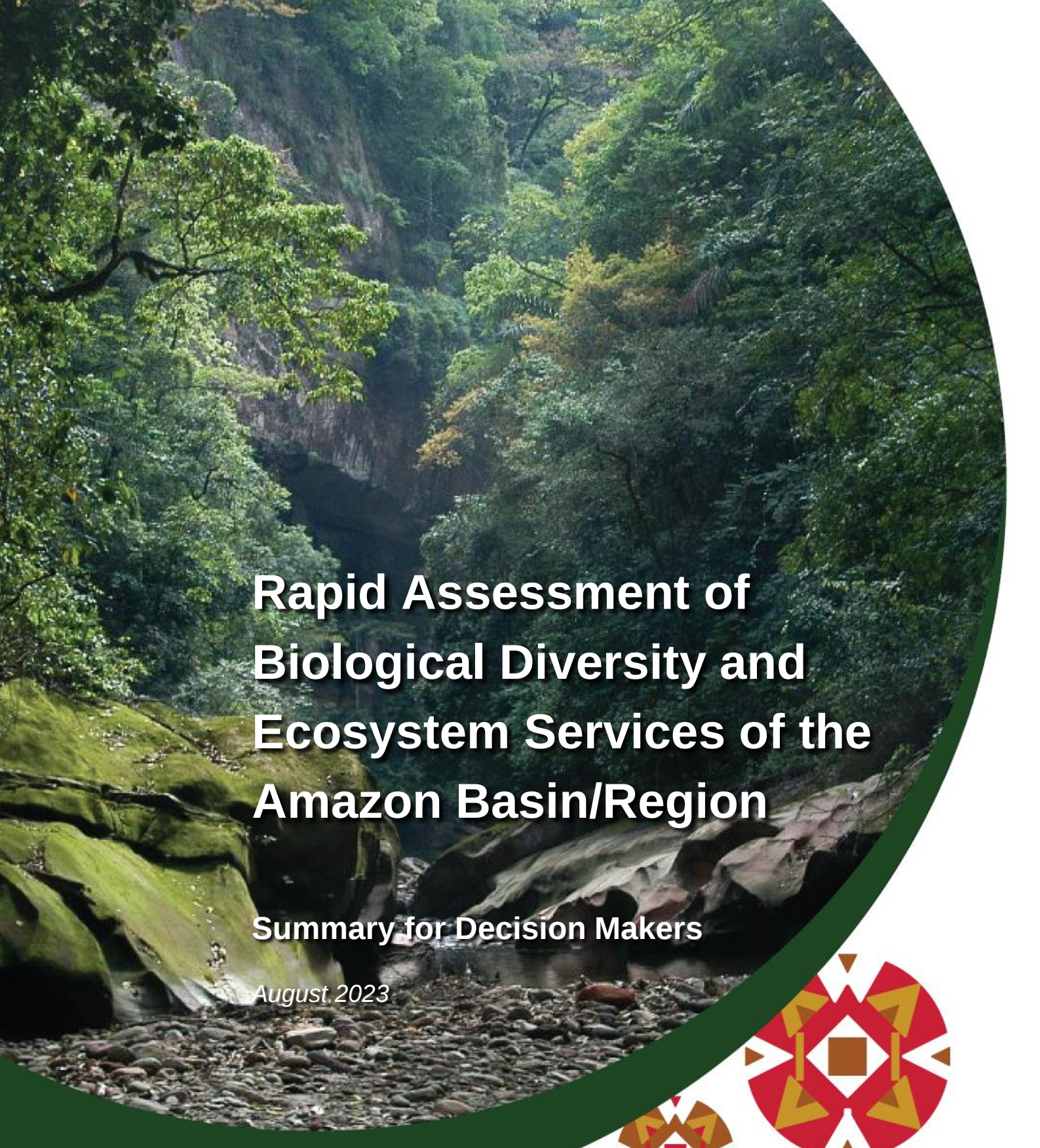




Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region

Summary for Decision Makers

August 2023



Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region

Summary for Decision Makers

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Explanatory Remarks

To adequately read and understand this document, the Summary for Decision Makers (SDM) of the **Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region** (hereinafter, “Rapid Assessment”), it is important to consider the following explanatory and contextual considerations, which are also applicable to the Technical Document underlying the SDM:

1. Following the Scope Document which establishes the guidelines for carrying out the Rapid Assessment, the latter was conducted using the conceptual framework and methodology adopted in 2014 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as a reference and guideline. As such, rather than being one of the assessments approved in the IPBES Work Plan, the Rapid Assessment is a research work led by ACTO which adapts the IPBES methodology to the context of the Amazon Basin/Region but does not strictly adhere to it.
2. This Assessment is described as “Rapid” because it was prepared in two years – from 2020 to 2022– a period shorter than that taken for the geographic or thematic assessments conducted under the IPBES Work Plan, which have usually taken between four and five years.
3. Consistent with the IPBES methodology, the Rapid Assessment was conducted by gathering, analyzing, and systematizing existing secondary information from different sources; it was therefore not intended to generate primary information or to collect new data. Given that the Rapid Assessment was conducted between 2020 and 2022, information produced after that date is not included in the Technical Document or the SMD, and this should not be considered an information gap.
4. Geographically, as per the Scope Document, the Rapid Assessment pertains to the Amazon Basin/Region, with the understanding that the region includes the Amazon Basin, Amazon Region and is also referred to as “the Amazon.”
5. Although French Guiana, an overseas French territory, is not part of the ACTO Member Countries, information on its biodiversity and its socioeconomic situation was included in the Rapid Assessment, as it belongs to the Amazon Basin/Region.
6. The Rapid Assessment was developed by 118 authors from ACTO Member Countries practicing a variety of disciplines, who, in accordance with the IPBES methodology, participated voluntarily and independently, without representing the particular interests of any of the countries, entities, nor institutions to which they are linked.
7. The Rapid Assessment considers the Blue Amazon under a comprehensive geopolitical perspective that includes, among other aspects, the region's strategic location connecting the Andes-Green Amazon-Atlantic Ocean corridor and its economic importance. This perspective does not necessarily reflect the origin of the concept.

8. Going back to the previous clarification –i.e., that the Rapid Assessment was prepared on the basis of secondary information– it was found that data regarding certain biological groups in the Amazon Basin/Region is scattered due to varying scales, geographic scopes, and timelines. Therefore, unifying such information is not possible. This should not be considered as an information gap but as one of the main situations revealed by the Rapid Assessment, which leads to the need to carry out more detailed assessments on these topics in the future, which will provide unified biological information on the biodiversity of the Amazon Basin/Region.
9. As per the IPBES methodology (IPBES/6/INF/17), each of the Key Messages contained herein is assigned a confidence level that refers to the quantity and quality of the supporting evidence (data, theory, models and expert opinion):
 - **Well established:** Comprehensive meta-analysis or multiple consistent syntheses or independent studies.
 - **Established but inconclusive:** There is general consensus, but the number of existing studies is low; there is no comprehensive synthesis or the existing studies do not address the issue with precision.
 - **Unclear:** There are several independent studies, but their conclusions do not coincide.
 - **Inconclusive:** Scant evidence and considerable knowledge gaps.

Disclaimer

The information contained in this document is purely informative and does not necessarily reflect the opinion of the Amazon Cooperation Treaty Organization (ACTO) nor of the Technical Support Secretariat for the Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region. The information provided is based on sources believed to be reliable, but its accuracy, completeness, or timeliness is not guaranteed. All opinions expressed in this document are solely those of the authors.

Table of Contents

Presentation	7
A. Introduction	10
B. The Importance of the Amazon's Biological and Cultural Diversity	13
C. Threats and Drivers of Change	21
D. The Amazon and Climate Change	32
E. Knowledge and Dialogue of Knowledge for Decision-Making	37
F. Visions of Development and Land-Use Planning for the Amazon Basin/Region	42
G. Political Institutions and Participation in Governance	48

Presentation

The **Amazon Cooperation Treaty Organization (ACTO)** is an intergovernmental body constituted by the eight Amazonian countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela, who signed the **Amazon Cooperation Treaty (ACT)** in 1978. The ACT is both a current and visionary legal instrument whereby the countries acknowledge the transboundary nature of the Amazon Basin/Region in order to undertake a common commitment: the preservation of the environment and the rational use of the Amazon's natural resources.

This event was a regional follow-up to the Stockholm Conference on the Environment (1972) to address issues such as river pollution, deforestation, and biodiversity conservation in the region. In that Conference the United Nations Environment Program (UNEP) was also created, a strategic ally of ACTO.

The World Commission on Environment and Development was held 25 years after the creation of the ACT, presenting the Brundtland Report, which defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

For this reason, the eight Member Countries created the **Amazon Cooperation Treaty Organization (ACTO)** in 1995, which is based on a shared vision of the Amazon Region aimed at achieving sustainable development.

Thus, in 2002, the ACTO's **Permanent Secretariat (PS)** was established to provide spaces of political and technical dialogue among the 8 Member Countries and facilitate collaboration among them to address the environmental and socioeconomic challenges and opportunities of the Amazon through specific regional programs and projects.

As a result, in order to meet the strategic objectives of ACTO, and establish priorities, actions, and goals, the Member Countries defined the **Strategic Agenda for Amazonian Cooperation (AECA, 2010-2018)**, which is in the process of being updated.

Its regional scope encompasses six areas: Natural Resource Conservation; Indigenous Peoples; Regional Health Management; Knowledge Management and Information Sharing; Emerging Issues: Climate Change, Regional Development, and Energy; Infrastructure and Transportation. It is also worth mentioning the ACTO's **Amazon Regional Observatory (ARO)**, a reference center for information on the Amazon covering six topics: CITES; Biodiversity; Forests; Water Resources; Indigenous Peoples; and Climate Change. The ARO is capable of collecting and analyzing data, sharing content and connecting multiple users.

