their unique characteristics, these areas are not only destined for conservation, but also for the scientific research of their natural resources. Currently there are only 2 NNRs in Colombia.

Unique Natural Area (UNA): This area constitutes a unique landscape composed by geomorphological structures that are not found anywhere else in the country. The Unique Natural Area of Estoraques is the only UNA in Colombia.

Park-Way: This is a special stripe of land crossed by a road and surrounded by wetlands, forests and mangroves. The Salamanca Isle is the only Park-Way in Colombia.

2. National Protective Forest Reserves

Forest Reserves are IUCN category VI areas that were created in 1959 by Law 2, which provided for seven large areas for the development of forestry activities, conservation of soils, water and natural species. These 51 forest reserves constitute 50% of the Colombian continental territory, extending over 51.3 million, has of which 43.6 million has are covered by forests. A total of 267 municipalities and 101 urban settlements are located inside of these areas.⁴³

Law 1448 of 2011 provides a framework that regulates land use and determines which areas may be subtracted from Forest Reserves for purposes other to forestry. Resolution 629 of 2012, provides approaches to subtract forest reserve areas for agrarian reform, rural development, peasant economy, and legal and material land restitution to victims of the armed conflict.⁴⁴

Law 2 of 1959 established a protection regime over the existing forest resources on extensive areas of the country. In total, seven grand Forest Reserve Zones were established in the Amazon, Pacific, Central region, Magdalena river, Sierra Nevada de Santa Marta, Serranía de los Motilones and Cocuy. This area, where all the country's natural forests are being protected, currently covers 51 million hectares, equivalent to 45% of the national territory⁴⁵. National Natural Parks and Indigenous reserves tend to overlap with the National Forest Reserve Zones.

In recent years, due to a variety of reasons, regulatory and political initiatives have been supported to modify the protection regime of the Forest Reserve Zones, in order to: i) allow for more flexibility in the conditions established for extractive activities; ii) expand the agricultural

⁴³Ministerio de Ambiente y Desarrollo Sostenible, Informe de Gestión al Congreso 2012, Bogotá, Julio de 2012, Pg. 10,

⁴⁴ Ibid, Pg. 11

⁴⁵ Caracterización de las Reservas Forestales de Ley 2/59, Consultoría del Proyecto de Protección de Tierras y Territorios de la Población Desplazada, Bogotá, junio 2009.

frontier; iii) allow for the establishment of large agricultural and forestry enterprises for the production of bio-fuels; iv) change the legal priority that indigenous communities have over these areas for the constitution or expansion of Indigenous Reserves; v) allow for prohibited activities through the subtraction of areas of the Forest Reserves; and vi) settle the reintegrated members of illegally armed groups in the areas of the Forest Reserve.

A zoning process for Forest Reserves is underway to establish which areas will be destined for protection and which for production. Productive areas will include mineral exploration and exploitation activities which, in the case of the Amazon region Forest Reserve, have been suspended according to the precaution principle established by the Biological Diversity Convention of 1992.

To this date, management acts that determine the protected and productive areas within the Forest Reserves have been issued for the departments of Antioquia, Caldas, Cauca, Nariño, Putumayo, Quindío, Risaralda, Tolima and Valle del Cauca⁴⁶; Cesar and Norte de Santander⁴⁷; Bolívar, Cundinamarca and Santander⁴⁸; Caquetá, Guaviare and Huila⁴⁹; Choco and Córdoba⁵⁰. This process, which is being lead by the MADS, does not appear to have provided adequate space for citizen participation or prior consultation with indigenous communities.

3. Indigenous Reserves

Colombia's National Protected Areas System is a pioneering initiative that not only seeks to conserve the country's vast biodiversity, but also to protect its rich cultural and ethnical heritage. Although the first Indigenous Reserves were legally established by 1977, it was president Virgilio Barco who, in 1988, took matters into a complete new level. Despite the opposition of many, President Barco decided to give back to the native indigenous people of Putumayo and area of 6 million ha (the world's largest indigenous reserve at the time) of forest as both a sign of respect towards these communities and as a strategy to protect the Amazon rainforest. This first action gave way to a new conservation strategy based on the idea that the best way to protect the Amazon was by allowing the people who had lived there for more than nine thousand years to manage it. In 1990, four major National Natural Parks (Cahuinari, Chiribiquete, Puinawai and Tinigua) were constituted in order to protect both the local biodiversity and the cultural and ethnical heritage of the indigenous communities of the Amazon. This strategy has since been

⁴⁶ Resolución 1922 de 2013 MADS, Zonificación y Ordenamiento de la Reserva Forestal Central – Ley 2ª de 1959.

⁴⁷ Resolución 1923 de 2013 MADS, Zonificación y Ordenamiento de la Reserva Forestal de la Serranía de los Motilones – Ley 2ª de 1959.

⁴⁸ Resolución 1924 de 2013 MADS, Zonificación y Ordenamiento de la Reserva Forestal de la Serranía del Río Magdalena – Ley 2ª de 1959

⁴⁹ Resolución 1925 de 2013 MADS, Zonificación y Ordenamiento de la Reserva Forestal de la Amazonía – Ley 2ª de 1959

⁵⁰ Resolución 1926 de 2013 MADS, Zonificación y Ordenamiento de la Reserva Forestal de la Serranía del Pacífico – Ley 2ª de 1959

implemented all over the country and currently all indigenous reserves also seek to be environmental conservation areas.

Currently there are 778 Indigenous Reserves in Colombia, covering 27% of the national continental territory, with a total extension of over 30.5 million hectares and containing 43% of the country's natural forests (26,485,028 ha), 1% of the planted forests (819 ha) and 7% of the secondary vegetation (583,347 ha). (See Annex No. 6, Map No. A8).

4. Natural reserves of civil society

The Association of Natural Reserves of Civil Society (RESNATUR) is a private initiative founded in 1991 that aims to create a network of all privately owned natural reserves. Its seeks to contribute to the knowledge and consolidation of conservation initiatives led by civil society to create alternative ways of life and development that support intergenerational equity.

This initiative is supported by the Articles 108, 109, 110, 111 and 116 of Law 99 of 1993, where a natural reserves of the civil society is defined as: "An area that conserves at least a part of an ecosystem and which is managed under the principle of sustainable use of natural resources and where productive activities comply with the regulations stipulated for non-profit organizations". RESNATUR includes 123 private reserves distributed in 22 departments⁵¹

E. LAWS AFFECTING THE PROTECTION OF ENDANGERED SPECIES

According to Articles 8, 79 and 80 of Colombia's Political Constitution, it is the State's duty to protect the diversity and integrity of the environment, conserve the areas of special importance, promote education to attain these objectives, and establish appropriate resource use strategies to guarantee its sustainable development, its conservation, restoration or substitution.

Based on the above legislation, several regulations have been issued to guarantee conservation of threatened species. After signing CITES in 1973, which aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival, Colombia issued law 17 of 1981, ratifying the terms of the CITES. According to this convention, each country member must designate one or more competent management authorities to issue certificates or permits relevant to the terms of the CITES. In compliance to the above, through Decree 1420 of 1997, the Ministry of Environment was designated and determined its functions as the Management Authority for Colombia regarding all matters relevant to the CITES. Law 807 of 2003 approved the amendments of the CITES, which had been adopted in 1979.

As part of all efforts to prevent the extinction of species, it is the State's duty to regularly produce an official list of all the threatened species in the country and their risk status. Through resolution 1218 of 2003, the Ministry of Environment created the Committee for the Categorization of Wild Threatened Species, an asset for government decision-making.

Resolution 584 of 2002 (recently replaced by Resolution 383 of 2010) from the Ministry of Environment, establishes the official list of all threatened and endangered species and indicates their level of risk, according to IUCN categories.

⁵¹ <http://www.resnatur.org.co>

Law 1333 of 2009, Article 7, states that any actions against threatened or at risk of extinction natural resources is an aggravation of environmental responsibilities. Title XI of the Penal Code determines that the use of species that are threatened or endangered is illicit.

REVIEW OF GOVERNMENT, NGO, AND DONOR PROGRAMS AND ACTIVITIES

The GOC has been working with donors to develop a broad strategy to control deforestation in the country. Donors recognize that many developing countries are successfully developing low carbon development strategies, as called for in the Cancun Agreements. They acknowledge that the maintenance of the world's tropical forests through REDD+ and other strategies should be a key component of these new development models. They have been working with the GOC to design a payment-for-performance mechanism for initial implementation in the Amazon.

Germany, Norway and the United Kingdom intend to support the government of Colombia's ambitious goal to reach zero net deforestation in the Amazon by 2020. This ambition was first stated by Colombia at the UNFCCC COP15 in Copenhagen, and reaffirmed at COP16 in Cancun, through the projected expansion of protected areas. Colombia is currently developing a multi-sectoral Low Carbon Development Strategy, a National REDD+ strategy, and a National Plan for Climate Change Adaptation, as explained above. Colombia's commitment to low carbon development and protected area expansion as a key strategy, was made clear through the expansion of Serranía de Chiribiquete National Natural Park in August 2013.

The United States Agency for International Development (USAID) is an important donor. As of today, USAID is not part of the Vision Amazonia project, but might consider participation in the future if the strategy of net-zero deforestation strengthens and consolidates.

The Ministry of Environment and Sustainable Development is now mapping all forest and biodiversity related interventions currently under implementation in the country. It has identified over 140 projects throughout the national territory. Annex No. 7, Table A2 contains some of the most relevant projects related to forests and biodiversity.

ASSESSMENT OF THE MOST IMPORTANT THREATS TO FORESTS AND BIODIVERSITY

The following analysis considers the results of the national evaluation on direct threats to forests and biodiversity included on the PNGIBSE (MADS, 2012), as well as the development objectives and intermediate results expected by USAID's CDCS 2014 - 2018, focusing on the areas where the new cooperation strategy plans to prioritize its activities.

The objective is to identify those biodiversity components that could be affected when considering the effects of programmed development project in the forest regions of Colombia. Additionally, it intends to point out the environmental opportunities and safeguards to be considered when protecting the biodiversity and its ecosystem services, as structuring components of the social and territorial sustainable development in conflict and post-conflict areas.

In supporting the peace process it is important to consider land requirements for the return of displaced communities to their homelands and for the militant population of illegally armed groups that will reincorporate into society. The main threats to be considered are: a) changes in land use and occupation and the fragmentation of its ecosystems; b) loss or degradation of native ecosystems and agro-ecosystems; c) introduction and transplant of exotic species; d) contamination; and e) climate change.

The new intervention areas in the regions proposed by the CDCS 2014 - 2018 where biodiversity issues need to be preventively addressed are: a) the Amazon region (areas where deforestation is critical in the departments of Caquetá, Guaviare and Meta); b) inter-Andean valleys of the Magdalena and Cauca rivers, as well as the flood plains (mid and lower part of the basin in the departments of Antioquia, Sucre, Córdoba and Bolívar); c) higher basin of the Magdalena river (department of Huila); and d) biogeographic Chocó (department of Cauca).

