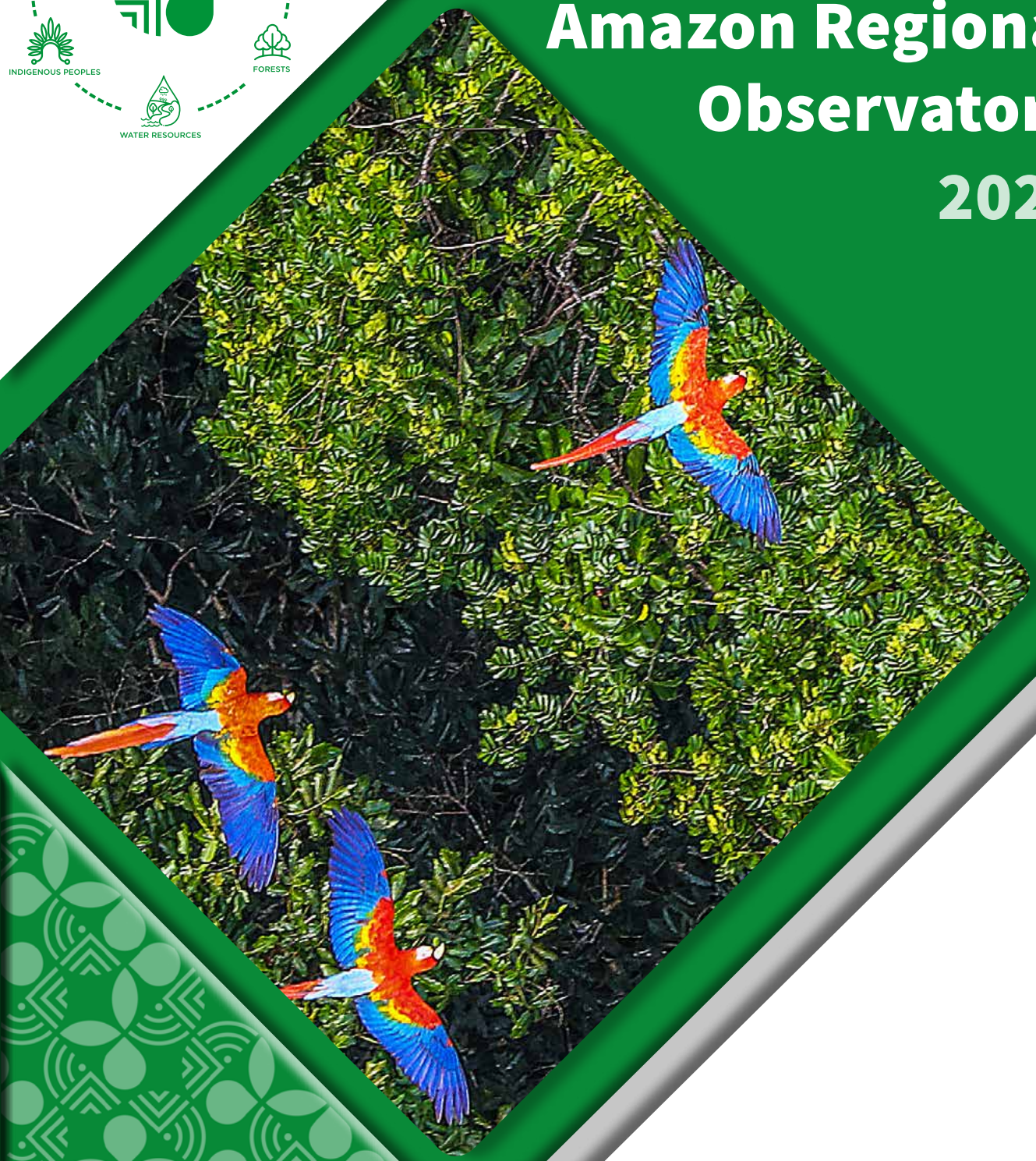
English

| Annual Report |

Amazon Regional Observatory 2021



ARO
AMAZON REGIONAL OBSERVATORY

ACTO
Amazon Cooperation Treaty Organization

Permanent Secretariat | Amazon Cooperation Treaty Organization (PS/ACTO)

General Secretary
María Alexandra Moreira López

Executive Director
Ambassador Carlos Alfredo Lazary Teixeira

Administrative Director
Carlos Armando Salinas Montes

Amazon Regional Observatory (ARO)

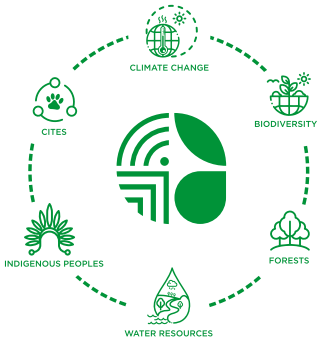
Coordinator
Mauro Luiz Ruffino

Data Specialist
Isaac Ocampo Yahuarcani

Technical Specialist
Vicente Guadalupe

IT Developer
Lelis Saravia

Meteorologist
Diego Silva



Annual Report
Amazon Regional Observatory (ARO)
2021

Brazilia | Brazil | 2022

Annual Report | Amazon Regional Observatory (ARO) | 2021

Original Language

Spanish

Photos

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ACTO´s Photo Gallery and iStcok

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ARO AMAZON REGIONAL OBSERVATORY

ACTO Amazon Cooperation Treaty Organization

BIOAMAZON PROJECT Conservation of species threatened by unsustainable trade

german cooperation DEUTSCHE ZUSAMMENARBEIT

Implemented by: KFW

Observatorio Regional Amazónico (ORA)

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ACKNOWLEDGMENTS

The Amazon Cooperation Treaty Organization thanks the institutions that contributed to the Amazon Regional Observatory.

ACTO´S MEMBER COUNTRIES	PUBLIC INSTITUTIONS OF THE MEMBER COUNTRIES
Bolivia	**Ministry of Environment and Water (MMAyA)** **National Statistics Institute (INE)**
Brazil	**Ministry of Environment** **Brazilian Institute of Environment and Renewable Natural Resources (Ibama)** **Chico Mendes Institute for Biodiversity Conservation (ICMBio)** **Rio de Janeiro Botanical Garden Research Institute** **National Center for the Conservation of Flora (CNCFLORA)** **National Institute of Space Research of Brazil (INPE)** **Brazilian Biodiversity Information System (SiBBr)** **Brazilian National System for the Control of the Origin of Forest Products (SINAFLOR)**
Colombia	**Ministry of Environment and Sustainable Development** **Amazonian Institute for Scientific Research SINCHI** **Alexander von Humboldt Biological Resources Research Institute** **National Parks of Colombia**
Ecuador	**Ministry of the Environment, Water and Ecological Transition** **National System of Protected Areas** **Geo-spatial services CIIFEN**
Guyana	**Ministry of Natural Resources of the Cooperative Republic of Guyana** **Guyana Wildlife Conservation and Management Commission (GWCMC)**
Peru	**Ministry of Environment** **Ministry of Production (PRODUCE)** **Forest and Wildlife Service (SERFOR)** **Research Institute of the Peruvian Amazon (IIAP)** **Institution Prueba Water Resources** **Faculty of Biological Sciences (UNMSM)**
Suriname	**National Land Monitoring System of Suriname (GONINI)**
Venezuela	**Ministry of Popular Power for Ecosocialism Venezuela** **Experimental Botanical Garden Institute Dr. Tobías Lasser**

COUNTRIES	OTHER INSTITUTIONS
Brazil	**Oswaldo Cruz Foundation (Fiocruz)**
Colombia	**Pontifical Javeriana University**
Ecuador	**Corporation for Research and Monitoring of Ecuadorian Biodiversity** **Pontifical Catholic University of Ecuador**
France	**Freshwater Fish Distribution & Ecology**
Switzerland	**Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** International Union for Conservation of Nature (IUCN)
Venezuela	**PROVITA**

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- Ecuador
- Guyana
- Peru
- Suriname
- Venezuela

Participants and that contribute to ARO

466.777,33 USD
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For the construction of the premises, implementation of the platform web and equipment

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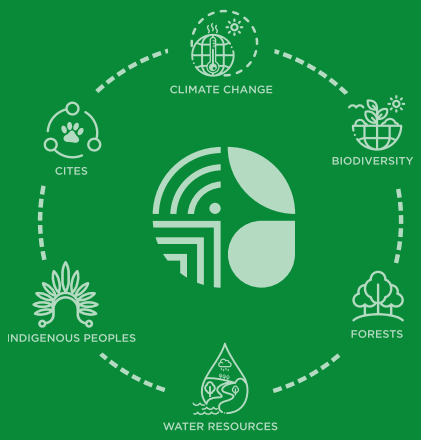

Annual Report

Amazon Regional Observatory (ARO)

2021

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Acronyms

ABC	Brazilian Cooperation Agency
ACT	Amazon Cooperation Treaty
ACTO	Amazon Cooperation Treaty Organization
AECA	Amazonian Strategic Cooperation Agenda
ANA	National Water and Sanitation Agency
API	A set of protocols used to develop, integrate, and connect different systems or software applications.
ARO	Amazon Regional Observatory
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNPs	ACTO Permanent National Commissions
EXCO	Excelencia Corporativa
GBIF	Global Biodiversity Information Facility
IKMS	Information and Knowledge Management System
IRD	French National Research Institute for Sustainable Development
KfW	German Development Bank
MB	Member Countries
OiAgua	International Water Organization
PS/ACTO	Permanent Secretariat of the Amazon Cooperation Treaty Organization
RHA	Amazon Hydrological Network
SC-ARO	ARO Steering Committee
ToR	Term of Reference
USD	American dollars

1
Introduction

Aerial view of the Amazon forest
Photo: ©iStock

Cedro (*Cedrela odorata*)
Photo: ©Nicolás Castaño Arboleda / Instituto Sinchi

1. Introduction

The Amazon Cooperation Treaty (ACT) was signed on July 3, 1978, by the governments of Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela, with the aim of undertaking joint actions and efforts meant to promote the harmonious development of their respective Amazonian territories to produce equitable and mutually beneficial results and achieve also the preservation of the environment, and the conservation and rational use of the natural resources of those territories. On December 13, 2002, the Amazon Cooperation Treaty Organization (ACTO) and its Permanent Secretariat (PS/ACTO) were established in Brazilia, with international legal status, to legally improve and strengthen the cooperation, coordination the process, and joint actions of its Member Countries to promote the sustainable development of the Amazon within the framework of the Treaty.

The Amazon Cooperation Treaty (TCA) was signed on July 3, 1978.