The ACTO is currently the only socio-environmental bloc in South America, working on various levels: political-diplomatic, strategic, and technical. It strives to create synergies for the Amazon by collaborating with governments, multilateral organizations, cooperation agencies, the scientific community, organized civil society, social movements, productive sectors, and the public.

Given that the conservation and sustainable use of biological diversity demands an articulated and organized public management, in 2021, the Amazon countries, through dedicated technical work and a joint political decision, created the **Regional Biodiversity Program for the Amazon Basin/Region**, a guiding framework for the development and implementation of strategic and cooperative actions.

As part of this Program, the ACTO Member Countries prioritized the development of the **Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region** as a means to better understand the state and trends of biological diversity and ecosystem services, as well as their complex interrelationships and the effectiveness of responses to the threats faced today.

The Rapid Assessment is a strategic tool that provides relevant, timely, and rigorous information for decision-making. The Assessment seeks to strengthen the connection or interface between science, politics, and society, actively involving experts in the Amazon Region along with indigenous peoples and their traditional knowledge. Its main objective is to promote appropriate sustainable development processes and to contribute effectively to the implementation of public policies based on scientific and technical information for decision-makers.

This Rapid Assessment was made possible thanks to the voluntary work of **more than 118 experts from the Amazonian countries**, who, guided by a Scientific Committee and assisted by a Technical Support Secretariat, prepared the first subregional assessment under the methodology and conceptual framework of the Scientific-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

Valuable support was also provided by the Alexander von Humboldt Biological Resources Research Institute of Colombia and the German Development Cooperation Agency in Brazil, through the Project to Support the Regional Program on Biological Diversity for the Amazon Basin/Region, within the framework of the Convention on Biological Diversity (CBD) for Latin America.

It is for these reasons that I am particularly pleased to present the **Summary for Decision Makers**. This is a synthesis of the Rapid Assessment containing the **Amazon Key Messages**, which identify vital and strategic actions to be taken immediately and in the short term, in the face of imminent risk of reaching a point of no return in the Amazon.

Alexandra Moreira
Secretary General of the ACTO

A. Introduction

According to unified criteria, the Amazon Region covers an area of 7,918,682.31 km², while the Amazon River basin, strictly speaking, covers 6,118,000 km² (ACTO & CIIFEN, 2021). The region covers 44% of the land area of South America, hosting the most extensive contiguous tropical rainforest in the world. It is also one of the continent's most important sources of freshwater, providing approximately 20% of the total freshwater discharge on the planet's surface. It is also a hub for biological diversity, offering numerous benefits to the well-being and development of the people living in the countries within the Amazon Basin/Region. Likewise, the Amazon is also megadiverse, multiethnic, and multicultural.

Biodiversity and ecosystem services in the Amazon require that all sectors of society must come together around shared goals that take into account the diverse economic, political, environmental, and social interests surrounding the Amazon. It was under this recognition that the eight Amazonian countries –Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela– signed the Amazon Cooperation Treaty (ACT) in 1978 and approved the creation of the Amazon Cooperation Treaty Organization (ACTO) in 1998, an intergovernmental organization for the implementation of the Treaty.

The ACTO is the official mechanism for the eight Member Countries of the Amazon Basin/Region to cooperate, have political dialogue, and work together under the Strategic Agenda for Amazonian Cooperation (Spanish acronym AECA). The ACTO implements programs, projects, and initiatives with joint efforts to promote sustainable development in each of the Member Countries' Amazonian territories. Such actions aim to produce equitable and mutually beneficial results.

In 2021, the ACTO Member Countries approved the Regional Biodiversity Program for the Amazon Basin/Region, which aims to improve biodiversity management and protect the traditional knowledge of the Region's indigenous peoples, local communities, and other tribal communities. The Program identified the need to assess the state of biological diversity and ecosystem services in the Amazon Region by taking into consideration and applying the Intergovernmental Science-Policy Platform

on Biodiversity and Ecosystem Services (IPBES) conceptual framework and methodology.

The Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region considers the regional context and its multiple territorial, social, cultural, legal, and environmental levels. The Assessment took into account recommendations shared by indigenous peoples through a dialogue with their representatives, co-organized by the Coordinating Body of Indigenous Organizations of the Amazon Basin (Spanish acronym COICA) and the Fund for the Development of Indigenous Peoples of Latin America and the Caribbean (Spanish acronym FILAC).

Likewise, this Assessment also considers the findings of similar studies, such as the Science Panel for the Amazon Report, the IPBES Assessment Report on Biodiversity and Ecosystem Services for the Americas, the Brazil Initiative, and the National Assessment of Biodiversity and Ecosystem Services of Colombia, among others. Such findings contribute to determining the status and trends of biological diversity and Nature's Contributions to People (NCP, a concept introduced by the IPBES to highlight nature-human relationships such as the provision of food, water, and air, among others), as well as the opportunities and effectiveness of responses to threats that impact human well-being, quality of life, and socioeconomic and cultural growth.

The purpose of this Summary for Decision Makers is to lay out the Assessment's Key Messages in a relevant way, as an input to guide the formulation of policy instruments and the definition of strategic actions aimed at the sustainable management of the Amazon Basin/Region by key social sectors (governmental, private, academic, indigenous peoples, local communities, and civil society).

The Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region comprises six chapters, the blueprint from which this Summary for Decision Makers was developed:

1. Introduction and Context
2. The Situation, Trends, and Dynamics of Biological Diversity and Nature's Contributions to People in the Amazon

3. Drivers of Threats, Losses, Opportunities, and Transformation of Nature
4. Dialogue of Wisdom and Traditional Knowledge Associated with Biological Diversity
5. Present and Future Interactions Between Nature and Society: Pathways to Sustainable Development and Good Living
6. Policies, Institutions, and Governance at Different Scales and Sectors

Numbers in curly brackets, which you will find throughout this Summary, correspond to the Assessment's chapters. E.g., "{2.2}": the first number refers to Chapter 2 and the following number refers to Section 2 of that same chapter.

B. The Importance of the Amazon's Biological and Cultural Diversity

The Amazon is one of the most biologically and culturally diverse regions on the planet. Its conservation goes hand in hand with recognizing its strategic importance in the provision of ecosystem services and Nature's Contributions to People (NCP) at the global (climate regulation and carbon sequestration, among others), regional, and local scales and the role of indigenous peoples, local communities, and other tribal communities, as well as local, regional, and national governments, in its management and sustainable use.

B1. The Amazon is megadiverse, multiethnic, and multicultural (Well established). The Amazon Basin is the largest river basin on the planet, contributing between 15% and 20% of the world's freshwater flow to the oceans. Its main river, the Amazon, with a length of 7,062 km and an average flow of 225,000 m³/s, is the world's largest and most abundant. Two of its main tributaries, Madeira and Negro, are among the ten largest rivers in the world. With an area of 6,118,000 km² and rainfall greater than 2,000 mm per year, it covers 67.8% of the territory of Brazil, 9.9% of Peru, 5.5% of Colombia, 2.4% of Venezuela, 7.9% of Bolivia, 2.8% of Guyana, 1.9% of Suriname, and 1.7% of Ecuador {2.2}.

The Amazon Region is characterized by a wide range of altitudes, starting from the Andean-Amazonian transition area, through the floodplains, and extending to the mouth of the Amazon River in the Atlantic Ocean. It also displays a diverse ecosystem, consisting of freshwater environments that supports living, terrestrial, and estuarine organisms. Several Amazonian countries are considered megadiverse because they are home to a large number of species and the traditional knowledge related to them.

Regarding culture, there are between 420 and 511 indigenous peoples in the Amazon Basin/Region, according to figures from the ACTO (2021) and COICA (n.d.), cited respectively in the Amazon Regional Observatory (ARO-ACTO), of which approximately 66 are in voluntary isolation or initial contact, in addition to other ethnic communities, quilombolos, riparians, Afro-descendants, peasants, and settlers.

B2. The potential benefits of Nature's Contributions to People of the Amazon Basin/Region including social, cultural, and economic advantages, are threatened and diminished by anthropogenic processes (*Well established*). The Amazon Basin/Region boasts rich biodiversity and traditional knowledge systems that offer immense benefits for the planet, and access to genetic resources and traditional knowledge should always be granted with Prior Informed Consent, ensuring fair and equitable sharing of benefits. Such valuable contributions that enhance the overall well-being of humankind include food security and sovereignty, climate regulation, and raw materials for producing herbal medicines and other derivatives. They are also significant elements of the culture of indigenous peoples, local communities, and other tribal groups {2.3.3, 4.3.1, 4.9}.

In the Amazon Basin/Region, drivers of global change such as Climate Change, alteration of biogeochemical cycles, land use change, forestry (forest cultivation and management), introduction of invasive species, overexploitation of natural resources, and pollution, lead to the modification, fragmentation, and destruction of natural habitats, negatively impacting resilience capacity, environmental functions, and the provision of ecosystem services {3. 3.1.7, 3.3.2, 3.3.4, 3.3.5, 3.6.2, 3.7.6}.

Land use and territorial planning processes largely ignore the territorial occupation models specific of the Amazon, and urban planning processes are not adapted to socio-ecosystemic conditions, producing a gap between rural and urban areas, increasing intersectoral conflicts (mining, energy, agriculture, livestock, tourism), and illicit activities {6. 2.13.1, 6.2.14, 6.5, 3.3.1.1, 3.3.1.3, 3.3.1.8, 3.4.7, 3.6.2, 4.3.4, 4.8.2, 4.9}.