A. DIRECT THREATS

The following section describes the direct and indirect threats to biodiversity (at all hierarchical levels of organization). Such threats should be considered when implementing land use or socioeconomic development projects, so as to fully grasp their effects on the current status of nature conservation. The following information synthesized and presented in Table 5, was taken from the PNIGBSE, adopted in 2012:

Table No. 5 Direct biodiversity loss, drivers, and causes identified for Colombia

Direct drivers of deforestation and the loss of biodiversity and ecosystem services at a global scale	Direct drivers of deforestation and the loss of biodiversity and ecosystem services at a national scale and expressions in Colombia
1. Transformation and loss of ecosystems and natural habitats	Driver 1. Changes in land use (continental and marine territory), occupation and ecosystem fragmentation. <ul style="list-style-type: none"> • Direct transformation and loss of natural or semi-natural ecosystems. • Transformation of productive systems, which maintain elements of biodiversity. • Infrastructure development. • Changes in watersheds and water damming
2. Overexploitation	Driver 2. Loss or degradation of natural ecosystem elements or agro-ecosystems. <ul style="list-style-type: none"> • Overuse of species populations (marine and terrestrial) • Ecosystem degradation • Loss of genetic diversity, cultigens and varieties
3. Biological invasions	Driver 3. Biological invasions <ul style="list-style-type: none"> • Introduction and transplant of species • Introduction and transplant of modified living organisms (MLO)
4. Pollution	Driver 4. Pollution and toxicity <ul style="list-style-type: none"> • Water and soil organic contamination (Eutrophication Nitrates and Phosphates) • Chemical contamination and others (air, soil, and water)
5. Climate Change	Driver 5. Climate change

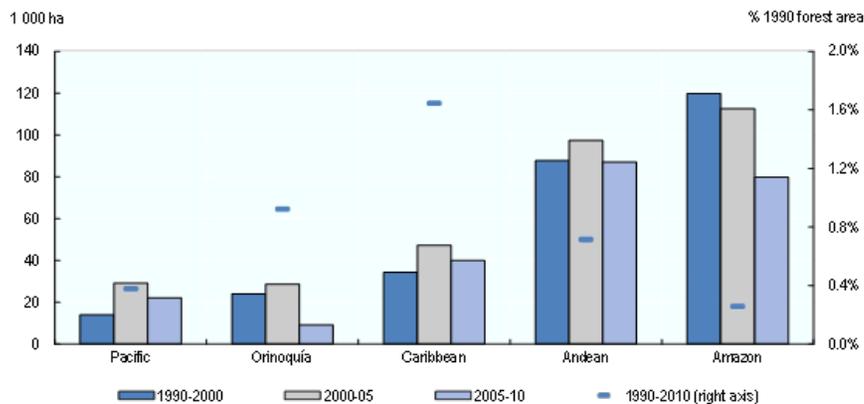
Source: PNGIBSE, 2012.

1. Land use and occupation changes leading to ecosystem transformation

According to Etter et al., (2008), cattle raising is the main cause of land use change resulting in a loss of native ecosystems in Colombia, such as tropical dry, Andean and humid forests. A key indicator of threats to biodiversity consists of changes in ecosystem areas (MADS, 2012). According to IDEAM et al. (2007), 31% of the total area of natural ecosystems in Colombia has been modified. However, more recent studies estimate that this figure has increased to 52% (MADS, 2012). Other studies show that the Caribbean and Andean regions, including the inter-Andean valley, have suffered high levels of transformation (72%, 59% and 67% respectively). Dry forests in the Caribbean have been the most affected by human activities, with only a few forest remnants surrounded by areas of highly transformed land remaining. In the Andean region, the most affected ecosystems are the misty forests. Additionally, there are high

deforestation rates of tropical rainforests in the Amazon and Pacific regions (Etter et al, 2008). For example, in the last two decades, the Amazon region has lost more forest area than any other region in the country (Cabrera et al., 2011) (See Figure No. 8).

Figure No. 8 Percentage of annual deforestation by regions



Source: Cabrera et al., 2011

The most recent deforestation analyses were developed under the "Technical and scientific institutional capacity to support Reduction of Emissions from Deforestation and Degradation - REDD in Colombia"⁵² project, which determined national deforestation rates in the period between 1990 and 2010. (See Annex No. 8, Map No. A9, location of the main natural forest deforestation hotspots in Colombia).⁵³

The analysis performed by IDEAM shows, at a 1:500,000 scale, that the forest cover surface loss in the period between 2000 and 2007 was of 2,356,445 ha, with a loss rate of 336,581 hectares per year. The greatest transformation levels took place in the Amazon, with an average deforestation rate of 104,480 ha per year, while the lowest levels were recorded at the Orinoquia with 36,499 ha per year. In relative terms, the Caribbean region lost the greatest proportion of forest area in this period of time.

The fine scale analysis (1:100,000, years 1990, 2000, 2005 and 2010) indicated that in 1990 the forests covered an area of 64'417,248 ha, which represented 56% of the national territory, mainly located in the Amazon and Andean regions; in 2000 forests covered 61,732,841 ha, representing 54.1% of the territory, located in the Amazon and Andean regions; in 2005 there were 60,206,330 ha of forest, equal to 52.8% of the country mainly in the Amazon region; and

⁵² Consultar la Memoria Técnica del Mapa de Deforestación de Colombia en: <https://docs.google.com/a/fundacionhumedales.org/file/d/0B0xJi97alavicGpTUktfZ01ZaTg/edit>

⁵³For this purpose, Remote Sensor Digital Image Processing techniques were used to establish the basis to monitor deforestation at two scale: national (1:500,000) and sub-national (compatible with 1:100,000)(Cabrera *et.al.* 2011).

finally by 2010 the forest cover was 58,633,631 ha, representing 51.4% of the national territory and mainly located in the Amazon region.

This analysis helped to establish the cover type that replaced the lost forests in the periods between 2000 - 2005 and 2005-2010. In these two periods, forest cover was mainly transformed into grasslands, secondary vegetation and heterogeneous agricultural lands.

The seven main causes of deforestation which were identified are: i) expansion of agricultural lands and livestock farms; ii) illicit crops; iii) colonization and community displacement; iv) infrastructure (including everything associated to the energy sector, roads, etc.); v) mining; vi) timber extraction for commercialization or household use (including both legal and illegal extraction); and vii) forest fires.

Expansion of agricultural land is the major type of land use change in Colombia, and an acute threat to biodiversity. Conversion of forest to pasture for livestock grazing is the primary driver of deforestation.

According to Colombia's livestock strategy 2019 (FEDEGAN, 2006), livestock occupied 38.3 million ha of land. The strategy suggests, however, that only 19.3 million ha are suitable for livestock, while the other 19 million ha are considered more suitable for forest (10 million ha) and crop cultivation (9 million ha). The strategy suggested that 10 million ha of pasture should be returned to a more natural state (e.g. through reforestation or conversion to silvopasture), and that production of livestock on the rest of the land should be intensified. However, the strategy does not appear to have influenced the rate of forest lost to pasture: between 2000 and 2005, 495,044 ha were lost, and between 2005 and 2010, the period just before and after the adoption of the strategy, 664,000 ha were lost. By way of comparison, between 2000 and 2007, the Ministry of Agriculture administered support to CARs to reforest 155,000 ha (IDEAM, 2011). During the period between 2000-2007, reforestation with conservation objectives only reached 41,223 ha (IDEAM, 2011).

The increase in pasture area between 2000 and 2010 coincided with an increase in the number of cattle, indicating continued extensive cattle rearing. The livestock strategy set a goal of 48 million cattle head on 28 million ha of pasture, in line with reducing the 38.3 million ha of pasture land in 2005 by 10 million ha. Achieving the strategy's goal implies intensifying cattle raising across the country, from 0.6 to 0.7 head/ha in 2010 (range from FAO STAT and national industry data) to 1.7 head/ha in 2019. However, intensification of livestock production would exacerbate other environmental problems, such as run-off from increased manure production. Measures would need to be put in place to avoid or minimize these effects.

At the heart of the problem is a set of national-level incentives that promote the expansion of grazing land: property tax exemptions that encourage agriculture do not consider underuse of land, while agricultural credits and other incentives do not include environmental criteria (MADS, 2012).⁵⁴ Decoupling growth in livestock from habitat loss and degradation requires a coordinated effort to reduce direct and indirect incentives for extensive farming while actively

⁵⁴MADS (2012). Colombia's response to the OECD Environmental Performance Review questionnaire.

supporting intensification of cattle rearing and increasing the implementation of silvopasture schemes.

The second key impact on biodiversity from agriculture is loss of natural habitats to crop cultivation. This is most significant on the Caribbean coast, where the climate is suitable to grow oil palms and other plantation crops. For example, the area of oil palm cultivation increased by 108,000 ha between 2008 and 2012 to 452,000 ha (Fedepalma, 2013). Henson et al. (2012) suggest that the majority of oil palm plantation takes place on previously cultivated or grazed land. However, this can still put pressure on natural habitats and biodiversity, as the displaced cultivation or grazing will increase demand for land converted from natural habitats.

The oil and mining sectors have rapidly expanded over the last decade. By 2011 they represented 12% of total value added and more than half of exports. The fast expansion of the extraction of non-renewable natural resources (oil, coal, gold) is a main cause of pollution of soil and water, degradation of sensitive ecosystems (e.g. paramus) and can have severe impacts on human health (e.g. from the use of mercury in gold mining).

There are important overlaps between mining areas and those areas that are important for biodiversity. Most mining titles, requested and granted, are in the Andes, the region with the highest level of threatened and endemic species (CGR, 2011). There are also significant mining interests in the Amazon region, which led to a two-year moratorium on new mining in the region, which was announced in 2012 while a management plan was being developed. The moratorium was an important initiative to stem growing pressures from mining on biodiversity.

There is evidence of tens of thousands of mining titles of various designations being sought in protected areas. Of particular concern is a significant increase in titles solicited in paramus between 2005 and 2009 (CGR, 2011), with over 400 titles granted in 2010 and, according to the IAvH over 800 titles sought. The IAvH also recorded over 1,000 mining titles granted (and over 3,000 sought) in wetland habitats, and 2,000 granted (nearly 9,000 sought) in forest reserves in 2010.

Environmental policies relating to the mining sector have not been enforced effectively. Depending on the data source, 16% or 32% of the land titled for mining is found in areas of environmental importance. Nevertheless, these data should be interpreted with caution: not all areas with mining titles are necessarily mined (the area varies depending on the mineral involved). On the other hand, water and air pollution are generated by mining operations, which suggests that pressures on biodiversity from mining may be greater. For example, mining is a source of heavy metals, which have been detected in fish (CRG, 2013). In addition, pressures from other human activities associated with greater access to areas that typically follow mining developments, can also contribute to biodiversity loss.

With respect to marine and coastal ecosystems, there was a net loss of 12,191 ha of mangrove, mainly in the Pacific coast, representing 4% of the total cover for the year 2009 (INVEMAR, 2009). Furthermore, many coral reefs have suffered extensive degradation in the last decades and almost 75% are currently under some type of threat as a result of human and natural disturbances (Burke et al., 2011). Factors such as overfishing, destructive fishing, coral diseases, climatic events, high sedimentation rates, coastal development and pollution are the principal causes of coral degradation. Currently, global climate change constitutes a major long-term threat for the future of coral reefs all over the world (Birkeland, 1997; Díaz et al., 2000; Wilkinson y Souter,

2008; Burke et al., 2011). All of the above problems have important consequences and implications for the livelihood of millions of people who use and depend on marine resources.