The main roles and functions of the PS/ACTO are, among others, to facilitate the exchange, knowledge, cooperation and joint projection of the Member Countries (MC) in pursuance of the mandates of the ACT, seeking consensus for the conduction of activities, programs and projects involving national, regional and international stakeholders; establishing spaces for political and technical dialogue with the purpose of fulfilling the mandates conferred; executing and managing all the activities, programs and projects, regionally, observing the mandates of the Member Countries; producing regional reference information for the Amazon based on the exchange of experiences and knowledge; and strengthening the institutional and management capacity of the Member Countries as required.

The ACT aims at promoting collaboration in scientific research and exchange information so as to increase knowledge of the flora and fauna of the Amazon territories, as well as establishing a regular system for the adequate exchange of information.

A decision adopted during the XI Meeting of Ministers of Foreign Affairs in 2011, entrusted ACTO to the task of developing and launching the Amazon Regional Observatory (ARO). Since then, working groups with representation from ACTO Member Countries have discussed the concept of the Observatory, its characteristics and format, as well as the management structure and mechanisms for the transfer of official information. On May 3, 2013, during the XII Meeting the Ministers of Foreign Affairs of the ACTO decided to "establish the Amazon Regional Observatory as the permanent forum that brings together institutions and authorities linked to the study of the Amazon, reference center for regional information on biodiversity, natural resources, and social diversity of the Amazon Region".

XI Meeting of Foreign Ministers of the Cooperation Treaty Organization Amazon (ACTO), in 2011.

XII Meeting of Foreign Ministers of the Cooperation Treaty Organization Amazon (ACTO), May 3, 2013.

In 2019, ACTO made the decision to effectively implement the Observatory through the Permanent Secretariat, and for that purpose, an intense work began hiring the companies responsible for the technological development of the computer platform and physical facilities. In June 2019, through an international bidding process, the company Excelencia Corporativa (EXCO) was hired by the PS/ACTO to design the conceptual structure of the ACTO's Information and Knowledge Management System (IKMS) and the Amazon Regional Observatory, including a concept for its operation and financing.

Within the activities planned for the consultancy, technicians from ACTO and the EXCO Company visited the MC, between 2019 and 2020, and workshops were held using methods and tools to collect national information from information systems, as well as from the best internationally recognized standards and practices. Combining information led to the consolidation of a solid and coherent proposal.

In August 2020, the PS/ACTO approved the conceptual design of ACTO's Information and Knowledge Management System and the ARO's structure, including a concept for its operation and financing.

The MC received, through the Note Verbale[1] , information about the process and the final documents of the EXCO consultancy.

[1] SP/ACTO/521/2021 of October 20.

In November 2020, the PS/ACTO submitted the proposal to the KfW, which approved the Observatory's implementation in three phases, as shown in Figure 1.

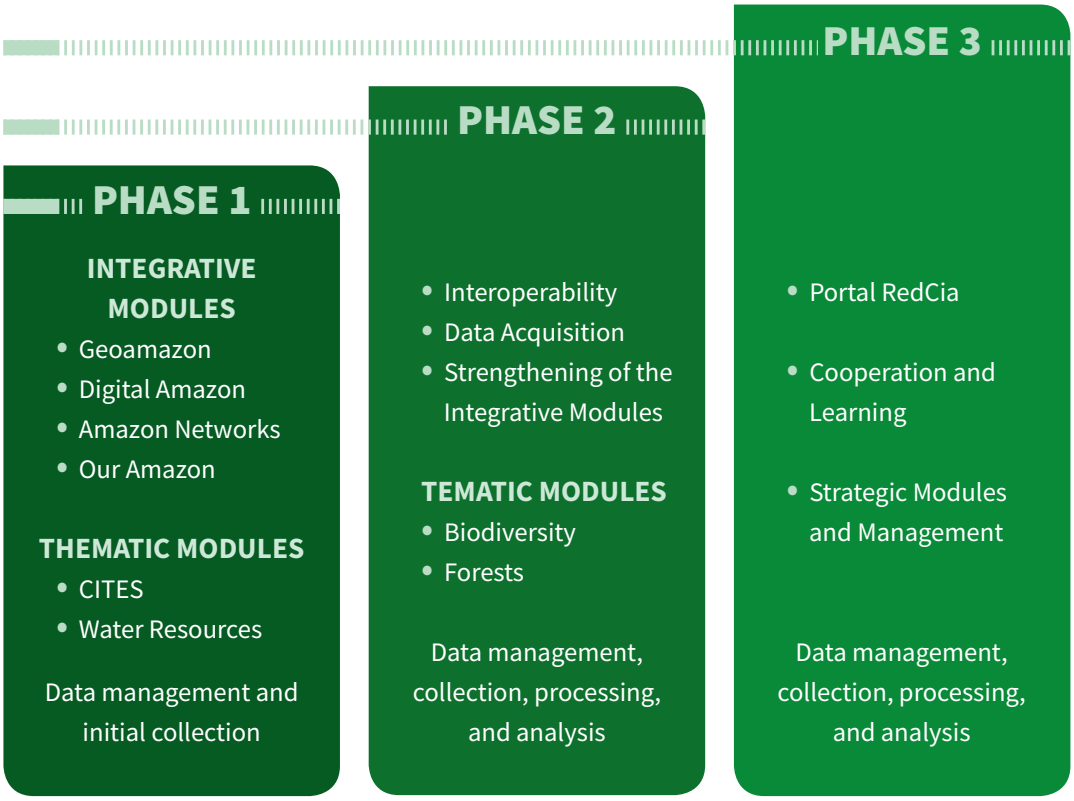
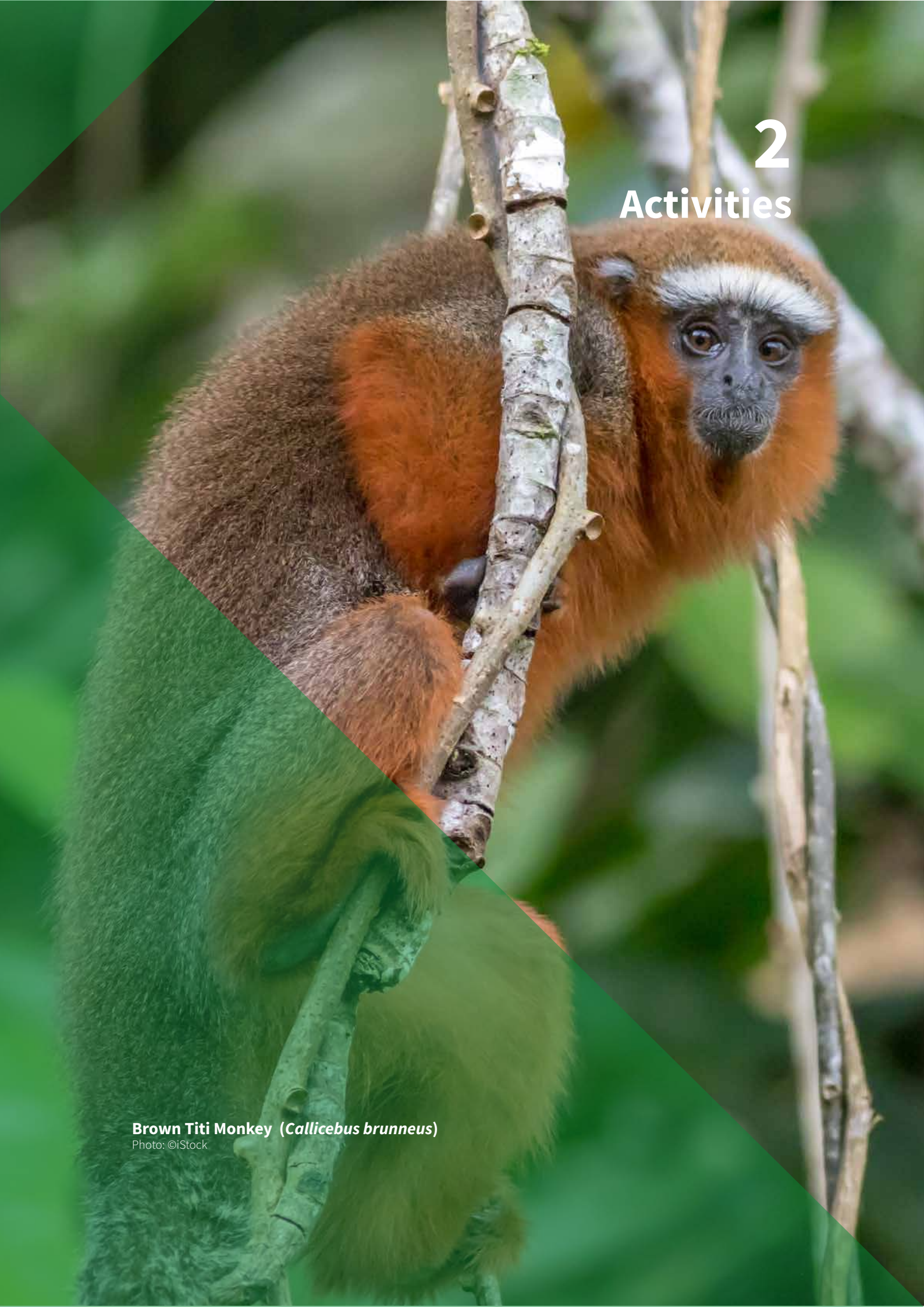


Figure 1 - Implementation phases of the Amazon Regional Observatory (ARO)

The total investment in ARO during 2021 was more than USD 1.1 million, of which USD 926 thousand were spent by the Bioamazon Project for infrastructure works, purchase of equipment and computer development of the platform and modules, etc.; and USD 180 thousand invested by the Brazilian Cooperation Agency (ABC) and the National Water and Sanitation Agency (ANA) in the ARO Situation Room.

This Report presents all the activities developed around the implementation of the ARO during 2021 and foresees the challenges for 2022.

2
Activities



Brown Titi Monkey (*Callicebus brunneus*)
Photo: ©iStock

Amazon landscape
Photo: ©DanielAlarcon/ACTO

2. Activities

2.1. Meetings of the ARO Steering Committee

2.1.1. First Special Meeting of the ARO Steering Committee

The first Extraordinary Meeting of the Steering Committee of the Amazon Regional Observatory held on April 5, 2021, convened by Note Verbale[2], presented a timeline about ARO's historical process showing management milestones since 2010. It also presented the advances in the development of the ARO Platform and on the issue of interoperability of national information systems with the ARO, working on the interoperability of information for the Module CITES.

The Term of Reference (ToR) for the formation of ARO's Steering Committee (SC--ARO) were also presented, and April 16, 2021 was set as the deadline for both the designation of the members of said SC and the revision of the ToR document.

