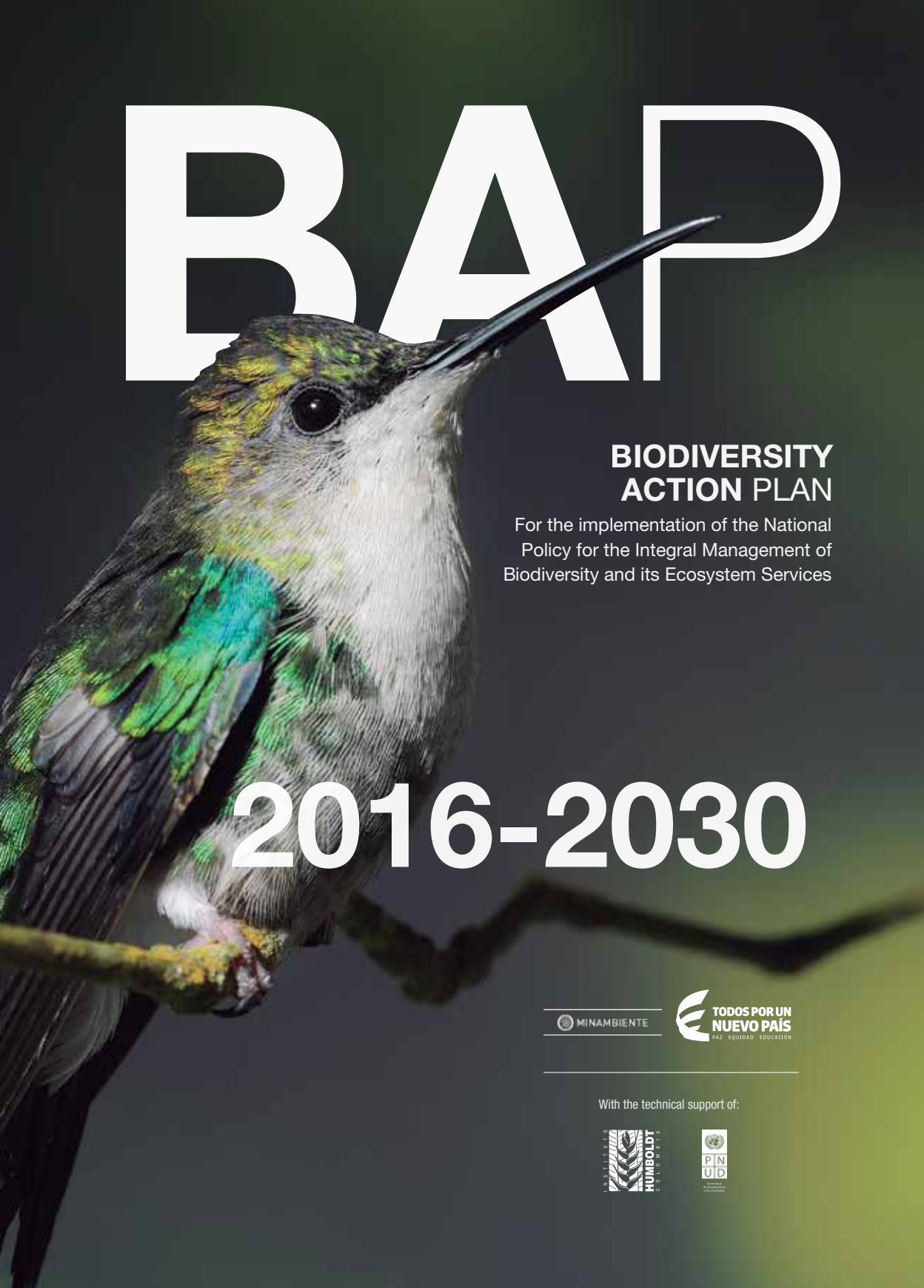

BAP

BIODIVERSITY ACTION PLAN

For the implementation of the National Policy for the Integral Management of Biodiversity and its Ecosystem Services

2016-2030

MINAMBIENTE

TODOS POR UN NUEVO PAÍS
PAZ EQUIDAD EDUCACIÓN

With the technical support of:

INSTITUTO HUMBOLDT COLOMBIA

PNUD

BAP

BIODIVERSITY ACTION PLAN

For the implementation of the National Policy for the Integral Management of Biodiversity and its Ecosystem Services

2016-2030

Ministry of Environment and Sustainable Development, Department of Forests, Biodiversity and Ecosystem Services

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PAZ EQUIDAD EDUCACIÓN

With technical support from:

INSTITUTO HUMBOLDT COLOMBIA

PNUD
Al servicio de las personas y las naciones

BAP

BIODIVERSITY ACTION PLAN FOR THE IMPLEMENTATION OF THE NATIONAL POLICY FOR THE INTEGRAL MANAGEMENT OF BIODIVERSITY AND ITS ECOSYSTEM SERVICES / 2016 - 2030

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INSTITUTO HUMBOLDT COLOMBIA

TODOS POR UN NUEVO PAÍS PAZ EQUIDAD EDUCACIÓN

PNUD Al servicio de las personas y las naciones.

INITIALS AND ACRONYMS

AAU: Urban Environmental Authorities

AICA: Important Bird Area (IBA)

ANH: National Hydrocarbons Agency

ANLA: National Environmental Licensing Authority

APC: Presidential Agency for International Cooperation of Colombia

Biofin: The Biodiversity Finance Initiative

BPND: Grounds for the National Development Plan

CAR: Autonomous Regional Corporations

CDB: Convention on Biological Diversity

CDS: Sustainable Development Corporations

CHM: Clearing-House Mechanism of the Convention on Biological Diversity

Colciencias: Administrative Department of Science, Technology and Innovation

Corpoica: Colombian Agricultural Research Corporation

CVC: Regional Autonomous Corporation of Valle del Cauca

Cepal: Economic Commission for Latin America and the Caribbean

CONPES: National Council for Economic and Social Policy

DBBSE: Deparment of Forests, Biodiversity and Ecosystem Services

DNP: National Planning Department (NPD)

EOT: Territorial Ordering Scheme

GBIF: Global Biodiversity Information Facility

GEF: Global Environmental Facility

Gibse: Integral Management of Biodiversity and its Ecosystem Services

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit, German Agency for Technical Cooperation

IDEAM: Institute of Hydrology, Meteorology and Environmental Studies

IIAP: Environmental Research Institute of the Pacific

Invemar: Institute of Marine and Coastal Research "José Benito Vives de Andreis"

Ipbes: Intergovernmental Platform for Biodiversity and Ecosystem Services

MADS: Ministry of Environment and Sustainable Development

OECD: Organization for Economic Co-operation and Development

PGAR: Regional Environmental Management Plan

PANGIBSE: National Action Plan for the Integral Management of Biodiversity and its Ecosystem Services

PARGIBSE: Regional Action Plan for the Integral Management of Biodiversity and its Ecosystem Services

PARB: Regional Action Plan of Biodiversity

PND: National Development Plan (NDP)

PNEIET: National Plan for the Control of Invasive, Exotic and Transplanted Species

PNGIBSE: National Policy for the Integral Management of Biodiversity and its Ecosystem Services

POMCA: Watershed Ordering and Management Plan

PNOEC: National Policy of the Ocean and Coastal Areas

SPNN: National Natural Parks System

PNUD: United Nations Development Programme (UNDP)

POT: Territorial Ordering Plan

SIAC: Colombian Environmental Information System

SiB: Colombian Biodiversity Information System (BIS)

SINA: National Environmental System

Sinap: National System of Protected Areas

Sinchi: Amazonian Scientific Research Institute

UAESPNN: Special Administrative Unit of the National Natural Parks System

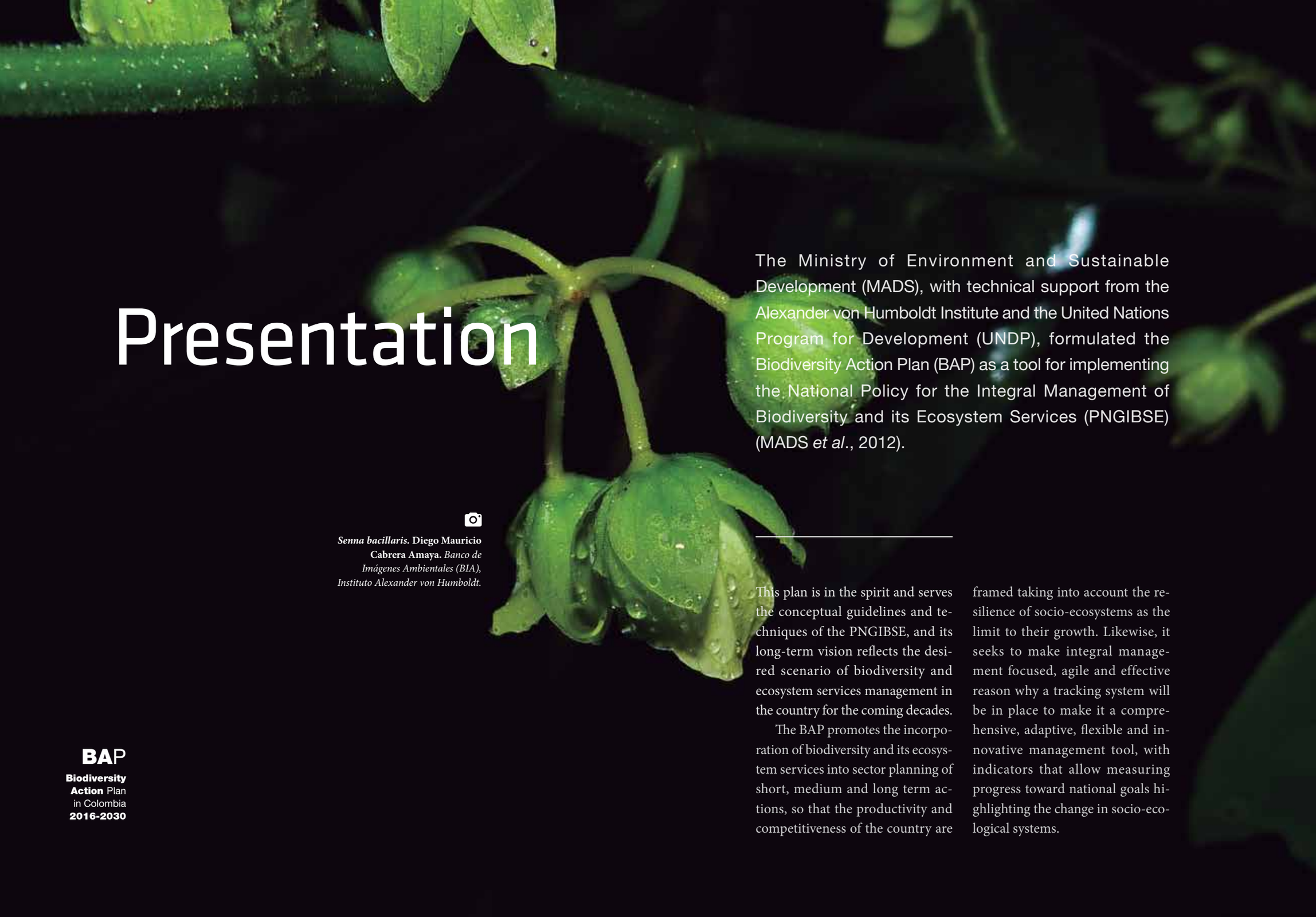
UICN: International Union for Conservation of Nature

Upme: Mining and Energy Planning Unit

WWF: World Wild Fund

Presentation

The Ministry of Environment and Sustainable Development (MADS), with technical support from the Alexander von Humboldt Institute and the United Nations Program for Development (UNDP), formulated the Biodiversity Action Plan (BAP) as a tool for implementing the National Policy for the Integral Management of Biodiversity and its Ecosystem Services (PNGIBSE) (MADS *et al*., 2012).



Senna bacillaris. **Diego Mauricio Cabrera Amaya.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

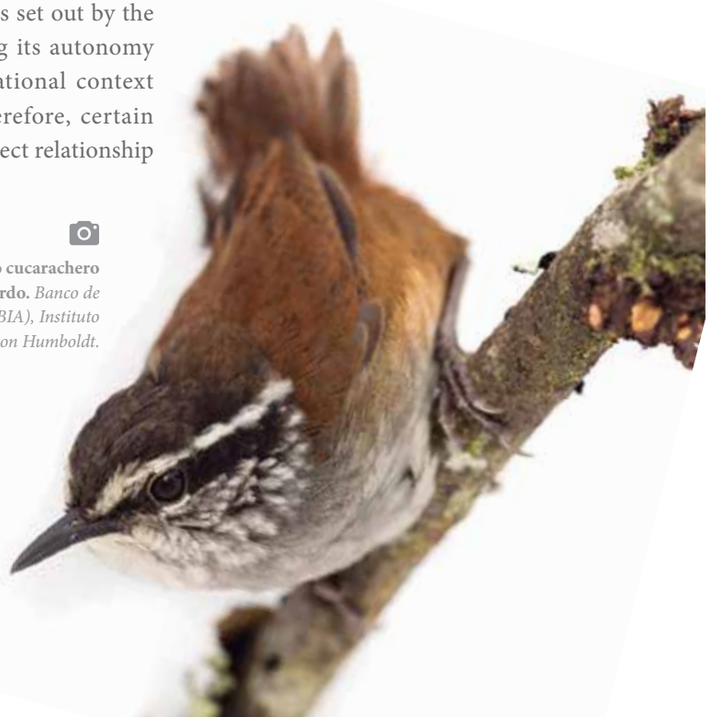
This plan is in the spirit and serves the conceptual guidelines and techniques of the PNGIBSE, and its long-term vision reflects the desired scenario of biodiversity and ecosystem services management in the country for the coming decades.

The BAP promotes the incorporation of biodiversity and its ecosystem services into sector planning of short, medium and long term actions, so that the productivity and competitiveness of the country are framed taking into account the resilience of socio-ecosystems as the limit to their growth. Likewise, it seeks to make integral management focused, agile and effective reason why a tracking system will be in place to make it a comprehensive, adaptive, flexible and innovative management tool, with indicators that allow measuring progress toward national goals highlighting the change in socio-ecological systems.

Similarly, from a program standpoint, this plan adopts the recommendations of the Environmental Performance Assessment of Colombia (Cepal, 2014), the mandate of the National Development Plan (2014-2018): "All for a New Country.Peace, Equality, Education" (PND), and context-based national and regional priorities, organized in line with the vision, purpose and principles of the PNGIBSE around its thematic pillars. This takes into account the country's progress at different levels and the committments undertaken within the framework of the Convention on Biological Biodiversity (CBD)[1], in compliance with the Aichi Targets.

National goals, however, were identified and suggested emphasizing the priorities set out by the country exercising its autonomy and taking the national context into account. Therefore, certain goals set have a direct relationship with the Aichi Targets; others, on the contrary, should be read indirectly and tacitly in light of the global targets.

The PNGIBSE develops the political, regulatory and institutional framework of the country through its content; it advances the importance of biodiversity and ecosystem services for the development and wellbeing of society; it presents a comprehensive diagnosis and identifies biodiversity's drivers of transformation and change at the national level using globally identified drivers for reference; and it points to the conceptual approach and strategic framework of the Integral Management of Biodiversity and its Ecosystem Services (Gibse). That said, the BAP does not dwell on these points; it only briefly mentions some relevant contextual and national outlook aspects, so it should be read and understood in light of the content developed by the PNGIBSE.



***Henicorhina leucophrys* o cucarachero pechigrís. Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Construction of the BAP began in 2014 around contributions from a variety of sectors and, although it follows parameters agreed to internationally within the framework of the CBD, it also considers the particularities of the national context and the priorities independently set by the country.

The process of preparing the BAP began in 2014 and was carried out through consultations with officials of the National Environmental System (departments of the Ministry of Environment and Sustainable Development -MADS-, Autonomous Regional Corporations -CAR-, research institutes attached and associated with MADS, National Natural Parks -PNN-) and with the national and regional academic and scientific sector. Workshops and working groups were additionally carried out with a few of the country's productive sectors (mining, energy and hydrocarbons, agriculture, and infrastructure) within the framework of the inter-ministerial agendas. The construction of this document, therefore, was done taking into account inputs generated through a variety of in person and remote discussions, the review of secondary information and consultations with experts[2]. As part of the participatory construction process, however, the first phase of implementation of the BAP

1. In 2010, the parties to the Convention on Biological Diversity (CBD) adopted the Strategic Plan for Biological Diversity 2011-2020 as a decennial framework for action to safeguard biological diversity and its associated benefits. Como parte de este plan estratégico se adoptaron 20 metas, conocidas como las Metas de Aichi.