B3. The Amazon has a high and exceptional diversity of microorganisms, plants, birds, mammals, reptiles, fish, insects, and other invertebrates that constitute the largest number of species on the planet in the same biome (*Well established*). Megadiversity refers to a large quantity and variety of plant and animal species and ecosystems within a given country or region. In the Amazon Basin/Region, megadiversity, aside from harboring biological diversity, encompasses different types of interconnected societies, cultures, and landscapes. The concept of megadiversity arose from the United Nations Environment Programme World Conservation Monitoring Centre, which aims to encourage the preservation and

safeguarding of megadiverse areas, as they contain significant natural resources that cannot be found anywhere else. There are only seventeen countries worldwide classified as megadiverse, including several ACTO Members.

The variety of plants and animals in the Amazon is characterized by a large number of unique, charismatic, and endemic species, i.e. species that are found nowhere else. The total number of plant species is still debated, with estimates ranging from ~7,000 to 15,000. According to estimates, Ecuador hosts 4,500 endemic plant species, Brazil 4,400, Peru 4,197, Bolivia 2,402, and Colombia 280 {2.3.3}. The group of mammals in the Amazon has a high species richness. About 140 genre have been documented, including 265 species in Colombia, 292 in Peru, and 468 in Brazil {2.3.10}.

B4. The Amazon Basin/Region constitutes a strategic reserve of freshwater biodiversity, not only because it hosts the largest number of freshwater fish species described worldwide, but also because of its contributions to regional subsistence and livelihoods (*Well established*). 62.5% of the 2,716 freshwater species in the Amazon are endemic {2.3.7.1}. The productivity of Amazonian waters is associated with the type of water (white, clear, and black) and its periodic fluvial dynamics with the landscape, with whitewater rivers and their extensive flood plains being those with the highest fish production {2.3.7.2}. Freshwater fish represent a quarter of all vertebrate species, although freshwater occupies less than 1% of the Earth's surface and represents less than 0.0001% of the total water on the planet {2.3.7.3}.

Fish play a crucial role in ensuring food security and supporting the local and regional economies of the Amazon. They serve as the primary source of protein for many indigenous and riparian communities, who possess valuable knowledge about the ecology of fish species and aquatic ecosystems, which is essential for effective ecological management {4.1}.

Even though riparian villages may be living below the poverty line, they are not experiencing hunger. On the contrary, their fish consumption is among the highest in the world, with a usual daily per capita consumption of half a kilo of fish {2.4.6.1.3, 5.2.6}.

Thanks to knowledge accumulated over millennia or centuries, riverine populations have developed diverse fishing and capture techniques that allow them to sustainably access abundant quantities of food throughout the year in rivers, canals, lakes, backwaters, and flooded environments {5.2.6}.

Fish stocks play a crucial role in supplying Amazonian cities, particularly in fighting hunger and poverty in marginal areas. Despite the importance of fisheries, there is scant information on fishery productivity in the Amazonian countries {2.3.7.2}.

Despite its importance, fishing communities are not very involved in the governance of this resource, a fact that has stimulated not sustainable practices and territorial and transboundary conflicts {5.2.4}.

The overexploitation of fish supply, the introduction of non-native species (like the paiche in Bolivia), and illegal and unsustainable fishing practices pose a threat to the food security of local communities {3.3.4, 6.2.13.1}. Furthermore, there are elevated levels of mercury pollution resulting from gold mining activities in the Amazon. {3.3.1.7, 5.2.5, 5.2.7}.

B5. The Blue Amazon is a concept generated from a geopolitical connotation, given its economic, ecological, and sovereignty importance, needs to be incorporated into planning processes based on an integrated vision of the Amazon Basin/Region that connects marine, coastal, freshwater, and terrestrial territories (*Established but inconclusive*). The Blue Amazon corresponds to the region of contact between the Amazon biome and the Atlantic Ocean. The discharge of the Amazon River influences the ocean, and the latter's tidal cycle, in turn, influences the estuarine region of the Amazon basin—which extends more than 400 km inland. This complex dynamic area is crucial in understanding Amazonian ecosystems, not only because of its significance to fisheries but also because of the atmospheric interactions and ecosystem services provided by the mangroves therein.

Moreover, this area is home to an essential part of the region's traditional population, whose ways of relating with biodiversity are unique. The Green and Blue Amazon are characterized by the diversity and abundance of natural resources, which attract ambitious international economic and environmental interests, thus generating

tensions between resource extraction, environmental conservation, and national sovereignty. Current policies for conserving biodiversity are insufficient for proper management. A greater level of attention and integration is necessary at the regional level among all stakeholders to prioritize the Green and Blue Amazon and ensure shared responsibility {2.2}.

B6. The Amazon Basin/Region is globally essential for its capacity to regulate climate, as it is the largest hydrographic basin on the planet and it provides crucial ecosystem services, e.g., it is the world's largest terrestrial carbon reservoir (*Well established*). The Amazon rainforests have a direct influence on the world's climate. However, the greater frequency of extreme climatic events and fires, coupled with the greater vulnerability and low adaptive capacity of tropical forests, leads to a reduction in their productivity, the natural vocation of these forests (e.g., a decrease in soil fertility), and a decrease in their capacity for climate regulation {6.2.6}.

Amazonian forests influence climate regulation in the following ways:

1. Flying or aerial rivers of the Amazon are a phenomenon created by the evapotranspiration of the trees –the process by which water evaporates from the soil and the leaves of the trees– and by the oceanic atmospheric column. Aerial rivers supply the Amazon forest itself with rain, but also rural and highly populated urban territories, as well as areas with high agricultural and livestock production in South America that depend on this ecosystem service. The total area is located, from east to west, between the Andes and São Paulo, Brazil, and from north to south, between Cuiabá, Brazil, and Buenos Aires, Argentina. It has been shown that this phenomenon is responsible for the cooling of the lower layers of the atmosphere, which contributes to global climate equilibrium {2}.
2. By acting as a giant heat absorber close to the ground that absorbs half the solar energy in the process of water evapotranspiration from leaves {3.3.3}.
3. By acting as a mega carbon reservoir sensitive to disturbances such as deforestation, drought, and fires, among others. The depletion of such reservoir

contributes to the accumulation of greenhouse gases in the atmosphere, which is the leading cause of global warming {3.3.3, 6.2.6}.

4. The water draining from these forests into the Atlantic Ocean represents 15% to 20% of the total freshwater discharge worldwide. It may be sufficient to influence some of the major ocean currents that are themselves essential regulators of the global climate system {3.3.3}.

B7. The Amazon Basin/Region is a complex system whose water network and hydrological cycles connect the Andes Mountains to the Atlantic Ocean, influencing the world's air and sea currents. This network and its seasonal and resilient cycles determine the integrity of the region's ecosystems and species (Well established). Amazonian rivers are among the most productive in the world, due to their geographical position, topography, and wind regime. Furthermore, the region's high rainfall causes the level of water bodies (from small streams in the forest interior to rivers and tributaries) to rise periodically, overflowing and covering areas as wide as 100 km. The Amazon ecosystems produce large quantities of water for Brazil and all of South America. The so-called “flying rivers”, i.e., air masses loaded with water vapor produced by evapotranspiration, transport humidity to large parts of Brazil. These huge rain clouds also influence precipitation in Bolivia, Paraguay, Argentina, Uruguay and even in the extreme south of Chile {2.4.6, 2.3.7.2, 5.2.6, 6.1.3}.

Flood pulses are recurring and natural incidents that cause water levels to rise in rivers, wetlands, or estuaries due to heavy rainfall. They are essential in the productivity of Amazonian ecosystems, and fundamental for the reproductive cycles of aquatic species, as they facilitate food chains and provide aquatic species to have access to a source of food from diverse flooded environments—from forests to fields. This, in turn, contributes to the abundance of fish, chelonians (turtles), caimans, porpoises, manatees, and otters.

Besides food, flooded environments offer a multitude of shelter and breeding sites for multiple species. Animals, who ingest fruits and seeds and carry them along, favor plant dispersal and ensure the perpetuation of interconnected ecosystems, which means there is a close relation between the different levels of the river and animals' migration, reproduction, and feeding patterns. {2.4.6, 5.2.6}.

River dynamics have historically determined human occupation, which has always been greater along the riverbanks than in the vast mainland forests, partly because of the amount of food rivers offer and partly because of their importance as communication routes {5.2.6}.

It should be noted that traditional knowledge is also closely related to the hydrological cycles that guide agricultural, hunting, gathering, and fishing practices in the region {4.3.2}.

On the other hand, analyses of the potential impacts of infrastructure projects show that the effects of dams include deforestation, forest degradation, contamination of water bodies, and negative effects on biodiversity. Likewise, due to their connectivity to the piedmont, the impacts could extend to the Amazon floodplains, causing ecological homogenization, changes in flood pulses, and nutrient retention (nitrogen and phosphorous).

Such changes limit primary productivity in aquatic ecosystem food webs, the channel geomorphology, fertility, including streambed elevations and loss of riparian habitats and their vegetation, in addition to reducing sediment by 64%, phosphorus by 51%, and nitrogen by 23%. These variations have profound effects on flora, fauna, their movement and migration patterns, on the livelihoods of local populations, on fisheries and their ecological dynamics. Involving a reduction of approximately 88% in annual yield, which can affect and threaten the food security and sovereignty of the communities strongly associated with this resource {3.3.1.4, 3.5, 5.2.6}.

The impacts of dams on aquatic ecosystems and their contribution to regional and global greenhouse gas emissions are so severe that many countries have decided to remove them, as the negative socio-environmental effects outweigh any economic benefits they may provide {5.2.6}.