The MC received, through the Note Verbale[3], the Minutes of the Meeting.

2.1.2. Second Meeting of the ARO Steering Committee

The first Ordinary Meeting of the Steering Committee of the Amazon Regional Observatory, held on May 20, 2021, convened by Note Verbale[4], addressed the following topics:

- Presentation of advances and projections of ARO
- Graphic design sketch
- Thematic indicators
- Acquisition of equipment and/or contracting of ACTO hosting service
- Advances in interoperability, identification of databases, analysis, and reports
- National Work Plan proposal
- Brazilian proposal for the Biodiversity Module.

[2] SP/ACTO/127/2021 of March 22, 2021.
[3] SP/ACTO/162/2021.
[4] SP/ACTO/213/2021 of May 5, 2021.

In this meeting the designation of the members of the ARO Steering Committee (Table 1) by the MC was informed, and emphasis was placed on the work and role of the Steering Committee in articulation with the national institutions that will participate and collaborate in ARO's development.

Table 1.
Members of ARO Steering Committee appointed by the MC.

Country	Name	Institution
BOLIVIA	Eduardo Duran Juaniquina	Ministry of Environment and Water (MMAyA)
	Rosse Mary Chura Janco	Ministry of Environment and Water (MMAyA)
BRAZIL	Luiz Henrique Mourão do Canto Pereira	Ministry of Science, Technology, and Innovations (MCTIC)
	Cláudia Morosi Czarneski	Ministry of Science, Technology, and Innovations (MCTIC)
COLOMBIA	Luz Marina Mantilla Cárdenas	Amazonian Institute for Scientific Research (SINCHI)
	Marco Ehrlich	Amazonian Institute for Scientific Research (SINCHI)
ECUADOR	Byron Adrian Lagla	Ministry of Environment and Water (MAAET)
GUYANA	Diana Fernandes	Department of Environment and Climate Change, Office of the President
PERU	Fabíola Núnez Neyra	Ministry of Environment (MINAM)
	Harol Gutiérrez Peralta	Ministry of Environment (MINAM)
SURINAME	Marci Gompers-Small	Ministry of Territorial Planning and Environment
	Rathna Kewal	Ministry of Territorial Planning and Environment
	Charlene Sanches	Ministry of Territorial Planning and Environment
VENEZUELA	Nancy Álvarez	Ministry of Popular Power for Foreign Affairs (MoFA)
	Miguel Serrano	Ministry of Popular Power for Ecosocialism (MINEC)
	Grisel Romero	Ministry of Popular Power for Science and Technology (MINCYT)

It was considered important that each MC prepare a Work Plan with the mapping of the institutions, their activities, and institutional managers, for each of the issues related to this initial phase of the ARO, which are, water resources, forests, and biodiversity.

Likewise, it was recommended that the transfer of information be carried out by different modalities, including interoperability (direct consumption of information by web services); and that each institution make a list of available resources and their format. The identification of these resources, their formats and requirements for transfer and upload to the ARO database should be worked on in bilateral meetings of the project team with each MC.

The MC received through the Note Verbale[5] the minutes of the meeting.

[5] SP/ACTO/274/ 2021.

2.2. Bilateral and Thematic Meetings

The document "Planning of thematic--bilateral meetings with MC institutions in the framework of the implementation of the ARO" was sent to the MC through Note Verbale[6].

The thematic meetings were held between July and August 2022 with the delegations from the Member Countries. During the meetings, the following documents were presented and shared: i) Metadata formats for data exchange in ARO; ii) Guide for identification/collection of information resources for ARO; and iii) Catalog of indicators by thematic area.

The minutes with respective annexes were sent to the Member Countries through Note Verbale[7].

2.3. Development of the Platform and Thematic Modules:

In 2021, approximately USD 405,868.00 were invested in the development of the ARO IT Platform, the CITES, Biodiversity, and Forests Modules; and in the systematization and loading of data, infographics, logo, domain registration, video production; and the conformation of ARO's team.

2.3.1. Platform Development

After a bidding process that involved calls and the selection of a company for ARO's implementation, the IngenioSIG was hired, and it was entrusted to develop the ARO platform, along with its operation, which included operationalizing its different modules with their functionalities, and also the collection, interoperability and loading of pre-existing information that was shared by public organizations and official sources of the MC.

The ARO Computer Platform considered the following technical specifications for its structure and functionality:

- Articulation with ARO and integration of information available in the current platforms of ACTO Member Countries on the subject of natural resource management.
- Integration of open information available on platforms and portals related to environmental issues and other relevant topics in the Amazon Region.
- Organization and presentation of information according to the themes, sub--themes included in the Amazonian Strategic Cooperation Agenda (ASCA) and observing ACTO definitions.

[6] SP/ACTO/437/2021 of July 19, 2021.

[7] SP/ACTO/485/2021.

- Technical and computer development of the ARO based on the successful experiences of the MC in this field, and on the requirements of the PS/ACTO.
- Use of software packages and services based on criteria of functionality; usability; technical complexity for implementation; support; information security; and efficiency in terms of implementation times, licensing and implementation costs, and maintenance and operation for the ARO implementation and management.
- Development of the ARO in open software and hosted in the cloud.
- Use of the Geonode/Geoserver platform and the incorporation of "Google Analytics and RSS" tools to develop the geographic information management module.
- Definition of the key audience based on updated user experience and user interaction standards in three languages: Spanish, English and Portuguese.
- Creation of the main pages and modules of the ARO, contemplating open sections (with free access) and closed sections (for internal use).
- All modules and pages linked to a database that retrieves official information from the MC and other unofficial information (in the case of Our Amazon) automatically or through manual means. All modules have a private area where information is stored and processed in interaction with the MC before being posted online.
- All query modules have information search options.
- Development of the administrative panel with specific environments and sections for managing the different types of website users: administrators, content editors, content viewers.
- All pages and modules made available in Spanish, English and Portuguese.

The Observatory is organized in thematic modules, along with their respective functions. The Thematic Modules tackle the topics prioritized by ACTO Member Countries and which are part of the ASCA. The degree of specific information contained in the modules, associated with their catalog of indicators, is their added value, as follows:

Table 2.
Description of the ARO Thematic Modules

Module	Description
CITES 	It provides information on central management issues for the implementation, in the ACTO/MC, of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), such as: permits; exports, imports, re-imports and repatriations of species; and illegal trafficking of species.
Biodiversity 	It offers a set of information and data about biodiversity, as well as data management tools from different collections in the region, to produce and share new knowledge related to the biological diversity of the Amazon.

continuation

Module	Description
Forests 	Its purpose is to provide information to contribute to the integral development, conservation, management, and use of forests. The data and indicators available will reinforce the actions of follow-up, monitoring, and early warning of deforestation; prevention and control of forest fires; sustainable forest management practices; etc.
Water resources 	It seeks to provide information on the situational status (quality and quantity of surface and groundwater) and the management of water resources in the Amazon basin, with a level of disaggregation of basins or hydrographic units, based on a methodology (Pfafstteter).
Indigenous Peoples 	Its purpose is to strengthen the capacity for coordinated and culturally relevant response of the different national and local health services in the face of the emergency and post-emergency of COVID-19 for indigenous peoples in indigenous territories in border areas.

The integrating modules group information based on the same type of technological tool.

Table 3.
Description of the ARO Integrating Modules

Module	Description
Geomazon	It provides information through maps received from national information systems or from the official entities that hold these maps on public servers. The module articulates official information with a regional focus. https://oraotca.org/en/geoamazonia-en/
Digital Amazon	It submits information resources based on documents, data, multimedia, etc.; and articulates statistical information and official regional indicators, official documents, legal framework, and other documents related to the Amazon. https://oraotca.org/en/amazoniadigitalen/
Amazon Networks	It articulates specific monitoring cases on water resources management with official data provided for by the ACTO/MC, such as the Amazonian Hydrological Network (AHN), the Water Quality Monitoring Network of the rivers of the Amazon Basin, and the Groundwater Monitoring Network. https://dev-redes-ora.geodatin.com/
Our Amazon	It articulates documentary information on good practices and successful experiences in the Amazon Region in different areas, by means of official and unofficial information. https://oraotca.org/en/nuestraamazoniaen/
Country Window	It shows relevant information of each of the ACTO/MC, organized in charts and graphs, with a comparative approach, including social, economic, and environmental issues https://oraotca.org/en/member-country/

The Amazon Regional Observatory platform was launched on November 10, 2021, and it is hosted in the link: https://oraacto.org/en/

All the information is available in the ARO, in its different sections, on this link.

Figure 2 - Main interface of the Amazon Regional Observatory web portal

- About ARO: basic information about the Amazon Regional Observatory, its Mission, Vision, among others.

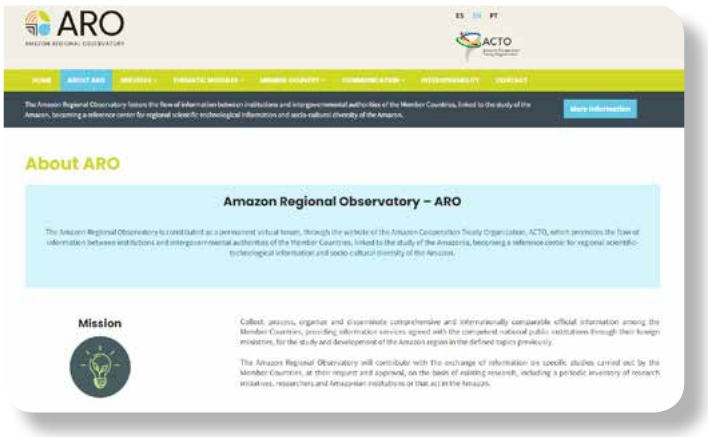


Figure 3 - ARO information sections interface

- Services: among the main services within the ARO are:

- Geoamazon: It comprises two sections. The first section corresponds to the Geovisor, which is a geographic infor-

mation viewer of the working themes and sub-themes of the Amazonian countries; and the second section is a Catalog of Maps, comprising geographic information provided by studies and projects from the Amazon Cooperation Treaty Organization, as well as from the information collected by the different institutions in each of the MC.