2. Annex 1 details the process of preparing the BAP.

Camaleón Anolis heterodermus. **Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

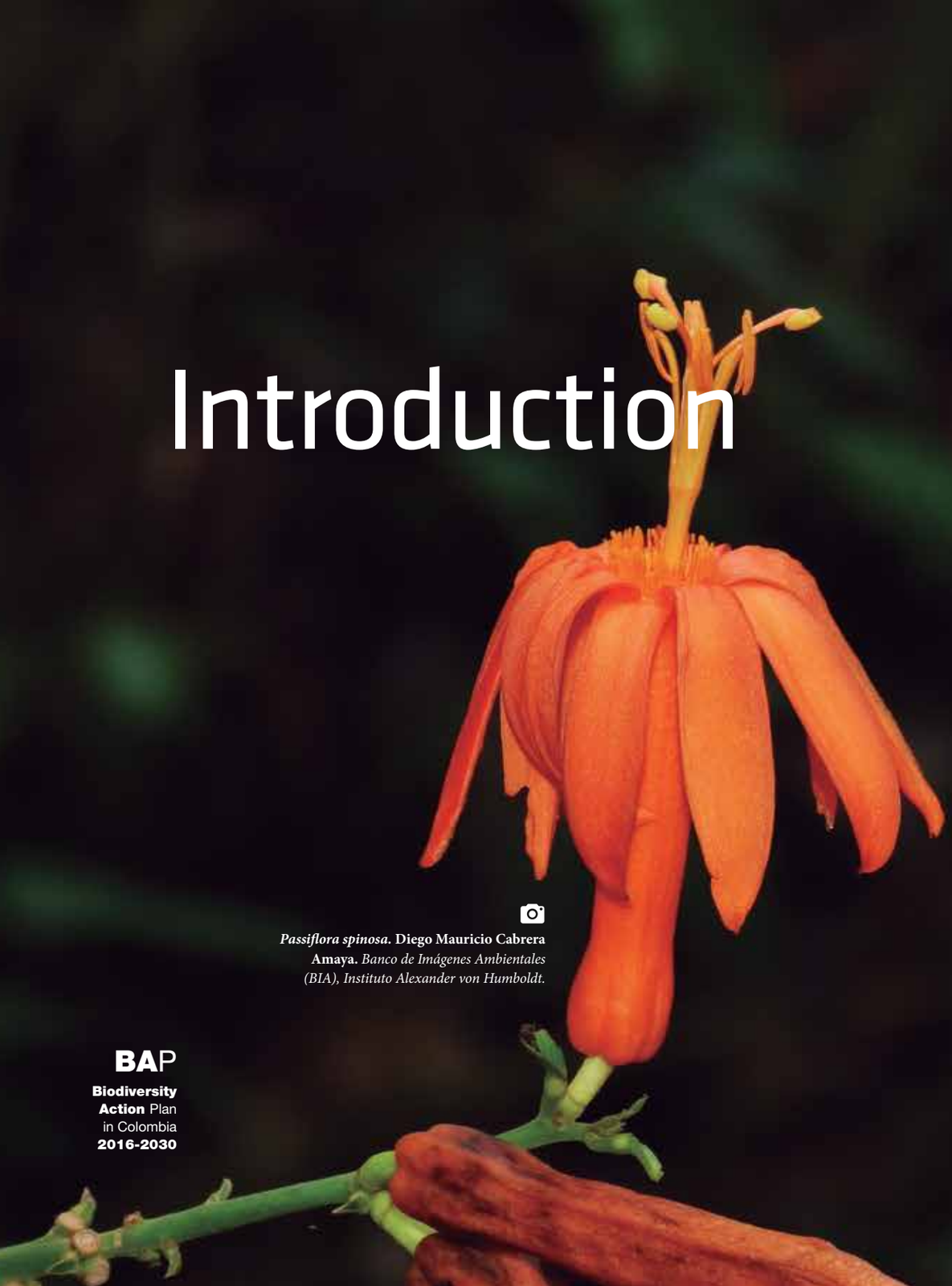
an exercise in collective feedback is considered, which will lead to consolidating this instrument, defining actions and specifying indicators, accountabilities and budget required for its implementation.

The Action Plan, as a guidance document, begins with an introductory section that briefly addresses the referential framework that protects the formulation of the BAP, highlighting the Convention on Biological Diversity, the National Policy on Biodiversity and Ecosystem Services, the recommendations of the Environmental Performance Evaluation of Colombia, and the National Development Plan 2014-2018. For context, a second section briefly addresses the biodiversity situation in the country, the biodiversity change and transformation factors, the most notable advances over the past four years in terms of biodiversity, and the new political context of the country, which will determine the Gibse and the articulation of the BAP to regional planning instruments. A final section presents the strategic framework with short, medium and long term objectives and goals and a budget estimate.

This action plan is a call to the authorities of the National Environmental System, sector ministries and productive, social and academic sectors to work in coordinated and articulated fashion under a shared management scheme that promotes shared responsibility in knowledge, conservation, use and restoration actions, increasing participation and acknowledging biodiversity and its ecosystem services as a public value. As established by the PNGIBSE, in the process of operationalizing the integral management of biodiversity, regional autonomous corporations (CARs) and for Sustainable Development (CDS) and urban environmental authorities (AAU) need to develop or update their regional biodiversity action plans, articulate them conceptually and strategically with the Policy and, in consequence, with its Biodiversity Action Plan (BAP).

For the Ministry of Environment and Sustainable Development it is satisfactory to submit this Action Plan on Biodiversity as an advocacy strategy whose long-term aim is to channel management decisions at the territorial and sector level towards the preservation and sustainable use of biodiversity and its ecosystem services, avoiding exceeding the change thresholds of socio-ecosystems toward irreversible configurations. The BAP, essentially and specifically, seeks to generate a trend and lead the country on to the path of sustainability, contributing to the building of a sustainable regional peace.

Introduction



***Passiflora spinosa*. Diego Mauricio Cabrera Amaya.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

BAP
Biodiversity Action Plan in Colombia **2016-2030**

The Convention on Biological Diversity (CBD), approved by Colombia through Law 165 of 1994, establishes the need for each the parties thereof to design and constantly revise their public policies and adopt concrete mechanisms for the protection of biodiversity. Additionally, it mandates that the national policy framework align with the Action Plan 2011-2020 thereof, in order to contribute effectively to meeting the Aichi Targets to reduce the rates of loss of biodiversity and ecosystem services.

Following on this commitment, the Ministry of the Environment and Sustainable Development, in an open process to review and update the National Biodiversity Policy (1996), formulated the National Policy for the Integral Management of Biodiversity and its Ecosystem Services (PNGIBSE) (MADS *et al.*, 2012).

The PNGIBSE, as a State policy, is aimed at "promoting the Integral Management of Biodiversity and its Ecosystem Services (Gibse), so as to maintain and improve the resilience of socio-ecological systems at national, regional, local and cross-border levels, considering change scenarios and through joint, coordinated and concerted action by the State, the productive sector and civil society".

This aim involves redirecting society-nature relations calling on the various stakeholders, with their expectations, interests and assets, toward building a shared vision, from where it would be possible to induce specific changes in relation to the manner in which we understand and take on biodiversity in the country's development.

In the above context, the PNGIBSE approach conceives continental and marine biodiversity, not only as natural attributes (genes, species and ecosystems), but in a broad sense, as the source, base and guarantee of the services (for support, regulation, provision and cultural values) that are provided by continental and marine ecosystems to society and which are vital to ensuring the viability of the processes of growth, development and wellbeing of Colombians. In consequence:

- **It adopts** the socio-ecological approach and acknowledges the interdependence between social and ecological systems whose dynamics and interactions are changing and complex and, for this reason, the responses and proposed solutions must be innovative, flexible and creative.

- **It assumes** that the management of continental and marine biodiversity involves actions of preservation, sustainable use, knowledge generation, restoration and risk management, which requires coordinated social, interinstitutional and inter-sector interventions targeted at sustainable production models.

- **It considers** that the management of continental and marine biodiversity must be stated in a concrete manner in land-use planning processes and become, in turn, a structuring element that guides the political-administrative and planning actions at various scales.

- **It identifies** the need for strengthening participation and governance processes, which means recognizing and incorporating production systems and knowledge, and taking all stakeholders who have an interest in the territory as valid and legitimate interlocutors.

The country's biodiversity should be understood in the light of its interaction with society. This focus taken on by the PNGIBSE has given rise to six thematic pillars targeted at promoting and handling the country's natural wealth.

Mariposa macho (*Phoebis philea philea*). Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

- **It recognizes** that men, women, boys, girls and adolescents, as different members of society have different interests and therefore exert a differential impact on the territory.

Through these statements, the PNGIBSE proposes the following six thematic pillars:

i. Biodiversity, conservation and care of nature.
ii. Biodiversity, governance and public value creation.
iii. Biodiversity, economic development, and quality of life.
iv. Biodiversity, knowledge management, technology and information.
v. Biodiversity, risk management and provision of ecosystem services.
vi. Biodiversity, shared responsibility and global commitments.

The six thematic pillars are expressed in 33 strategic lines, aimed at addressing the underlying causes and drivers of loss and transformation of biodiversity. They should allow in this manner, through the BAP, guiding the management decisions projecting and promoting biodiversity and ecosystem services as an innovative and transformative element in national dynamics. As is evident, there is a significant interdependence that is both conceptual and operational between the thematic pillars, so defined goals and actions for their achievement should not be read individually but in context and jointly.

It should be noted that in 2013, member countries of the Organization for Economic Co-operation and Development (OECD) accepted the candidacy of Colombia to kick off the formal process of joining the organization. In this scenario, a way forward was designed that the various ministries need to follow in accordance with the

priorities identified in the thematic committees of the OECD[3]. 45 specific recommendations emerged from there, consolidated in the Environmental Performance Assessment of Colombia, that are added to the recommendations by the OECD in the document *Better policies - Colombia: priority policies for inclusive development* (OECD, 2015). These recommendations should lead to reforms and institutional, political and legal adjustments in the environment and biodiversity, and materialize through the BAP, among other instruments. The following recommendations, which came from the document mentioned, were prioritized for the formulation of this BAP:

1. Strengthen environmental governance for better management at all institutional and territorial levels.

2. Promote greater use of taxes and fees in relation to the environment, gradually eliminating subsidies and tax exemptions that are harmful for biodiversity in all sectors.

3. Incorporating biodiversity and ecosystem services as key aspects in the planning processes of the sectors (agriculture, livestock, mining, transportation and infrastructure, housing) and as a basis for land use planning.

4. Strengthen the Colombian Environmental Information System (SIAC) for knowledge management and generation and articulation of information to support decision-making at territorial and sector levels.

5. Positioning biodiversity as a strategic element of the sustainable economic development of the country.

6. Promote actions for biodiversity conservation and proper use of the country's strategic ecosystems (including protected areas, research, genetic resources, biotechnology, compensations, deforestation, strategic ecosystems, climate change and risk management).

The National Government makes these recommendations viable over in the short term through the National Development Plan 2014-2018. The draft bill[4] by which the National Development Plan 2014-2018 "All For a New Country" is issued and which is an integral part of the document entitled *Grounds for the National Development Plan 2014-2018: All for a new country* (BPND)[5] considers

3. http://wsp.presidencia.gov.co/

The entry of Colombia to the OECD demands a national commitment to implementing a development scheme that preserves the country's biodiversity The BPNDs and the BAP are a few of the instruments that are based on this premise.

the objective: "build a peaceful, equitable and educated Colombia, in harmony with the purposes of the National Government, with OECD standards, and with the vision of long-term planning provided by the post 2015 Development Agenda".

BPNDs start by recognizing that economic growth is on an environmentally unsustainable path, that total wealth is running out and that the Colombian economy is intensive in the use of natural resources, over which the extractive industry, extensive ranching, urbanization and motorization exercise pressure.

They also indicate that "the inappropriate use and occupation of the territory and the degradation of environmental quality have created conditions for conflict that need to be addressed through planning and sector-basedsectornvironmental management, contributing to building a more equitable and peaceful country ". In turn, they note that "Biodiversity and its ecosystem services provide benefits that are the basis for the development of economic and social activities of the country and adaptation to climate change" and that comprehensive regional planning, strengthened environmental institutions, sustainable sector and urban management and business momentum are indispensable for its conservation that promote the appropriate use of biodiversity.

The NDP, in the chapter on Green Growth suggests sector strategies and actions for attai-

4. Filed in the Congress of the Republic on February 7, 2015.

5. Grounds for the National Development Plan 2014-2018. All for a new country: peace, equality, education. Preliminary version for discussion of the National Planning Council.

The county currently faces issues such as the inadequate use and occupation of the territory and the degradation of environmental quality. It is, therefore, necessary to implement environmental regulation and management processes that protect the natural base upon which the well-being and productivity of Colombians depend.

Mariposa en una inflorescencia. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

ning goals related to sustainable and low-carbon growth in productive sectors such as transport, housing, agricultural , mining, oil and industry. It also considers:

1. Improving sector management to reduce environmental impacts.

2. Protecting and ensuring the sustainable use of natural capital, conserving biodiversity, reducing deforestation and supporting payment for environmental services and conservation management in transformed landscapes.

3. Improving knowledge, identifying actions and moving forward with concrete activities that reduce vulnerability to climate change. These acknowledgements represent a window of opportunity for the country to enter the path of environmental sustainability as a commitment and intersector pact.

It should be noted that the BAP is not circumscribed or limited to the NDP in terms of scope (period of government), but it does understand that short-term progress and development that happen within the framework of the NDP set the stage for permanent actions and long-term commitments.

Over the long-term, acknowledging the role that civil society and every productive sector play in land management with shared responsibility for biodiversity conservation at national, regional and local level is essential to achieve the sustainability of productive and economic activities of the country, as well as for the maintenance of ecosystem services vital for the wellbeing of society in general. In this sense, the harmonization of the BAP with other sector policy instruments is essential to promote the incorporation of biodiversity and ecosystem services conservation actions in sector production decisions. Thus, it is possible to conserve biodiversity and reduce sector vulnerability to shortages of ecosystem services.

The 2020, 2025 and 2030 goals matrix is grounded on the need to ensure that civil society and the productive sectors, especially within the situational context represented by the resolution of armed conflict, carry out their activities in sustainable fashion to conserve national biodiversity.

Abuelos Corynaea crassa Hook.f. **Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

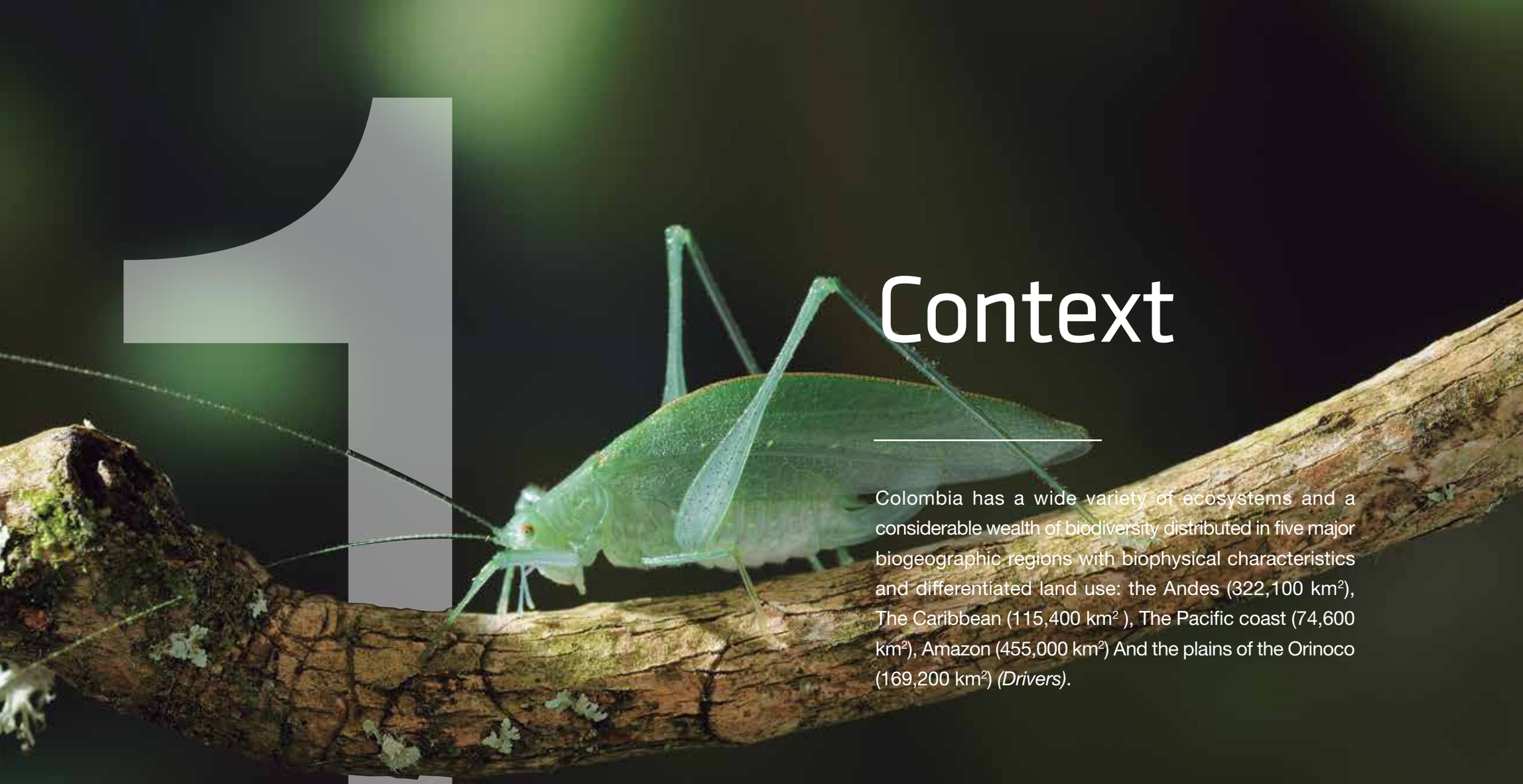
As noted in the *V Biodiversity Report* (MADS, 2014), in the historical context facing Colombia vis-à-vis conflict resolution, the building of peace scenarios is through decision-making in regard to territories and ecosystems in good condition that are biodiverse and fragile, which could represent a risk or an opportunity depending on the measures taken to channel this.