According to INVEMAR (2011), Colombia is the only South American country that has coral reefs on both the Atlantic and Pacific oceans. These areas cover an extension of 2,900 km², of which 1,091 km² have sea beds with high coral reef coverage (Díaz et al., 2000), representing less than 0.4% of the world's total reefs (Spalding et al., 2001). The Pacific coast has a small fraction (15 km²) distributed between Gorgona island, the Utría Cove, Malpelo Island and the Tebada Peninsula (Díaz et al., 2000). The Caribbean reefs cover a much wider extension, with 77% of the total coral reefs (including the most complex and developed structures) found within the archipelagos of San Andrés, Providencia and Santa Catalina. Other lesser, although still important reefs are found in the archipelagos of San Bernardo and Nuestra Señora del Rosario, the Urabá Gulf and the Tayrona National Natural Park (Díaz et al., 2000). Although these reefs present different states of conservation, according to the analysis done by the Reefs at Risk Revisited project (Burke et al., 2011), which reviewed the current state and main human threats of the world's coral reefs, the continental reefs in the Caribbean region of Colombia were identified to have a medium to high degree of risk, while those on the Pacific ocean, found in remote locations (Gorgona and Malepo island), are at low risk.

Other marine ecosystems like rocky littorals suffer human transformations resulting from activities such as extraction of construction materials, infrastructure projects, increase in tourism, a growing population, and increasing erosion rates related to the biophysical processes of the coastal littorals. (INVEMAR, 2009).

In general, the transformation and fragmentation of ecosystems produced by human activities, generates significant impacts on biodiversity as they fragment ecosystems creating secondary vegetation patches (Etter et al., 2006). This in turn causes situations where unique ecosystems and/or endemic species survive exclusively in privately owned lands and are not represented within the country's protected areas (Franco et al., 2007). According to Armenteras et al., (2003), on the Eastern Andes the most fragmented ecosystems are the sub-Andean forests with some 302 patches, and the Andean dry forests with some 135 patches, while the ecosystems with the largest fragments are the high-Andean forests and the paramus.

2. Loss or degradation of native ecosystems and agro-ecosystems

The main cause of overexploitation of plant species is commercial timber extraction. It is estimated that 42% of all the timber is extracted illegally (IDEAM and Ecoforest, 2008), causing a major problem which threatens populations of wild species such as *Swieteniamacrophylla* and *Credelaodorata* which have high quality wood and have been extensively exported to the point where they are practically extinct (Cárdenas y Salinas, 2007). The regions with the highest numbers of threatened timber species are Magdalena, followed by the Chocó-Darién and the western Andean range.

Forestry exploitation is based on selective extraction of up to 470 native tree species, a clear example of Colombia's biodiversity being an economic asset. Although clearance for cattle grazing is the primary cause of forest biodiversity loss, forestry activities to extract timber and fuel also exert pressure. In 2008, some 1.5 million m³ of timber were extracted, but commercial reforestation amounted to about 300,000 ha in 2010 (MADS, 2012). The evidence suggests that

policy instruments such as forest fees have had little influence on reducing logging or controlling the biodiversity impact of forestry.

Another activity that is frequently underestimated, but which generates a significant pressure on timber species, is the extraction of firewood and/or vegetable coal for local and regional consumption (Campos et al., 2006). It is widely used in some municipalities as fuel for bread ovens, stoves, sugar cane processing and brick factories. According to the IDEAM (2010a), the production and consumption of firewood in Colombia between 2000 and 2008 decreased, but is still very high (approximately 21,000 kilotons/year). High consumption levels are reported for places such as Encino, Santander, where 79% of the families cook exclusively with firewood and the average consumption is approximately 6.2 t/year per capita, and 2.9 Kg/day (Aristizabal, 2010).

Furthermore, the non-sustainable extraction of animal species through activities such as hunting and fishing are also considered causes for biodiversity loss. Continental as well marine fishing is in a very fragile state given that the most captured species are being overexploited. Fishing data collected between 1990 and 2002 by the National Institute for Fishing and Aquaculture (INPA), indicate that the levels of fish and crustacean capture in both the Atlantic and Pacific oceans decreased in this period of time (MADS, 2012). In the Magdalena river, there has been a decrease in capture rates from 79,000 tons/year in 1973 to 6,044 tons in 2006 (Mojica et al. 2002), and species such as *Pseudoplatysomafasciatum*, *Prochilodusmagdalenae*, *Sorubimcuspicaudus*, *Ageneiosuscaucanus* and *Ichthyoelephaslongirostris* have been exploited almost to their extinction (Mojica et al. 2002). However, there is not enough research on this subject to clearly determine the main causes for such dramatic decreasing population rates of these species.

With respect to animal species, the main cause in the decrease of biodiversity is related to the illegal traffic of wildlife. By 2009, the Regional Autonomous Corporations (CARs) reported 211,571 confiscated individuals (reptiles, mammals and birds amongst others) due to illegal commerce (See Annex No. 8, Table No. A2) (MAVDT, 2011).

3. Introduction and transplant of species

In Colombia, 176 species have been identified as introduced, 17 of which are part of the list of the 100 most invasive species on the planet (MAVDT, 2010). Additionally, 42 plants (31 species of herbs, 5 trees, 4 bushes, 1 liana and 1 palm) species have been registered for having a high risk of invasion. With respect to invasive vertebrates, an evaluation of 73 species identified 21 species (mainly birds and mammals) as posing a high risk of invasion, 29 pose a moderate risk and 4 pose a low invasion risk (Baptiste et al., 2010).

The IAvH has reported for Colombia a list of invasive species which includes: plants such as *Melinisminutiflora*, *Ulexeuropaeus*, *Telinemonspessulana*, *Thunbergiaalata*, *Eichhorniacrassipes*; invertebrates like the mollusks *Electroma sp.* and *Mytilopsissallei*, *Helix aspersa*; the arthropod *Paratrechinafulva*; the frog *Ranacatesbeiana* and the following fish species: *Salmotrutta*, *Onchorhynchusmykiss*, *Oreochromisniloticus* and *Pteroisvolitans* (Gutierrez-Bonilla, 2006). Additionally, 137 fresh and brackish water fish species have been registered, out of which 82 have been introduced and 57 transplanted (Baptiste et al., 2010). In marine and coastal ecosystems the situation is no better, as a total of 26 species have been identified as introduced including 1 reptile, 2 fish, 8 decapods, 1 crustacean, 8 mollusks, 1

annelid, 2 bryozoans, 2 corals and 1 alga. Most of the introduced species come from Asia and have been brought as ornamental species, used for aquiculture, consumption or repopulation (Baptiste et al., 2010).

Furthermore, marine and coastal ecosystems are also affected by the ballast waters discharged by international ships before reaching docks, promoting the introduction of exotic species to Colombian waters. A total of 86 non-native marine species in the country have been identified, including 44 phytoplankton taxa, 16 zooplankton species, 2 nekton species and 24 benthos species (Ahrens et al., 2006).

4. Pollution

Waste discharges originating from municipalities are one of the main sources of contamination of superficial waters in the country, contributing to approximately 65% of the total DBO contaminant load (IDEAM, 2010b). The sectors that produce most of these contaminants are households (58%) followed by industry (39%). Furthermore, the Bogotá, Chicamocha, Alto Cauca, Lebrija and Chulo rivers present very poor water quality due to their locations in river basins with very high population densities where many economic activities develop around the rivers (IDEAM, 2004). The variables that contribute the most to poor water quality are related to low levels of dissolved oxygen, high levels of dissolved solids, coliforms, hydrocarbons and orthophosphates (MAVDT, 2009). Additionally, between 2005 and 2008, the superficial water quality index (based on physicochemical variables such as: dissolved oxygen, chemical oxygen demand, total suspended solids, pH and conductivity) indicated good quality levels in 4.5% of the monitoring stations, acceptable in 50%, regular in 40% and very bad quality in 5.5% (MAVDT, 2010). Furthermore, the wild life conservation index for marine and coastal waters reported inappropriate to very bad conditions in 23% of the monitoring stations (INVEMAR, 2012).

Organic contamination resulting from increasing concentrations of nitrogen and phosphorous in continental waters have mainly affected the basins of the Magdalena, Cauca, Guarapas, Suaza, Páez, Neiva, Fortalecillas, Cabrera, Prado, Saldaña, Recio, Opia, Totaré, Gualí, Cimitarra, Quinamayo, Palo, Amaime, Cerrito, Guabas, Guadalajara, Mediacanoa, Tuluá, Bugalagrande, La Miel, and Chinchiná rivers (MAVDT, 2009). Additionally, contamination resulting from industrial discharges is concentrated and limited to industrial corridors such as: Bogotá- Soacha, Medellín-Valle de Aburrá, Cali-Yumbo, Cartagena-Mamonal and Barranquilla- Soledad amongst others. Some of the most toxic heavy metals discharged by the industrial sector are: cadmium, zinc and lead (Chaves et al., 2006).

Contamination does not only have impacts on freshwater, marine and coastal ecosystems, but it also affects the air and soil, and produces negative impacts on biodiversity in general. Some of the main sources to these types of contamination are: industrial residues (heavy metals or petroleum), human discharges generated by domestic activities and oil spills produced by the petroleum industry which have detrimental effects on the environment (MADS, 2012).

With respect to coal and gold mining, it has been reported that these activities generate an increase in water body sedimentation; gas, particulate material and noise emissions; production of debris and the contamination of soils due to heavy metals and other chemical discharges (CGR, 2008). Several gold extraction processes such as chlorination, cyanide leaching, mercury

amalgamation and pyro-metallurgical processes generate toxic residues that contribute to the loss and transformation of both aquatic and terrestrial biodiversity.

5. Climate Change

The effects that climate change has on the Colombian biodiversity are not well known and many of the statements related to this situation come from indirect sources of information (MADS, 2012). According to ecosystem vulnerability evaluations from climate change, the most sensitive ecosystems are the high mountain ecosystems (high Andean forests, paramus, glaciers and wetlands), dry zones, marine and coastal zones and islands (IDEAM, 2001).

The mountain ecosystems that could potentially be affected by climate change cover an extension of approximately 70% in areas such as Boyacá, Nariño, Tolima, Cauca and Cundinamarca. With respect to forest ecosystems, the most affected ones are found in Boyacá, Valle del Cauca, Bolívar, Magdalena and Antioquia (IDEAM, 2010c). In coastal and marine ecosystems, as well as in islands, forecasts predict permanent floods over 4,900 Km² of low coastal areas and water-logging of 5,100 Km² of continental coastal areas (INVEMAR, 2003).

In the paramus, the effects of climate change on animal and plant species under conditions of rising temperature are critical, because of changes (altitudinal modifications) in the conditions that allow the development of ecological interactions characterizing such ecosystems. Thus, displacements between 140 and 800 m will produce acute problems such as increasing vulnerability to the invasion of exotic species (MADS, 2012). Glacier ecosystems are currently losing between 3% and 5% of their area each year, with a regression of the lower glacier boundary of between 15 and 25 m per year. According to the above data and given the dynamic response that glaciers represent to atmospheric changes, it can be predicted that at current rates glaciers will have disappeared by the year 2050 (IDEAM 2010c).