Figure 4 - Main interface of the Geomazon Integrated Module

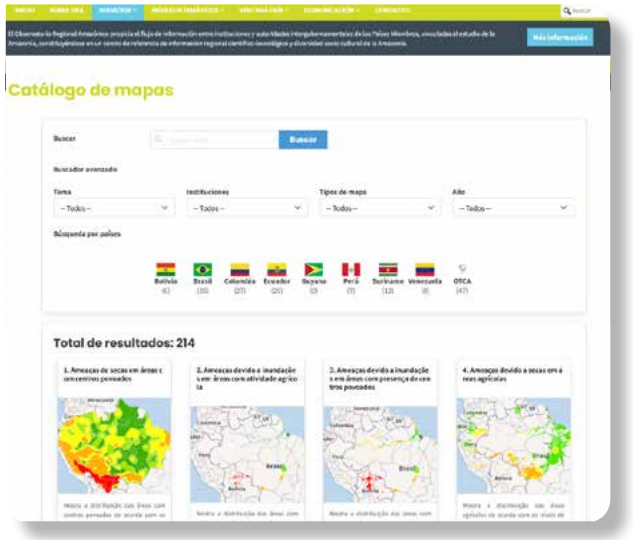


Figure 5 - Geomazon Integrated Module Map Catalog interface

Figure 6 - Amazon Hot Spots service interface provided by INPE in the ARO Geovisor

- **Digital Amazon:** All documents of the Thematic Modules of the ARO are listed here.

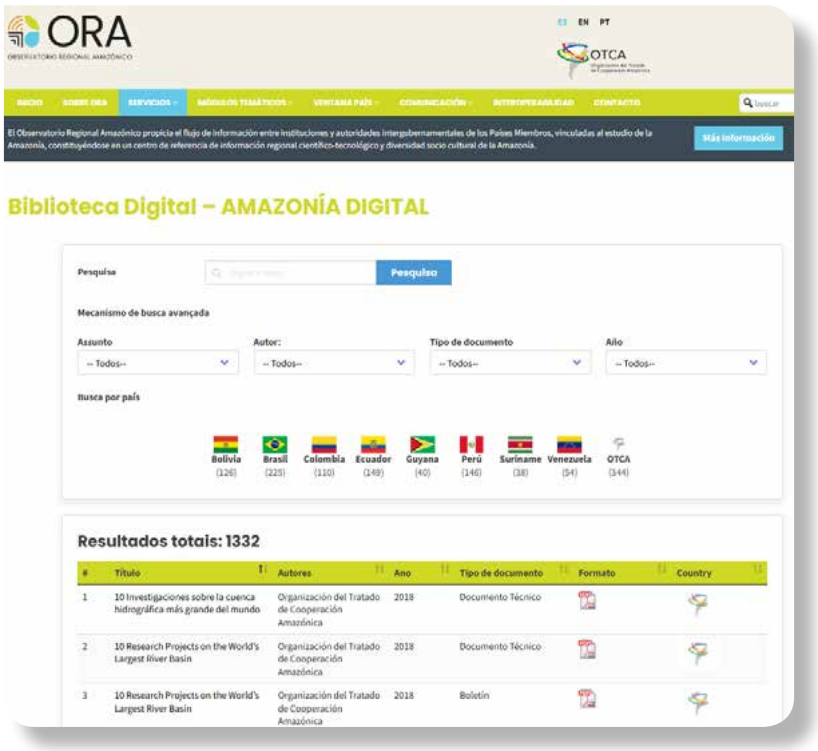


Figure 7 - Main interface of the Digital Amazon Integrated Module

- **Our Amazon:** The documents related to the Member Countries experiences are listed here.

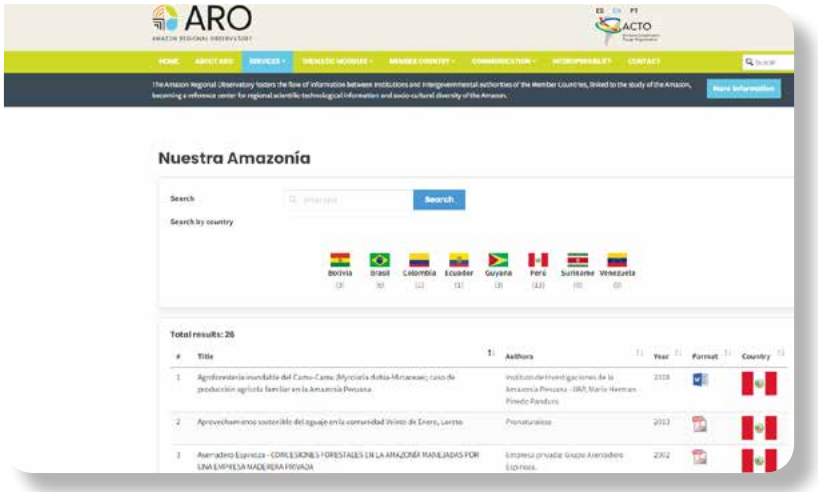


Figure 8 - Main interface of the Our Amazon Integrated Module

- **Amazon Networks:** These are the Amazon Hydrological Network (RHA), Water Quality Monitoring Network and Groundwater Monitoring Network.

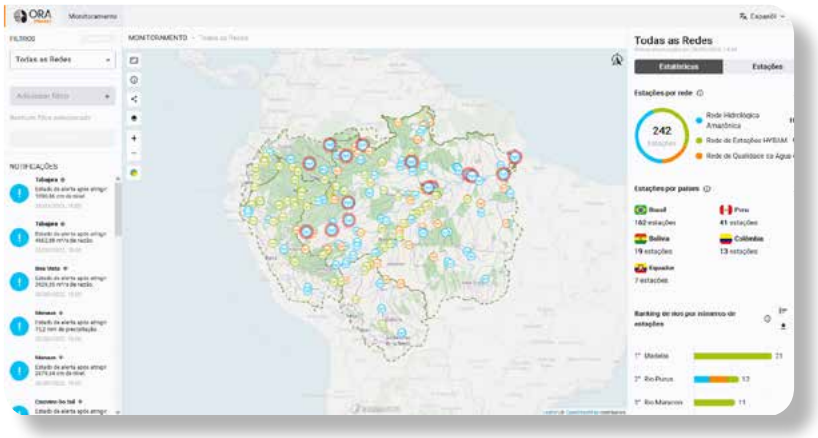


Figure 9 - Main interface of the Amazon Networks Integrated Module

- **Indicators:** The indicators are grouped by theme consistent with those defined in the Amazonian Strategic Cooperation Agenda (ASCA).

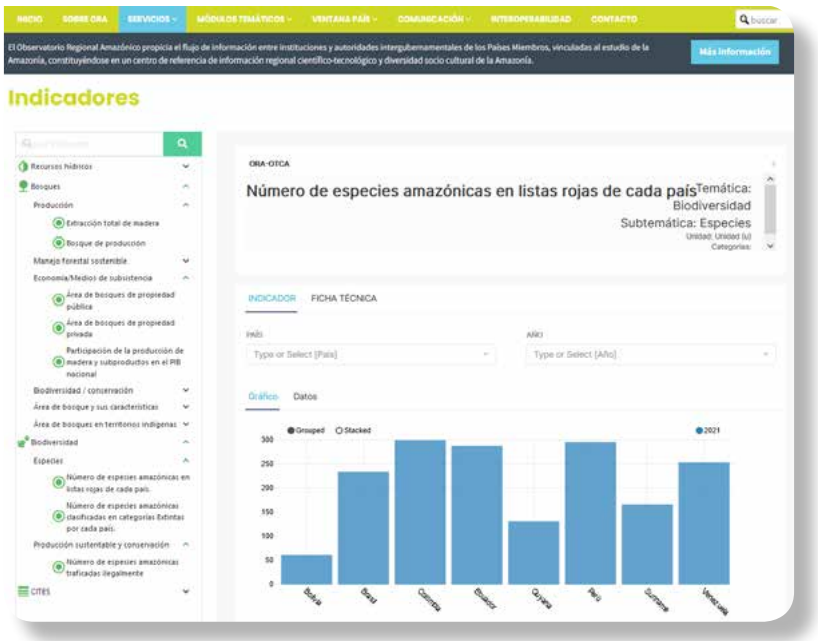


Figure 10 - Main interface of Indicators for each ARO Thematic Module

- **Thematic Modules:** Two thematic modules are currently integrated into the ARO Platform, the CITES Thematic Module and the Biodiversity Thematic Module; however, the development and implementation of two other thematic modules is in process: Forests and Water Resources, which will be integrated into the ARO in the first half of 2022.

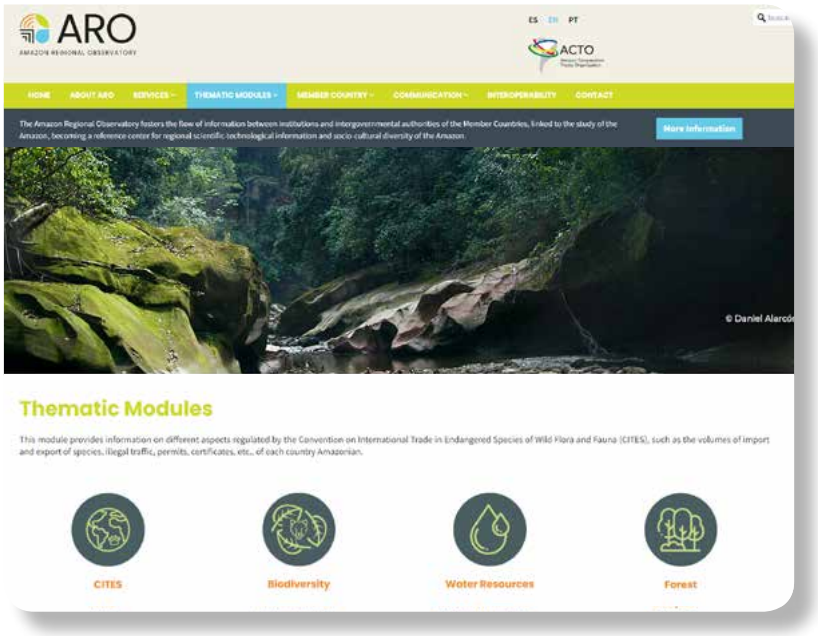


Figure 11 - Main interface of the list of ARO Thematic Modules

- **Country Window:** this section contains information on general identification data of each ACTO Member Country together with socioeconomic and demographic data to facilitate an initial characterization of the Member Country.