In a context of international commitments, conditions, and new approaches to the PNGIBSE, the Biodiversity Action Plan is presented as an instrument of environmental, regional and sector planning, which addresses the issues needed to contextualize and give meaning to the objective and strategic framework the PNGIBSE. Biodiversity and ecosystem services management are expected to be focused in this manner for preservation purposes, confronting environmental change and maintaining resilience in social-ecological systems. On this basis, and crossing-referencing with the guidelines of the OECD, the Aichi Targets and the NDP led to producing the targets matrix for 2020, 2025 and 2030.

1

Context

Colombia has a wide variety of ecosystems and a considerable wealth of biodiversity distributed in five major biogeographic regions with biophysical characteristics and differentiated land use: the Andes (322,100 km^2), The Caribbean (115,400 km^2), The Pacific coast (74,600 km^2), Amazon (455,000 km^2) And the plains of the Orinoco (169,200 km^2) *(Drivers)*.



Insecto. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.

The most transformed ecosystems are land-based and insular, while those that are aquatic and coastal seem to be preserved in greater proportion. 68.93% of the territory is in natural ecosystems; 30.58% in transformed ecosystems; and 0.48%, lack information on coverage. The transformation process is associated primarily to activities related to the agricultural sector, mining and energy, forestry and infrastructure, which has generated significant levels of erosion, mainly in the Andean region and in the Caribbean region.

ACCORDING TO IDEAM
(2014 and 2015), the country has a total of 98 general ecosystems (74 natural and 24 transformed) divided into the following categories:

Marine
26
natural

Terrestrial continental and insular
26
natural and
9
transformed

Continental coastal and insular
8
natural and
1
transformed

Aquatic
15
natural and
1
transformed

STATUS OF BIODIVERSITY

In terms of biodiversity, and according to the Biodiversity Information System (BIS), Colombia has 54,871 species recorded in the Global Biodiversity Information Facility (GBIF) on the various biological groups, a figure that does not include the huge variety of microorganisms.Although there are no detailed and comprehensive biological inventories in Colombia for all its territory, there are estimates listed by biological group in Figure 1.

Additionally, it is estimated that about 34 species of mammals, 367 amphibians, 66 birds, 115 reptiles, 1,500 plants and 1,543 orchids are endemic (SiB, 2016). Most of them are located in two of the most important biodiversity *hotspots* identified in the world: Amazon and biogeographical Chocó (PNGIBSE, 2012). With these estimates, Colombia ranks first worldwide in diversity of birds and orchids; second in diversity of plants, amphibians, freshwater fish and butterflies; the third in diversity of reptiles and palms; and fourth by variety of mammals.

1,203 species have been identified at various threat levels, taking into account the criteria of the International Union for Conservation of Nature (IUCN). Of these, 173 are critically endangered; 390, endangered; and 640, [2][3] are listed as vulnerable (Resolution 192 of 2014). Of the total [6][7] threatened species, 407 correspond to species of animals and 796 to plant species. Of the group of amphibians, reptiles, mammals, birds and invertebrates and bony and cartilaginous fishes, there are 60 species listed as critically endangered, 129 are considered endangered and 218 listed as vulnerable. In the case of plants, 113 species are critically endangered; 261 are endangered, and 422 are listed as near-threatened[6].

Although the country has a good model for compiling information on biodiversity, which includes the Ministry, research institutes, the National Parks System and the National Environmental Licensing Authority (ANLA), lack of information remains a significant limitation to support negotiations with the sectors, support decision-making and to strengthen the dissemination at different scales of the value of biodiversity and its ecosystem services.

6. Http://www.minambiente.gov.co/index.php/noticias/122-noticias-mi-nambiente/2204-especies-amenazadas-en-colombia

VERTEBRATES

- Mammals 476
- Birds 1,889
- Reptiles 571
- Amphibians 763
- Marine fish 2,000
- Freshwater fish 1,533
- Migratory birds 197

INVERTEBRATES

- Butterflies 3,274
- Ants 900
- Marine mollusks 2,250
- Terrestrial mollusks 650
- Beetles 7,000
- Arachnids 109
- Decapods 688
- Bees 398

PLANTS

- Flowering plants 22,840
- Ferns and related 1,643
- Palms 262
- Orchids 4,010
- Flowerless plants 45
- Mosses and related 1,636

LICHENS

- Lichens 1,636

MUSHROOMS

- Macrofungi 1,239
- Rusts and smuts 405

Figure 1.
Estimates of species by biological group for Colombia.
Source: http://www.sibcolombia.net/web/sib/cifras

BAP
2016-2030

As one of the main strategies for *in situ* conservation of its rich biodiversity, Colombia has decisively driven the creation of protected areas at different scales and integrated into the National System of Protected Areas (Sinap)[7]. According to the Single Registry of Protected Areas (Runap), the country has a total of 769 protected areas in different categories (116 national, 235 regional and 418 civil society reserves), corresponding to 23,805,244.49 ha (Runap- Cut-off 8 August 2016). Of the total protected areas, 59 belong to the National Parks System, representing 14,258,224 ha (142,582 km^2) of the national area (marine and terrestrial), where 11.27% is the continental area, and 1.5%, the marine area. Of these areas, 26 overlap with indigenous and afro-descendent reservations, and 34 are occupied by settlers and farmers[8]. However, it is clearly not only enough to increase the number or extension of the protected areas; the effectiveness of this needs to be assessed for the actual conservation of biodiversity and ecosystem services.

Although the benefits reported by the creation of protected areas are eloquent in terms of hydrological supply, it is of the essence to assess in greater depth the effectiveness of this strategy driven by the country to conserve its biodiversity wealth.

The benefits that protected areas generate are significantly related to service provision and regulation of water resources. The SPNN is calculated to annually contribute approximately 0.9% to the gross domestic product (GDP), with a value of at least US$ 2,770 million. In hydrographic sub-basins (SZH) with national parks, there is an additional 25% and 30% offer of water supply on an average year and dry year respectively (National Natural Parks, 2014). At the sector level, it has been estimated that at least 19 areas of the SPNN supply water to 25 million people, contributing at least US$ 491 million to the domestic sector. Among the beneficiary cities are Bogota, Cali, Manizales, Neiva, Santa Marta and Valledupar. Furthermore, about 50% of the hydroelectric energy produced in the country comes from the SPNN, contributing at least US$ 502 million in additional water supply to the energy sector. On the other hand, irrigation districts that benefit from water coming from the SPNN represent at least 152,286 ha with 25,857 beneficiary families and provide at least US$ 884 million in additional water supply to the agricultural sector (National Natural Parks of Colombia, 2014).

We also highlight that the areas of the SPNN retain four of the six most important hydrographic basins of the country and over 62% of national aquifer springs. They also contain 28 of the 41 biogeographic districts of the country and a large part of two of the most important areas of global biodiversity (biogeographic Chocó and the Amazon), with high bioprospecting potential. In addition, protected areas and their systems contribute to mitigation and adaptation to climate change, and

***Camaleón Anolis heterodermus.* Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

7.Sinap:

a set of protected areas, social actors and strategies and management tools that articulate to contribute jointly to fulfilling the conservation objectives of the country. It includes all protected areas of public, private or community governance, and within the scope of national, regional or local management.

8.

http://www.parquesnacionales.gov.co/portal/es/sistema-de-parques-nacionales-naturales

provide space for recreation and ecotourism development, benefiting local populations, regions and the business sector (National Natural Parks of Colombia, 2014).

In 2010 the country produced the protected areas policy, contained in CONPES document 3680[9]. purpose is to *consolidate the SINAP as a complete, ecologically representative and effectively managed system, that contributes to land-use planning, compliance with the national objectives of conservation and sustainable development of the country.* The action lines this policy proposes include the generation of complementary land-use planning actions that contribute to the SINAP's ability to connect and represent the country's ecological structure with ideas not necessarily for conservation such as biological corridors, buffer zones, rural landscapes or other types of categories such as Ramsar sites, IBAs, biosphere reserves or humanity heritage sites (NPD, 2010). As part of these complementary strategies, the country has 5 biosphere reserves, 6 Ramsar sites and 8 sites listed on Unesco's World Heritage List. IBAs 124 are also recognized and there is a declaratory process for mixed natural and cultural heritage on the tentative list of World Heritage Sites (IAVH, 2015).

In addition to protected areas, there are other land-planning elements that contribute to the conservation of biodiversity and of ethnic and cultural diversity. According to the 2005 Census, there are 87 indigenous groups in Colombia with a population of 1,378,884 people, of which 933,800 are living in 710 reservations located in 27 departments and 228 municipalities in the country. All the reservations total an area of 34 million hectares, equal to 29.8% of the national territory (DANE, 2005 General Census). The same census indicates that the Afro-Colombian community, raizales and palenqueras amounts to 4,261,996 people, representing 10.5% of the country's total population. Currently there are 132 collective territories in the Pacific with an area of 4,717,269 hectares, equivalent to 4.13% of the national territory. There are additionally seven Law Two of 1959 (ZRF) Forest Reserve Zones, corresponding to about 53.4 million hectares approximately. The ZRFs overlap the collective lands of black communities in an area of 3,765,115 28 ha, where 131 of the 155 collective titles are superimposed exclusively with the Pacific Forest Reserve Zone, corresponding to 47% of the total Reserve. Map 1 displays the protected areas of the SNPP, indigenous reservations and Afro-Colombian collective territories.

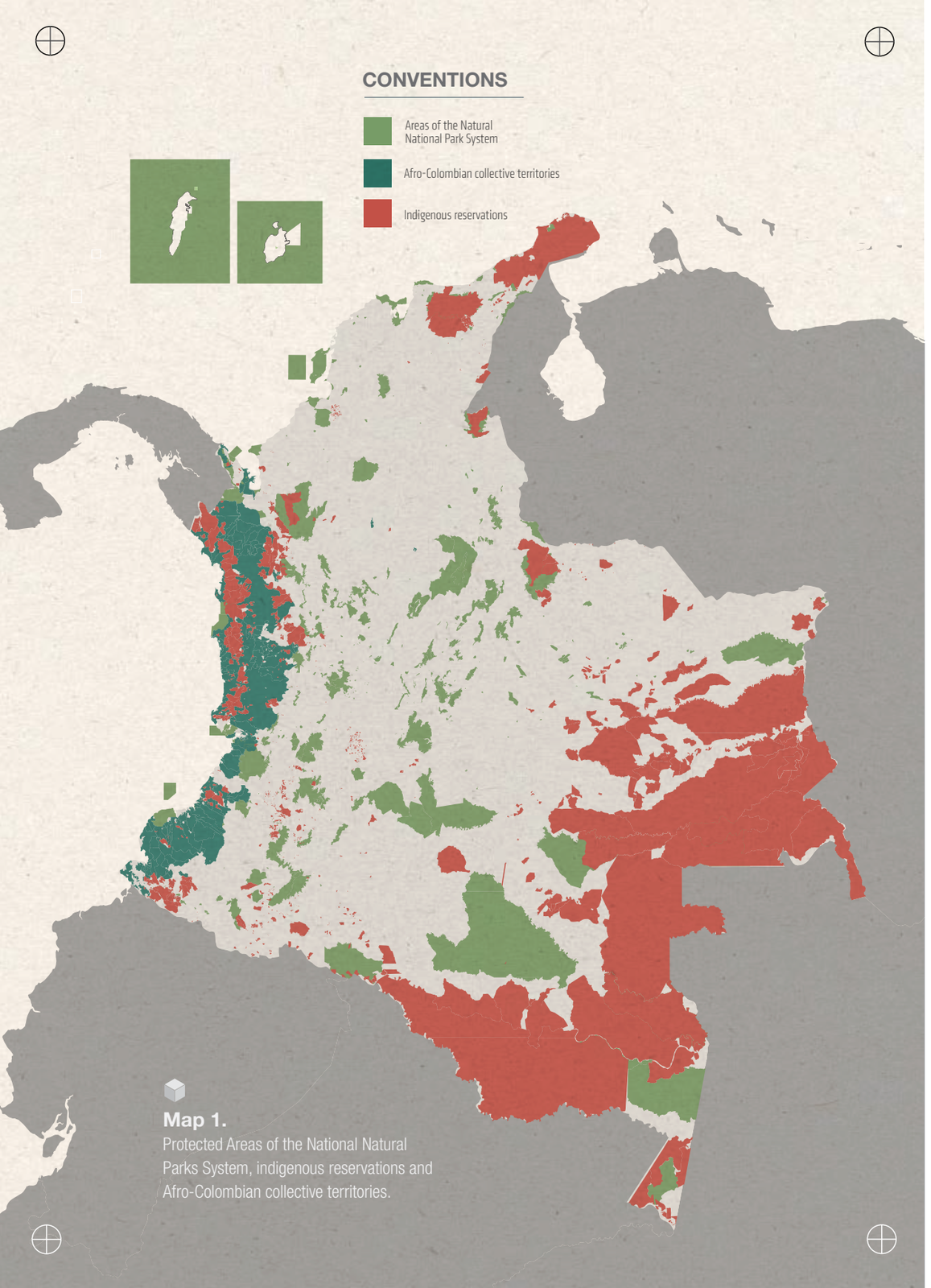
For their part, 304 indigenous reservations are within forest reserves with an area of 20,949,694 hectares, representing 40.7% of the Law Two Reserve Zones and 69.8% of all indigenous territories (Social Action, 2009).

On the other hand, there are six systemsunder the category of Peasant Reserve Areas[10] with 849,265 ha. Their purpose is "to promote and stabilize the rural economy, overcome the causes of social conflicts that affect them and, in general, create conditions for achieving peace and social justice", subject to the policies of environmental conservation and renewable natural resources and land-use planning criteria and rural property (Law 160/94).

In addition to protected areas, there are a variety of schemes targeting the conservation of Colombia's natural and cultural wealth, such as Ramsar sites, biosphere reserves, and Peasant Reserve Areas, among others.

9. Los documentos CONPES son el instrumento técnico de apoyo y coordinación en la formulación de las políticas y son aprobados por el Consejo Nacional de Política Económica y Social (CONPES), que fue creado por la Ley 19 de 1958. Es la máxima autoridad nacional de planeación y se desempeña como organismo técnico asesor del Gobierno en todos los aspectos relacionados con el desarrollo económico y social del país.

10. Calamar Rural Reserve Area, in the municipalities of Calamar, El Retorno and San José del Guaviare (Guaviare); the Cabrera-Sumapaz Province ZRC (Cundinamarca); Pato-Balsillas ZRC, in the municipality of San Vicente del Caguan (Caqueta); Southern Bolivar ZRC, in THE municipalities of Arenal and Morales (Bolívar); Cimitarra River Valley ZRC, in the municipalities of Yondo and Remedios (Antioquia) and Cantagallo and San Pablo (southern Bolivar); Upper Cuembí and Comandante Centro-sur ZRC in the municipality of Puerto Asis (Putumayo).



Map 1.
Protected Areas of the National Natural Parks System, indigenous reservations and Afro-Colombian collective territories.

BIODIVERSITY AND ECOSYSTEM SERVICES CHANGE AND TRANSFORMATION FACTORS

Despite having relatively developed political, institutional and regulatory frameworks in place and an extensive array of conservation systems, in practice, conflicts generated by land use persist reflecting the failures in the implementation of land-use planning. Because of this, biodiversity and ecosystem variety have been heavily impacted by human settlement and production activities, legal and illegal use and extraction of renewable and nonrenewable natural resources.

The Rural and Agricultural Planning Unit (UPRA) identifies land use conflicts in 50% of the national territory, most of which are generated by livestock production in areas suitable for agriculture or for conservation, or from agricultural uses in strategic ecosystems for conservation. As a result of inappropriate land use in 16.5% of the territory desertification processes have been identified with reduced productivity and total and irreversible loss of soil (Perfetti *et al.*, 2013). It is estimated that in the conflict over land use, areas applied to livestock production exceed 1.3 times the existing potential, while only 24% of suitable lands are use in agriculture (NDP, 2015). This situation highlights the need to define strategies that allow moving forward in planning processes defining areas suitable for different land uses and the carrying capacity of strategic ecosystems (e.g. water providers) in order to optimize the sustainable production of the territory (NDP, 2015).