Desertification is a problem associated to soil degradation, which is accentuated by climate change. This phenomenon could mainly affect the driest zones of the country that represent 21.5% of the total national territory. Climate change scenarios for dry areas predict a tendency of longer and harsher draughts with possible direct effects on species and ecosystems, which in turn could produce additional changes as a result of synergies with other disturbances in natural processes (MADS, 2012).

Box Climate change and biodiversity

Colombia's second national communication under the United Nations Framework Convention on Climate Change in 2010 summarized knowledge at the time of the potential impact of climate change on biodiversity in Colombia. It included information on expected changes in temperature and precipitation across the country.

The greatest large-scale changes, it is predicted, will occur in the Caribbean and Andes. Both regions would shift from a semi-humid to semi-arid climate over the course of this century. Impacts in the Andes are particularly worrying, as the region contains 75% of the Colombian population, and run off from the mountains is an essential source of water for domestic and industrial consumption, irrigation and hydropower.

Beyond such large-scale shifts, there is not yet much evidence available on the direct impact of climate change on biodiversity. The Humboldt Institute communicated results of a modeling study of the impact of climate change on bird species (Salazar-Holguín et al., 2010), indicating that some species

are migrating to higher altitudes, have reduced overall ranges and probably face a higher risk of extinction. Some experts warn of the interaction of climate change with other risks that biodiversity faces. In the Colombian Andes, for example, an altitudinal shift in species is particularly worrying because invasive species shift faster than native ones (Spanne, 2012).

Additionally, the loss of biodiversity and ecosystems increases the vulnerability of Colombia to climate change. Certain regions are expected to become more arid and provide fewer ecosystem services, particularly water services (an example is the páramo; see Box 7.4). At the same time, the number of extreme precipitation events is expected to increase. The impact of extreme events is exacerbated by loss or alteration of natural habitats. Deforestation and degradation of hillsides and river-beds increase river run off, while artificial diversion of rivers and drainage of wetlands exacerbate flooding (ECLAC, 2012).

Colombia is actively improving its institutions and processes for adapting to climate change, including improved information. In the process, efforts should be made to better understand the direct impact of climate change on biodiversity and the effects of natural capital loss and alteration on adaptation and resilience across the country. Early evidence indicates that the synergies between biodiversity and adaptation, including the potential for ecosystem-based adaptation, should be explored. This could support Colombia's dual objective of increased incorporation of biodiversity and adaptation into landscape and sectoral planning.

Source: EPR/MADS/OCDE – Draft Report – 2013

B. INDIRECT THREATS

1. Deficiency in the access and quality of information

Even though the country is currently undertaking efforts to enhance the access, type and quality of information and knowledge, these efforts have focused on characterizing and understanding the relationships within ecosystems, or between these and society. Although the knowledge of conservation and sustainable use of biodiversity has increased in the country, still much of that information is not considered by decision-makers, limiting gains in the management capabilities of environmental institutions (MADS, 2012).

Currently much of the information and knowledge produced is neither clear nor adequate for the needs of decision-makers. Thus, there is a lack of interconnection between institutional management capabilities and access, type, and quality of information and knowledge (Meijaard y Scheil 2007). Moreover, national, regional and local institutions have little recognition for any type of knowledge that is not academic, but with the potential to contribute to local decisions for land-use planning, biodiversity conservation and climate change adaptation.

The regulatory and cultural barriers that exist in Colombia hinder initiatives to develop research on the country's genetic and molecular heritage, as possible assets to implement strategies for the use, conservation and restoration of biodiversity (MADS, 2012).

2. Low management capabilities of public institutions

According to the PNGIBSE (2012), management capabilities of public institutions in Colombia focus almost exclusively on a scheme that is based on the generation and compliance of regulations. This is sought through a command and control model that faces environmental and biodiversity problems by seeking to change human behavior, without considering the real subjacent causes (human activities that fail to adequately consider the environment). The above situation has generated a "practical divorce" between productive activities and biodiversity

conservation actions, and an increase in the risks associated with biodiversity loss and the supply of ecosystem services.

Another aspect to be considered is the low level of adaptability of environmental institutions. These institutions tend to take long periods of time to respond to land use changes, as a result of slow management actions, little flexibility, resistance to change, and low capacity to innovate. Furthermore, these institutions do not have adequate evaluation and follow-up systems for the different environmental management tools, making it difficult to understand if these elements work efficiently or not.

3. Availability and criteria to assign financial resources

For a long time the country's financial resources have been used to promote and develop economic and sectoral policies, strengthening some sectors such as mining, agriculture and energy. The opposite has happened to public institutions in charge of making policies and managing biodiversity. They have lacked adequate resource assignment from the state, in spite of the fact that many productive activities depend directly or indirectly on ecological systems. This situation tends to aggravate due to the lack of clear prioritizing during investment planning of scarce available resources, which ultimately results in the low level of implementation of conservation programs and projects of weak impact (MADS, 2012).

4. Economic and sectoral policies

Environmental and sectoral policies are currently disjointed and there is a clear separation between the activities that generate economic development and those that aim for the conservation of biodiversity and its ecosystem services.

There is still a predominant idea that biodiversity is an obstacle to economic development, and it is not recognized as the primary supplier of environmental goods and services required for most productive activities. In this sense, the importance of biodiversity for society is usually related to ethical considerations, rather than functional arguments on the provision of ecosystem services and their impact on the country's social and economic welfare.

Although there have been important advances in the zoning of the territory for adequate land uses, the land use planning scheme for economic sectors still has problems, particularly when identifying productive areas for different types of activities, and possible problems arising from impacts on biodiversity. It has been acknowledged that it is necessary to incorporate efficient biodiversity management criteria in productive systems (DNP, 2011) because the plans that are currently in action are limited to the development of specific projects which are usually generated by the environmental sector.

5. Low efficiency of planning instruments

With regards to land use planning and territorial ordering, Colombian legislation makes a conceptual and practical difference between territorial ordering (Law 388 of 1997) and the environmental planning of the territory (Law 99 of 1993, Art. 5 and 7). The above has led to confusions regarding territorial planning, as if environmental planning was separate from territorial ordering in a given municipality. Thus, environmental planning of the territory has been made almost invisible at local scales, while the central government guidelines provided to

the regional environmental authorities have been insufficient for an adequate implementation. Additionally, the country is still not clear as to the environmental factors involved in territorial ordering (Ley 388/93, Art. 10). This has led to situations where regional environmental authorities have sometimes taken environmental planning guidelines for determinant factors, a situation which has increased the general sense of confusion regarding this subject.

COST EFFECTIVE ACTIONS TO CONSERVE FORESTS AND BIODIVERSITY IN COLOMBIA

From an environmental perspective, as mentioned above, any program, project, or activity that expects to implement in the focus area of the CDCS 2014 – 2018, requires understanding of the critical linkages between property rights, land use, and land zoning. Many of the areas to where the population is expected to mobilize and settle in a post-conflict scenario have land use restrictions consistent with protected areas, as described above. Most post-conflict scenarios would require a redefinition of land uses and land zones to establish property regimes in reserves suitable for resettlement. This redefinition would likely extend to protected areas throughout the country, providing PA land title to farmers to support sustainable land uses.

The process requires strengthening the GOC entities to adopt and implement a strategy for reserve lands and protected areas. Success in mitigating climate change, consolidating a sustainable State presence and improving the livelihoods of Colombians in those areas depends on the reform of land use management and land zoning within land reserves, as this area constitutes a main restriction of the territory within the CDCS focus areas.

Clarification of land use and land zoning will be critical to any land formalization strategy and to determine which state-owned vacant lands can be awarded vulnerable populations and landless farmers. Municipal governments must be strengthened to be able plan and implement land use management, including support to regulate specific environmental issues to reorder land zones more effectively.

Opening this land, rather than simply being viewed as an environmental loss, should be considered as a new opportunity to “get it right”. Programs could attempt to increase and complement livelihoods of rural households through, for example, the implementation of payment for ecosystem services (PES) initiatives. Such schemes provide incentives that discourage migration to new protected lands and encourage communities to develop sustainable livelihoods and take advantage of improved security and State presence. However, USAID should take preventive measures to avoid the expansion of illicit activities to protected areas and/or unoccupied lands. Considering the environmental, economic, social and cultural characteristics of the focus areas of the proposed CDCS 2014 – 2018, the most feasible ecosystem services in these regions would include projects on carbon and water services.

Additionally, and as indicated in the diagnosis, the loss of biodiversity is closely associated with the lack of conservation measures in sectoral growth policies. Environmental and sectoral policies are currently uncoordinated and there is a clear divorce between the activities that generate economic development and those that aim for the conservation of biodiversity and its ecosystem services. There is still a predominant idea that biodiversity is an obstacle to economic development, and it is not recognized as the primary supplier of environmental goods and services required for most productive and extractive activities.

Although there have been important advances in the zoning of the territory for adequate land uses, the land use planning scheme for economic sectors still has problems, particularly when identifying productive areas for different types of activities, and potential negative impacts on biodiversity. It has been acknowledged that it is necessary to incorporate efficient biodiversity

management criteria in productive systems (DNP, 2011) because the plans that are currently in action are limited to the development of specific projects which are usually generated by the environmental sector.

The mining sector is a critical example of the above, it was discussed above in the analysis of biodiversity losses, and is an important element of the CDCS. Environmental experts indicate that the main issues with mining are: a) the lack of formal instances of internal coordination between the MADS and the regional environmental authorities, the inequity in the distribution of CAR resources to attend their responsibilities, and inability to control and monitoring of mining activities; b) the ambiguity in the establishment of environmental conditions for land management and mining development, generating land use conflicts; c) the inappropriateness of the instrument of environmental licensing and other similar instruments as environmental management plans, permits, authorizations and concessions for the use of renewable natural resources, to artisanal and small scale mining activities; and d) the absence of an effective strategy to control the environmental impacts of informal mining.

Among possible solutions, any strategy to improve mining environmental performance could consider: a) establishment of a mechanism for internal SINA coordination allowing monitoring policies and regulations between the CARs and the Ministry as well as assessment of the effectiveness of its implementation and the CARs enforcement; b) design, co-financing and implementation of joint programs between the Ministry and the CAR with jurisdiction in areas of greatest mining environmental conflicts, containing the activities and specific instruments for the implementation of a policy on environmental control of mining; c) adoption of a concrete regulation for the definition of environmental conditions and the design of a platform that consolidates them and places them at the disposal of the territorial ordering process; d) the adoption and regulation of environmental mining technical protocols, as an administrative tool that facilitates the formalization and control of informal mining; and e) the design and application of local informal mining legalization plans, jointly between the environmental authorities and the mining authorities.

ASSESSMENT OF THE CONSERVATION APPROACH IN CDCS

A. THREATS TO BIODIVERSITY AND FORESTS FROM ACTIVITIES PROPOSED BY USAID'S CDCS

The CDCS 2014-2018 aims to strengthen Colombia's capacity to implement a sustainable and inclusive peace. Towards that goal, the strategy has designed four development objectives: DO1) Effective presence of democratic institutions and processes in targeted areas; DO2) Reconciliation advanced among victims, ex-combatants and other citizens; DO3) Improved conditions for inclusive, rural economic growth; and DO4) Environmental resiliency and low emissions development strengthened.