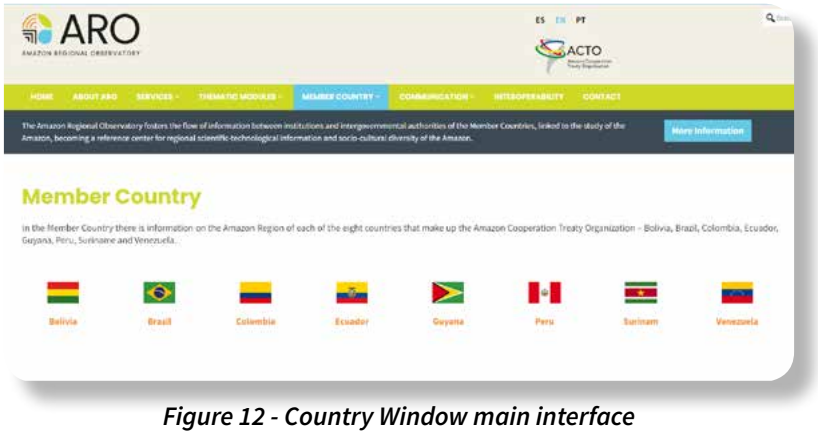


Figure 12 - Country Window main interface

- **Interoperability:** this section in the menu corresponds to displaying the Amazon Regional Observatory Interoperability API, through which it shares information about the list of CITES Amazonian species, the Databases of biological collections, the list of documents, among other information shared by the different institutions of the Member Countries with the ARO.

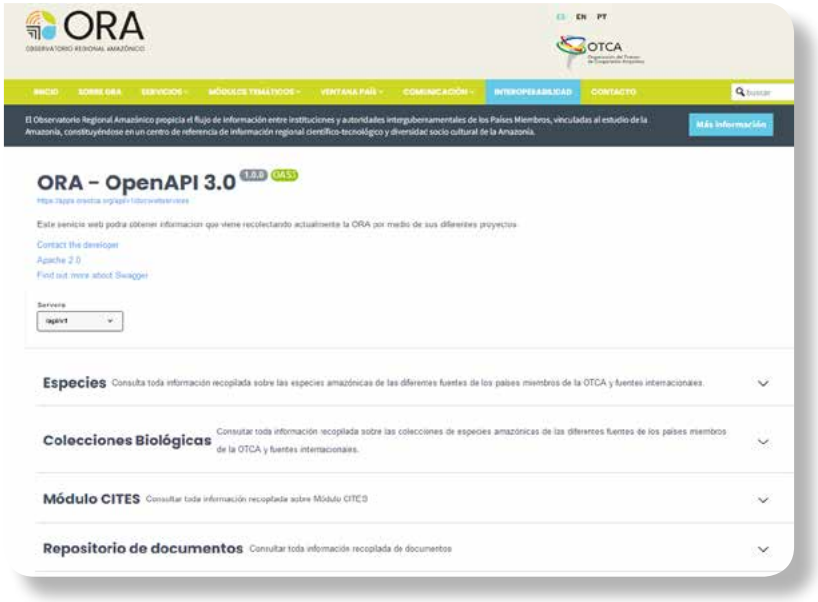


Figure 13 - ARO Interoperability API section interface

- **Communication:** this section contains news, information on job opportunities for consultancies, ARO-related videos, among others.

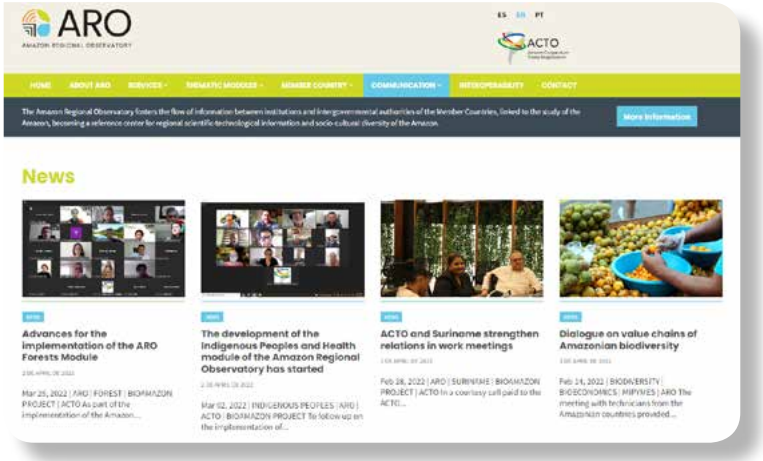


Figure 14 - Main interface of the ARO News section

- **Publications:** This section comprises only documents published by the ACTO related to different topics.

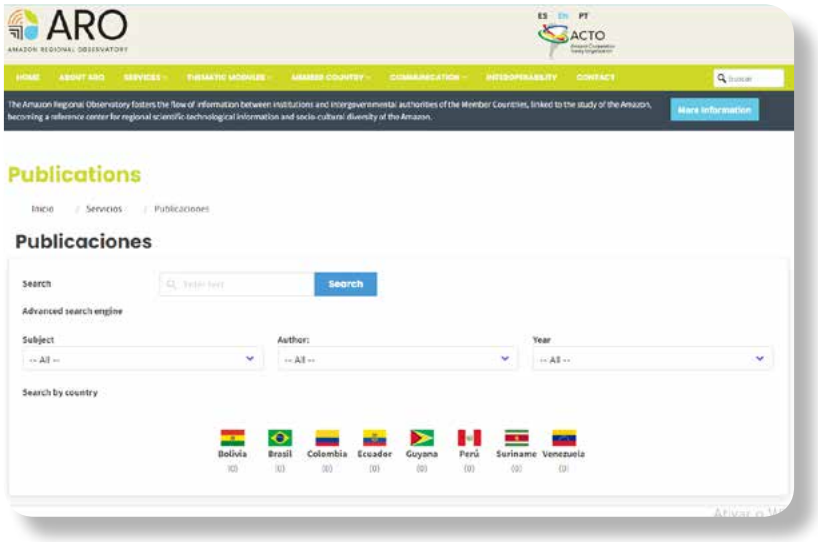


Figure 15 - Main interface of the ACTO Publications section in the ARO

- **Legislation:** a list of documents related to legal issues, such as ministerial agreements, decrees, opinions, laws, among others, published by the various institutions of the Member Countries.

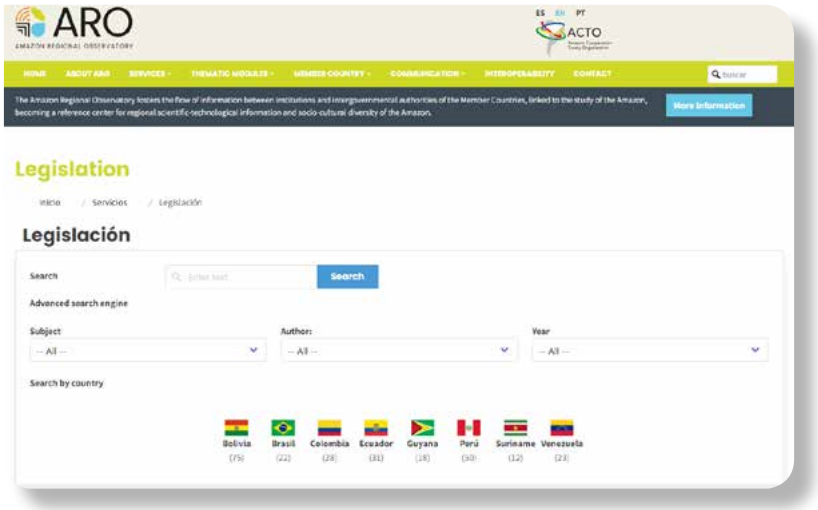


Figure 16 - ARO Interoperability Legislation section interface

- **Video gallery:** contains a list of videos related to the different species that are registered within the CITES Thematic Module and Biodiversity Thematic Module.

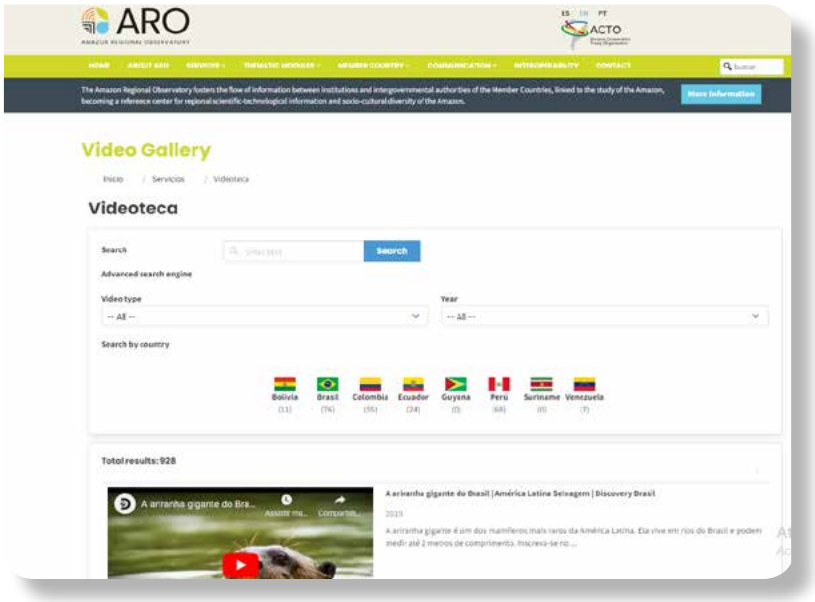


Figure 17 - Interface of the ARO Video Gallery section

- **Photo gallery:** contains a list of photos related to the different species that are registered within the CITES Thematic Module and Biodiversity Thematic Module.

Figure 18 - Interface of the ARO Photo Gallery section

The video and image gallery will be constantly updated according to the multimedia content that is generated within the new thematic modules.

2.3.2. Indicators Catalog Development

As part of the implementation activities of the Amazon Regional Observatory Portal, the company hired to develop ARO's platform, together with the technical team of the Bioamazon Project, worked on an Initial Catalog of Indicators for the four themes prioritized by the MC, Biodiversity and CITES, Forests, and Water Resources. The Catalog is organized by themes and sub-themes according to table 4.

Each indicator that appears in the ARO portal is associated with tabular and spatial information. Additionally, each indicator will have a file to consult information such as, definition, reporting frequency, calculation method and required data, etc.

Data and indicators uploading, and publication will provide useful data to users of the ARO Portal for the analysis, evaluation, follow-up or monitoring of specific issues related to the Amazon Region in the aforementioned topics and, in the future, it is expected to have additional indicators for the other topics of interest contemplated in the Amazon Strategic Cooperation Agenda.

Table 4.
Thematic lines and sub-themes of the Amazon Regional Observatory.