It's crucial to draw attention to the trends observed in constructing future scenarios worldwide, especially in the Americas. These trends indicate a rise in pollution and eutrophication - an excessive growth of algae and aquatic plants due to increased nutrients - which lead to the degradation of aquatic ecosystems. Consequently, part of the transitions required to move toward sustainability include measures such as

fisheries planning, limiting harvesting activities, managing basins, and restoring and monitoring landscapes and watersheds to enhance ecosystem services {5.3.5}.

B8. Conserving the biological and cultural diversity of the Amazon firstly implies, recognizing the importance of indigenous peoples and local and tribal communities as crucial agents for the adequate management of the region's biodiversity and ecosystem services (*Well established*). Amazonian diversity is not limited to the natural world. It also includes a cultural and social dimension whose breadth and scale are second to none in the world. It is well established among researchers that human presence, which has always taken advantage of the diversity offered by the Amazonian territories in the Amazon Basin/Region, dates back to the late Pleistocene (11,700 years before the present) and early Holocene (or, it seems, less than a thousand years ago), taking advantage of the diversity offered by the Amazonian territories.

This long history of land occupation led to a strong bond between the native communities and the ecosystems, a connection that was established through a profound understanding of the forest's dynamics. The peoples who have lived in the forest have adapted to the ecological conditions of the landscape through the careful observation of the attributes of nature and its interactions and cyclical processes, which has been the case to this day. Likewise, indigenous communities possess extensive knowledge about the intricate Amazonian ecosystems. They know how to reside in the forest, communicate with it, and use it in a sustainable manner. This knowledge encompasses symbolic aspects and cultural expressions (rituals, songs, dances, games, etc.) which define management strategies for the environment. Therefore, it is no coincidence that the Amazonian countries with the greatest wealth of endemism and species –Brazil, Colombia, Peru, Ecuador and Bolivia– also have the greatest cultural diversity {4.3, 4.3.1, 4.4}.

C. Threats and Drivers of Change

The unsustainable development models and extractivist mechanisms implemented in the Amazon have led to an unprecedented increase in the loss of its forests, biodiversity, and ecosystem services. If current trajectories related to extractivism continue, Nature's Contributions to People (NCP), which depend directly on the quality of ecosystem services, may not be secured in the medium term, affecting and causing complex and unpredictable losses for indigenous peoples, society in general, and the world, but above all, they put their resilience to future changes at stake.

C1. Economic factors focused on extractivism are the main drivers of change for the Amazon landscape (Well established). The extractive economy, which is based on the intensive extraction and export of natural resources, determines land-use change on a large scale and in terms of the decisions taken by local inhabitants involved in the regional integration process.

In this context, the opening of roads, agro-industry, mining, land grabbing, and other unplanned or unsustainable activities, and additionally those illicit, are done solely for economic or personal interests related to integration and the expansion of domestic and global markets in the context of globalization, without taking into account or solving local needs {5.2.5, 5.2.6, 5.2.7, 5.2.8}.

Natural resources extraction, hydropower, agribusiness, population growth, road interconnection, and urban sprawl have been and, according to future scenario projections, will continue to be the drivers of irreversible change in the Amazon Basin/Region and for society-nature relations if they are not shifted into trajectories towards sustainability {4.9, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.2.7, 5.2.9, 5.2.10, 6.5}.

The consequences of economic growth based on extractive activities enclose, reduce, and affect the Amazon Basin/Region¹.

¹ Please refer to the Amazonian Network of Geo-referenced Socio-environmental Information (Red Amazónica de Información Socioambiental Georreferenciada -RAISG-, 2020).
<https://www3.socioambiental.org/geo/RAISGMapaOnline/>

Hence, policies aiming at building hydroelectric dams as a means of promoting sustainable and clean energy are a topic of debate. Dams have significant impacts on the connectivity of ecosystems, carry large amounts of sediments and pollutants, and emit large amounts of methane, which cannot be avoided or mitigated. As a result of flood pulses, Amazonian hydroelectric power plants act as pumps for the transformation of carbon dioxide (CO₂) into methane (CH₄) {5.2.6}.

The growing demand for food and products over the last 30 years, coupled with globalization, continues to cause an increase in the world trade of non-renewable natural resources and agricultural raw materials, systematically impacting the natural and cultural diversity of the Amazon Basin/Region.

Soybean (one of the main imports from the European Union) is just one example. Between 2001 and 2006, one million hectares of new soybean crops were planted in the Brazilian Amazon, leading to record levels of deforestation during this period {3.4.3}.

In response to this situation, between 2008-2009 and 2017-2018, the European moratorium on Brazilian soybeans (SoyM) was put in place, i.e. the temporary suspension of the product due to negative environmental impacts, which reduced the observed deforestation rate in the Brazilian Amazon by 5.2 times.

Furthermore, in September 2022, the European Commission approved a regulation to curb imported deforestation related to 14 tropical commodities or basic natural resources (including palm oil, soy, timber, cocoa, coffee, and beef), whereby producers are required to prove that their products do not come from land that has been deforested after December 2020 {3.4.3}. This measure was put in place to offset the effects of imported deforestation, i.e. when a country imports a product that contributes to deforestation in another country. This concept shows the direct or indirect responsibility that, given its consumption patterns, a country must assume for affecting an ecosystem in another country.

The Amazonian “gold rush”² has also triggered an extractive cycle that leads to the destruction and contamination of soil, water, and other associated resources, including fish. This “gold rush”, although it is a global phenomenon, has special repercussions for the Amazon Basin/Region, given the fragility and vulnerability of its ecosystems.

There are two main factors behind this trend. Firstly, central banks motivation to increase their gold reserves due to the high demand for gold worldwide, which has risen since 2011 and peaked in 2022; in the face of a downward trend in the world economy, gold has become a safe investment option, leading to historic levels of gold purchases by central banks. Secondly, the growing global market demand for jewelry and luxury items made of or with a high gold content, with China and India, Southeast Asia, the United States, Europe, Turkey, and the United Arab Emirates as the main consumer countries. Similarly, the breakdown of gold demand by sector, in the third quarter of 2022, indicates that jewelry ranks first, followed by investment and bullion demand {3.3.1.7}.

Illicit traded gold is often funneled into the same production chain as legally exported gold. International cooperation agreements for supply chain regulation are an important tool for strengthening environmental governance and traceability systems, especially for countries with weaker institutional capacity {5.2.7}.

Closely related to the “gold rush” phenomenon, mercury contamination in the Amazon has progressively increased in recent years, due to the growth in demand for gold in the world. As a consequence, the increase accelerated illicit and informal gold mining practices that release mercury into the water sources. The illegal and irresponsible use of mercury causes bioaccumulation up to 30 times higher than the maximum safe value established by the World Health Organization (WHO).

The main source of mercury contamination in the Amazon is illicit, artisanal, and small-scale gold mining, with consequences for the inhabitants of the Amazon which include the deterioration of nerve functions, cognitive problems, physical malformations, miscarriages, altered psychomotor development, and cleft palate in children. Similarly,

² The rapid and massive migration to remote areas where gold deposits have been discovered. The term comes from the social phenomenon that occurred in the United States between 1848 and 1855, when a large number of immigrants arrived in the San Francisco area in search of gold, and it has been extended to other regions of the world where similar phenomena occur.

bioaccumulation is present in flora and fauna species {3.3.1.7, 4.8.2, 5.2.5, 5.2.7, 5.3.1}.

Mercury in the Amazon is a multidimensional problem that transcends borders and requires actions in several areas. Regional, transboundary policies are needed to progressively reduce mercury trade and its use in gold mining. However, other external factors are also at work, such as the international demand for gold. Therefore, the illicit sourcing of gold and its relation to mercury contamination in the Amazon must be made visible in international markets. It is also important for the authorities of the Amazonian countries to accelerate the implementation of the Minamata Convention, as a strategy for the protection of Amazonian biodiversity and its inhabitants {3.3.1.7, 6.2.4}.

C2. The Amazon is a shared basin/region, in this context, avoiding further deforestation and not reaching the tipping point or point of no return requires articulated, supported, forceful, and short-term actions (*Well established*).

Understanding that nature has a tipping point or point of no return is crucial for decision-making. This term refers to a situation in which an ecosystem undergoes irreversible drastic changes. In other words, if this critical point is reached, it would be difficult or impossible to return to the previous state, as an unstoppable destructive dynamic has been set in motion. The Intergovernmental Panel on Climate Change (IPCC) has warned of the existence of such “points of no return”, which could be devastating.

Scientific models show that the Amazon Basin/Region may cross a tipping point if deforestation exceeds the threshold of 20-25% of the original forest surface area, triggering complex environmental disturbances and cascading effects on species interactions {3.6.3}.

Regardless of deforestation rates, a global warming of 3-4°C may also represent a tipping point that would result in the gradual death of the Amazonian forests. The upward trend in the intensity and scale of forest fires, which are potentiated by global warming and changes in land use and land degradation, can combine with and accelerate deforestation, particularly during periods of drought induced by the El Niño phenomenon {3.3.3}.

Between 1985 and 2020, the Amazon lost 75 million hectares of natural vegetation cover (an area equivalent to the territory of Chile), which, together with the alarming rate of deforestation and the impacts of climate change and environmental degradation, has aggravated the loss of natural and cultural heritage and caused severe deterioration in the present and future of the reserves of natural capital (defined by the Convention on Biological Diversity as the global stock of natural assets, including geology, soil, air, water and all living beings) and of ecosystem health {3.6.1, 6.2.6}.

Combating deforestation requires actions related to the economy, fiscal policy, access to rural credit, local, regional and national development planning, and adequate planning in opening roads, infrastructure, and mining activities {3.3.1.1, 6.2.4}.