The *World Atlas of Environmental Justice* identifies 115 environmental conflicts caused by the use of resources as a result of the execution of sector policies related to energy expansion, mining and hydrocarbon exploitation, crops and infrastructure development. Conflicts identified are specifically associated with water concessions, infrastructure

The persistently poor use of soils in Colombia highlights the regulatory deficiencies that have existed in the territory. Planning processes are required that optimize sustainable production in appropriate areas.

(ports, roads), fumigation of illicit crops with glyphosate, diversion of rivers for coal mining, gold mining, coal, coltan and building materials, oil drilling, forest plantations, sugarcane and palm crops, damming of rivers for power generation, tourism concessions, among others.

Deforestation

Conflicts are reflected, among others, in the deforestation rates exhibited by the country. High costs include not only a loss of biodiversity, but also soil impoverishment, increased erosion, increased carbon emissions, lower capacity to adapt to climate change and reduced development opportunities for communities and for the country in general.

While the annual rate of deforestation has increased from 310,000 ha in 2010 to 120,933 ha in 2013, in 2014 the increase was 16% with a total of 140,356 ha/year deforested -Forests and Carbon Monitoring System (SMBYC) IDEAM-. Deforestation in 2014 was mainly concentrated in the regions of the Amazon with 45%, Andean with 24%, Caribbean with 17.5% and Pacific with 13.5%. In net terms, the region with the highest forest loss was the Caribbean with 18,903 ha, where the deforested area was equivalent to a 1% loss of total forest cover in the region. Deforestation patterns are associated directly to mining, the increase of the agricultural frontier, forest fires, agricultural crops, illicit crops, infrastructure and population growth. Extensive ranching accounts for almost 60% of the deforestation in the country, with an approximate inventory of 23 million head in 40 million hectares (García, s.f.; Nepstad *et al.*, 2013).

The persistently poor use of soils in Colombia highlights the regulatory deficiencies that have existed in the territory. Planning processes are required that optimize sustainable production in appropriate areas.

By 2015, according to the Forests and Carbon Monitoring System, the annual rate of deforestation in the country was reduced 12% compared to 2014. During 2015 deforestation was 24,035 has and it mainly concentrated in the Amazon (46%) and Andean (24%) regions. The main phenomena associated with this problem are:

- **Illegal mining,** as the factor with the greatest presence in the Colombian Pacific region and in northeastern Antioquia department.

- **The conversion** to agricultural areas, mainly to new grazing areas in Putumayo, Caqueta, Guaviare and Norte de Santander, among others.

- **Illegal logging** in the departments of Nariño, Caqueta, Guaviare, Norte de Santander, Antioquia and Cauca.

- **Forest fires** in the departments of the region of the Orinoco (Vichada, Casanare) of the Andes (Cauca, Valle del Cauca, Antioquia, Nariño, Tolima, Cundinamarca and Norte de Santander), and the Pacific (Chocó).

Figure 2 displays deforestation over the last 25 years in the country.

Biofuels

The loss of vegetation cover not only affects forest areas but also wetlands, natural grasslands, paramos, rivers, etc. Industrial biofuel crops cover about one million hectares across the country (429,000 ha of palm and 478,000 ha sugarcane) (Nepstad *et al.*, 2013) , 2013) and have generated direct effects, for example, in the savannah and gallery forest ecosystems in the Orinoco region. The projection of the sector for the next 15 years is 3,000,000 ha of new crops for biomass, i.e., 14% of the total area of Colombia that the Ministry of Agriculture identified as suitable for biofuel production (Nepstad *et al.*, 2013).

Timber explotation

Another factor of change and transformation of biodiversity is logging. Annual timber production in Colombia is estimated at 3.4 million cubic meters, of which 25% comes from commercial plantations and imports, and 75% from natural forests. About 42% of this production is illegal, contributing 480 km^2 of annual forest degradation and overexploitation of 21 tree species (Nepstad *et al.*, 2013).

Illegality in the forestry sector affects the entire marketing chain and therefore requires joint efforts between the various links (buyers of raw materials, transporters and processors, end users) to ensure the sale and purchase of legal products. To this end, the Inter-sector Pact for Legal Timber was signed in Colombia with the goal is to ensure that timber harvested, transported, processed, marketed and used comes exclusively from legal sources.

DEFORESTED SURFACE AREA IN COLOMBIA FROM 1990 TO 2015

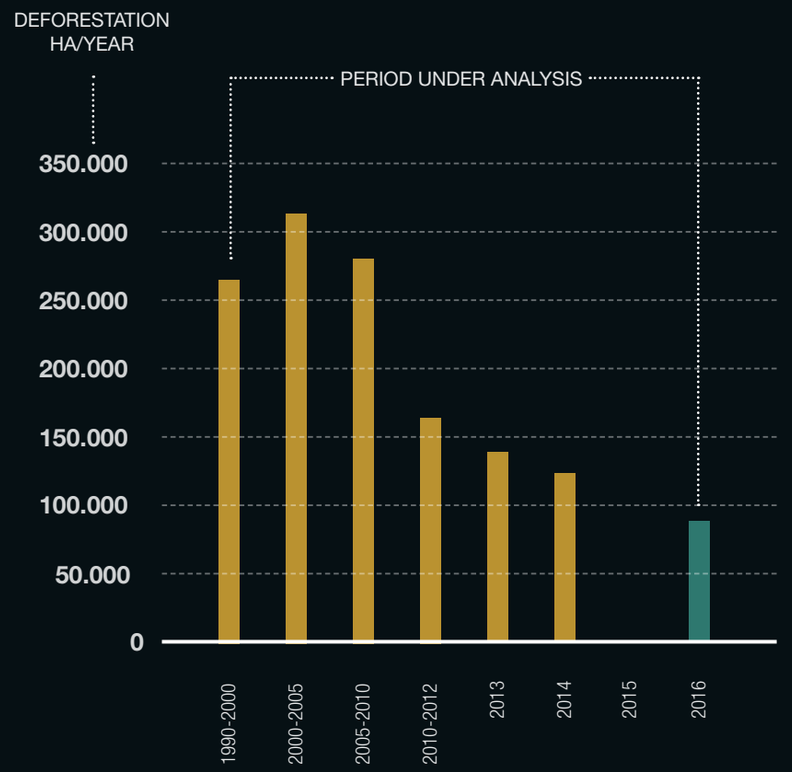


Figure 2.
Deforested surface area in Colombia from 1990 to 2015. *Source: Forests and Carbon Monitoring System. Update of 2015 figures. IDEAM (2016).*

Illegal logging, it is acknowledged there, is due, among other reasons, to institutional weakness, reflected in poor implementation of enforcement mechanisms regarding the use, mobilization and storage of forest products; the limited participation of local communities in the control of the territories; the incidence of armed groups in forest production areas and the lack of coordination between environmental authorities and the law enforcement authorities (PISMLC, 2009). This illegality not only has repercussions on biodiversity loss, but also, on the limited benefit derived for local communities and the generation of market distortions (PISMLC, 2009).

Biological invasions

Biological invasions are another factor of biodiversity loss (EEM, 2004; PNGIBSE, 2012). In Colombia 296 introduced, transplanted and continental invasive species have been identified (terrestrial and aquatic), including plants, mollusks, crustaceans, fish and terrestrial vertebrates (Franco, Baptiste and Diaz, 2011). All told, there are 168 terrestrial species introduced, transplanted and invasive, of which 42 are of flora, 20 invertebrates, 4 amphibians, 20 reptiles, 52 birds, 25 mammals and 128 fish.

The loss of biodiversity is related with the introduction of species that alter the balance and health of ecosystems.

The greatest concentration of species occurs in the Andean region (Antioquia, Caldas, Cauca, Valle del Cauca and Santander). At sea level, 57 species (27 marine and coastal species and 30 species from ballast water) are identified: including lionfish *(Pterois volitans)*, with the ability to threaten the viability of wild species, reducing genetic diversity and transmitting diseases to wild flora and fauna and even to humans. In 2012, the MADS formulated the Lionfish Management and Control Plan, whose purpose is to provide a framework that minimizes environmental damage in marine ecosystems in the Colombian Caribbean.

Highlighted among terrestrial invasive plants are Black-eyed Susan *(Thunbergia alata)*, Common gorse *(Ulex europaeus)*, the water hyacinth *(Eichhornia crassipes)* and African oil palm *(Elaeis guineensis)*. In the savannah of Bogota, common gorse was introduced as an ornamental plant and

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Land use conflicts have been reported in one half of the Colombian territory. Livestock production practices in zones where agriculture would be more appropriate and agricultural uses in strategic ecosystems are the top pressures on the resource.

for hedgerows. It currently invades the eastern hills of Bogota and important areas in Cundinamarca, Boyaca and Antioquia. The giant African snail is included among the invasive terrestrial invertebrates, which represent a major threat to biodiversity and public health (Biodiversity ABC), and in amphibians an important example is the American bullfrog *(Lithobates catesbeianus)*, native to North America and introduced for animal breeding purposes in 1986. This frog is an aggresive predator of native amphibians and reptiles, birds and small mammals and a fungi vector for native species. It proliferates in areas of Cundinamarca, Tolima, Caldas and Valle del Cauca (Laguna de Sonso).

Upon recognizing the threats posed by biological invasions, in 2011 MADS formulated and adopted the *National Plan for the Prevention, Control and Management of Introduced, Transplanted and Invasive Species*, with a 10 year outlook.

***Colibri Eriocnemis vestita hembra*. Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Fishing

Another important topic in terms of providing benefits to communities are fishing resources. As indicated in Figure 1, Colombia has 2,000 species of marine fish and 1,533 species of freshwater fishes distributed in three fishing areas: Pacific Ocean, Caribbean Sea and the continental areas (Map 2). According to the National Authority for Aquaculture and Fisheries (Aunap) (2013), catch volumes in the three areas have shown a downward trend that has accelerated in recent years, with the sharpest reduction seen in the Pacific, with a drop close to 60,000 t between 2004 and 2011. Thus, despite the diversity of species, fisheries and aquaculture activities are only able to exploit these resources in limited fashion. As noted by the Aunap (2013), fishing massively exploits 126 species of freshwater fish, including food and ornamental fish, while only the white and black cachamas, the bocachico *(Prochilodus spp.)* and yamú *(Brycon spp.)*, certain catfish in Huila and Meta, and arawana *(Osteoglossum spp.)* as an ornamental fish.

The reductions in fishing volumes account for the impacts that the alteration of biodiversity could have on the population's well-being.

In the national production of capture fisheries, 2011, the contribution of catches in the Pacific accounted for 65.7% of total production, and a total of 13,000 artisanal fishermen is estimated for the region. Meanwhile, catches in the Caribbean Sea had a share of 3.2%, with about 3,500 artisanal fishermen.

Inland fisheries are located in five major basins: the Magdalena, with a 19.3% share in the volume of the total catch and with nearly 40,000 artisanal fishermen; the Amazon, with a share of 7.6% in catches, has 8,000 artisanal fishermen; the Atrato, with a share of 2% in catches and 1,000 fishermen; the Orinoco region, with a share of 1.8% in catches and 7,200 fishermen; and Sinu, with a share of 0.4% in catches and 3,000 fishermen (Aunap, 2013).

The reduction in fish production is associated with bad practices such as fishing in breeding seasons, catching fish below the minimum size established, the use of non-selective fishing gear, silting and shallowing of river beds (which prevents proper migration of fish), drying of many water bodies that make up the watersheds, deforestation in sources and along the banks, contamination with heavy metals from mining and sewage from coastal and riverine human settlements.

The number of artisanal fishermen is estimated at 120,000, of which 100,000 are permanent and on average families consisting of five persons depend on their activity. Maritime artisanal fishing in the Caribbean and the Pacific is performed by about 40,000 fishermen and inland fisheries, by 60,000 fishermen, of which 30,000 are located in the Magdalena Basin, 10,000 in the Orinoco, 5,000 in the Amazon basin, 5000 in the basin of the Sinu and 10,000 distributed in the Atrato, Catatumbo basins, Rancheria and other basins in the country (Incoder, 2014).

Urban development

The country is moving from urban development to the "metropoliza-

Map 2.
Aquatic, coastal and marine ecosystems.

tion", forming large urban regions (savannah of Bogota, Aburrá Valley, axis of Valle del Cauca) with transformation of the territory, mainly in the Andean region, which concentrates 77.4 % of the population. These dynamics generate pressure on biodiversity and ecosystem services related to water demand for consumption and power generation, food supply, waste generation, etc.

In Colombia, assessments have begun on how cities grow and project themselves, while acknowledging the importance of ecological processes that generate ecosystem services that are essential for urban dwellers. With this in mind, strategies have been defined to incorporate biodiversity and ecosystem services in urban planning (protected areas, regional corridors and green belts, master plans at local levels, green roofs and facades, etc.). MADS has moved forward in the process of identifying the ecological structure for urban areas, granting priority to cities with over 100,000 inhabitants.

Illicit crops

On another front, the expansion of illicit crops associated with the dynamics of conflict and colonization in the agricultural frontier remains a threat to biological and cultural diversity. According to the Illicit Crop Monitoring System (Simci) (2015), illicit crops exhibited an increase of 39% from 69,000 ha in 2014 to 96,000 ha in 2015. In special management areas, the area cultivated with coca increased significantly: in indigenous reservations it increased 52%, going from 7,799 ha in 2014 to 11,837 ha in 2015; collective territories grew 51% from 10,626 ha to 16,030 ha; and in National Natural Parks the increase was 13%, from 5,480 ha to 6,214 ha.

Of the 59 protected areas in the National Natural Parks category, for 2015, 16 are affected by coca cultivation. 58% of the area with coca is concentrated in the PNN Sierra de la Macarena and the NNP Nukak. The greatest percentage increases were recorded in Paramillo and Catatumbo-Barí, with 110% and 80%, totalling 772 ha and 412 ha, respectively. Puinawai, De Los Picachos mountains, Orito Ingi-Ande Medicinal Plants, Sierra Nevada de Santa Marta, El Tuparro and Serrania of Churumbelos have less than 10 ha of coca.

Mining and energy

In terms of sector interventions with potential effects on biodiversity, the mining and energy sector

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Although a sharp decrease has been observed in capture volumes, marine fishing is mostly concentrated in the Pacific Ocean. At the continental level, for its part, the basins of the Magdalena, Amazon, Atrato, Orinoco and Sinú stand out.