Theme (ASCA)	Subtheme	
Water Resources (18 + IB*)	• General Features • Climate • Water Offer • Water Availability • Water Quality	• Water Demand • Risks and Disasters • Water Inventory • Water Governance • Water Infrastructure
Forests (17 + IB)	• Forest area and features • Production • Biodiversity/conservation	• Forest Disturbance and Degradation • Measuring Progress Towards Sustainable Development • Economy/Livelihood
Biodiversity (21)	• Species • Ecosystem Services	• Sustainable Production and Conservation • Availability – Financing Scientific Research
CITES (15)	• Import • Export • Illegal Trafficking	• Species • Stakeholders • Instruments

*IB - Baseline data

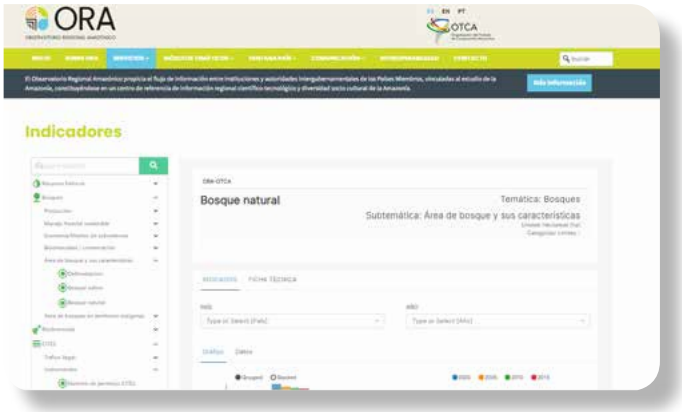


Figure 19 - IMain interface of Indicators of each ARO Thematic Module

At present, a complete catalog of indicators of the CITES module and the catalog of the other three priority topics are still under construction. The Member Countries were provided with the access link to the portal of these indicators, as part of the tool's performance tests, as well as for data verification and validation. Valuable contributions have been received for the improvement of their functionality, and the updating of some data.

2.3.3. Developing CITES Module

After call and selection process the company IquitosPlay was hired to develop the CITES Thematic Module aimed at managing, integrating and interoperating data on the Trade of CITES species in the eight ACTO Member Countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela.

Figure 20 - Main interface of the ARO CITES Thematic Module

Within the CITES Thematic Module there are different services to inquire about: CITES Operations, Illegal Trafficking, and the list of CITES Species of the Amazon.

- **Illegal Traffic:** a series of graphs are shown on the illegal trade of CITES specimens, as well as hotspots, routes and main markets and demands, modus operandi, drivers that promote illegal trafficking activities, among others.

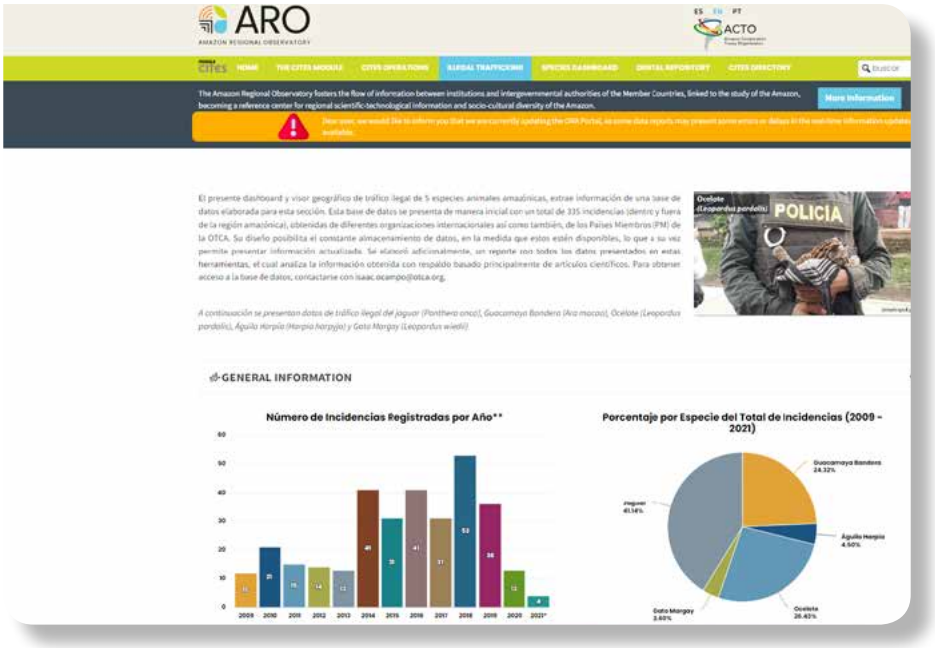


Figure 21 - Interface of the Illegal Trafficking Section of the ARO CITES Module

- **CITES Specimens:** This section of the CITES Thematic Module lists taxonomic and CITES Trade information on all Amazonian CITES specimens. Presently, there are 2801 Amazonian CITES specimens registered in the CITES Module. Also, within the information section on CITES Trade information on Exports, Imports, Permits and Confiscations are offered.

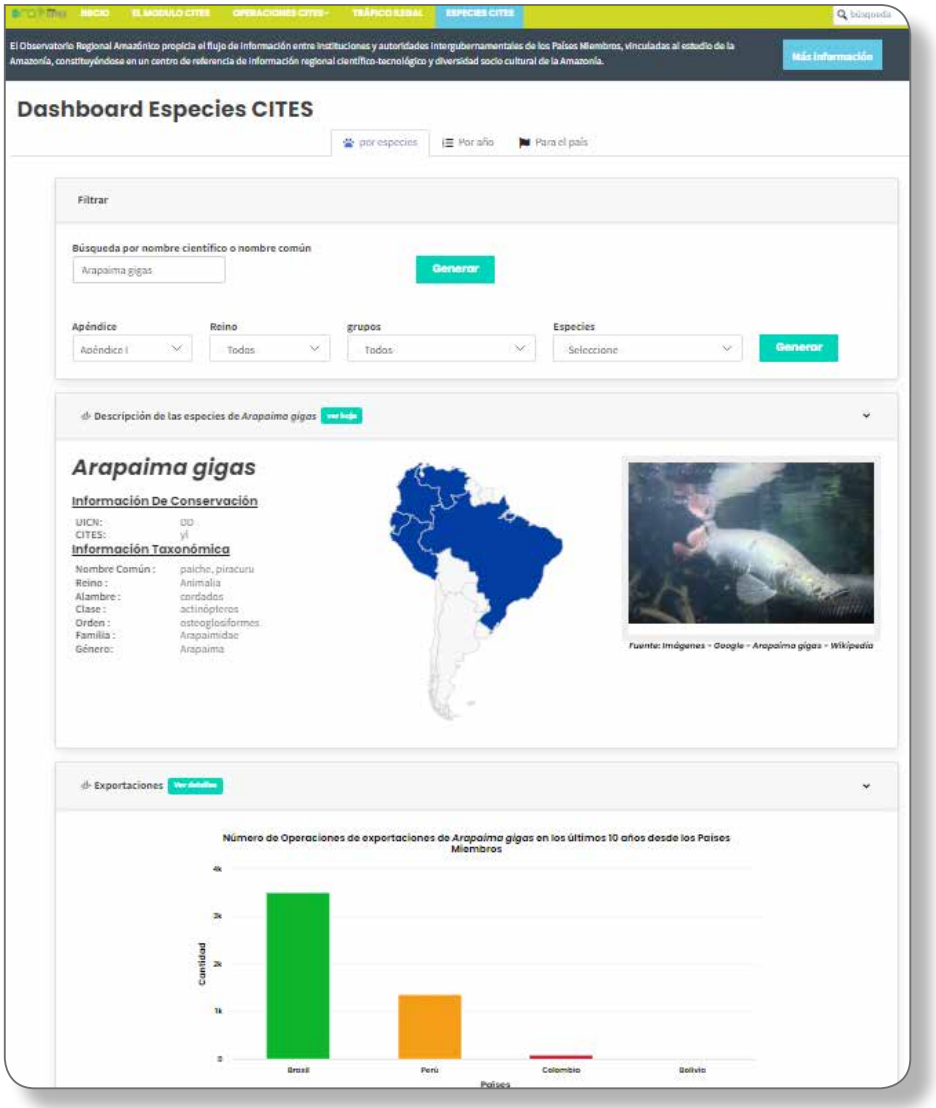


Figure 22 - Amazon CITES Species Dashboard Interface in the ARO CITES Module

2.3.4. Developing the Biodiversity Module:

After a call and selection process the company IquitosPlay was hired to develop the Biodiversity Thematic Module aimed at managing, integrating and interoperating data on taxonomy and range of Amazonian specimens in the eight ACTO Member Countries.

Within this module there are different services to inquire about: Specimens, Biological Collections, Documents, Directory.

Figure 23 - Main interface of the ARO Biodiversity Thematic Module

- **Specimens:** this section includes all species within the Amazon Basin. It provides detailed information on taxonomic, range and description of the specimen, and on its natural history and ecological information.

All the information contained in this Dashboard comes from the official sources such as, firstly, the Red Books of each Member Country, and secondly, the biological collections databases shared by the different institutions of each Member Country.

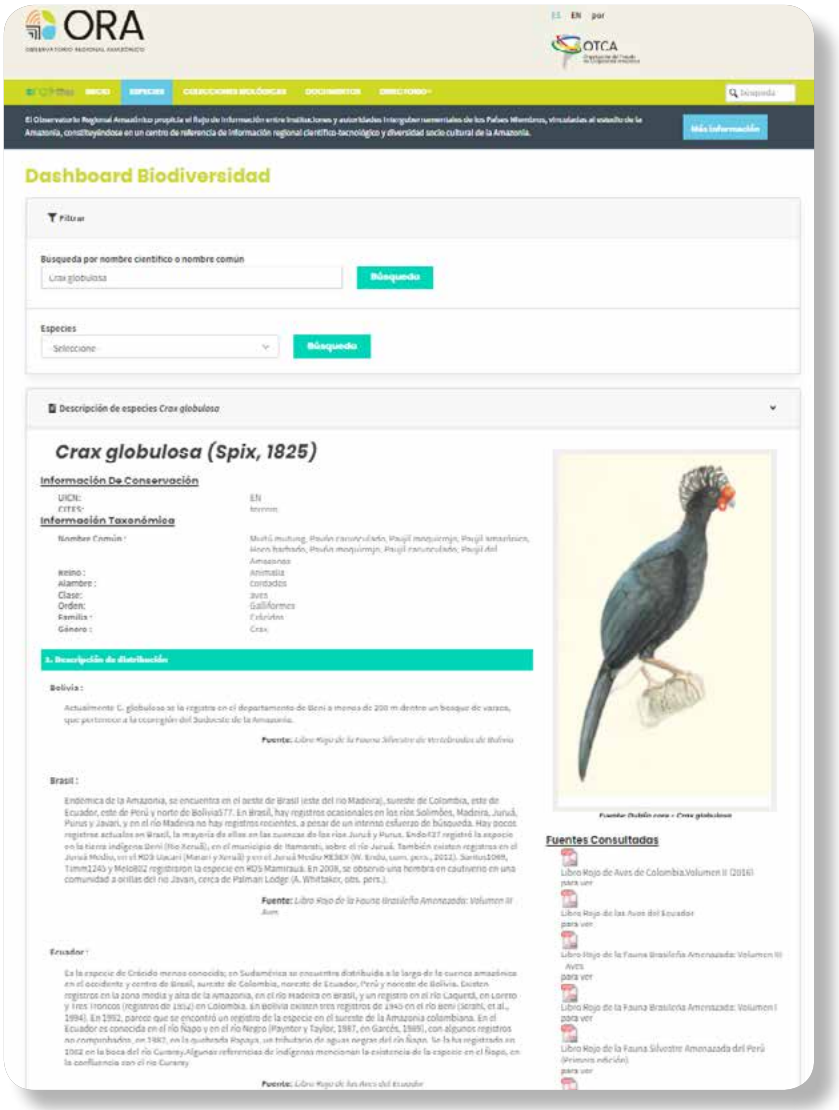


Figure 24 - Amazon Species Dashboard Interface of the ARO Biodiversity Module

Figure 25 - Interface for the downloading of collection distribution points from the Species Dashboard of the ARO Biodiversity Module