There are approximately 31.5 Gt (gigatons) of carbon stored in the Amazon, one of the world's highest density and magnitude reserve of this element {3.6.1}. Trees and plants undergo photosynthesis, wherein they absorb carbon dioxide (CO₂) from the atmosphere (and store it as carbon in the soil, trees, and plants of the Amazon biome) while releasing the oxygen necessary for life. In the oceans, this process is carried out by plankton (algae and bacteria).

This ongoing process by the trees in our region helps mitigate climate change. If carbon were to be transferred to the atmosphere, it would act as a greenhouse gas: allowing solar energy to pass through to the Earth while preventing that heat from escaping into space, thus increasing global temperatures.

Effective strategies to reduce the likelihood of catastrophic climate change need to identify the large, irretrievable carbon stocks at risk from anthropogenic action and prioritize their protection and sustainable management, along with efforts to eliminate fossil fuel emissions and restore degraded ecosystems {3.6.1}.

The Amazon rainforest produces roughly 8% of the global methane emissions, out of which around 17% come from the burning of biomass. Livestock also contributes to these emissions, increasing the concentration of greenhouse gases. Therefore, the 30% reduction targets for methane emissions by 2030 are an important commitment to decrease the effects of climate change in the Amazon {3.3.3}. Overcoming

fragmented visions and conducting transboundary actions that go beyond the national boundaries of the States in the Amazon will only be possible if the Amazon Basin/Region is conceived as a living, fully integrated and interconnected being, as it is seen by traditional knowledge.

There is well-established evidence that forest loss spreads rapidly around newly opened and/or paved roads, which generate secondary, unplanned road networks that increase the spatial extent of habitat alteration and the entry of extractivist activities. For instance, for every kilometer of legal roads in the Brazilian Amazon, there are almost three kilometers of illegal roads and deforestation {3.3.1.4}; and one of the indirect impacts of activities such as timber extraction, mining, or hydrocarbon exploitation is the easy access to remote areas generated by the opening of roads and routes, which increases logging activities (by loggers), hunting, deforestation, and even new human settlements, which have cultural effects on indigenous peoples {3.3.1.5, 3.3.1.6, 3.3.1.7}.

C3. Monocultures, extensive farming, and illicit activities negatively affect the forest, its biodiversity, and ecosystem services, threatening and harming indigenous peoples and local and other tribal communities in the Amazon (*Well established*). The degradation and loss of biodiversity in the Amazon have recently increased, threatening its ecosystem functions and services, as well as the NCPs of vital importance to the indigenous peoples who depend on them for their livelihoods and well-being {3.1, 4.3.1}.

The increase in deforestation and anthropogenic forest fires in Amazonian countries is more significant in territories with a lack of governance and an absence of State institutions {3.3.5, 3.4.7, 3.6.1}.

Transformations and land use change are related to:

- Colonization processes.
- Expansion of the legal agricultural frontier (e.g., palm oil, cocoa, intensive and extensive cattle ranching, among others).
- Illegal expansion due to the illicit cultivation of coca, poppy, and marijuana.

- Extraction of timber and non-timber forest products.
- Exploitation of oil and mineral deposits (e.g., gold, construction materials, coltan, among others).
- Land grabbing.

These factors have accelerated deforestation and the fragmentation of primary forests {3.3.1}.

It is estimated that soybean monoculture is responsible for 9% of all deforestation in the Amazon {3.3.1.1}, while unsustainable, legal and illegal farming is one of the main drivers of deforestation in countries such as Colombia, Brazil, Bolivia, Ecuador, Peru, and Venezuela {3.3.1.2}.

The Amazon accounts for 13% of the world's tropical timber production, but unfortunately, a large part of its extraction is illegal. For example, between 1996 and 2016, total timber production in the Brazilian Amazon increased from 14% to 85%, out of which 80% was extracted illegally {3.3.1.5}.

Amazonian biodiversity and ecosystem services are closely related to human populations in genetic, linguistic, cognitive, agricultural, and landscape terms, as a result of thousands of years of interaction between cultures and their natural environments. Despite the impact of globalization, there are various human-nature relationships that have successfully endured and adjusted over time. This is represented by diverse habits, customs, worldviews, beliefs, rituals, and local histories.

The abundant but fragile Amazonian environment has shaped the indigenous peoples' cultural approach to occupying space and utilizing natural resources. Traditionally, they follow a selective strategy, utilizing the environment periodically and alternating locations to allow for the recovery of species and soils used. The physical and cultural survival of Amazonian human groups depends on this strategy; therefore, unsustainable human activities not only modify the environment, but also harm indigenous peoples, local communities, and other tribal communities in the Amazon {4.3}.

C4. Illegal wildlife trade is a major driver of biodiversity loss in the Amazon Basin/Region and may constitute a latent danger to the population health (*Well established*). Illegal wildlife trafficking is a growing problem in the Andean-Amazon region which threatens the survival of various species, undermines good governance, and violates national laws and international treaties while threatening food security, the cultural well-being of indigenous peoples, biodiversity, and ecosystems {4.3, 5.2.4}.

Millions of people in the Amazon Basin/Region depend on and benefit from using wild species for purposes such as food, medicine, energy, income, among others. The sustainable use of wild species is key to the identity and subsistence of many indigenous peoples, local communities, and other tribal communities; hence it is necessary to ensure the sustainability of this use, stop overconsumption and illegal wildlife trade, and reverse the trend of biodiversity loss {5.2.4}.

Nearly two-thirds of emerging infectious diseases are zoonotic, that is, they have been transmitted from animals to humans, and three-quarters of them originate in wildlife. The risk of new and re-emerging infectious diseases or their outbreak in regions where they have not traditionally occurred is increased by drivers such as land-use change (including deforestation), habitat destruction and fragmentation, and increased contact between humans and wildlife and domestic animals, especially in areas of human expansion (the rural frontier).

In the Amazonian context, emerging tropical diseases such as Chagas disease, malaria, leishmaniasis, Chapare virus, and Machupo virus, for example, may increase in the face of a greater change in land use due to non-planned activities such as monocultures, cattle ranching, urban development, mining, among others {3.4.8, 6.2.13.1}.

Therefore, it is a priority to conduct studies using the One Health approach, which takes human health and animal health to be interdependent and inseparable from ecosystem health.

C5. Urban development and urbanization processes that ignore the socio-environmental context and the existence of diverse territorial occupation

models specific to the Amazon are one of the drivers of land use change, which affects both ecosystems and human populations (*Well established*). The occupation of the Amazon has a long history that is closely tied to the existence of indigenous peoples who have inhabited the region for more than 11,700 years, protecting and making sustainable use of the forests and landscapes.

The settlement and urbanization of the Amazon have been framed by historical processes of military and/or religious colonialism, the rise of extractivist economies of natural resources, and governments' promotion of colonization and policies related to borders, urban planning, and development. These factors have generated the current migratory dynamics where different settlement patterns coexist (e.g. indigenous, local and tribal communities, military, or commercial) under heterogeneous degrees of urbanization, infrastructure connectivity, access to public services, and regional articulation {2.2.1, 3.3.1.3, 5.3.5, 6.2.14}.

Few studies have been carried out to understand the phenomenon of large urban centers in the Amazon, and there are knowledge gaps related on the effects and needs arising from urbanization in the Amazon {2.2.1, 3.3.1, 6.2.14}. However, it is clear that the current urban model increases deforestation and pollution, and the demand for water, soil, and even air resources. As urban centers grow, they increase the pressure on and consumption of wild products such as wildlife {5.2.4, 3.3.1.3, 3.3.2}.

An absence of planning and an intense cross-border population exchange mark the occupation of the Amazonian territory. It is possible to establish a correlation between the population dynamics of urban territories with the loss and degradation of biodiversity and ecosystem services in the Amazon Basin/Region {3.4.5}.

On the other hand, plans to interconnect urban centers have caused major socio-ecosystemic impacts, although there are new initiatives for developing green and resilient infrastructure, meaning, designed to withstand and recover from adverse natural or human-caused events and adapted to the region's characteristics {3.3.1.3, 3.3.1.4}.

In order to analyze the urban phenomenon in the Amazon, it is necessary to overcome the false image of an uninhabited territory, or thought of an exuberant place of magical

experiences and of beings devoid of civilized features. Confronting this reality is a way of drawing attention to a distinct urban phenomenon, enriched not only by landscape, ethnicity, and cultural diversity, but also by the region's social, economic, and political phenomena that are present there.

The Amazon is a fragile territory with various territorial occupation models and unique historical dynamics which afford the opportunity to advance towards a sustainable city model that is appropriate to the socio-natural context and that allows for adaptation to climate change. For example, promoting green infrastructure, valuing and rescuing vernacular architecture (also called native or traditional), adapting to climatic conditions, and engaging in intercultural dialogues of knowledge are all conducive to territorial resilience {6.2.14}.

C6. Undiversified national and international programs for income enhancement have negatively influenced sustainable agricultural and food practices (*Well established*). It is necessary and urgent to take into account and include sustainable agricultural and food practices utilized by indigenous peoples, local communities and other tribal communities in the development and implementation of development policies in the Amazon {4.10.1, 5.2.4}.

In spite of positive economic growth, levels of inequality and poverty persist in all Amazonian countries, along with increasing biodiversity loss. Since 1970, trends in agricultural production, fisheries, bioenergy production, and raw materials extraction have increased, but most of nature's contributions to people have declined {3.4.2, 3.6, 5.3.5}.

Tax incentives and subsidies, agricultural credits, and settlement programs have promoted and stimulated deforestation in the Amazon by focusing on production for large international markets {4.9}. There is no single formula to reduce current poverty and inequality, therefore, public policies with a differential approach are required aligned with the wide diverse sociocultural and ecological characteristics of the Amazon {2.1.2, 2.2, 5.3.2, 5.3.3, 5.3.4, 5.3.5}.