With regards to DO1, USAID focuses on supporting Colombian efforts to increase institutional presence, foster a culture of respect for human rights, promote access to justice, increase public investment, and provide services to historically underserved and conflictive rural areas where illicit activity often goes unchecked. Helping Colombia to ensure that government services reach citizens, especially marginalized populations in historically neglected areas, is a major challenge. To this end, USAID supports efforts to restructure public investment towards traditionally marginalized areas. USAID works with Colombian officials to develop policies and programs that build state presence in areas recently stabilized by Colombia's security forces.

Regarding DO2, USAID supports reconciliation for victims, ex-combatants and citizens by helping build the capacity of the GOC's new Victims Unit and key entities charged with delivering services, reparations, and transitional justice to victims as mandated by recently enacted Colombian law (Victims and Land Restitution Law). For instance, USAID is supporting the Center of Historical Memory to document the tragedies of the past and conduct outreach to strengthen broad societal commitment to ensuring Colombia does not return to a state of systematic violence. USAID also assists the Presidential Programs for Afro-Colombians and Indigenous Affairs, as well as regional and local institutions to design and execute public policies addressing the needs of these population groups. USAID promotes reintegration of ex-combatants into society and assists the Colombian Agency for Reintegration (ACR) to provide reintegration services to former fighters. This support is expected to become more important should FARC combatants demobilize under a possible agreement to end the conflict.

As per DO3, to improve the conditions for inclusive rural economic growth, USAID has committed to helping the GOC create the pre-conditions for a vibrant rural economy with actions in three areas: 1) Helping the Ministry of Agriculture and other key institutions (such as the Land Restitution Unit) to return land to its rightful owners and speed the granting of land titles, including collective titles of indigenous and Afro-Colombian communities. Such assistance is aimed at modernizing the cadaster system as a prerequisite to guaranteeing citizen's property rights; 2) helping spur greater public and private investment in the rural sector, for example by strengthening local governments' capacity to compete for and manage public funds; and 3) working to ensure that producer associations are better able to provide services and benefits to their members (mainly small farmers).

With regards to DO4, USAID aims at strengthening environmental resiliency and low-emissions development by improving natural resource management, including forest and watershed management, to reduce threats to biodiversity. USAID efforts strengthen the capacity of GOC

institutions to protect biodiversity, foster stakeholder participation in community-based conservation, and introduce best environmental practices, especially for mining, fisheries, and other productive systems. Additionally, USAID supports GOC efforts to create incentives for firms and public sector entities to reduce their overall level of carbon emissions, while contributing to improved local livelihoods. USAID also helps build resilience to anticipated climate change impacts by diversifying local economies and improving management of water supplies.

While the CDCS is closely linked to the GOC-FARC negotiating agenda, ongoing CDCS activities may be refined to support early implementation requirements, subject to negotiation results.

Thanks to a military build-up under former President Alvaro Uribe, and his successor (and former defense minister) Juan Manuel Santos, the guerrillas of the FARC and the right-wing paramilitary militias who opposed them, are reduced in numbers. According to Juan Carlos Pinzón, the current defense minister, in 2000 more than half of Colombia's 1,100 municipalities suffered terrorist actions and/or the presence of illegal armed groups.⁵⁵ Today, FARC operates in 142 municipalities in the country. Their actions against infrastructure in these areas are common. They have been able to adapt their attacks to the pace of negotiations. When negotiations go slow, the intensity of FARC attacks against infrastructure increase, and vice versa. During 2013 the FARC perpetrated 180 armed actions, most of which were low intensity. However, the military forces have gained the capacity to rapidly respond to those actions and have increased their artificial and human intelligence capabilities, making it more difficult for FARC to perpetrate large-scale operations.

The state's increased capacity to combat guerrilla actions has forced the FARC to withdraw from the center of the country (Bogota and surrounding municipalities) that were under siege in 2002, and retreat to the south. Fifteen months after the formal start of talks, the Colombian government and FARC guerrillas are now negotiating the third of six agenda items. Meanwhile, the country is entering an election campaign season in which peace is a principal issue. This is Colombia's fourth attempt to negotiate peace with the FARC guerrilla group, and for the first time there is a strong perception that a post-conflict scenario might be possible. In June 2012, legislators approved a constitutional framework for bringing justice to demobilized guerrillas. Once the subsequent laws are in effect, the reform will institute alternative sentencing procedures for FARC combatants, should an agreement in Havana materialize.

After the war, the Colombian Government and international aid agencies may be too preoccupied with urgent support to peace initiatives to focus fully on longer-term issues, such as forest management or conservation. They will be under tremendous pressure to restore the economy. Harvesting activities might therefore expand much more rapidly than the public sector's capacity to regulate them. After conflict, farmers, ranchers and loggers will return to resume their

⁵⁵"In 1999, the Defense Ministry reported nearly 2,000 terrorist acts, more than 3,000 kidnappings, and a homicide rate that exceeded 60 per 100,000 (and peaked three years later at 70 per 100,000)." After Uribe's presidency, "kidnappings declined to just 200 a year, homicides were halved, and FARC forces were reduced to roughly 9,000 fighters while many of their leaders were captured or killed." Combs, Cameron, Heine, Tim, *Debating the Prospects for Peace in Colombia*, **Inter-American Dialogue Report**, Washington DC, April 2013, Pg. 3, http://www.thedialogue.org/PublicationFiles/IAD9114_LAWG_Colombia_final_2.pdf

activities in rural areas, some areas formerly protected. In addition, heavily armed unemployed young men, with few choices besides logging, illegal mining, commercial hunting and banditry, might join them.

The GOC's perception that, after a decade of intense repression, including the assassination of thousands of peasants, trade unionists and human rights activists and the forcible displacement of three to four million peasants from zones of guerrilla activity, the popular insurgency would no longer be an immediate threat to state power and it would be an appropriate moment to shift from militarization of the country to exploiting its abundant natural resources, especially at a time of high commodity prices. If this materializes, the environmental impacts would be significant. Future developments related to biodiversity will be conditioned by the issue of peace and violence in Colombia, and the ability to imagine and implement alternative development strategies.

1. Peace Process and Post-Conflict Scenario

In November 2012, after talks were launched in Norway, formal peace talks began in Cuba between representatives of the Government of Colombia and the FARC guerrillas. The parties signed a general framework agreement in August 2012 that lays out a roadmap for the process, including a six-point agenda widely considered to be very manageable, with an explicit goal to end the conflict. Talks have now entered their 20th cycle. The process is well resourced with highly capable professionals, and it reflects lessons learned from Colombia's long history of past initiatives. Such lessons dictated holding the talks outside of Colombia, forfeiting a demilitarized zone, and maintaining a certain confidentiality of the process, among other things. Both negotiating teams include highly experienced military and political authorities as well as veterans of past peace initiatives. The initial government negotiating team included representatives of the business, military and police sectors. It has recently been expanded with the addition of two women plenipotentiaries (with the authority to speak on behalf of the Government), who while they are not charged with representing civil society, will provide a structural link for civil society to provide inputs.⁵⁶

The FARC negotiating team has been further strengthened with the inclusion of additional members from its secretariat. In spite of the obstacles faced after *Semana Magazine* reported that the military intercepted the communications of government officials negotiating with FARC rebels,⁵⁷ most reports indicate that the parties in Havana have created a climate of mutual respect and a solid working relationship that has been able to produce agreements. They have woven a careful web of gestures and concrete actions over the last three years, beginning with secret talks in Havana, when both sides maintained absolute discretion for a period of six months to forge the framework agreement that has set the stage for the peace talks.

⁵⁶Noticiero Caracol, *Dos Mujeres Ingresan al Equipo Negociador del Gobierno con las FARC*, **Caracol Radio**, Noviembre 26 de 2013, <http://www.caracol.com.co/noticias/actualidad/dos-mujeres-ingresan-al-equipo-negociador-del-gobierno-con-las-farc/20131126/nota/2024698.aspx>

⁵⁷*Semana*, *¿Alguien Espió a los Negociadores de la Habana?*, **Revista Semana**, Bogotá, Febrero 3 de 2014, <http://www.semana.com/nacion/articulo/alguien-espio-los-negociadores-de-la-habana/376076-3>

The Government has advanced a legislative agenda that addresses key FARC priorities of agrarian issues, and has set out a framework for future negotiations. It has lifted outstanding arrest warrants against members of the FARC negotiating team, and legalized the political movement known as the *Marcha Patriótica*, which provides a potential platform for future ex-FARC engagement in political life.⁵⁸

For its part, the FARC has announced that it would cease the practice of kidnaping, release its remaining military and police hostages, and declared a time-limited unilateral cease-fire for two months in December 2012, and again in December 2013 for another month. While there is some debate over how many violations of the cease-fire occurred, and whether defensive acts or land mine incidents can be counted as violations, most agree that the latest cease-fire demonstrated that the FARC leadership retains significant control over its rank and file, and should be able to deliver on a peace accord.

So far the parties have reached preliminary agreements on the first two agenda items: agrarian development policy and political participation. This is no small task considering that the land issue and exclusion have been the drivers of the Colombian conflict for over half a century. The parties are now discussing the issue of illicit crops and drug trafficking, a theme that has perpetuated and aggravated the conflict in recent decades. The remaining issues address the impacts of the conflict and how to move forward, namely victims and reparations, the terms for ending the conflict including disarmament demobilization and reintegration (DDR), and dealing with the paramilitary groups, and the endorsement, verification and monitoring mechanisms to be used once an agreement is signed.

So far the process has withstood many efforts to derail it. The parties' confidence was especially tested – as exploratory talks were just getting underway in Havana – by the killing of the FARC's top leader Alfonso Cano in November 2011,⁵⁹ and subsequent killing of local FARC leaders. Likewise the decision to escalate the war while talking peace has proven challenging. There is no bilateral cease-fire as these talks proceed. This has contributed to a certain amount of skepticism among the public that doesn't see yet any benefits of the pursuit of peace talks at the table in Havana.

Former President Alvaro Uribe and his supporters have used this to their advantage. Violence on the battlefield, especially following the end of the FARC's unilateral cease-fire at the end of January 2013, and numerous attacks on key FARC leaders more recently, feed the notion that the war can be won militarily. Uribe and his allies – virulent opponents of the talks – are a force to be reckoned with. In the context of past congressional and coming presidential elections this spring, their opposition to the talks is likely to accelerate as the elections become a choice on war or peace. Moving the peace agenda forward as a State policy, and not merely the campaign of a single candidate, poses its own challenges. Threats against those seeking restitution of their lands

⁵⁸Redacción Política, *Gobierno abre diálogo de participación política con Marcha Patriótica*, **El Tiempo**, Noviembre 28 de 2013, <http://m.eltiempo.com/politica/gobierno-abre-dilogo-de-participacin-politica-con-marcha-patritica/12405517>

⁵⁹Bedoya, Jineth, *Así fue la operación con la que se dió muerte a alias Alfonso Cano*, **El Tiempo**, Noviembre 6 de 2011, <http://www.eltiempo.com/archivo/documento/CMS-10713647>

have continued unabated throughout the peace talks. The State has been unable or unwilling to provide effective protection to those who are seeking to make change. Whether it's the victims who choose to return to their lands or organize others to do the same, union workers struggling for better work conditions, or social organizations or politicians from the left who threaten the status-quo, the ability of these non-violent forces to work safely for change within the electoral system is a test for what's to come.