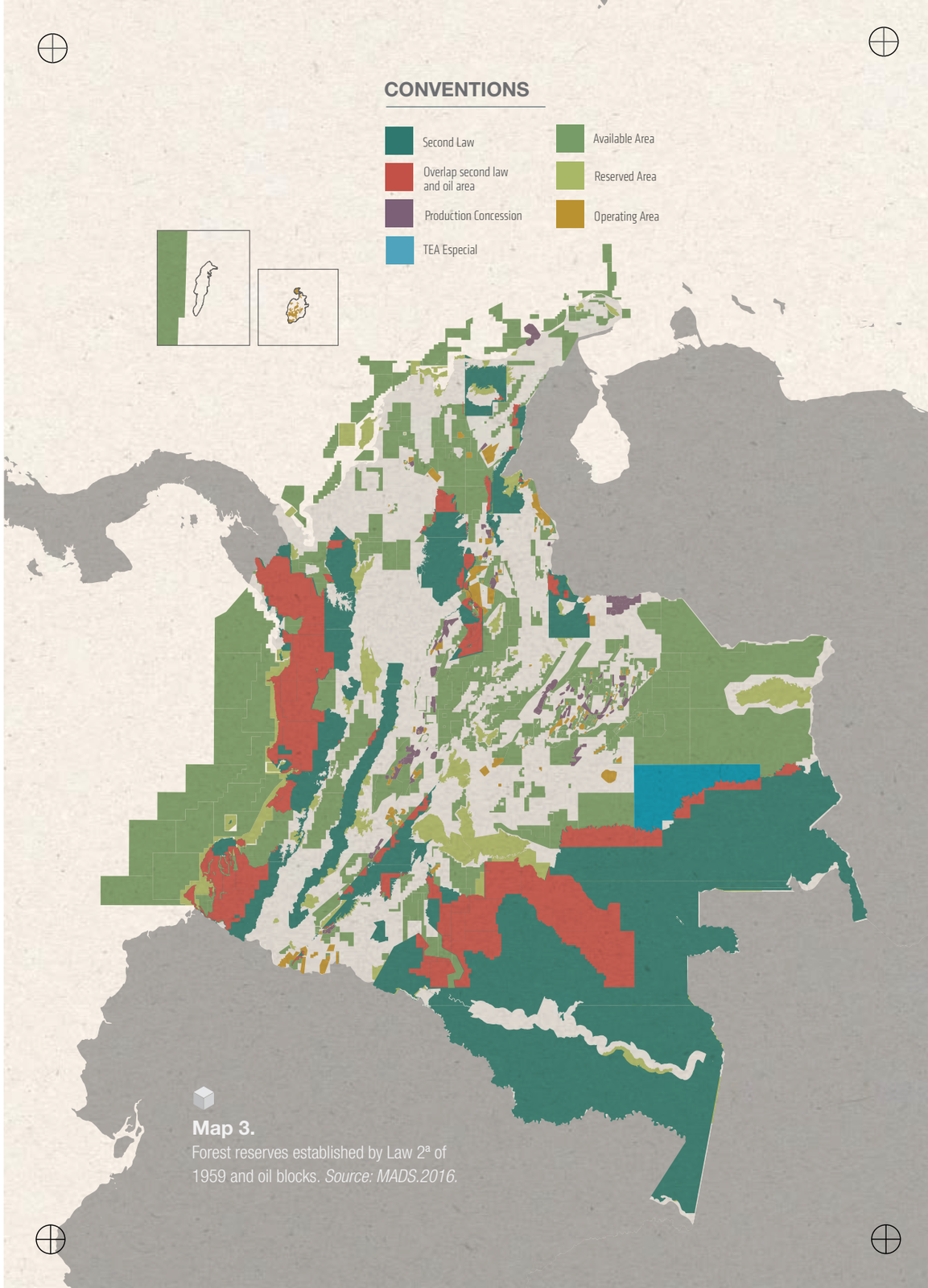
The move from urbanization to "metropolization", the expansion of illicit crops and the strong push of mining are three challenges that need to be considered when dealing with conservation of biodiversity.

stands out. Mining has been declared the foundation of the national economy and consequently has been driven strongly in the last 15 years. Between 2004 and 2007 the mining rights requested and granted for coal extraction increased by 87%, concentrated in the departments of Antioquia, Boyaca, Cesar, Cundinamarca, Norte de Santander and Santander. The number of titles requested for gold mining, quintupled between 2003 and 2007. In hydrocarbons, the total area allocated for oil activities in the country (exploration, production, technical assessment and reserved areas) amounted to 66,498,313 ha (41% of the total area of sedimentary basins in the country), of which 21,476,379 ha are continental aresa, and 45,021,934 ha, are marine areas (General Comptroller of the Republic, 2013) (Map 3).

According to the Ministry of Mines and Energy (MME, 2016), there was an increase in mining ownership: moving from 8,574 titles registered in the National Mining Registry to 9,742 in 2013. or 2014, the mining titles registered in the National Mining Registry were 9,612, and by 2015 this number dropped to 9,291: 36% corresponded to construction materials (the highest percentage of titles granted in the country); 25%, to precious metals, mainly gold; 17% coal; and 23%, other minerals (clays, quartz, iron, emerald, salt, silica, gypsum, etc.).

The National Mining Agency (ANM) states that there are 473 mining titles in force in moorland [páramos] with an area of 125,811 ha (the country has 1,900,000 of paramo): 262 titles correspond to coal; 112, to precious metals; 53, to minerals; 42, to building materials; 3 to emeralds; and 1 to nickel. 262 titles correspond to coal; 112, to precious metals; 53, to minerals; 42, to building materials; 3 to emeralds; and 1 to nickel.

Similarly, 44 mining titles have been granted in the PNNs and 57 in ZRFs. Mining expectations increased in June 2012 when the coun-



Map 3.
Forest reserves established by Law 2ª of 1959 and oil blocks. *Source: MADS.2016.*

***Glaucidium jardinii* o búho andino. Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Mining is the production line that best evidences the need for development policies be articulated with an environmental perspective.

try declared 17,600,000 ha strategic mining areas, in highly biodiverse areas of the Amazon, Orinoco and Chocó. However, mining and energy activities not only represent effects on biodiversity and ecosystem services, but also establish new labor conflicts between this sector and agricultural development. In 2010, 5.8 million hectares were granted exploration concessions on agriculturally suited soil (Perfetti *et al.*, 2013), with the consequent environmental and social effects.

Under these conditions, as noted by the OECD, the main challenge facing the country in reducing pressures on biodiversity and ecosystem services is through achieving their integration into sector policies and that the role played by natural capital be recognized as the crucial foundation of economic development (OECD, 2014). The integrated management of biodiversity and ecosystem services requires reconciling conservation with development prospects, especially in a country acknowledged as mega-diverse, multiethnic and multicultural and, at the same time as one of the most unequal countries in Latin America, which has the highest number of documented socio-environmental conflicts in the region, with a barely acceptable ranking in environmental performance (ranked 57) (Hsu *et al.*, 2016), with the aggravating circumstance that in the most biodiverse regions of the country (Amazon and Chocó) indices of unsatisfied basic needs remain high.

Conservation

New context for conservation of biodiversity and ecosystem services

Slowly, and following difficult experiences such as flooding caused by El Niño in 2011, the country has begun to visualize and take into account the limits of ecosystems as the basis for the development of productive activities, as was expressed in the Grounds for the National Development Plan 2014-2018.

Serpiente cazadora en bosque de "Banqueta del oso" . Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

This new view is timely and necessary in the current political situation in the country: MADS is aware that the Havana Agreements change the context and the management conditions in much of the country and the actions carried out can negatively affect the environment if sustainability criteria are not considered.

The comprehensive rural reform that is put forward as point 1 of the Havana Agreements needs to include sustainability criteria that respond to the vocation of the lands, with particular emphasis on the areas prioritized for implementation of agreements such as the ZRFs, among others. This requires that biodiversity and ecosystem services be acknowledged in land-use planning processes in areas prioritized post-conflict and strengthening the environmental authorities politically, technically and financially so they can take on the challenges of building peace.

While armed actors have benefited financially from mining activities (coca, gold, wood, oil, coal), it is also true that the same conflict has been a favorable barrier to conservation in certain regions. In fact, the Amazon is in relatively good condition thanks, not only to indigenous reserves and natural parks, but also that the conflict meant an impediment to the entry of livestock, mining and other extractive economies. With the signing of the agreements, it is necessary to define strategies so the costs of peace will not be transferred to the natural base of the country.

The Havana Agreements are also an opportunity to the extent that:

- Actions are incorporated that promote land use planning as a basis for harmonizing the actions and interests of the various social, government and industry sectors.

- They define actions for closure of the agricultural frontier.

- They promote the protection of native seeds and control of genetically modified organisms.

- They propose sustainable productive options to rural communities involving forest conservation agreements.

- They provide for the eradication of illicit crops in National Natural Parks.

- They consider strengthening instances of social participation as a mechanism for generating processes of control over the territories.

- They make a call for intersector coordination, particularly between MADS and the agricultural sector, to reconcile rural development policies with the purposes of conservation of biodiversity and ecosystem services.

- Encourage dialogue between the government and the social-productive sector to harmonize territorial interventions with environmental sustainability criteria.

- They promote the establishment of conservation agreements in critical areas of deforestation.

The end of armed conflict is a unique opportunity to implement strategies and activities that link the development of the country with full awareness of its rich natural capital.

WHAT DOES THE BAP SUGGEST IN THIS CONTEXT?

In this complex scenario of political and sector interventions, illegal mining activities, new configurations and territorial dynamics within an already complex regulatory framework, it is necessary to take measures to prevent conflicts from exacerbating and that biodiversity and ecosystem services become the victims.

In this regard, the Biodiversity Action Plan proposes actions vis-à-vis:

- Strengthening the regional environmental institutions.

- Promoting models of sustainable local development and green growth.

- Creating incentives that promote the protection and recovery of strategic ecosystems.

- Strengthening environmental information systems so that they guide decision-making.

- Intersector agreements and programs that will address issues regionally and locally, including advancing the development of strategies such as payment for environmental services, agricultural conversion programs, eco-efficient sector programs, sustainable development programs with ecological sustainability criteria, education programs and strengthening of the mechanisms of democratic participation (for example, popular consultations and environmental hearings).

Instruments

¿How does the BAP articulate with the regional environmental planning instruments?

Biodiversity as a public value is the responsibility of all citizens and economic, social and institutional stakeholders in the country who benefit directly or indirectly from it; therefore, it will require that the actions for the conservation of biodiversity and its ecosystem services are not only carried out by the environmental sector, but also by national, regional and local productive, social and institutional sectors.

Flora reserva El Santuario. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

There are, however, specific institutional responsibilities and tasks. The CARs, as policy implementers are those that have, in principal, the possibility of investing resources and taking concrete steps in regard to handling and managing biodiversity in their jurisdictions. Consequently, their participation and articulation in this process cannot be overlooked in order to incorporate actions and goals of the Biodiversity Action Plan in its planning instruments.

As indicated by the PNGIBSE, the formulation or updating of the Regional Biodiversity Action Plans (PARB) must be articulated conceptually and strategically with the BAP and incorporate the goals as a strategy to address the underlying causes and drivers of loss and transformation of biodiversity in each region. The PARB should be the basis for prioritizing and defining actions in the Regional Environmental Management Plan (PGAR) and the environmental authority's Quadrennial Action Plan (PAC). In like fashion, the PARB needs to contain the guidelines and actions for the management and conservation of biodiversity components that are important for the region. They also need to incorporate and develop the actions necessary for the ecological structure of the territory, and include guidelines for managing risks associated with biodiversity loss and shortages of ecosystem services, as a result of the action of the drivers of transformation and loss of biodiversity.

Watershed Ordering and Management Plan (POMCA) and the Management Plan of the UAC to be articulated to the PARB and collect their guidelines for the conservation of biodiversity and its ecosystem services, and incorporate them into the Plans, Basic Plans and Schemes of Municipal Territorial Ordering, treating them as environmental determinants of such ordering and environmental guidelines to ensure conservation in the other types of land uses and the identification of lands to be protected. Other instruments of regional planning, prepared by the CAR, CDS and AAU, such as plans for the ordering of forestry (POF), plans for the ordering of water resources (POHR), plans for the clean-up and management of spillages (PSMV) and the activities derived from these instruments must also be articulated to the PARB on issues of conservation of ecosystems and ecosystem services that concern them.

Figure 3 shows the relationship of articulation between the PNGIBSE and territorial management of regional autonomous corporations in municipalities and departments (PNGIBSE, 2012).

The PARBs need to be strongly articulated with a variety of instruments: among them the Pomca, the POFs, the POHRs and the PSMVs.

Inca negro. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto "Alexander von Humbolt".

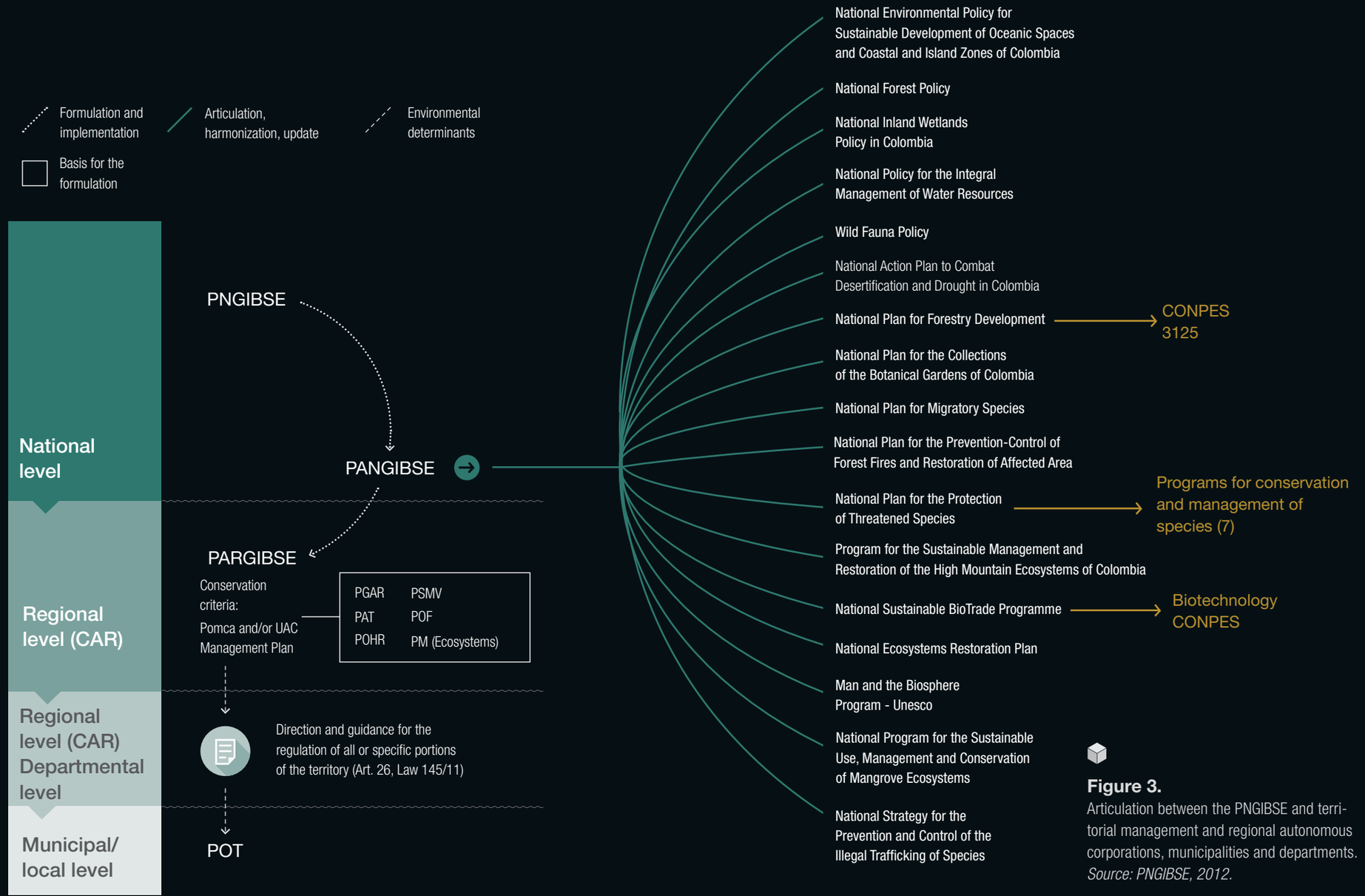


Figure 3.
Articulation between the PNGIBSE and territorial management and regional autonomous corporations, municipalities and departments.
Source: PNGIBSE, 2012.

4

Strategic Framework

VISION

"By 2030 biodiversity and continental and marine ecosystem services in the country will be recognized as goods of high public value that provide tangible benefits to society, are vital for national development, and therefore will be incorporated into decision-making in all sectors of society, as the foundation for the wellbeing of the Colombian people."

OBJETIVE

The Biodiversity Action Plan makes the National Policy for the Integral Management of Biodiversity and its Ecosystem Services viable through the implementation of concrete and coordinated actions, inter-sector and regionally, in order to decrease the direct and indirect pressures on biodiversity and ecosystem services.

Frailejón carraco *Espeletiopsis guacharaca* (S.Díaz) Cuatrec.
Federico Pardo. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

2020-2025-2030 GOALS FOR THE BIODIVERSITY ACTION PLAN FOR THE IMPLEMENTATION OF THE PNGIBSE

Axis I. Biodiversity conservation and care of nature.

Refers to the need to advance conservation actions *in-situ* and *ex-situ*, both in wilderness areas (protected or not), as well as in transformed continental, marine, coastal and island landscapes, so as to maintain viable populations of flora and fauna, the resilience of social-ecological systems and the provision of ecosystem services is supported at national, regional, local and cross-border scales.

Table 1.
Axis I. Biodiversity, conservation and care of nature.

	GOAL 2020	GOAL 2025	GOAL 2030
I.1	100% compliance with SINAP's CONPES 3680 action plan.	100% complaince with the goals of the work plan for protected areas (PoWPA).	The effectiveness of the National System of Protected Areas will have been assessed as a complete mechanism, ecologically representative and effectively managed, that ensures the conservation of biodiversity and continental, marine and coastal ecosystems, within the framework of rural and urban land-use planning in the country.
I.2	The ecological structure will have been identified in 100% of the cities with more than 100,000 inhabitants. The manner in which the ecological structure is to be incorporated into the various instruments of territorial regulation and management will have been identified Watershed Ordering and Management Plan (Pomca), POT, partial plans, master plans for public space, Metropolitan Strategic Land-Use Plan (Pemot), Departmental Regulation Plan (POD).	The ecological structure of 50% of municipalities with fewer than 100,000 inhabitants will have been identified. The ecological structure will have been incorporated into prioritized instruments of territorial ordering and management.	The ecological structure of 100% of municipalities with fewer than 100,000 inhabitants will have been identified. The ecological structure will have been incorporated into 100% of territorial instruments of territorial ordering and management. The assessment will have been performed on the effectiveness of the incorporation of the ecological structure in rural and urban development instruments and planning processes.
I.3	The country will have biodiversity and ecosystem services management programs that are suitable and differentiated for landscapes/territories that are occupied and transformed and under transformation.	Planning instruments (POT, Pomcas, master plans for public space, partial plans) shall incorporate suitable and differentiated biodiversity and ecosystem services management for landscapes/territories that are occupied and transformed and under transformation. Connectivity and representation of ecosystems in landscapes/territories that are occupied/ transformed and under transformation and shall be connected to ecological networks at rural and urban level, for municipalities of more than one million inhabitants.	The resilience of ecosystems and biodiversity gains will have been assessed given the increased connectivity and representation of ecosystems in landscapes/territories that are occupied/ transformed and under transformation.