#	rec_txt_name	ins_txt_name	scientific_name	latitude	longitude	country
1	Base de datos Iquitos-Nauta	Instituto de Investigaciones de la Ar	arapaima gigas	-4,127753	-73,2291384	Perú
2	Ictiologia Collection - Instituto Nacional de Pesquisas da Amazônia (I	Instituto Nacional de Pesquisas da A	arapaima gigas	-2,050608	-60,02628	Brasil
3	Espécimes repatriados do Museu de Zoologia Comparada (MCZ) da U	FIOCRUZ - Oswaldo Cruz Foundatio	arapaima gigas	-3,575	-68,925	Brasil
4	Base de datos Tigre-Pucacuro	Instituto de Investigaciones de la Ar	arapaima gigas	-3,041181	-75,1001626	Perú
5	Base de datos Putumayo	Instituto de Investigaciones de la Ar	arapaima gigas	-0,465097	-74,4639848	Perú
6	Base de datos Yagua-Moronal-Apayacu	Instituto de Investigaciones de la Ar	arapaima gigas	-2,863726	-77,415024	Perú
7	Base de datos Yavarí	Instituto de Investigaciones de la Ar	arapaima gigas	-5,049328	-72,7283388	Perú
8	Base de datos Arabela-Curaray-Napo-2012	Instituto de Investigaciones de la Ar	arapaima gigas	-1,827001	-75,0228738	Perú
9	Base de datos Putumayo	Instituto de Investigaciones de la Ar	arapaima gigas	-0,328457	-75,4529257	Perú
10	Base de dados da Coleção de Peixes do Instituto de Biodiversidade e S	Sistema de Informação sobre a Biod	arapaima gigas	-3,10193992	-60,0250015	Brasil
11	Ictiologia Collection - Instituto Nacional de Pesquisas da Amazônia (I	Instituto Nacional de Pesquisas da A	arapaima gigas	-3,3694444	-66,035	Brasil
12	Coleção Ictiológica (MNRJ), Museu Nacional (MN), Universidade Fed	Instituto de Pesquisas Jardim Botân	arapaima gigas	-1,29166667	-46,5116667	Brasil
13	Espécimes repatriados do Museu de Zoologia Comparada (MCZ) da U	FIOCRUZ - Oswaldo Cruz Foundatio	arapaima gigas	-2,641667	-56,758333	Brasil
14	Base de datos Putumayo	Instituto de Investigaciones de la Ar	arapaima gigas	-0,145691	-75,4160032	Perú
15	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,7184	-68,7575	Bolivia
16	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-9,8017	-65,5373	Bolivia
17	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-9,9019	-65,7051	Bolivia
18	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,2305	-68,3723	Bolivia
19	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-11,1577	-67,6459	Bolivia
20	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-11,4082	-67,8967	Bolivia
21	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-10,8311	-66,2524	Bolivia
22	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,0296	-68,0721	Bolivia
23	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,2834	-68,2735	Bolivia
24	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,1386	-68,2188	Bolivia
25	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,4552	-68,2639	Bolivia
26	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,3286	-68,2734	Bolivia
27	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,5638	-68,3096	Bolivia
28	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,2925	-68,2827	Bolivia
29	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,3831	-68,3561	Bolivia
30	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-12,4377	-68,5031	Bolivia
31	Distribution of arapaima (Arapaima gigas) (Pisces: Arapaimatidae) in	Wildlife Conservation Society - Boliv	arapaima gigas	-11,003	-66,0672	Bolivia

Figure 26 - Excel spreadsheet view of records of collection distribution point downloaded from the Species Dashboard of the ARO Biodiversity Module

- **Biological Collections:** this section includes the record of observations of species (Collections) shared by the various Institutions in the Member Countries. Each record can be viewed through a viewer, whereby a map of the points recorded in the different collections will be obtained.

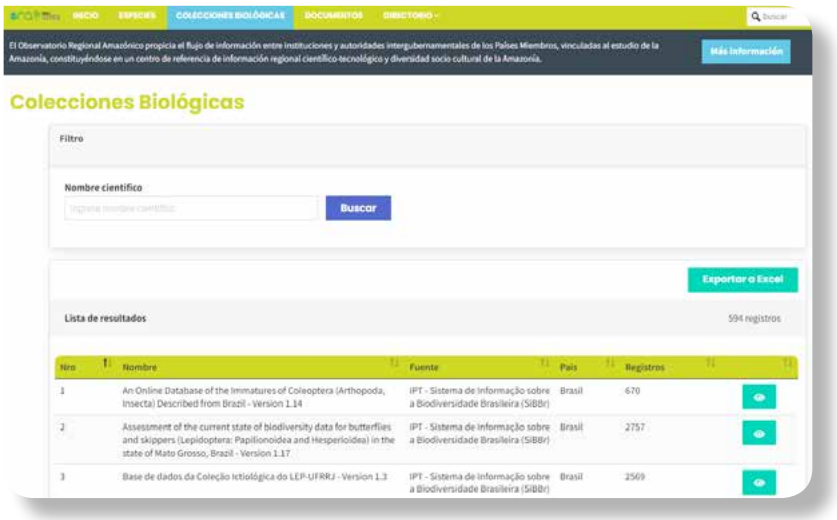


Figure 27 - Interface of the list of Biological Collections Database of the ARO Biodiversity Module

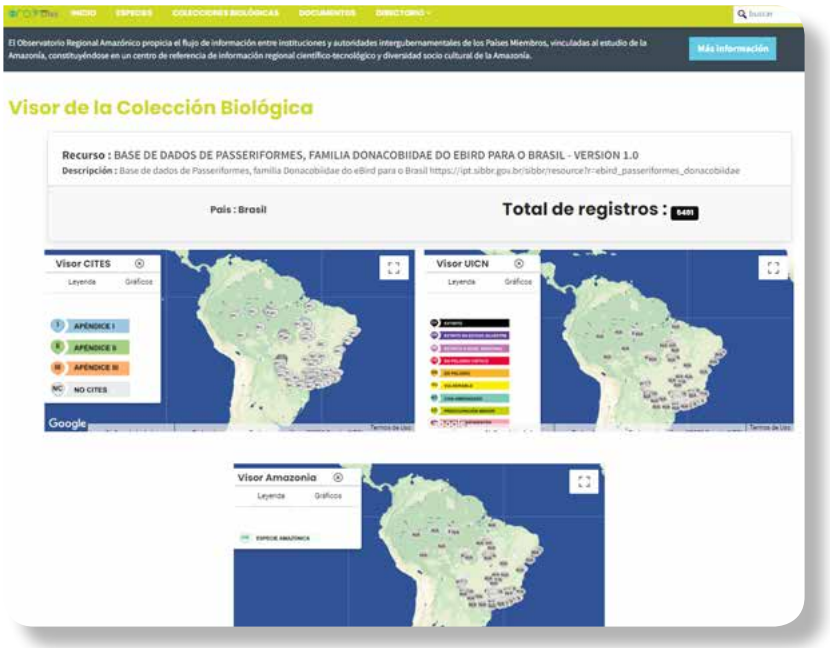


Figure 28 - Amazon Species Visor Interface of the ARO Biodiversity Module

- **Documents:** this section contains the list of all the documents of the different topics related to Biodiversity.

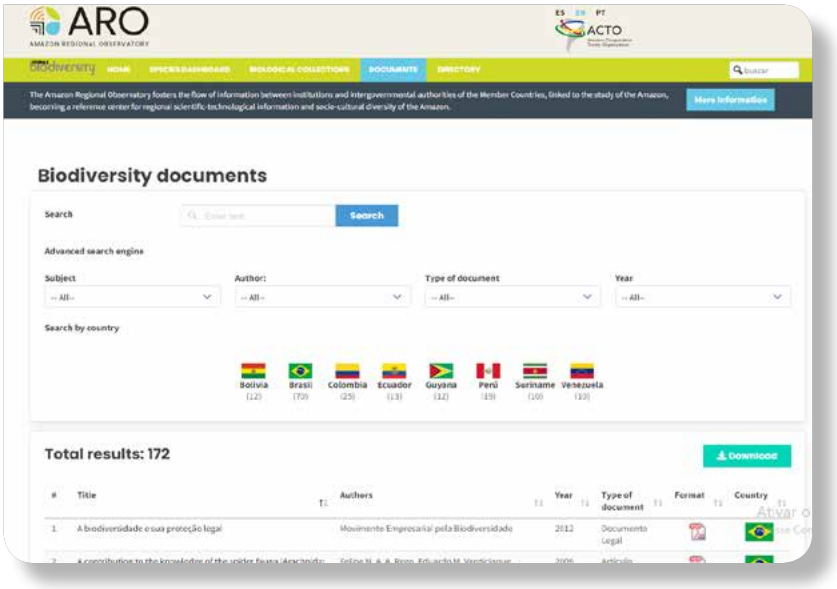


Figure 29 - Interface of the ARO Documents section of the Biodiversity Module

- **Directory:** It comprises a list with basic information of the different institutions and experts of the Member Countries in the theme of biodiversity.