While the political participation agreement already reached appears to address some of these concerns, the security environment for legitimate political dissent continues to be problematic. Recent allegations that 29 *Marcha Patriótica* members were killed, even as the entity has been given legal standing, and that the organization has experienced other forms of legal and political persecution, some at the hands of the State, led *Marcha Patriótica* leader Piedad Cordoba to announce that she is considering disbanding the organization for security reasons.⁶⁰

The FARC leader negotiator, Ivan Marquez read a communiqué stating that the killings and detentions of the *Marcha Patriótica* members undermined confidence in the Government's word and is a betrayal of the agreement on political participation already reached.⁶¹ This has created a climate of skepticism that will need to be addressed in order to provide credible guarantees for democratic engagement.

With the "peace process" due to be signed in the next year or so, the question is how it will affect spatial planning. Once signed, regions like Catatumbo in the northeast should no longer be battlegrounds and the guerrillas and paramilitaries should be integrated into normal life. Local communities are already beginning to prepare local land use and economic development plans.

The IGAC (Colombia's national geographic institute), the Ministry of the Interior and the *Federación Colombiana de Municipios* have been running workshops in the regions, as well as the recent IGAC international conference, to discuss the role of post conflict planning within the peace process. The aim is to enable planning to tackle post conflict issues around land use, infrastructure and social integration. The planning system in Colombia is at an early formative stage. Regional and subregional planning needs to be developed to complement municipal planning. Professionals, politicians and local communities need training in planning to develop plans for the future that will integrate the guerrillas and paramilitaries into normal life as part of the peace process.

Successful peace negotiations should enable money that was being spent on conflict to be invested in development. But, peace will mean the guerrillas will be without jobs and some may choose instead to join one of the criminal bands. Municipalities will have to help these people to rejoin civil life through social and economic development achieved through local planning.

⁶⁰Redacción Política, *Piedad Córdoba Plantea la Disolución de Marcha Patriótica*, **El Tiempo**, Enero 20 de 2014, http://www.eltiempo.com/politica/la-exsenadora-piedad-cordoba-plantea-disolucion-de-marcha-patriotica_13386496-4

⁶¹Redacción, *FARC Instan al Gobierno a Detener Viacrucis de Marcha Patriótica*, **El Mundo**, Enero 22 de 2014, <http://www.elmundo.com/portal/pagina.general.impresion.php?idx=230620>

2. The Issue of Land Restitution

Colombia is a highly unequal country regarding land holdings; the issue of equitable land distribution and agrarian reform has challenged Colombia during the last decades.⁶² Inequitable land distribution has long been a GOC concern, with successive governments attempting agrarian reform with limited success. Large landholders have evaded reform, while institutions charged with promoting reform suffer from internal corruption and lack capacity to implement changes.⁶³ Such highly unequal distribution of land makes it more difficult to sustainably reduce poverty and achieve peace.

Additionally, Colombia's conflict has been marked by massive displacement. This is one of the issues that the Law of Victims and Land Restitution has sought to address. In addition, the land issue in Colombia is central to the conflict's origins. Over the years, the Colombian conflict has forced the displacement of approximately five million Colombians, the evacuation of an estimated 20 million hectares of land, and produced a "reverse agrarian reform" that concentrated half of Colombia's land in the hands of only one percent of its population and consolidated one of the most inequitable land tenure systems in the world. Thus, providing reparations and restituting lands to those who were forcibly displaced will be an important step toward the reconciliation of the country. Before the talks began, President Santos had already launched a Law for Victims and Land Restitution and other legislation to address land inequities and victims' needs. Furthermore, Santos has shown political interest in reducing the power of the landholding elites, which have been the sustenance of former President Alvaro Uribe. It is unclear however just how deep the reforms will be or if the development model itself is up for discussion at the table.

For the first time since the 1960s, the GOC and its institutions are developing the capacity to deal with agricultural issues. The negotiations have been complex and will find many enemies whose interests will be affected. However, recognizing the need to protect the rural economy (for both medium and small holders) in order to achieve land restitution, ensure food security and promote social justice in the countryside is a crucial step forward. This will also enable a broader evaluation of the agro-industrial sector that has emerged in the countryside. The challenge is to find a balance among agrarian interests and the enemies of the peace process.

The FARC/GOC accord on the first point of the agenda (agrarian reform) represents a positive step in the current process. There are four central elements to the agrarian reform accord. The first aims to distribute land to the landless from a "land bank" that would be "capitalized" with illegally held land, underused land and state-owned land which would be redistributed to the landless and displaced. Second, the agreement calls for the establishment of special development

⁶²Land distribution in Colombia is highly inequitable, with an estimated 0.4% of the population owning 62% of the country's best land. See UN Habitat, **Land tenure, housing rights and gender – National and urban framework: Colombia**, UN Habitat, Nairobi, 2005, Pg. 30

⁶³"While various policies have been adopted to deal with this, their success was limited by a combination of an inappropriate policy environment, limited financial resources, cumbersome processes loaded with bureaucratic obstacles, and the impact of drug money and violence on the rural economy." Deininger, Klaus, Castagnini, Raffaella, Gonzalez, Maria, **Comparing Land Reform and Land Markets in Colombia**, World Bank, Washington DC, 2004, Pg. 4

programs for farmers, such as subsidies, technical, and marketing assistance as well as credit. Third, the accord calls for increased spending on social programs, infrastructure, housing plans, and potable water in marginalized rural regions. Finally, the FARC and the government agreed to improve food security by increasing the productivity of farmlands as well as working to eradicate hunger. Related to these goals is a commitment to formalize land ownership through the proper titling of these properties as well as the creation of agricultural systems of justice and expanded police presence dedicated to settling land disputes and defending property ownership. The institutionalization of an accurate cadastral map to comprehensively register lands throughout the country will ostensibly secure the properties from illegal theft as well as allow small farmers greater access to credit.⁶⁴

In addition to the Victims and Land Restitution law, the FARC hopes to expand upon the use of “peasant reserve zones” which are regions of the country that limit the size of land properties and in which communities enjoy a degree of political autonomy. These zones were legally institutionalized in 1994 and the agrarian accord recognizes them as one tool to address landlessness. There are presently six peasant reserve zones with a total of 800,000 hectares and another five, consisting of 1.5 million hectares, are in the process of being created. INCODER is considering requesting the Ministry of Environment and Sustainable Development for the subtraction of an additional 1.5 million has. Thus, a total subtraction of 3 million has from the forest reserves will be studied and presented for approval during 2014-2015, which represent another potential mechanism to distribute land.⁶⁵

A particularly problematic issue with implications on deforestation has been a conflict between the actual laws and the people’s perceived rights to land. Historically, the government has promoted the opening of the agricultural frontier for small-scale farmers. In fact, anyone lacking property rights over land could enter virgin unused territories, or forests belonging to the state, to gain possession by clearing the land. After one year, colonists would have gained legal status as occupants. However, in 1961 the state set a maximum size of land to be claimed by one colonist, consisting of the Agricultural Family Unit (UAF), the area required for one family’s sustainable livelihood. The Ministry of Agriculture calculated the size of a UAF depending on soil fertility, climate and distance to urban areas.

In spite of such limitation to the size of land available for colonization, tenants in practice claim landowner rights over large areas under the assumption that they have cultivated those lands for several generations. Even small-scale farmers actually have more land than what’s permitted by the UAF. While large-scale farmers might have invested large amounts in land clearing as a common practice, they have never been previously challenged nor opposed by state authorities. Thus, although against the law, property rights are – in practice – recognized based on the

⁶⁴Patricia Grogg, Patricia, Vieira, Constanza, *Key Land Reform Accord in Colombia’s Peace Talks*, **Inter Press Service**, Bogota, May 2013, <http://www.ipsnews.net/2013/05/key-land-reform-accord-in-colombias-peace-talks/>

⁶⁵The Colombian Rural Development Institute (INCODER) is responsible for devising and executing agricultural policies, rural development, and some aspects of land registration. INCODER replaced the Colombian Institute for Agrarian Reform (INCORA), a subsidiary of the Ministry of Agriculture and Rural Development, which was in charge of land titling and adjudication prior to 2003. INCORA was dissolved after it failed to achieve its land-reform objectives. Interview with INCODER Official Ricardo Zambrano, Manager of Rural Lands on February 27, 2014.

owner's work and efforts to clear the land. Consequently the rural population in Colombia still perceives unused state land as an open frontier.

In 2012, the National Security Council identified 12 macro-focalized areas⁶⁶ for land restitution based on criteria of land density, security, and actual possibilities for the return of internally displaced persons (IDPs) (See Annex No. 4). Input from an inter-ministerial working group headed by the Ministry of National Defense was crucial in this process. The land restitution unit also created a Register of Abandoned and Forcefully Dispossessed Land (RTDAF), where victims of forced displacement could register their lost properties as a prerequisite to benefit from the land restitution process. As of February 2013, over 32,000 people had registered their lost parcels, which amounted to over 2.3 million hectares (URT 2013).

After the macro-areas were identified, the Land Restitution Unit's (URT) regional offices identified several micro-focalized areas within the previously identified territories for prioritized restitution. Such focalization followed the same criteria as at the local level. The RTDAF registry provided input to identify municipalities with high density of abandoned land. The Centre of Integrated Intelligence for Land Restitution (integrated by different governmental agencies, including the military) assessed the municipalities' security situation. The Local Operative Committees (integrated by state agencies, NGOs, the military and the civil society) was then called upon to assist in the restitution process and return of IDPs.⁶⁷ (See Annex No. 10, Maps No. A10 and A11).