Las especies de 'mantis religiosa' son los predadores más temidos en el mundo de los insectos. ***Stagmatoptera septentrionalis.*** **Francisco Nieto Montaño.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
1.4	The country will incorporate ecological criteria and sustainability indicators in policies for land redistribution and comprehensive rural reform.	Monitoring shall be performed on sustainability indicators in land redistribution policies and comprehensive rural reform.	Monitoring shall be performed on sustainability indicators in land redistribution policies and comprehensive rural reform.
I.5	The country will have 210,000 ha in a restoration process in susceptible areas defined by the National Plan of Ecological Restoration, Rehabilitation and Recovery of Disturbed Areas.	The country will reach 500,000 ha in a restoration process in susceptible areas defined by the National Plan of Ecological Restoration, Rehabilitation and Recovery of Disturbed Areas. The country will assess the contribution of restoration processes to the mitigation and adaptation to climate change, and combating desertification.	The country will reach 1,000,000 ha in a restoration process in susceptible areas defined by the National Plan of Ecological Restoration, Rehabilitation and Recovery of Disturbed Areas. The country will have assessed the contribution of restoration processes to the mitigation and adaptation to climate change, and combating desertification.
I.6	The rate of deforestation will have decreased from 120,000 ha to 50,000 ha in the deforestation *hotspots* identified by the IDEAM.	The rate of deforestation will have decreased from 50,000 ha to 25,000 ha.	The rate of deforestation will have decreased going from 25,000 ha to 10,000 ha in the deforestation *hotspots* identified by the IDEAM. The country will assess the implementation of forest governance of instruments by the environmental authorities.
I.7	Compliance shall reach 50% in medium-term goals of the National Plan for the Prevention, Control and Management of Invasive, Exotic and Transplanted Species (PNEIET).	Additional risks posed by climate change and the introduction of invasive species will have been identified and decreased. Compliance shall reach 100% in medium-term and long-term goals of the National Plan for the Prevention, Control and Management of Invasive, Exotic and Transplanted Species (PNEIET).	Prioritized invasive, exotic and transplanted species will have been controlled and effective mechanisms will be in place to prevent new introductions and establishments.

Atrapamoscas perchado en rama. Federico Pardo. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
I.8	There will be 100% compliance with the goals of the *National Strategy for the Prevention and Control of Illegal Wildlife Traffiking* 2012- 2020. The country will have specific management plans for the conservation of endemic species at augmented risk of extinction because of climate change, illegal trafficking and other anthropogenic causes.	The country will have advanced in the implementation and start up of at least 50% of the action plans for the conservation of endemic species at risk of extinction accentuated by climate change, illegal trafficking and other anthropogenic causes The country will have decreased the rates of illegal trade in wild fauna and flora 50%, through a variety of mechanisms, including: the maintenance and consolidation of regional committees for the prevention, control and monitoring of illegal trafficking of native species, the articulation and cooperation of enforcement agencies and for control of illegal wildlife trafficking of countries, whether or a party of the CBD.	The country will have advanced in the implementation and start up of 100% of the action plans for the conservation of prioritized endemic species in accentuated risk of extinction due to climate change, illegal trafficking and other anthropogenic causes. The conservation status and sustainability of species that are endangered and in risk of extinction accentuated by climate change, illegal trafficking and other anthropogenic causes. The threat status of the species that are the object of implementation of management plans to date will have been assessed.
I.9	The formulation and implementation of the National Program for Payment of Environmental Services for Conservation of Ecosystems of Strategic Interest will be in hand.	Coverage will be increased for the National Program for Payment of Environmental Services for Conservation of Ecosystems of Strategic Interest in all the departments, including natural reserves of civil society. Environmental services will have been recovered in 30% of the area in strategic ecosystems or in continental and marine conservation priority areas, including natural reserves of civil society.	The recovery of ecosystem services in strategic ecosystems or priority areas of continental and marine conservation will have been assessed.

Palicourea guianensis. **Diego Mauricio Cabrera Amaya.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
I.10	The country will establish criteria and precise indicators on the investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption, to be applied by the national, departmental, district and municipal Government. 25% of the country's municipalities with more than 100,000 inhabitants shall apply the criteria and indicators on investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption.	50% of the country's municipalities with more than 100,000 inhabitants shall apply the criteria and indicators on investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption. 50% of the municipalities with more than 100,000 inhabitants shall apply the criteria and indicators on investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption.	100% of the country's municipalities with more than 100,000 inhabitants shall apply the criteria and indicators on investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption. 100% of the municipalities with less than 100,000 inhabitants shall apply the criteria and indicators on investment of transfers, taxes and royalties that target the conservation of water basins supplying urban consumption.
I.11	Mechanisms will be established for transferring resources from conservation beneficiary municipalities to those who assign areas to the conservation of contributor basins, especially in areas of paramo and high Andean forest.	50% of beneficiary municipalities will transfer resources to the municipalities of paramo and high Andean forest conserving the contributing basins.	100% of beneficiary municipalities will transfer resources to the municipalities of paramo and high Andean forest conserving the contributing basins.
I.12	A National Biodiversity Loss Compensation Strategy, will be in hand incorporating terrestrial, freshwater and marine-coastal components.	100% of environmental licenses will have compensation plans according to the actions defined in the components of the National Biodiversity Loss Compensation Strategy.	The country will have a registry of areas subject to compensation plans and will take stock of the gains in biodiversity with the recovery and/or conservation of biodiversity. 100% of the regional environmental authorities will have portfolios with priority areas for compensation.

Cucarrón de los hongos. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
I.13	20% of the regional environmental authorities will have implemented the Policy Guidelines for the Protection of Traditional Knowledge Systems Associated with Biodiversity in the management cycle starting from coordination with ethnic authorities and local communities in their jurisdiction, through programs and projects.	50% of the regional environmental authorities will have implemented the Policy Guidelines for the Protection of Traditional Knowledge Systems Associated with Biodiversity in coordination with two ethnic authorities and local communities in their jurisdiction, through programs and projects under implementation.	70% of the regional environmental authorities will have implemented the Policy Guidelines for the Protection of Traditional Knowledge Systems Associated with Biodiversity in the management cycle, starting from coordination with ethnic authorities and local communities in their jurisdiction, through programs and projects.
I.14	The implementation of the National Biosafety Strategy for the Management of Biological Risks will have been designed and kicked off.	The implementation of the National Biosafety Strategy for the Management of Biological Risks will have been implemented 50%. The key sectors of the economy that make use of biodiversity and ecosystem services, will have incorporated within their action plans and sector planning instruments, management of biological risks to biodiversity.	The country will have 100% of the assessment tools for managing the risks associated to biodiversity.
I.15	The country will have the National Water Resources Plan (NARP), as a policy instrument based on knowledge of aquatic biodiversity (marine, coastal and freshwater), and sustainable management of the associated ecosystem services.	Progress will have been seen in the implementation of the National Water Resources Plan (NARP) and will have targets and indicators for aquatic biodiversity (marine, coastal and continental).	The recovery and maintenance of viable populations of aquatic biodiversity (marine, coastal and freshwater) and associated ecosystem services will have been assessed. Direct pressures will have been reduced on marine and freshwater aquatic diversity, ensuring conservation and promoting sustainable use.
I.16	Recovery, protection and conservation programs will be promoted *in-situ* and *ex-situ* of native seeds and varieties, important for food security and rural and local economies in the Amazon, Pacific and Andes.	They will have recovered, protected and conserved native varieties and traditional practices of use of biodiversity for maintaining food security and adaptation to environmental change in the Andean, Amazonian and Pacific region. Local/community communications networks will be established for the exchange of information on traditional practices.	Recovery, protection and conservation experiences *in-situ* and *ex-situ* of native seeds and varieties, important for food security and rural and local economies in the Amazon, Pacific and Andes will be structured and disseminated.

The goals suggested in light of the first thematic axis of the PNGIBSE seek to preserve flora and fauna and the resilience of socio-ecological systems throughout the national territory. They are also targeted at ensuring the supply of ecosystem services. The second axis, for its part, suggests actions that would allow the State and its citizens to articulate around environmental management. This point highlights the importance of the country's natural capital as the basis for the population's quality of life.

Serpiente (*Chironius monticulata*). Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Axis II. Biodiversity, governance and public value creation

Refers to the need to strengthen the relationship between the State and citizens (urban and rural) to comprehensively manage biodiversity and ecosystem services from participation and shared responsibility in conservation actions. Thus, the maintenance of biodiversity in explicit socio-ecosystemic contexts needs to be absorbed and socially perceived as an irreplaceable benefit that maintains and improves the quality of life at the national, regional and local levels.

Table 2.
Axis II. Biodiversity, governance and public value creation.

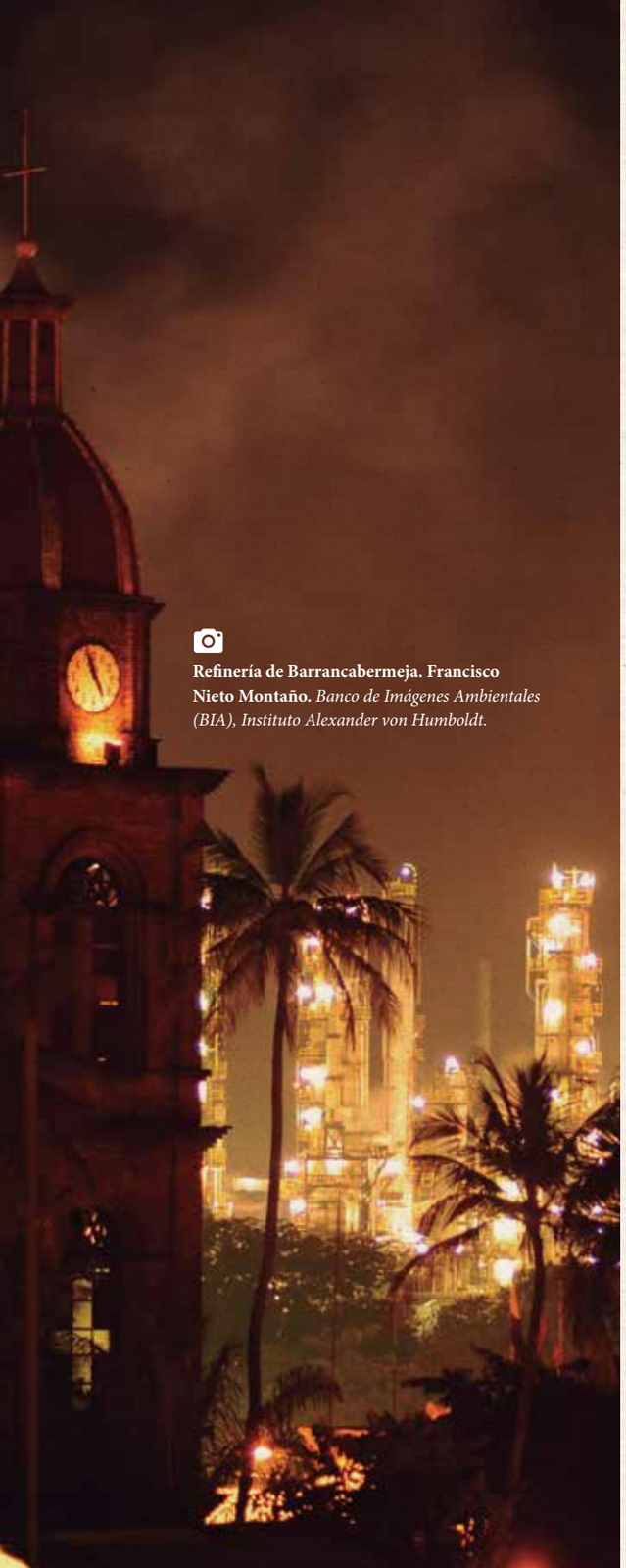
	GOAL 2020	GOAL 2025	GOAL 2030
II.1	Integrated Management of Biodiversity and its Ecosystem Services (Gibse) will be incorporated into 100% of the regulatory documents, environmental and sector policies and sector planning instruments and land use planning, at the national level. 100% of POTs shall incorporate regional protected areas as environmental determinants.	70% of regional and local planning instruments are coherent and consistent with the conceptual and strategic guidelines of the PNGIBSE.	100% of regional and local planning instruments are coherent and consistent with the conceptual and strategic guidelines of the PNGIBSE, focused on national and local poverty reduction. 100% of the POTs shall incorporate elements of the ecological structure of the territory as environmental determinants.
II.2	The country will have strategic environmental assessments of the territories associated with land allocated by the land distribution policy for post-conflict.	Compliance shall be verified with the ecological function of property in 25% of the land allocated by the land distribution policy for post-conflict.	Compliance shall be verified with the ecological function of property in 50% of the land allocated by the land distribution policy for post-conflict.
II.3	There will be five plan contracts under implementation including commitments on biodiversity and ecosystem services.	All plan contracts under implementation plan will include commitments on biodiversity and ecosystem services.	By 2030 there will be a comparative diagnosis of the impacts of incorporating commitments on biodiversity and ecosystem services and the benefits that were forecast in the plan contracts, using as a starting point plan contracts where this type of commitments were not incorporated. All territorial partnership schemes and strategic agreements for regional development shall incorporate commitments for the conservation of biodiversity and ecosystem services.

Rineloricaria sp. **Francisco Nieto Montaño.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
II.4	At least four sectors will have environmental responsibility sector strategies associated with the Gibse.	All sectors shall have environmental responsibility strategies associated with the integrated management of biodiversity and ecosystem services.	For 2030 environmental responsibility strategies associated with the Gibse will have been implemented in all sectors. Sector investment will have increased by 100% in biodiversity management.
II.5	The country will have a strategy for institutional strengthening and governance of regional environmental authorities, urban environmental authorities and local authorities for the Gibse. An assessment study will be carried in comprehensive fashion on achievements, effectiveness and efficiency of all environmental government agencies, to include an analysis of the technical, operational and financial capacity of corporations to respond to environmental challenges by jurisdiction.	100% of the regional environmental authorities will have been strengthened institutionally according to the study assessing achievements, effectiveness and efficiency. A proposal for an assessment and performance system of the SINA shall be designed and implemented. A strategy for articulation and coordination of the SINA will be implemented to strengthen regional dialogue and integration of national and regional policies between the Ministry of Environment and Sustainable Development, the CAR and local authorities.	Performance and environmental governance indices will have improved at territorial and national levels. Territorial partnerships between public, private and community sectors, and intra and inter-institutional and intersector articulation positioning biodiversity as a strategic element in economic and sector policies in the country will have been strengthened. Instruments and monitoring mechanisms, tracking and assessment of the management and performance of the agreements established in each territory will have been developed.
II.6	38 national and regional partnerships will have been executed for the sustainability of the National Environmental Education Policy of the SINA, which incorporate actions that contribute to understanding and collective action in their action plans addressing contextual environmental issues, including those associated with biodiversity: appropriation of natural and socio-cultural contexts.	There will be national and territorial partnerships in place for the sustainability of the National Environmental Education Policy of the SINA, which incorporate actions that contribute to understanding and collective action in their action plans addressing contextual environmental issues, including those associated with biodiversity: appropriation of natural and socio-cultural contexts.	The country will have generated awareness in regard to the public value of biodiversity, the need for its conservation and sustainable use. The country will have an assessment and measurement tool generating awareness about the value of biodiversity, at the departmental and municipal levels.

Crecimiento de hongos sobre tronco caído. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.

	GOAL 2020	GOAL 2025	GOAL 2030
II.7	20% of citizen's and community environmental education projects (Proceda) registered in MADS's environmental education social map shall incorporate into their work plans actions that contribute to understanding and collective action addressing contextual environmental issues, including those associated to biodiversity.	50% of citizen's and community environmental education projects (Proceda) registered in MADS's environmental education social map shall incorporate into their work plans actions that contribute to understanding and collective action addressing contextual environmental issues, including those associated to biodiversity.	
II. 8	26 inter-institutional departmental committees on environmental education (Cidea) incorporated in their policy instruments to manage environmental education in the territorial milieu (guidelines, policies, plans, among others), training and research activities that contribute to the acknowledgement and sustainable use of biodiversity in their particular contexts.	32 inter-institutional departmental committees on environmental education (Cidea) incorporated in their policy instruments to manage environmental education in the territorial milieu (guidelines, policies, plans, among others), training and research activities that contribute to the acknowledgement and sustainable use of biodiversity in their particular contexts.	
II.9	50% of significant school environmental projects registered in the Ministry of National Education's PRAE database and on MADS's environmental education social map shall incorporate actions in their contextual, conceptual and forward-looking elements that contribute to understanding and collective action addressing contextual environmental issues, including those associated with biodiversity.	70% of significant school environmental projects registered in the Ministry of National Education's PRAE database and on MADS's environmental education social map shall incorporate actions in their contextual, conceptual and forward-looking elements that contribute to understanding and collective action addressing contextual environmental issues, including those associated with biodiversity.	