To achieve the conservation and sustainable goals of natural resources used in the Amazon, it is crucial to increase and prioritize strategic and efficient financial support

in relation to opportunities arising from local needs, thus strengthening sustainable management processes and ensure efficient territorial conservation {5.2.9}.

D. The Amazon and Climate Change

Three-quarters of the Amazon are in the process of losing its resilience capacity to the impacts caused by climate change, which, added to the combined effects of other processes such as deforestation, pollution, and fires, can generate transformations in regional precipitation patterns, losses in carbon storage, and, in general, a decrease in the contributions that people receive due to constant disturbances in the Amazon Basin/Region.

D1. Climate change has effects on biodiversity and ecosystem services in the Amazon Basin/Region, which has profound implications on the hydrological cycle of the Andean-Amazonian piedmont, therefore, it is necessary to develop mitigation and adaptation measures as priorities in the public policy of the Amazon countries (Well established). Tropical forests, for example, are considered crucial in maintaining the stability of global processes like the carbon cycle, hydrological regulation, biodiversity conservation, and their potential effects on the global climate {6.1.1}. According to the IPCC 5th Assessment Report, precipitation dynamics in the Amazon are influenced by inter-annual fluctuations linked to El Niño-Southern Oscillation (ENSO) or by decadal variability, as Amazon forests are responsible for 50-75% of its annual rainfall, so deforestation processes and land-use change can play a significant role in modifying the hydrological and climatic cycle {6.2.6}.

Adaptation measures are aimed at reducing vulnerability to the current and potential effects of climate change, i.e., its impacts, with regard to losses and damages such as:

- Biodiversity loss
- Regional extinction of species
- Economic impacts
- Increase of fires
- The “savanization” of forest ecosystems

- Changes in regional rainfall and river discharge patterns
- Carbon storage losses and
- A transition to a regime dominated by disturbances.

To best address the vulnerabilities of the Amazon Basin/Region, it is important to generate adaptation strategies through participatory processes that consider the social and cultural practices already in place and focus on addressing the main drivers that make the Amazon Basin/Region vulnerable. To achieve this goal, it is imperative to incorporate technical knowledge, environmental governance criteria, and to assert control over existing resources.

In terms of adaptation strategies, it is necessary to reorient policy instruments and public and private planning in sectors such as agriculture, transportation, mining, energy, industry, infrastructure, water, health, among others, using approaches such as Ecosystem-based Adaptation (EbA), Community-based Adaptation (CBA), the Disaster Risk Management and Human Rights, all of which can contribute to more comprehensive and relevant solutions {3.3.3.2}.

Similarly, new technologies to combat climate change will require strong financial support from both the public and private sectors, to generate and channel funds to enable the implementation of climate action measures and the development of green initiatives that provide welfare by reducing environmental risks.

D2. The initiatives promoted and implemented by the ACTO Member Countries for the Amazon Basin/Region should incorporate the needs, visions, and proposals of indigenous peoples, local communities, and other tribal communities while focusing on sustainability, support for self-determination, and mitigation and adaptation to climate change (*Well established*). Development policies, plans, programs, and projects in the Amazon Region formulated and implemented on the basis of participatory processes, considering existing social and cultural norms as well as the leading causes of vulnerability of the Amazon Basin/Region to the effects of climate change, can foster the implementation of social actions for the recognition of the rights of indigenous peoples, local communities, and other tribal communities.

In this context, it is essential to develop resilient infrastructure (transportation, energy, communications, water, sanitation) adapted to the characteristics of the region {3.6}.

Actions developed to fight climate change and its effects on biodiversity focus on mechanisms such as Payment for Environmental Services (PES) in order to link providers and beneficiaries residing in different countries.

One of the main instruments developed under the Kyoto Protocol was carbon sequestration, carried out through the Clean Development Mechanism (CDM), which includes projects such as Reducing Emissions from Deforestation and Forest Degradation (REDD+).

Avoided Deforestation is another international alternative that can be complemented with an approach that incorporates the needs and visions of indigenous peoples, local, and other tribal communities, which are gaining momentum in the global discussion agenda on climate change mitigation and adaptation mechanisms, just like debt swaps for nature conservation or climate action, which will hopefully be implemented {2.4.5, 3.4.7; Case study 3.12}.

D3. The effects of climate change poses a significant threat to the Amazon Basin/Region in relation to the provision of ecosystem services, which is why they must be addressed from various strategies (*Well established*). Climate change needs to be addressed through multiple strategies. National governments should strengthen climate management for mitigation and adaptation in areas and communities that require urgent intervention; such measures include, among others:

- Working with the different productive sectors to advance in the incorporation into their business policies and practices of climate transition plans that include environmental, social, and corporate governance (ESG) standards. This also involves advocating for the use of clean energies and providing technical training and financing support for initiatives that contribute to climate change adaptation.
- Moving towards meeting global targets such as the SDGs; the United Nations Framework Convention on Climate Change (UNFCCC) COP27 commitments regarding the establishment of the Loss and Damage Fund; the Santiago Network for Loss and Damage, which aims at channeling technical assistance to the

country's most vulnerable to climate change; the Sharm el Sheikh Program for Adaptation, which aims at enhancing the resilience of people living in the most climate-vulnerable communities by 2030; a just transition to Net Zero; the IPCC recommendations; the Sendai Framework for Disaster Risk Reduction 2015-2030; and Target 8 of the Kunming-Montreal Global Biodiversity Framework {3.4.1}.

- Involving other sectors such as NGOs, academia, and international cooperation to support short-, medium-, and long-term mitigation and adaptation interventions that generate knowledge on an adequate scale. Likewise, accompany the monitoring and capacities to understand and halt climate change, environmental degradation, and the decrease in natural capital reserves {6.2.6}.

D4. The effects of climate change on the Amazon Basin/Region cause significant economic, environmental, and social losses, which could be addressed with new mitigation and adaptation measures (*Established but inconclusive*).

Preliminary estimates of the Interamerican Development Bank (IDB) suggest that reaching a tipping point in the Amazon would generate a cumulative GDP loss of more than US\$230 billion by 2050, which is why, climate change has profound implications for the economy {6.2.6}.

These implications are related to the effects of climate change on the environmental conditions of the Basin/Region and the consequent impact on important ecosystem services for Amazonian populations. For instance, reduced precipitation could cause the loss of half of the ants' nests and species which play a key role in ecosystem regeneration, nutrient transport, organic matter decomposition, soil aeration, and seed dispersal. Similarly, the reduced rainfall could also cause the loss of 41% of butterfly species, which pollinate various plants and promote their genetic diversity, are part of food chains, and are ecological indicators of the diversity and health of the ecosystems in which they live {2.3.4; Box 2.3.4.3}.

On average, temperatures have increased by 0.5°C since 1980 in the Amazon Basin/Region, with the most significant increases observed in the southwest. However, the quality of available historical climate and hydrological information is often affected by the lack of integration of environmental risk and vulnerability studies, which impedes the systematization of tabular, documentary, or geographic data at the

regional level. To address this issue, the ACTO's Amazon Regional Observatory (ARO) is an essential effort that can contribute significantly to national and regional decision-making {6.2.6}.

It's worth mentioning that within framework of the Paris Agreement and global action to combat the climate crisis, the common mitigation goal is not exceed 1.5 °C with respect to pre-industrial levels. It has been acknowledged that Bolivia, Brazil, Colombia, Guyana, and Ecuador have made progress in developing their Nationally Determined Contributions (NDC) tools to decrease their national emissions and adapt to the effects of climate change. It is also essential to influence long-term fiscal policy strategies to incorporate climate change actions into development and land-use plans, in order to manage economic and fiscal risks and move towards a just transition {6.2.6.1}.

E. Knowledge and Dialogue of Knowledge for Decision-Making

In the face of the inestimable risk of biodiversity loss in the Amazon, the knowledge, innovations and practices of indigenous peoples, local communities, other tribal communities and the role of the wise men and women emerge as important allies to develop and plan innovative and effective actions for the management, sustainable use and conservation of the Amazon Basin/Region and its associated ecosystem services. Their knowledge is in permanent adaptation, never static, and it must be valued, recognized, and protected, given that it is fundamental to guarantee the protection of ancestral indigenous lands and territories, as well as the fulfillment of their constitutionally recognized rights by the ACTO Member Countries, considering that biodiversity in these territories is closely linked to traditional knowledge.

E1. In order to recognize and protect the knowledge of indigenous peoples and local and other tribal communities, it is necessary to guarantee the protection of their lands and territories, and design consistent policies in which the regional approach is particularly relevant (*Well established*). The right to land and territory is the cornerstone of the rights of indigenous peoples and local communities. The countries that make up the Amazon Basin/Region already have a broad regulatory framework that seeks to promote the protection and sustainable management of biodiversity and territorial rights.

To a large extent, national regulatory frameworks were inspired by international conventions and agreements, such as the 1989 International Labor Organization (ILO) Convention 169 on Indigenous and Tribal Peoples and the 2007 United Nations Declaration on the Rights of Indigenous Peoples.

Both international legal instruments recognize a wide range of rights, but emphasize territorial rights related to the ownership and usufruct of the natural resources present in their territories, territorial self-determination, self-management, and the right to free, prior, and informed consent in good faith concerning various actions that may affect their territories and, therefore, their ways of life. In this sense, it is necessary to

continue making progress in implementing ILO commitments within the legal and normative framework of the ACTO Member Countries.