Although these advances were reached under the premise that the agricultural frontier would be "closed" with a particular concern toward environmental conservation, all of these accords will imply further pressures on deforestation. Consolidating peace in the countryside will involve not just loans and technical help for small farmers, as the joint GOC/FARC communiqué suggests,

⁶⁶The macro zones for land restitution are: 1) Catatumbo; 2) Cauca and Valle; 3) Magdalena Medio; 4) Magdalena and Cesar; 5) Montes de María; 6) Nariño; 7) Putumayo; 8) Southeast Antioquia; 9) Southern Cordoba and Bajo Cauca Antioqueño; 10) Southern Meta; 11) Tolima; and 12) Urabá. Of these, numbers 3, 4, 9 and 10 are prioritized for restitution. Unidad de Restitución de Tierras, 2013,

<http://restituciondetierras.gov.co/media/descargas/Prog%20y%20Proyectos/2013/Proy%20Implementacion%20Programa%20Tierras%20V%20Firme%202013.pdf>

⁶⁷The following municipalities were prioritized in the micro focalizaion: 1) in Antioquia, the municipalities of San Carlos, Apartadó, Granada, Mutatá, Necoclí and Turbo; 2) in Bolivar, the municipalities of San Jacinto, Carmen de Bolivar, María la Baja, and San Juan Nepomuceno; 3) in Cesar, the municipality of San Alberto; 4) in Córdoba, the municipalities of Montería and Valencia; 5) in Magdalena, the municipalities of Ciénaga, Chibolo, Plato, Sabanas de San Angel, Aracataca, Fundación, Pivijay and Zona Bananera; 6) in Meta, the municipalities of Cabuyaro, Puerto Gaitán, Acacías, Cumaral, El Dorado, Granada, Restrepo and Villavicencio; 7) in Nariño, the municipalities of Pasto, Tangua, Cabecera Municipal, and El Tablón de Gómez; 8) in Norte de Santander, the municipalities of Tibú, Zulia, La Esperanza, El Abrego, Cúcuta, Los Patios and Ocaña; 9) in Putumayo, the municipalities of Villagarzón and Valle del Guamuéz; 10) in Sucre, the municipalities of Ovejas, Coloso and Morroa; 11) in Santander, the municipalities of Sabana de Torres, Betulia and Rionegro; 12) in Tolima, the municipalities of Ataco, Valle del San Juan, Alvarado, Ambalema, Armero, Fresno, Lérída, San Luis and Suárez; and 13) in Valle del Cauca, the municipalities of Tuluá, Trujillo, Bolívar, Bugalagrande, Cali, Guadalajara de Buga, Jamundí, Riofrío, El Dovio, and Sevilla. Land Restitution Unit (URT), 2014, <http://restituciondetierras.gov.co/?action=article&id=92>

but a ten-year effort to bring government, roads and development to the countryside.⁶⁸ Crucial to the peace accord will be restoring up to 6.6 million hectares of land to its original owners, who were displaced by armed groups.⁶⁹ In 2011 Congress approved a sweeping law to restore land and repair the damage suffered by victims of the conflict. Some 170,000 victims have already received financial compensation or their land back.⁷⁰

3. CDCS and New Territories for Intervention in Post-Conflict Colombia

For decades there has been a lack of effective state presence in some areas of the country that are also areas of huge importance in terms of the biodiversity. Such ungoverned spaces have been used by illegal armed groups to take refuge and generate profit from illegality. However, an end to the conflict would mean that those environmentally important areas will be open to increased state presence and the presence of other actors. If a peace agreement is reached, USAID anticipates a geographic expansion of its program to locations where there has been a historic presence of guerrillas but will come under greater government control.

Considering natural resources in peace-building efforts can help to ease potential disputes over land or water and provide green jobs for former soldiers. Plans for the fair management and distribution of natural resources are usually excluded from peace negotiations and disarmament, demobilization and reintegration programs. The transition towards a sustainable and inclusive peace will demand that Colombia address long standing socio-economic inequities. Improving rural security conditions is not enough; rural residents must see an economic future in the licit economy. Sustainable environmental management is critical to protecting Colombia's economic future. The failure of the Colombian state to control vast swaths of resource-rich Amazonian forest, inter-Andean valleys, and Pacific lowlands has been a driver of conflict. Without the state engaged in sound environmental management, the door is left open for illegal armed groups to exert control in these areas, the majority of which are located in Afro-Colombian and indigenous territories.

These areas pose multi-dimensional challenges. On the one hand, there is limited state presence, illicit activities, violence and human rights abuses. On the other hand, these are areas of key biodiversity and ecosystem services. Some of these areas are not only the locations where violence and conflict takes place, but are also deforestation hotspots where cattle raising, illicit crops, illegal mining, illegal logging and other activities take place. These areas are generally prioritized for interventions of many kinds, including conservation, peace, and development. (See Annex 11, Map No. A12).

⁶⁸ The Economist, *Colombia and the FARC, Digging in for Peace*, **The Economist**, Bogota, 2013, <http://www.economist.com/news/americas/21578684-deal-land-marks-welcome-breakthrough-peace-talks-there-still-much-do-and>

⁶⁹The Commission for Observation of Public Policy on Forced Displacement estimated the abandoned land due to conflict between 1980 and 2010 to be 6,628,195 hectares. Wiig, Henrik, **Avoiding Conflict in the Colombian Land Restitution**, Presentation at NOLAN conference, Oslo 27-29 November, 2013, Pg. 3, http://www.colombialandgender.org/images/pdf/NOLAN_131119.pdf

⁷⁰ibid.

4. Guidelines to improve environmental performance

Considering the general diagnosis with respect to the direct and indirect causes for biodiversity loss in Colombia, it is clear that future land intervention actions should be planned so that no program, project or activity contributes to further aggravate the environmental situations described above. On the contrary, they should follow planning guidelines to improve the environmental performance of productive and social activities.

The deterioration, degradation and loss of ecosystems, natural resources and ecosystem services resulting from the effects of contamination, transformation due to inappropriate land use, poor productive practices, modifications to the water cycle and inadequate management techniques, among others, reduces the economic, social, cultural and environmental benefits derived from ecosystems. Conservation, rehabilitation and/or restoration programs seek to reduce future ecological losses, maintaining the existing environmental support structure, while rehabilitating and/or restoring the affected functions and attributes of natural systems that are of interest and are technically and economically feasible. Considering the above, this type of strategy plays an important role in supporting adequate actions to manage Colombia's natural capital.

Additionally, the areas where the proposed CDCS 2014-2018 plans to focus, present environmental and social restrictions that must be considered and that require special procedures in each case. Amongst these, the overlap of National Forest Reserves, protected areas (national and regional), collective territories and indigenous reserves. For an analysis of these overlaps and their distribution in each department of Colombia, see Annex No. 12, Map No. A13.

B. OPPORTUNITIES FOR CROSS-CUTTING, CROSS-SECTORAL LINKAGES WITH PROPOSED ACTIVITIES IN THE CDCS

In a post-conflict scenario, there will be a high demand for productive activities in both urban and rural areas as displaced communities return to their homelands and members of illegally armed groups are reintegrated, requiring viable means of livelihood. However, an increase in productive activities, such as cattle rearing, extensive cultivation and legal or illegal mining in rural areas, could have significant environmental impacts if not guided properly. In view of these possible effects, the COC should support the design and implementation of alternative and sustainable production systems that generate economic benefits for local communities, while having low or no negative impacts on biodiversity and ecosystem services.

1. Payment for Ecosystem Services (PES)

Law 99 of 1993, modified by Article 1450 of 2011, provides for all departments and municipalities to invest at least 1% of their income in the protection of water resources through the acquisition and maintenance of strategically located lands, or financing PES schemes.

PES schemes are systems of voluntary mutual agreement where an environmental service is bought by a user and the provider efficiently supplies the required service. In Colombia, PES schemes have been the most commonly used tool for the sustainable management of ecosystem services, and have been implemented through initiatives developed by the national government as well as by NGOs. Following the global trend, and according to the legislation previously described, most of these schemes have focused on water related services, such as sediment control and water regulation. For example, a PES scheme is currently working in the Chingaza national park, as this park is located in an important paramus that provides water to almost 8 million citizens from the country's capital city. In this scheme, users pay a monthly fee for the maintenance of the park and its water resources. However, although this PES scheme seems to be a successful example, there are still lessons to learn as the monthly fee does not accurately represent the total value of the water services provided by the paramus.

The GOC has worked for over two years in the planning of a prioritization exercise for preparing a portfolio of interventions it would like to propose to cooperating agencies under an agreement for a Payment-for-Performance program and grant funding that supports a long-term Amazon Vision. As mentioned above, this program aims to achieve zero net deforestation in the Amazon Region by 2020, while creating green economy opportunities for the local communities in a post-conflict scenario. Although the extent of this objective has been sometimes misunderstood, it is still quite ambitious and supports a sustainable development vision for the region.

2. Colombian Amazon Vision for 2020

Considering one of the regions where productive activities are currently having the greatest negative impacts on forests and biodiversity, and understanding the local and global importance of the environmental, cultural and scientific heritage of the Amazon rainforest, the GOC is developing the Amazon Vision 2020 strategy, which aims to eventually become a national policy on the sustainable management of forests. Amazon Vision 2020 is currently led by MADS, with support from National Natural Parks, IDEAM and the SINCHI institute. It has two main objectives: to meet the targets set by the Convention on Climate Change and reduce net deforestation in the Amazon region to zero by the year 2020; and to gain support by positioning the region in the national and international agendas.⁷¹

It is based on a group of compatible bilateral agreements, which cumulatively provide interim financing for Colombia's 2020 zero net deforestation target. There are three stages for the development of the model: earning payments, managing payments and investing payments.

For the first stage, Colombia will establish a payment mechanism, based on results, through which international, national and private partners can contribute by rewarding the protection of the Amazon rainforest and the climate change mitigation services it provides. This payment mechanism will work according to a reference level, consistent with UNFCCC guidance, established by an Amazon-wide spatial modeling approach, against which international partners will pay Colombia for quantifiable reductions in emissions resulting from adequate forest management conservation actions (MADS, 2013).

⁷¹ <http://www.minambiente.gov.co/contenido/contenido.aspx?catID=1387&conID=9154>

For the second stage, a financial instrument for the management of payments received as part of the results-based mechanism will be deployed, where the GOC presents the highest ranked options to be considered by international donors. The options will be ranked based on the scoring obtained by considering whether they could enhance national capabilities and over time strengthen existing institutions. The instrument to be selected will be used to manage the performance-based payments and related grants (MADS, 2013).

Finally, for the last stage, support from Colombia's partners will finance a set of prioritized interventions to address deforestation: land use planning and zoning; institutional strengthening, sectoral agreements; agreements with peasant associations; financing instruments for sustainable agricultural, forestry and cattle rearing activities; private and public partnerships for alternative low carbon development options and Amazonian production systems; safeguarding indigenous peoples and their territories; and creating the enabling conditions to deliver the overall strategy (MADS, 2013). Performance payments will be leveraged domestically and within the private sector in order to develop an investment portfolio and its corresponding policy framework to ensure a balanced program of action to minimize carbon emission, while having positive environmental, economic and social impacts.

There is an opportunity for the United States Government to coordinate and be part of this initiative. While USAID is currently working in the Amazon region through the ICAA initiative, its coordination with Amazon Vision 2020 could foster long-term conservation results based on a payment for performance mechanism, rather than the usual cooperation, and contribute to a long-term strategy that is currently being prioritized and aims at becoming a State policy at the National level, with an ambitious target. The GOC is willing to bring other partners into the mechanism, and would benefit from the United States participation.

3. Agroforestry Systems

Implementing land use strategies where forest degradation is reduced while productivity increases, is a key aspect of attaining sustainable development in rural areas in a post-conflict scenario. From a socioeconomic perspective, the use of agroforestry practices could provide a variety of additional benefits from trees, such as timber production, firewood, food, medicines, handicrafts, resins and fibers. Economic risks decrease based on the diversification of production and the creation of new jobs on associated activities such as managing plant nurseries, collecting and propagating species, sowing and maintaining the productive areas. Agroforestry systems optimize total land productivity per surface unit, based on the combination of multiple outputs and resource conservation (IDEAM, 2011)⁷². According to FAO (2014),⁷³ agroforestry enhances biodiversity, cleans water and decreases erosion, while sustaining livelihoods, contributing to food security, alleviating poverty and promoting productive and resilient cropping and grassland environments. In addition, when strategically applied on a large scale, agroforestry proves to be an excellent strategy for climate change adaptation as it helps to regulate the water cycle, enabling agricultural lands to withstand weather events, such as floods and drought (FAO, 2014).