Refinería de Barrancabermeja. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
II.10	The country will have a financial strategy in operation, led by the Ministry of Finance and Public Credit, the National Planning Department, the Presidential Agency for International Cooperation and the Ministry of the Environment and Sustainable Development.	The country will increase resources earmarked for Gibse 10% in relation to the average for the last ten years.	The country will increase resources earmarked for Gibse 20% in relation to the average for the last ten years and shall measure the effectiveness of expenditures.
II.11	The mechanisms of social and community participation at local and regional level shall be identified and strengthened to strengthen governance and public value creation.	Social and community participation at the local, regional and national levels shall exercise responsible and informed social accountability and social control regarding the management of biodiversity at territorial and sector levels. The rate of socio-environmental conflicts in the country will decrease.	The State, civil society and sectors shall acknowledge biodiversity and ecosystem services as a public value.

Saltarín Barbiblanco (*Manacus manacus*). Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

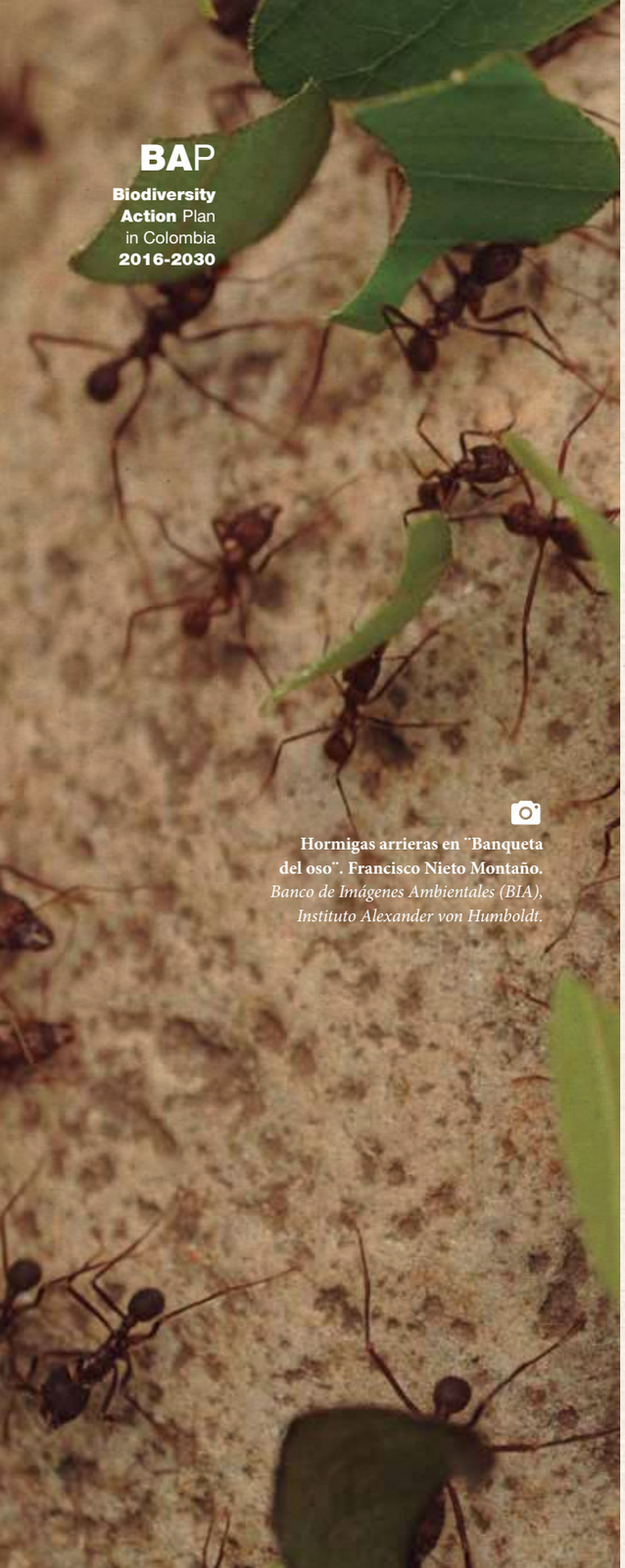
The third axis is targeted at ensuring that the development of the country's various productive sectors incorporate the holistic conservation and valuation of biodiversity and ecosystem services. The fourth, meanwhile, deals with equipping the Gibse with sufficient information assets to guide its decision-making at all possible scales

Axis III. Biodiversity, economic development, competitiveness and quality of life

Refers to the need to incorporate biodiversity and the supply of ecosystem services in sector-based planning and decision-making so as to generate shared responsibility to further conservation and integral valuation actions (economic and non economic), to allow maintaining the sustainability of production, extraction, settlement and consumption actions and quality of life improvement at the national, regional and local levels.

	GOAL 2020	GOAL 2025	GOAL 2030
III.1	The country shall have an impact and efficiency assessment of tax incentives associated to the Gibse and with reform proposal for tax incentives that are ineffective, inefficient or contradictory.	50% of ineffective, inefficient or contradictory tax incentives will have been eliminated.	100% of the ineffective, inefficient or contradictory tax incentives will have been eliminated.
III.2	The National Biodiversity Loss Compensation Strategy shall be consolidated and articulated with other economic and administrative instruments linked to biodiversity loss.	Directly regulated instruments (command and control), administrative instruments (licenses, permits such as those for logging) and economic instruments (PSA, tax exemptions) will be articulated and complemented to achieve conservation goals.	An assessment will be in hand regarding the effectiveness of the articulation of direct regulation instruments and economic instruments to achieve conservation goals.
III.3	Five regional programs for green business in the Pacific, Caribbean, Central, Amazon and Orinoco regions will be implemented under the National Green Markets Plan. Colombia will have an integral portfolio (supply and demand) of employment, income, entrepreneurship and value chain options related to the Gibse as a contribution to setting the stage for the peace and wellbeing of the population.	17 regional green business programs will be implemented within the framework of the National Green Markets Plan. The country will have strengthened capacities and opportunities for sustainability in production systems and the development of competitive chains that incorporate biodiversity and ecosystem services as an engine of sustainable social and economic development.	The country will consolidate green businesses chains at the regional level, increasing competitiveness, sustainably using biodiversity and generating wellbeing for the local populations associated.

Table 3.
Axis III. Biodiversity, economic development, competitiveness and quality of life.



Hormigas arrieras en "Banqueta del oso". Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
III.4	The country will have incorporated principles of eco-efficiency based on Gibse in at least 300,000 hectares for agricultural production. Technical support processes will be furthered to 50% of small rural producers associated to 300,000 ha to improve their capacity in entrepreneurship and business development.	Eco-efficiency principles based on Gibse will have been incorporated in at least 600,000 additional ha for agricultural production. Technical support processes will be carried out for 100% of small rural producers to improve their capacity in entrepreneurship and business development.	The benefits of incorporating the principles of eco-efficiency based on Gibse in agricultural production will have been assessed and the most efficient principles in these production systems will have been incorporated. All agricultural production areas will be managed sustainably, ensuring the conservation of biological diversity.
III.5	Sustainable production systems will be identified that combine production and conservation actions to generate local development. Sustainable production systems will be implemented in municipalities that are highly bio-diverse and affected by the armed conflict.	Sustainable production systems will be implemented in 50% of municipalities that are highly bio-diverse and affected by the armed conflict.	Sustainable production systems will be implemented in 100% of municipalities that are highly bio-diverse and affected by the armed conflict.
III.6	Management plans or reconversion plans will be formulated with sustainability indicators in land-holdings larger than 100 ha according to the POTs of 25% of the municipalities located in paramo ecosystems and high Andean forest.	Management plans or reconversion plans will be formulated with sustainability indicators in land-holdings larger than 100 ha according to the POTs of 60% of the municipalities located in paramo ecosystems and high Andean forest.	Management plans or reconversion plans will be formulated with sustainability indicators in land-holdings larger than 100 ha according to the POTs of 60% of the municipalities located in paramo ecosystems and high Andean forest.

Rana. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.

	GOAL 2020	GOAL 2025	GOAL 2030
III.7	At least five certifying agencies shall incorporate traceability of raw materials from biodiversity and ecosystem services into their verification systems.	100% of certifying agencies shall incorporate traceability of raw materials from biodiversity and ecosystem services into their verification systems.	The country will have an assessment of the efficiency of verification systems of traceability of raw materials from biodiversity and ecosystem services and the implementation of corrective actions that may be required to ensure said traceability.
III.8	100% of 4G infrastructure concession projects, mining development programs and energy expansion, housing and friendly cities, agriculture and rural development will have strategic environmental assessments.	Strategic environmental assessments will be implemented as structured and systematic assessment tools of the environmental impacts of policies, plans and programs in the early stages of sector planning.	The country will assess and track the implementation of strategic environmental assessments in the early stages of sector planning.
III.9	The agricultural, mining, energy and infrastructure sectors will have economic sustainability indicators and mechanisms for compliance monitoring and verification.	50% of economic sectors will have economic sustainability indicators and mechanisms for compliance monitoring and verification.	100% of the economic and development sectors in the country will have sustainability indicators and mechanisms for compliance monitoring and verification.
III.10	A system of oversight and accountability will have been established on the environmental effects of productive activities related to mining, hydrocarbons, infrastructure, livestock production and agriculture.	All productive sectors will have established a system of oversight and accountability of the environmental effects of their productive activities.	
III.11	Colombia will have a National Environmental Account updated and operating for biodiversity under the guidelines of the Gibse.	The variation of biodiversity *stocks* and its relationship to the economy will be known. Accounting of biodiversity usage flows and impacts in the economy will be known.	The effort of the various economic sectors to conserve, mitigate or protect biodiversity and ecosystem services will be known.

BAP
Biodiversity Action Plan in Colombia 2016-2030

Araña. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.

	GOAL 2020	GOAL 2025	GOAL 2030
III.12	The country will have a National Bioprospecting Strategy formulated and in implementation.	75% of the National Bioprospecting Strategy will be implemented. A survey will be performed for 50% of the inventory of genetic resources prioritized zones at continental and marine levels. Adoption of instruments to define the implementation of fair and equitable sharing of benefits arising from the use of biodiversity. Bioprospecting, biotechnology, and bioinformatics will be consolidated as activities generating employment and business development by driving at least 50 business initiatives.	100% of the National Bioprospecting Strategy will be implemented. The country will develop a sustainable economic model based on bioprospecting.
III.13	Formulation of a strategy to reduce pollution, including that from excess nutrients, to levels that are not detrimental to the functioning of ecosystems and biodiversity, especially in coastal and marine ecosystems.	Implementation of a strategy to reduce pollution, including that from excess nutrients, to levels that are not detrimental to the functioning of ecosystems and biodiversity, in two coastal areas of the Carribbean at pilot level.	Implementation of projects to reduce pollution, including that from excess nutrients, to levels that are not detrimental to the functioning of ecosystems and biodiversity, especially in marine areas of the Caribbean.

BAP
Biodiversity Action Plan in Colombia 2016-2030

The fifth axis is focused on maintaining socio-ecosystem resilience in the face of the various environmental change phenomena that could threaten the quality of life of Colombians, while the sixth is focused on the country's positioning at the international level as a supplier of ecosystem services and as part of the worldwide fight against environmental change phenomena.

Crecimiento de hongos. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Axis IV. Biodiversity, knowledge management, technology and information

Refers to the need to promote, strengthen and coordinate the generation, recovery, coordination and dissemination of information, knowledge and technological developments from different knowledge systems that can feed and guide decision-making for Integrated Management of Biodiversity and Ecosystem Services at national, regional, local and transboundary scales.

	GOAL 2020	GOAL 2025	GOAL 2030
IV.1	Regional and territorial information nodes will operate articulated to the SIAC through the Biodiversity Information System (SiB Colombia). Feedback mechanisms shall be generated to ensure feedback and social and sector buy-in of knowledge and information to facilitate participation and informed decision-making.	The country will have a scientific and empirical knowledge platform on biodiversity at continental and coastal-marine level that supports decision-making related to sector public policies at the national, regional and local levels. Environmental, economic and social sectors have access to a quality open information platform in understandable language to facilitate informed and responsible participation.	The country will have a management platform for environmental information to carry out actions monitoring biodiversity and ecosystem services. The country will have strengthened knowledge and information management on the management of biodiversity and its continental and coastal marine ecosystem services as a basis for decision-making related to sector public policies, land-use and environmental planning at national, regional and local scale, developmente planning, sector planning and management and life plans of indigenous and local communities.
IV.2	The National Science and Technology System will have an research agenda funded and under implementation associated with the identification of opportunities and innovation of biodiversity and ecosystem services.	The portfolio of strategic projects in science, technology and innovation of the Science and Technology System will incorporate and implement initiatives based on the use and exploitation of biodiversity and ecosystem services. A proposal for public-private partnerships will be in hand targeted at funding CTI programs nationwide based on the use and exploitation of biodiversity and ecosystem services.	The proposed public-private partnerships, targeted at funding CTI programs nationwide based on the use and exploitation of biodiversity and ecosystem services, and the portfolio of strategic projects in science, technology and innovation of the SCTID will be articulated and underway.
IV.3	The country will have a National Biodiversity and Ecosystem Services Monitoring System articulated with the SIAC, with up-to-date and accessible information to support national, regional and local decision-making.	The country will have a National Biodiversity and Ecosystem Services Monitoring System articulated with the SIAC, with up-to-date and accessible information to support national, regional and local decision-making.	The country will have a National Biodiversity and Ecosystem Services Monitoring System articulated with the SIAC, with up-to-date and accessible information to support national, regional and local decision-making.

Table 4.
Axis IV. Biodiversity, knowledge management, technology and information.

Colibrí volando cerca de flores. **Federico Pardo.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

	GOAL 2020	GOAL 2025	GOAL 2030
IV.4	A network of research centers on biodiversity and ecosystem services will be consolidated within the framework of the SINA. Ecosystem services will be identified and assessed in 3 of the 5 biosphere reserves in the country, including those that promote health and wellbeing.	The valuation of biodiversity and ecosystem services associated with the agricultural sector (including monetary and non-monetary values, ecological and social values and analysis of *trade-offs*) will be in hand. Ecosystem services will be identified and assessed in the 5 biosphere reserves in the country, including those that promote health and wellbeing.	The *trade-offs* identified will be implemented. The valuation of biodiversity and ecosystem services in areas associated with infrastructure and mining and energy activities will be in place. A payment scheme will be implemented for environmental services for the conservation of ecosystems of strategic interest in the 5 biosphere reserves in the country.
IV.5.	Develop and implement a communications and mass broadcasting strategy to generate political support and public awareness of the benefits of biodiversity and ecosystem services.	All the cities and municipalities with more than 250,000 inhabitants will be informed about the benefits of biodiversity and ecosystem services. 25% of the municipalities in the country with less than 250,000 inhabitants will be informed about the benefits of biodiversity and ecosystem services.	100% of the municipalities in the country with less than 100,000 inhabitants will be informed about the benefits of biodiversity and ecosystem services. Colombian society recognizes and defends biodiversity and ecosystem services as a collective right and a public value that must be preserved to maintain the quality of life of current generations and the enjoyment of future generations.
IV.6	System for monitoring and tracking of the implementation of the PNGIBSE through the BAP.	System for monitoring and tracking of the implementation of the PNGIBSE through the BAP.	System for monitoring and tracking of the implementation of the PNGIBSE through the BAP.
IV.7	Formulation of a communications and outreach plan to provide society with the main findings, lessons and results of the implementation of the BAP.	Formulation of a communications and outreach plan to provide society with the main findings, lessons and results of the implementation of the BAP.	Formulation of a communications and outreach plan to provide society with the main findings, lessons and results of the implementation of the BAP.
IV.8.	Formulation of a technical and scientific cooperation plan for capacity building necessary to implement the BAP.	Implementation of the technical and scientific cooperation plan for capacity building necessary to implement the BAP.	Implementation of the technical and scientific cooperation plan for capacity building necessary to implement the BAP.

Vulnerability to the effects of environmental and climate change will have been reduced and socio-ecosystem resilience shall be maintained at different scales. 100% the National Plan to Combat Desertification will be implemented.

Inflorescencia de *Palicourea*. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

Axis V. Biodiversity, risk management and supply of ecosystem services

It refers to the need to carry out actions to deal with the threats related to environmental change (loss and transformation of biodiversity and ecosystem services, variability and climate change), to maintain socio-ecosystem resiliency and reduce their vulnerability, following the focus on mitigation and adaptation based on ecosystems, so that the quality of life is not compromised at the national, regional, local and cross-border levels.