In order to replicate knowledge, maintain it and ensure it can adapt, it's necessary to acknowledge the importance of land access and autonomy over the managing territories by indigenous peoples, local communities, and other tribal communities. As long as there is access to land, practices and knowledge will be replicated in these territories, to ensure cultures are kept alive.

Therefore, the titling of lands, territories and reserves, strengthening governance, and aligning ethnic-community land-use planning instruments with those of the State and the productive sector are priorities for the Amazon countries {4.2, 4.6}.

Likewise, the daily practices that take place in the Amazonian territories are the means by which ancestral knowledge is passed down. In this sense, the conservation of traditional knowledge also includes respect for the self-determination of indigenous peoples in voluntary isolation or initial contact, through the preservation of large forest areas that effectively safeguard their territories, which in most cases are located in the border areas of the Amazonian countries {5.2.3, 5.2.4}.

E2. Unsustainable production models cause changes in land-use, loss of cultural diversity, and changes in the values and behaviors of younger generations, thus comprising the reproduction and transmission of traditional knowledge associated with biodiversity and hindering opportunities for dialogue with other knowledge systems and disciplines (*Well established*). The voluntary or forced participation of indigenous peoples, local communities, and other tribal communities in activities that limit or transform the direct and diverse relationship with nature entails the loss of ancestral knowledge and important cultural changes {5.2.3, 5.2.4, 5.2.6, 5.2.9}.

Decisions made by local and regional authorities on how land is occupied, regulated, and used can incorporate mechanisms that respect, protect, and rescue traditional ways of life and knowledge, self-determination, voluntary isolation, and particularly, the recognition that ancestral knowledge is constantly adapting and therefore requires innovative measures for its conservation {4.3.1, 4.6, 5.2.3, 5.2.4, 5.2.6, 5.2.9}.

Several indigenous territories with important forest areas are being absorbed by extractive processes and the illicit economies, which causes displacement and the loss of livelihoods, impacting the new generations {4.8.2}. The traditional knowledge of indigenous peoples, local communities and other tribal communities has become fragmentary due to acculturation processes and cultural mixtures.

If traditional knowledge associated with biodiversity disappears, there is a risk that elements essential to the subsistence and survival of these peoples and communities will also disappear. It is therefore necessary to promote intergenerational and intercultural dialogue processes for the rescue and valuation of traditional knowledge (e.g., knowledge on the management of hundreds of varieties of cassava and other tubers that guarantee food security and sovereignty), and to strengthen capacities to lead or participate in decision-making processes {2.5.3}.

E3. Understanding local management and the value of biodiversity through the perspectives of indigenous peoples, local communities, and other tribal communities is fundamental to respect local populations and ensuring greater conservation of biocultural heritage (*Well established*). The intrinsic value that indigenous peoples, local communities, and other tribal communities attribute to biodiversity is related to the possibility of guaranteeing their survival as a group and that of their natural environment, since the two are not disassociated. “Without the forest, there are no indigenous people, and the indigenous people cannot live without the forest and rivers”³: there is a mutual dependence.

Therefore, it is necessary to understand biodiversity from a more inclusive and global perspective, recognizing the rights of these traditional peoples and their worldviews, which give meaning to the practices and relationships with the complex ecological processes of the ecosystems in which they live {4.3, 4.5.3}.

E4. For indigenous peoples, local communities, and other tribal communities, it is urgent to continue making progress in the recognition of their knowledge and

³ Quote by an indigenous representative during the International Meeting held in Santa Cruz de la Sierra, Bolivia, to develop and design an instrument that incorporates traditional knowledge for good forest management and good living: Rapid Assessment of Biological Diversity and Ecosystem Services of the Amazon Basin/Region.

wisdom in a dialogue that encompasses different knowledge systems (Well established). Local, regional, and global solutions require articulating different knowledge systems to face the challenges of this era {2.6}. Although some Amazon countries are making progress toward the recognition of knowledge and local knowledge holders (e.g., Law 459 of 2013 in Bolivia, Law on Ancestral Traditional Medicine) or in the legalization of land tenure in the Amazonian countries, the involvement of indigenous knowledge keepers in academic spaces as experts with equal payment and their recognition as authors and co-authors in publications are still rare.

Progress is required from academia, the public and private sectors to increase access to academic and research institutions through quota policies or other selective processes, that take into account the socio-cultural characteristics of indigenous peoples, local communities, and other tribal communities. Including them in academic spaces can enrich the sciences epistemologically {4.5.5}. This means broadening and enriching the approach to science, with new perspectives and paradigms of traditional knowledge.

It is also important to recognize ancestral knowledge in the reproduction of indigenous culture outside of academic settings. In this context, it is essential to respect and maintain spaces such as the maloka, chagras or slash, hunting and gathering areas, homes and kitchens, where fundamental relationships for the reproduction of traditional knowledge based on ritual, daily practices, and orality (transmission of stories, songs, food preparation, land management, etc.) take place across different generations and gender relations {4.2}.

E5. Knowledge and the mechanisms for its transmission are not static, rather, they permanently undergo dynamic processes of transformation, in response to the need to adapt to environmental and socio-economic changes (Well established). Cultures are dynamic, and changes are a natural process in the evolution of knowledge. Hence, it is necessary to design multi-level strategies to manage knowledge transformations in the Amazon. The role played by elders and women (as leaders, authorities, and/or religious figures) in the transmission of knowledge to youth in local and traditional communities is undeniable, but even that

transmission is changing from oral to graphic, written, or digital forms of communication {4.5.5, 4.10, 5.2.2}.

F. Visions of Development and Land-Use Planning for the Amazon Basin/Region

At present, most public policies and land-use planning processes in the Amazon are based on extractivist development models which promote occupation and land-use patterns with positive economic impacts for some sectors, but ignore social and biological megadiversity and jeopardize the achievement of the SDGs.

F1. Changes in the current development paradigm for the Amazon Basin/Region are urgently needed, a fact based on scientific projections and recent regulations, the appeals of various social movements, and the views of indigenous peoples, local communities, and other tribal communities (*Well established*). The full application of the concept of sustainable development in decision-making regarding public policies and planning processes is based on the fact that each of the three pillars of the concept of sustainable development (environmental, economic, and society) has equal weight and relevance.

However, in practice, it is common for conceptions to prevail, in which natural and cultural diversity constitute obstacles to development, while the existence of multiple systems of knowledge and human/nature relations is ignored (e.g., hunting, necessary according to circumstances, for the maintenance of livelihoods systems, food, health and culture of indigenous peoples and local and other tribal communities) {3.4.6, 4.3, 5.3.2, 5.3.4, 5.3.5, 6.2.9}. Furthermore, the significance and contribution in local contexts and in accordance to livelihood systems of economies not based on monetary benefits, the participation of women and minority groups, are undervalued {4.5.4, 4.5.5, 4.9, 5.2.2, 5.3.4, 5.3.5, 6.2.11, 6.3, 6.6.1}. This encourages the destruction of ecosystems, perpetuates inequality and poverty, and exacerbates cycles of violence.

Achieving long-term sustainable development goals requires moving away from trajectories based solely or primarily on economic benefits and requires substantial and immediate actions to move towards “Great Transitions”⁴ or Transformative

⁴ Understood as fundamental and structural changes towards positive and sustainable scenarios in production and consumption patterns.

Changes, that is, to consider and implement the social and environmental pillars of sustainable development in public policy decision-making and planning processes, with the same weight and at the same level as the economic pillar.

In the Amazon Basin/Region, there are alternative proposals to the current development paradigm that are based on the biocultural approach. These proposals are based on the society-nature unit beyond economic ownership and prioritize intergenerational benefits. They advocate for a shift away from solely utilitarian approaches to the relationship with nature and instead promote the recognition of human and nature rights {3.4.6, 4.9, 5.2.1, 5.2.2, 5.2.4, 5.3.5, 6.2.9}.

F2. The paths toward sustainability for the Amazon require articulation between multilevel public policies, global economic instruments, and sectoral plans (*Well established*). The articulation between governments and the different productive sectors should promote environmental sustainability, equity, and inclusion under a new model of economic development framed in the protection of human rights, biodiversity conservation, social welfare, and cooperation for climate action management {6.2.2, 6.4}.

Basic products or raw materials that are extracted from nature or cultivated, also known as commodities, constitute to a large extent, the economies of South America's developing countries and are traded over long distances in massive quantities. From this arises the importance of strengthening training, communication, and coordination between various ministries, so that from a territorial approach, a commitment towards conservation and sustainable use of biodiversity and ecosystem services, as well as recognizing and protecting the biocultural diversity of the Amazon can be found {5.2.5}.

Additionally, the development of lobbying processes (direct communication with leaders) between the political actors responsible for making public policy decisions and the economic sectors is of utmost importance to strengthen scenarios and mechanisms aimed at promoting, without constituting Technical Barriers to Trade and from a vision of self-regulation instruments, that international markets establish regularization regimes for supply chains, so that products such as soybeans, beef, gold, timber, palm oil, among other commodities from the Amazon Basin/Region, are

obtained under parameters of social equality, without environmental detriment, and promoting measures to mitigate and adapt to climate change.

It is crucial to enhance the abilities of government authorities, as well as private and community stakeholders involved in commodities, to improve monitoring and traceability through a production-chain approach that involves shared and distinct responsibilities. {3.4.3, 5.2.1; Case study 5.2.7}.

F3. The Amazon requires a regional coordination based on a strategy for the geopolitical positioning of the Amazonian States (*Well established*). The Amazon is a territory inhabited by more than 48.5 million people, including between 420 and 511 indigenous peoples with their own territorial occupation model.

The geopolitical importance of the Amazon Basin/Region stems mainly on the following:

- Its strategic role in the global climate balance.
- Water generation and regulation of the hydrogeological cycle.
- The provision of ecosystem services.
- The existence of the largest stock of natural resources.
- Its potential for developing the bioeconomy.