⁷² IDEAM, **Sistemas agroforestales y restauración ecológica como medidas de adaptación al cambio climático en alta montaña**, Caso piloto, Proyecto Nacional de Adaptación al Cambio Climático -INAP- componente B, IDEAM y Conservación Internacional, Bogotá, 2011.

⁷³ <http://www.fao.org/forestry/81630/en/>

Agroforestry systems also support the maintenance of ecosystem services through: 1) the maintenance of soil fertility and the reduction of erosion as they provide organic material, fix nitrogen and recycle nutrients; 2) water conservation (quantity and quality), by favoring infiltration and reducing surface run-offs that could contaminate water sources; 3) carbon capture; and iv) the conservation of biodiversity in fragmented landscapes (IDEAM, 2011).

Currently there are several agroforestry programs in Colombia, led by institutions such as IDEAM and CORPOICA, which involve mixing crops like coffee, cocoa or rubber with other plant species that help enhance land productivity and provide a variety of products that contribute to better economic stability. According to CORPOICA, the three regions in Colombia with the highest potential for the implementation of agroforestry projects are the Orinoquía, Amazon and Andean regions (CORPOICA, 2014)⁷⁴, locations of great relevance for this report given their current status in the national conflict, the important role they will play in a post-conflict scenario, and the possibility for USAID to expand their actions into these territories according to the CDCS 2014-2018.

4. Silvopasture Schemes

Silvopasture systems have special relevance to Colombia, given the importance of cattle rearing in the country. Silvopasture schemes focus the production of livestock and tree products in one integrated pasture system, supporting diversification through managing a variety of both animal and plant species. It is considered the most efficient resource utilization, and provides a variety of products, helping to decrease economic risks. The environmental and economic benefits of silvopasture schemes are very similar to those described for other agroforestry systems. Additionally, nitrogen-fixing forage species, pasture fertilization and animal manure help improve the soil and tree nutrition; competition between trees is less at the longer distances employed with silvopasture, resulting in greater timber yield; trees create sheltered environments to protect animals from weather variations and improving forage quality and lengthens, resulting in better livestock growth; and the creation of more biologically diverse systems provide local wildlife with better living habitats (AFTA, 2014).⁷⁵ Currently, GEF and FAO are working with Sustainable Agricultural and Livestock Systems Research Center (CIPAV) to develop several silvopasture schemes in different regions of Colombia, which have proven to have positive impacts on biodiversity, water quality and carbon capture, as well as being profitable for farmers once the systems are adequately implemented.

The promotion of new mechanisms for conservation such as those mentioned above are not only required but constitute new opportunities for USAID's development cooperation actions. While USAID has played an important role in developing financial instruments for the financing of conservation efforts in the country, the above-mentioned activities require the continued support for successful development. Continuing economic support of funds and management strategies such as those developed by USAID in the Pacific Region, through the BioREDD project, or in the Amazon Region through the ICAA initiative, will greatly facilitate the implementation of new financing options for sustainable development and conservation.

⁷⁴ <http://www.corpoica.org.co/>

⁷⁵ <http://www.aftaweb.org/silvopasture.php>

C. RECOMMENDATIONS

- Deforestation hotspots identified by IDEAM in Colombia coincide with areas of poor governance, armed conflict with presence of the FARC and illicit crops. Efforts to halt deforestation in these hotspots face overwhelming difficulties, as public institutions are precarious in these areas where the armed conflict is still ongoing. CDCS should build upon the various programs for consolidation of governance, institutional strengthening, alternative development, crop substitution, justice houses, and other key strategies to achieve a strong institutional apparatus which is able to promote environmental resiliency.
- While focusing on the current threats is a priority, the nature of deforestation will change in the future. An improving environment for private sector investment in Colombia, large sectoral investment plans (mining and oil exploration), and the stability and relocated populations that the peace process will bring, will shape future deforestation trends. Moreover, a series of specific development opportunities now opening up in various regions carry the risk that they will also create future deforestation as policymakers capitalize on the economic value to the nation derived from these opportunities. We recommend focusing CDCS interventions in these new opportunities to guarantee that sustainable development criteria are applied.
- In recognition of the challenges posed by the current and future drivers of deforestation, and as part of its commitment to global climate change mitigation, in 2009 in Copenhagen, and again in Cancun in 2010 (UNFCCC, 2010), Colombia submitted a voluntary commitment to the UN Framework Convention on Climate Change (UNFCCC) to achieve zero net deforestation in the Amazon by 2020, if sufficient international financing is available. Colombia also committed to protect endangered forests by increasing its protected area system. The USAID has a unique opportunity to participate in this initiative, which is already being supported by other donors such as Germany, Norway and UK. The initiative seeks to establish a results-based payment mechanism through which international, national and private partners can contribute to Colombia's work towards a 2020 net deforestation target by paying for verified emissions reductions from avoided deforestation in the Colombian Amazon, where avoided deforestation is determined in accordance with a pre-agreed baseline set according to agreed eligible activities, reference area and reference level.
- Achieving the objective of zero net deforestation in the Colombian Amazon by 2020 will only be possible if driven by a wider, balanced suite of policies and transformative investment in improved governance and low-deforestation social and economic activities. This will require the implementation of integrated land use strategies to create incentives to maintain standing forest and their ecosystem services; enable investment in agriculture and other sectors to de-couple these activities from forest conversion; stimulate alternative income and employment options for forest and other local communities; and strengthen governance, policies and legislation, where necessary, to ensure equitable and durable outcomes. We recommend that CDCS actions aim at these strategic areas.

- Colombia has made great strides in zoning large tracks of land for strict conservation, indigenous communities and sustainable uses, and yet there is still more than 6 million hectares without well-defined and enforced property rights. This is a keystone for any long-term, sustainable land use strategy. Success in mitigating climate change, consolidating a sustainable State presence and improving the livelihoods of Colombians in those areas depends on the reform of land use management and land zoning within forest reserves, as this area constitutes a main restriction of the territory within the CDCS focus areas. Thus, clear land-use and zoning regulations will be critical to any land property strategy aimed at a post-conflict scenario in which land rights are sought for vulnerable populations and landless farmers.
- The above should also be complemented with strong, well-funded and operational institutions that are able to ensure the protection of the national parks, the enforcement of environmental regulations, a close and well-aligned approach with other sectors for alignment of environmental and sector development objectives, and strengthened sustainable production value chains. Coordination on production incentives with the agricultural, forestry and cattle ranching sectors is of essence; and so is the alignment with the mining and transport sectors.
- Colombia is already facilitating pilot projects, which are issuing carbon certificates that are being traded in the voluntary carbon market. However the benefits of REDD+ go far beyond carbon sequestration. There are numerous opportunities for productive projects based on the use of biodiversity and ecosystem services provided by forests, such as contributions to sustaining water-related ecosystem services, including filtering and purifying water; stabilizing soil and reducing erosion, which in turn reduce sedimentation of watercourses; and regulating the amount of water reaching watercourses, thus reducing the risks of flooding. Additional opportunities arise from sustainably managed forests including the provision of food, seeds and fibers; low carbon energy sources such as biomass-based energy; building and construction materials, pulp, paper, packaging board and tissue products; pharmaceuticals and medicinal plants; biofuels and bioplastics; oils, ornamentals and resins. The actions derived from the CDCS should explore such opportunities for cooperation efforts.
- Current GoC incentives for agricultural activities require that landowners intervene at least two thirds of their land plots. The CDCS could help the GoC design new productive incentives that encourage conservation of a larger percentage of land plots. For example, the Family Agricultural Unit (UAF) created as a way to consolidate land rights could include a conservation requirement on a certain percentage of land plots. A similar requirement could be applied to the approval of agricultural loans.
- Deforestation analyses show a lack of strategies to provide connectivity between protected areas to avoid patches of isolated ecological structures and ecosystems. The CDCS could support the creation of conservation corridors where productive activities are permitted so long as they provide for means of ecological connectivity. For example, silvopasture techniques for cattle ranching areas could improve connectivity and avoid patches of isolated ecosystems.

- Regional environmental authorities, particularly Regional Autonomous Corporations (CARs) and Sustainable Development Corporations (CDS) are generally responsible for protecting key ecosystems in large jurisdictions, while lacking resources and management capacity. The CDCS could provide assistance by exploring ways to increase available resources for these regional authorities, and technical capacity for environmental management and protection. A particular necessity in forest areas is a rural cadastre, which is currently inexistent.
- There are more than 2 million artisanal miners in Colombia, most of which operate illegally in forest areas of key importance, with significant environmental impacts in such areas. The GoC has started to crack down on them by making surprise visits to the mines, cancelling permits for a lack of security and instating higher fines for violations. The CDCS could provide significant aid to the GoC by promoting a formalization strategy for informal mining. In this sense, a legal reform could be sought in which a framework is set for formalization as well as measures to strengthen the capacity of informal miners to comply with environmental regulations and implement good extractive practices. The strengthening of national, regional and local environmental authorities is required for improved monitoring and enforcement.
- The new intervention areas in the regions proposed by the CDCS 2014 - 2018 where biodiversity issues need to be preventively addressed are: a) the Amazon region (areas where deforestation is critical in the departments of Caquetá, Guaviare and Meta); b) inter-Andean valleys of the Magdalena and Cauca rivers, as well as the flood plains (mid and lower part of the basin in the departments of Antioquia, Sucre, Córdoba and Bolívar); c) higher basin of the Magdalena river (department of Huila); and d) biogeographic Chocó (department of Cauca). These areas are key biodiversity hotspots and habitats of many endangered species. The CDCS could provide significant assistance by including activities to identify the nation's ecological structure as a pre-condition for territorial ordering and productive planning.
- Conservation efforts aimed at threatened species has proven to be ineffective. A new approach is required for the protection of threatened ecosystems and groups of species. The CDCS could promote such an approach by directing protection, restoration and rehabilitation efforts to threatened ecosystems and groups of species identified.
- Cooperation efforts have been traditionally focused on those areas rich in biodiversity, particularly within the national parks system. It is time to seek protection beyond the parks in buffer zones and non-protected areas. Communities living around natural parks and protected areas normally face land use restrictions. Such communities could become partners in conservation if they received incentives for implementing sustainable productive activities aligned with conservation and protection of biodiversity. This can be sought by promoting the use of biodiversity in many regions as a way to improve household incomes in areas of ecological importance.
- Finally, a post conflict scenario will require significant efforts and resources to provide land to a large number of demobilized actors and victims of internal displacement and violence. These lands will most likely be located in areas of significant ecological importance. The CDCS should take preventive measures to avoid additional

deforestation, or the expansion of illicit activities to protected areas and/or other unoccupied lands. Considering the environmental, economic, social and cultural characteristics of the focus areas of expansion of the proposed CDCS 2014 – 2018, the most feasible ecosystem services should be considered in these regions to promote projects on carbon sequestration, water services, and other environmental services.

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