	GOAL 2020	GOAL 2025	GOAL 2030
V.1	The Risk Prevention and Management Policy will integrate an adaptation strategy based on Gibse.	Vulnerability to the effects of environmental and climate change will have been reduced and socio-ecosystem resilience shall be maintained at different scales. 100% the National Plan to Combat Desertification will be implemented. 100% of the biodiversity component of the National REDD Strategy will be implemented. A risk assessment will have been done of terrestrial, aquatic and coastal-marine ecosystems most vulnerable to climate change in the country.	By 2030 the results of the risk assessment of terrestrial, aquatic and coastal-marine ecosystems most vulnerable to climate change in the country will have been incorporated into the management plans of these ecosystems, which will contain the respective management actions for the risks identified. Land degradation and desertification will have been controlled, the effects of drought will have been mitigated and sustainable ecosystem management of drylands will be performed. The main drivers of loss and degradation of forests in the country will have been controlled: the expansion of the agricultural frontier; colonization associated with pastures for livestock production, mining, forest fires, illegal crops; infrastructure (urban centers and road construction) and logging.
V.2	The SINA will have capabilities for assessment of risk and impact of geoengineering and synthetic biology on biodiversity and ecosystem services.	There will be assessment guidelines addressing the possible adoption technologies based on synthetic biology and geo-engineering in Colombia.	Assessment guidelines addressing the possibility of adopting technologies based on synthetic biology and geo-engineering will be incorporated into decision-making on the integrated management of biodiversity.

Table 5.
Axis V. Biodiversity, risk management and supply of ecosystem services.

Axis VI. Biodiversity, shared responsibility and global commitments

Refers to the actions that the country needs to carry out to strengthen its international position as a mega-diverse country, provider of ecosystem services of global importance. In like manner, it also suggests national actions to contribute to the global fight against climate-ecological challenges (environmental change) that threaten global stability.

	GOAL 2020	GOAL 2025	GOAL 2030
VI.1	The country will address the environmental agendas of the CBD and IPBES to include the Gibse approach. The country will contribute at least 50% of the national Aichi Targets.	The country will meet 50% of the prioritized environmental goals related to the Sustainable Development Goals for the country.	The country will meet 100% of the prioritized environmental goals related to the Sustainable Development Goals for the country. The country will decrease its rates of biodiversity loss and contribute from sustainable use to reducing poverty and to food security, in compliance with the Sustainable Development Goals.
VI.2	The country will promote complementary conservation strategies (biosphere reserves, IBAs, Ramsar) setting the stage in support of the implementation of the PNGIBSE.	70% of the country's complementary conservation strategies will effectively contribute to the implementation of the PNGIBSE.	100% of the country's complementary conservation strategies will effectively contribute to the implementation of the PNGIBSE.
VI.3	The Gibse will be included in the execution of Colombia's foreign policy in the national position to promote it in at least 50% of the agendas and bilateral and multilateral agreements.	The country will internationally strengthen its image as a mega-diverse country and will include Gibse in 70% of the related agendas and bilateral and multilateral agreements. The country will have increased 10% the mobilization of technical and financial resources from international cooperation for the Gibse in continental and marine ecosystems.	The country will include the Gibse in 100% of the related agendas and bilateral and multilateral agreements. The country will have increased 20% the mobilization of technical and financial resources from international cooperation for the Gibse in continental and marine ecosystems.

Table 6.
Axis VI. Biodiversity, shared responsibility and global commitments.

5

Financial Strategy

The BAP will have a resource mobilization strategy which is under construction and is supported by the Financing Initiative for Biodiversity (Biofin). In order to promote greater investment in ecosystem management and biodiversity, the agency will provide the necessary methodological framework to quantify the financing gap in this area at the national level and improve profitability through the incorporation of biodiversity in national development and sector planning.

Macho de *Zenipthoptera lanei*. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

According to the preliminary findings of Biofin, historical analysis of public spending in Colombia shows that investment in biodiversity in the country has been increasing in real terms in recent years. It is estimated that over the 2000-2015 period the country invested about $US 3,453 million, that is, about $US 240 million annually on average to manage biodiversity projects, representing 0.12% of the national GDP, 0,44% of public spending and 24% of environmental expenditure in the country.

The BAP challenges require integrating a diverse group of stakeholders as a source of the important resources entailed by the conservation of biodiversity.

As for the cost of short, medium and long-term goals of the BAP, initial estimates indicate that to achieve its implementation, the country will need about $US 4,813 million. EThis means that moving from an average annual public expenditure (2000-2015) of $US 40 million to $US 447 million (2017-2030), requires mobilizing additional resources estimated at $US 102 million a year.

The financial plan will identify a variety of funding sources, including the National Budget, private sector resources, international cooperation and innovative financial mechanisms (public and private). This plan is expected to be in hand in early 2017.

RESULTS OF THE GOALS ASSESSMENT

PROGRAMS	2017-2020	2021-2025	2026-2030	TOTAL	%
Axis I. Biodiversity, conservation and care of nature	969,9	1.210,6	1.955,8	4.136	85,9
Axis II. Biodiversity, governance and public value creation	22,3	14,8	8,6	46	1,0
Axis III. Biodiversity, economic development, competitiveness and quality of life	67,0	124,7	183,0	375	7,8
Axis IV. Biodiversity, knowledge management, and information technology	81,2	82,5	86,3	250	5,2
Axis V. Biodiversity, risk management and provision of ecosystem services	1,4	1,0	1,0	3	0,1
Axis VI. Biodiversity, shared responsibility and global commitments	1,3	0,8	0,8	3	0,1
TOTAL ACTION PLAN 2017-2020	**1.143**	**1.434**	**2.236**	**4.813**	**100**
PARTICIPATION FOR TERM	**24%**	**30%**	**46%**	**100%**	

Table 7.
Valuation of BAP goals 2020-2030 in millions of dollars.
Source: Proyecto Biofin PNUD Colombia

6

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BAP
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Anexxes

***Tángara matorralera Tangara vitriolina* en bosque de "Banqueta del oso". Francisco Nieto Montaño.** *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

ANNEX 1. BAP PREPARATION PROCESS

The formulation of the National Biodiversity Plan for implementation of the PNGIBSE has taken place under the project National Biodiversity Plan to Support the implementation of the CBD Strategic Plan 2011-2020, approved by the GEF Fund on October 25, 2012 as part of the second generation of enabling activities on biodiversity. Este proyecto responde a la necesidad del país de seguir cumpliendo sus obligaciones frente al Convenio de Diversidad Biológica (CDB) y, específicamente, para concretar la formulación del Plan Estratégico del CDB 2011-2020 a nivel nacional.

The aim of the project is to integrate the National Policy for Integrated Management of Biodiversity and Ecosystem Services, in the country's national and sub-national development and the frameworks for sector planning through the preparation, communication and implementation of its Strategic Action Plan, so that it is in line with the global guidance contained in the CBD Strategic Plan 2011-2020. The project considers three results:

- **Result 1.** Articulation of the Aichi Targets with national priorities for the conservation and sustainable use of biodiversity and maintenance of ecosystem services.

- **Result 2.** Biodiversity Action Plan for the implementation of the National Policy for the Integral Management of Biodiversity and its Ecosystem Services.

- **Result 3.** Mechanisms for tracking, implementating and communicating progress in the CBD, through the adjustment of the *Clearing House Mechanism*[11] to facilitate the exchange of regional and national information with the global CHM network of the CBD and other networks.

Institutional Arrangement and Role of Each Party

At the request of the Ministry of Environment and Sustainable Development, the project is implemented by the UNDP, in the form of direct implementation in close collaboration with MADS as the government agency responsible for the timely and verifiable achievement of objectives and results. In turn, MADS formally appointed the Humboldt Institute as the implementing partner, for which a letter of agreement was executed between UNDP and the Humboldt Institute (January 2013).

For coordination, guidance and strategic decision-making of the project, a Steering Committee was established consisting of the Director of Forests, Biodiversity and Ecosystem Services from MADS, the head of the Office of International Affairs of MADS, the Director General of the Humboldt Institute and the official delegate of UNDP. The Steering Committee meets according to need, but not less than once every six months, to review project progress and approve work plans and major deliveries.

As for the role of each party:

- **MADS,** as a national public institution, governing body for environmental policies, chairs the Steering Committee and is responsible for the supervision and technical guidance of the Government for the implementation of the project.

The preparation of the BAP committed a diverse group of institutional stakeholders around coordination, guidance and strategic decision-making.

- **The Humboldt Institute** is the party responsible for the execution of the project components and provides support and supplies for the performance of all activities.

- **El UNPD** is the body designated by the GEF as responsible for the use of funds. Working closely with MADS, it is responsible for: (i) project implementation; (ii) hiring of staff and consultants and service providers; (iii) supervision of financial expenditures versus budgets approved; and (iv) ensuring that all activities are carried out in strict compliance with the procedures of the UNDP/GEF.

Progress in the Development of the Bap

This proposed Biodiversity Action Plan has been developed based on inputs obtained in different venues

11. El Mecanismo de Facilitación o *Clearing House Mechanism* del CDB tiene por objeto promover la cooperación técnica y científica en todos los niveles entre las partes contratantes del Convenio y facilitar el acceso e intercambio de información.

Mariposa del género *Morpho*. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

The first step in the preparation of this draft BAP included different interactions with environmental authorities, indigenous experts, members of the academic and scientific sector, and representatives of productive sectors. Likewise, secondary information was consulted.

and from different sources. The following activities were carried during an initial phase:

- Two workshops and consultations with officials of the National Environmental System (MADS agencies, CAR, ANLA, research institutes attached and linked to MADS, authorities from the Protected Areas System).

- A workshop with indigenous experts.

- Consultations with the academic and scientific sector at national and regional level.

- Workshops and working groups with productive sectors:

    - Mining, energy and hydrocarbons (with public institutions, associations and companies).
    - Agriculture, infrastructure and tourism (within the framework of the inter-ministerial agendas).
        * Departmental consultation workshops convened by the autonomous regional corporations of Tolima and Valle del Cauca, with the following actors:
        * Environmental, departmental and municipal authorities.
        * Productive sectors.
        * Academic sector.
        * Civil society organizations.

- Consultation of secondary information[12].

As a result of this first phase, which ended in December 2014, an initial document was produced, titled *Sociological transitions towards sustainability: Foundations for the action plan of the National Policy for Integrated Management of Biodiversity and Ecosystem Services (PNGIBSE)*. This document summarizes the inputs provided by the various institutional and social actors who took part in the discussions. On this basis, in 2015, the Technical Committee -comprised of MADS, Humboldt Institute and UNDP - moved forward in the consolidation of the proposed BAP with the prioritization of goals. This prioritization came about taking into account the following general criteria:

- Relevance in the national and regional context.
- Alignment with OECD recommendations.
- Alignment with the Aichi Targets for biodiversity of the Convention on Biological Diversity.

12. View documents consulted.

Once the information from the first phase is collected, some of the goals suggested are prioritized. This proposal was later socialized through virtual fora.

- Articulation with ongoing processes.

Given the limitations related to both time and the resources available, the broad consultation, applying the traditional in-person methodologies of meetings and workshops, was not possible. Therefore, technological tools that extend coverage at lower costs were used. To this end, five virtual forums were carried out for socialization and feedback of the proposed BAP, convening the seven groups of actors identified in the PNGIBSE and considered essential for implementation at the national, regional, local and cross-border scenarios[13]:

1. Policy-makers and managers. This group includes public institutions responsible for generating the Environmental Sector Policy and the respective technical instrumentation and directly related regulations, as well as exercising authority or control over the actions permitted for governance and the protection of biodiversity in a given socio-ecological system at the national, regional, local and cross-border scale. Included in this group are MADS, the National Environmental Licensing Authority (ANLA), National Natural Parks (PNN), autonomous regional corporations (CAR) and for Sustainable Development (CSD), urban environmental authorities (AAU), Environmental Police, National Army, and departments, municipalities and districts (which have environmental functions from Law 99 of 1993). These actors interact through processes of public policy formulation, programs and strategies, management and action plans (territorial regulation plans, land management schemes) and projects at the national, regional, local and cross-border level.

2. Direct users. These are those who use biodiversity and ecosys-

13. National Policy for Integrated Management of Biodiversity and Ecosystem Services (2012).Ministry of the Environment and Sustainable Development. Bogota.

BAP
Biodiversity Action Plan in Colombia **2016-2030**

Revoloteo de mariposas a orillas del río. Francisco Nieto Montaño.
Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.

Seven stakeholder groups are considered for the implementation of the PNGIBSE: the policy-makers and administrators, direct users, indirect users, regulatory bodies, oversight bodies, knowledge generators and national and international collaborators.

BAP
2016-2030

Lagartija *Anadia bogotensis*. Federico Pardo. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

tem services as a key element for the performance of their activities or as a source of raw materials or inputs for small, medium and large scale production. This group includes the productive sectors: agriculture and forestry; extractive industry (mining and energy); road and port infrastructure; housing and territorial development; trade and tourism; botanical and zoological gardens; reservations and indigenous communities; collective territories of Afro-Colombian communities; palenquera and raizal communities; rural reserves and associations of small farmers; unassociated peasants and settlers; and NGOs. These actors interact through inter-ministerial and inter-sector agendas, participation in the construction of public policies, POT, EOT and joint environmental agendas, the permitting process, the processes of environmental licensing, cleaner production pacts, public-private inter-sector agendas public-private and self-regulatory mechanisms, among others.

3. Indirect users. Those who benefit from biodiversity and ecosystem services, but do not base their main productive activity on it. Those belonging to this group include the industrial processing sector (manufacturing), the services sector and civil society in general. They interact through inter-ministerial and inter-sector agendas, participation in the construction of public policies, social accountability committees, among others.

4. Regulatory bodies. Includes actors such as the Congress of the Republic, National Planning Department (DNP), Colciencias, National Administrative Department of Statistics (DANE), Administrative Department for Civil Service (DAFP), Department for Social Prosperity (DPS) high courts, departmental assemblies and municipal councils. These interact in legislative and political control debates, inter-ministerial agendas and hearings.

5. Oversight agencies. Such as the Comptroller General of the Republic, Attorney General's Office, the Prosecutor General's Office, Public Defender, and offices of the ombudsman and social accountability committees. They interact through the preventive control instruments ofpublic administration, political influence on the legislative agenda and set up of stakeholder groups.

The participatory character of the process definitely provided greater transparency and robustness to the BAP and gave rise to the commitment and buy-in of all the stakeholders.

6. Knowledge generators for decision making. This group of actors includes research institutes attached and linked to MADS (Humboldt I., Sinchi I., IIAP, Invemar and IDEAM), the Natural Sciences Institute (NCI) of the National University of Colombia (Unal) other institutes and research centers, universities and academies, botanical gardens and zoos, as well as reservations and indigenous communities, collective territories of black communities, raizales and palenquera communities, rural reserves, small rural producer associations and NGOs, the National Hydrocarbons Agency (ANH), Colombian Agricultural Research Corporation (Corpoica), Colombian Geological Service (QMS) and Mining and Energy Planning Unit (Upme). These actors interact in scenarios that are research programs and for formulation of public policy, action plans at national, regional and local levels, and territorial regulation plans.

7. National and international partners. Including actors such as the Presidential Agency for International Cooperation of Colombia (APC), international development cooperation agencies, multilateral banks, international conventions and in-

Pescador en el Caño Chucurí. Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

ternational governments. These interact through cooperation agreements for execution, research or human capital formation. The scenarios required for broad participation were generated in this manner to ensure the transparency of the process and allow decision-making to happen on the basis of information, anticipating conflict and subsequent push-back.This mechanism facilitated the understanding of the issues by non-specialists or laypersons and it helped the PNGIBSE reach places where it had not yet sunk in.For its part, theshared responsibility approach spearheaded by the PNGIBSE, and reflected in the definition of sector and regional goals, requires the express commitment of the sector's actors and regional environmental authorities for its performance, which was achieved in part through this exercise in participation.

Establishing clear, fixed and widely known rules, creating opportunities for dialogue so that stakeholders with interests and impact on biodiversity and ecosystem services will allow achieving a legitimate, genuine and viable BAP, that is clear about who decides, as well as what is the role that each person plays or will play, not only in the design but also in implementation.

Participation is supposed to be a means but also an end. Participation is about achieving specific goals in concrete situations and it is desirable in itself for viability and to establish shared responsibility in the actions that are defined. Consequently, the proposal will have greater legitimacy and sustainability to the extent that the public has an impact on the decisions that affect and involvethe future of biodiversity. This ultimately strengthens the Ministry's efforts because bringing buy-in and fostering consensus reduces push-back and improves communications channels enhancing the efficiency and effectiveness of the effort.

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Crecimiento de hongos sobre tronco caído.
Francisco Nieto Montaño. *Banco de Imágenes Ambientales (BIA), Instituto Alexander von Humboldt.*

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