It is also based on the prevention and management of socio-environmental, territorial, economic, and political conflicts.

The Amazonian States possess and exercise sovereignty over their territories; however, the Amazon Basin/Region is also a transboundary zone where ecosystems, species, rivers, and cultures share space and transcend the states' political-administrative boundaries. This territory has common opportunities and challenges that require articulated and synergic work on a regional scale {3.3.3, 3.4.1, 6.1.1, 6.2, 6.2.2, 6.3}.

With this context in mind, the Member Countries signed the Amazon Cooperation Treaty (ACT) in 1978 “oriented to promote the harmonious development of the Amazonian territories in such a way that the joint actions of the Amazonian countries

produce equitable and mutually beneficial results in achieving the sustainable development of the Amazon Region. Under the Treaty, Member Countries have pledged to preserve the environment and responsibly utilize the natural resources of the Amazon”. This commitment is brought about by the Permanent Secretariat of the Amazon Cooperation Treaty Organization (PS/ACTO).

The ACTO works to harmonize different political, strategic, and technical visions and dimensions to build synergies and reduce asymmetries between governments in pursuit of the sustainable development of the Amazon Basin/Region. Furthermore, this integration mechanism allows for the exchange of knowledge, joint cooperation, and the implementation of agreements between countries by identifying their priorities within the region's political, social, and economic reality. One of the programs promoted by ACTO is the Biodiversity Program for the Amazon Basin/Region.

F4. Currently, the incorporation of biological and cultural diversity (as well as recognition of nature's rights) into development and territorial planning policies is still in its early stages. These elements are crucial for creating resilient, inclusive, and sustainable territories. Just like the recognition of human, territory and environmental rights advocates and the need and co-responsibility of all in their protection (*Well established*). Although laws, policies, and instruments for land-use planning have improved, nature and culture are still overlooked. An integrated and effective approach to the development and territorial planning of the Amazon Basin/Region involves the participation of multiple disciplines and knowledge areas. Failure to do so can hinder understanding and management {6.2.4}.

To create a resilient, inclusive, and sustainable Amazonian Region, State policies must incorporate a differential approach that considers the multiethnic, pluricultural, geographical, ecological, and transboundary dimensions. This will help overcome fragmented views and promote transboundary actions that go beyond national borders. By managing ecosystems, watersheds, and shared cultures in an integrated and interconnected manner, better outcomes can be achieved. Tackling illegal economies and transnational crimes that challenge territorial control and the use of natural resources, requires States to work together. This involves harmonizing policies and regulations on environmental crimes {3.3.1.1, 3.3.3, 6.2.4}.

Land-use planning processes and instruments must recognize the existence of a *sui generis* territorial occupation model, made up of transboundary ecosystems and river basins, protected area networks with different governance systems, including territories of indigenous peoples, local communities, and other tribal communities that manage and regulate them, from their authority based on their traditional knowledge {6.2.4}.

There are instruments and procedures to establish dialogues between the State and the communities; some are legally stipulated, and others, although not standardized, are vested with local legitimacy; examples include Indigenous Life Plans, Protected Area Management Plans, Territorial Management Plans, Forest Management Plans and Biological Corridors, among others {4.8.3, 6.2.4, 6.2.4.1}.

It is also essential to acknowledge and carry out Other Effective Area-Based Conservation Measures (OECMs) and strengthen economic and financial mechanisms and incentives such as payments for ecosystem services, conservation agreements, and offsets, among others, to advance in consolidating multi-scale and multi-stakeholder territorial governance {6.2.5, 6.4}.

On the other hand, managing the human-nature relationship has reached the courts and has motivated the adjustment of public policy instruments, due to the following reasons:

- The global ecological and social crisis.
- An increase in socio-environmental conflicts.
- The assassination of environmental leaders.
- Advances in the vindication of ethno-territorial rights and native peoples' knowledge.
- Progress in the recognition of the existence of the Global South's own thinking.

The Amazon Basin/Region has not been immune to these situations: the Right to a Healthy Environment was included in the 1992 Rio Declaration, and has been incorporated into the Brazilian, Bolivian, Colombian, Ecuadorian, Peruvian, and Venezuelan Constitutions, with innovative advances in Ecuador and Bolivia, which

have included in their constitutions the recognition of the rights of Mother Earth and of the harmonious relationship between man and nature. Moreover, in Colombia, the High Courts have issued rulings based on the biocultural approach which recognize some rivers and territories, including the Amazon, as having rights; such rulings establish peremptory measures in terms of land use planning, deforestation control, and adaptation to climate change, and ordering the signing of an intergenerational agreement {6.2.9}.

Regarding human rights, land, and environmental advocates, the Global Witness report found 212 were murdered in 2019 alone. The reasons were: the intensification of extractive projects (mining, agro-industrial, and forestry), the substitution of illicit crops, the agrarian reform, dam constructions, and illegal hunting, among others. Forty-six percent of these environmental advocates belonged to five countries in the Amazon Basin/Region: Colombia (64), Brazil (24), Venezuela (8), Bolivia (1), and Peru (1). The 2022 report mentions that 200 environmental defenders were murdered worldwide, of which 34%, that is, 74 individuals, belonged to Amazonian countries. The total number of victims is distributed as follows: Colombia (33), Brazil (26), Peru (7), Venezuela (4), Ecuador (3) and Bolivia (1) {6.2.9}.

There have been advances towards environmental justice for environmental and land defenders; for example, the signing of the Escazú Agreement by six Amazonian countries {6.2.10.1}. As a pioneer case worldwide, in 2020, the Collective of Park Rangers of the National Natural Parks System of Colombia prepared a groundbreaking report aimed at the recognition of nature, park rangers, and other environmental defenders of the socio-ecological territory of National Parks as victims of the Colombian armed conflict and are therefore as entitled to reparation and non-repetition. The report was submitted to the Comprehensive System of Truth, Justice, Reparation, and Non-Repetition. However, such initiatives are insufficient; public policy measures are needed to protect environmental and land defenders, to implement the commitments of the Escazú Agreement, and to promote peace with nature, the territories and the people {6.2.9, 6.11}.

G. Political Institutions and Participation in Governance

The Amazon Basin/Region requires that national, regional, and local governments, the private sector, civil society, and international cooperation agencies work together to promote solutions to the high risk of losing its biodiversity and ecosystem services.

G1. Biodiversity and ecosystem services require that the various sectors of society converge in common minimum objectives based on recognizing the different economic, political, environmental, and social interests in the Amazon Basin/Region (Well established). Efforts to strengthen regional transboundary cooperation mechanisms such as the ACTO, result in better regional biodiversity governance systems and more effective joint coordination actions among the different Member Countries of this organization. These efforts are guided by internationally recognized legal frameworks and take into account each country's national priorities and inherent sovereignty.

In this context, it is also a priority to strengthen multi-level governance schemes to better articulate the multiple technical, economic, and political conservation efforts in the Amazon Region, giving way to horizontal relations between the communities that inhabit the territory and the governments, all within the framework of joint objectives and actions {6.1.1, 6.2.2, 6.2.4, 6.2.6.1, 6.2.12, 6.4}.

Additionally, productive sectors must become articulated in order to achieve global goals of environmental sustainability, equity and inclusion, which are explicit in the Sustainable Development Goals (SDGs) and the Convention on Biological Diversity (CBD), among others. This articulation should take place within an economic development model that prioritizes the protection of human rights, biodiversity conservation, and social welfare. It is essential to collaborate with various partners and establish a coordinated agenda to allocate resources and prioritize environmentally and culturally sustainable management of the Amazon. This approach will ensure that efforts and budgets are directed towards the most pressing issues. {6.1.1, 6.1.2, 6.2.6, 6.2.7, 6.4}.

G2. Civil society has played a strategic role in strengthening the capacities and knowledge of the science-policy interface and has promoted several multi-stakeholder processes for bottom-up decision-making (*Established but inconclusive*). However, in order to enhance biodiversity governance systems, it is essential to reinforce civil society by improving its organizational structure and utilizing various current or potential spaces for participation. An example of this could be implementing measures within the Escazú Agreement to increase monitoring, control, and surveillance of investments and budgets in the Amazon. This would hold existing institutions accountable for transparent and effective management.

In order to improve the relationship between indigenous peoples, local communities, and other tribal communities with governmental, business, and institutional representatives, it is vital to consolidate settings and opportunities for dialogue between all parties, following participation and equity criteria {6.3}.

G3. The investment and allocation of resources in research have been insufficient in the Amazon Basin/Region, with an immediate consequence for most biological groups and human communities due to a significant information gap (*Established but inconclusive*). The information gaps and the lack of systematization and synthesis of knowledge prevent the construction of a holistic vision of the Amazon and its biocultural dynamic, which implies a lack of understanding of regional and local socio-cultural processes and a lack of economic and financial tools for understanding and managing the processes that identify and value the essential ecosystem services provided by the biome.

Consequently, the aforementioned, demands to strengthen and expand platforms for the intercultural dialogue of knowledge, promote intercultural educational and linguistic policies, and design participatory curricular models as pillars of the transformation processes in the territories of the Amazon Basin/Region, thus reinforcing local governance and the political-administrative autonomy of indigenous peoples, local communities and other tribal communities in their territories.

It is also a priority for governments to be more committed to strengthening education, science, technology, and innovation for sustainable development in the Amazon

Basin/Region, including creating networks, co-financing strategies, and collaborating with the private sector {2.6, 6.6.1, 6.6.2}.



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Bolivia



Brazil



Colombia



Ecuador



Guyana



Peru



Suriname



Venezuela