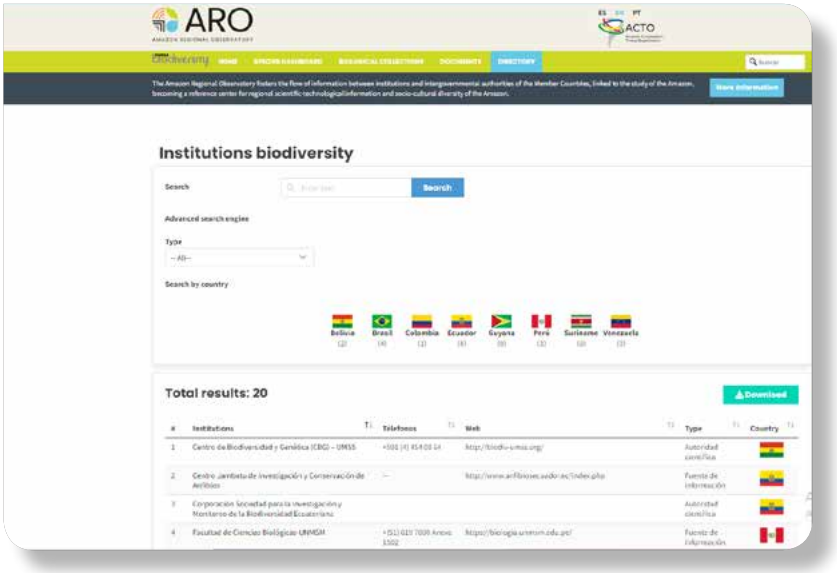


Figure 30 - **Interface of the ARO Directory list of the Biodiversity Module**

2.3.5. Developing the Forests Module

After the bidding process was finalized, the BITS Company was hired to design and develop the thematic module on forests and integrate it into the ARO platform. Information on the Amazon forests was incorporated into the integrating modules (GeoAmazon, Amazon Networks, Digital Amazon and Our Amazon) articulating with pre-existing data from public and official sources of the ACTO Member Countries, as well as international institutions and platforms with relevant action in the theme of forests (e.g. FAO, ITTO, UNFF, ForestPlots), all in line with the components and strategic actions of the ACTO Forest Program for the Amazon Region.

The BITS company has so far identified the needs (and gaps) of information, functional and non-functional requirements of the system (system architecture), and the initial proposal for the graphic design of the interfaces. The non--functional requirements contemplate the use of the ISO19115, Darwin core, Pinian core, Dublin core standards for the organization and systematization of data and information within the ARO.

Additionally, information resources of the eight ACTO/MC have been identified and collected from interoperable and non-interoperable resources; a directory of institutions that serve as sources of information for the Forest Module has been prepared, including data of the officials in charge; and the uploading of information and data to the ARO databases has started with the support of the IT team.

2.3.6. Developing the Water Resources Module

After a bidding process, the company GEODATIN was hired to develop this thematic module with financial resources from the Amazon Project.

In relation to Amazonian Networks, GEODATIN, along with the National Water Agency of Brazil, have supported the development of a monitoring viewer for water quality stations and stations with fluviometric parameters (e.g., flow, rainfall, and water level), which generate and transmit data every 15 minutes (which is carried out through interoperability processes). The system also allows access to historical data for each station (information has been made available for 70 years); To date, the system has captured more than 12 million records. On the other hand, data has been integrated manually with ORE HYBAM (a French initiative), and the integration with OIGUA is pending. Likewise, data from Ecuador, Bolivia and Peru are being integrated.

GEODATIN should soon present the content of the Water Resources Module and the integration activities with the other modules of the ARO.

2.3.7. Developing of the Information and Knowledge Management System (IKMS)

The terms of reference for the development of the Information and Knowledge Management System (IKMS) were prepared. The IKMS has been conceptualized as an electronic platform for information, collaboration, learning and exchange services, applied in the creation of integral solutions for the management of Amazonian knowledge. It will allow ACTO to increase the flow of information among institutions and intergovernmental authorities of the MC linked to the study of the Amazon, thus becoming a reference center for regional scientific, technological, and sociocultural diversity information in the Amazon. Likewise, with this tool ACTO will cover four dimensions of action of the countries: political, diplomatic, strategic, and technical (PS/ACTO, 2020).

In the coming weeks, coordination meetings will be held to address IKMS functionalities and services it provides to consolidate the terms of reference to start its implementation.

2.4. Information Resources from Member Countries as Contributions to ARO

After the thematic meetings held with the eight MC, bilateral work with each country, along with the institutions responsible for the thematic areas, was conducted for data uploading.

The following tables detail the institutions and the number of resources shared by modules, respectively.

CITES Thematic Module

Table 5.

Number of resources and records of the CITES thematic line, by institution and by country, shared with the ARO in 2021

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Bolivia	Ministry of Environment and Water	5	69
Brazil	Brazilian Institute of Environment and Renewable Natural Resources	14	259151
Colombia	Ministry of Environment and Sustainable Development	2	6
Ecuador	Ministry of the Environment, Water and Ecological Transition	17	108515
Guyana	Guyana Wildlife Conservation and Management Commission	4	1163
ACTO	Amazon Cooperation Treaty Organization (ACTO)	34	4056

continuation

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
PERU	Research Institute of the Peruvian Amazon (IIAP)	2	311
PERU	Ministry of Environment	9	7140
PERU	Ministry of Production (PRODUCE)	2	1494
Venezuela	Ministry of Popular Power for Ecosocialism Venezuela	1	6
Other Countryes	Other institutions		
Switzerland	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	11	1180728

For more details, see the following link: https://oraACTO.org/cites/reportes/resumen_recursos/module_cites/

Biodiversity Thematic Module

Table 6.
Number of resources and records of the BIODIVERSITY thematic line, by institution and by country, shared with the ARO in 2021.

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Bolivia	National Statistics Institute (INE)	2	2
	Ministry of Environment and Water	8	1002
	Wildlife Conservation Society - Bolivia	2	26
	Total Bolivia	**12**	**1030**
Brazil	National Center for the Conservation of Flora (CNCFLORA)	1	2118
	Chico Mendes Institute for Biodiversity Conservation	7	13394
	Rio de Janeiro Botanical Garden Research Institute	332	6365012
	National Institute for Amazonian Research (INPA)	33	172452
	National Institute of Space Research of Brazil (INPE)	19	19
	Botanical Garden of Brasilia	2	12472
	Ministry of Environment of Brazil	2	7
	Museum of Biodiversity	34	78710
	Museu Paraense Emílio Goeldi	21	165022
	Brazilian Biodiversity Information System (SiBBr)	99	4183857
	Brazilian National System for the Control of the Origin of Forest Products (SINAFLOR)	1	235
	Federal University of Mato Grosso do Sul	20	38594
	Total Brazil	**571**	**11031892**
Colombia	Amazonian Institute for Scientific Research SINCHI	1	34
	Alexander von Humboldt Biological Resources Research Institute	3	194
	Ministry of Environment and Sustainable Development	6	405
	National Parks of Colombia	13	13
	Total Colombia	**23**	**646**

continuation

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Ecuador	Ministry of the Environment, Water and Ecological Transition	7	7
Guyana	Ministry of Natural Resources of the Cooperative Republic of Guyana	1	2
ACTO	Amazon Cooperation Treaty Organization (ACTO)	56	29811
	Total ACTO	**56**	**29820**
PERU	Faculty of Biological Sciences-UNMSM	1	4735
	Research Institute of the Peruvian Amazon (IIAP)	40	65559
	Ministry of Environment	2	204
	Forest and Wildlife Service- SERFOR	1	381
	Total PERU	**44**	**70879**
Suriname	GONINI - National Land Monitoring System of Suriname	1	1
	IPCC	1	1
	Total Suriname	**2**	**2**
Venezuela	Experimental Botanical Garden Institute "Dr. Tobías Lasser "	1	534
	Ministry of Popular Power for Ecosocialism Venezuela	1	2
	Total Venezuela	2	536
Other Countryes	Other institutions		
Brazil	FIOCRUZ - Oswaldo Cruz Foundation	22	552710
	MapBiomas	7	7
	Amazonian Network of Georeferenced Socio-Environmental Information (RAISG)	5	5
Colombia	Pontifical Javeriana University	2	161
Ecuador	Corporation for Research and Monitoring of Ecuadorian Biodiversity	2	363
	Pontifical Catholic University of Ecuador	1	1948
Switzerland	International Union for Conservation of Nature (IUCN)	1	31003
Venezuela	PROVITA	1	202

For more details, see the following link: https://oraotca.org/cites/reportes/resumen_recursos/module_biodiversity/

Forests Thematic Module

Table 7.

Number of resources and records of the FORESTS thematic line, by institution and by country, shared with the ARO in 2021

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Bolivia	Ministry of Environment and Water	1	1
Brazil	National Institute of Space Research of Brazil (INPE)	22	22
Brazil	National Forest Information System- SNIF	3	3
	Total Brazil	**25**	**25**

continuation

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Colombia	Territorial Environmental Information System of the Colombian Amazon - SIAT-AC	14	14
Ecuador	Ministry of the Environment, Water and Ecological Transition	4	21
ACTO	Amazon Cooperation Treaty Organization (ACTO)	6	6
PERU	Forest and Wildlife Service- SERFOR	7	7
Suriname	GONINI - National Land Monitoring System of Suriname	10	10
Other Countryes	Other institutions		
Brazil	MapBiomas	9	9
	Amazonian Network of Georeferenced Socio-Environmental Information (RAISG)	8	8

For more details, see the following link: https://oraotca.org/cites/reportes/resumen_recursos/module_forest/

Thematic Module on Water Resources

Table 8.

Number of resources and records of the WATER RESOURCES thematic line, by institution and by country, shared with the ARO in 2021

ACTO Member Country	Public Institutions from Member Countries	Total Resources	Total Records
Bolivia	Ministry of Environment and Water	1	1
Brazil	National Water Agency- ANA/ BR	0	0
	National Institute of Space Research of Brazil (INPE)	2	2
	National Forest Information System- SNIF)	1	1
	Total Brazil	4	4
Ecuador	Ministry of the Environment, Water and Ecological Transition	2	2
ACTO	Amazon Cooperation Treaty Organization (ACTO	9	9
Other Countryes	Other institutions		
Brazil	MapBiomas	1	1
France	SO HYBAM	1	1

For more details, see the following link: https://oraotca.org/cites/reportes/resumen_recursos/module_water/

2.5. Registration, Communication and Dissemination

2.5.1. Developing the Logo

In 2020, the ACTO authorities decided to implement the Amazon Regional Observatory; therefore, the support of the Bioamazon Project was required to develop several of its stages until its inauguration.

One of these stages was, precisely, the development of a new logo in the three official languages of ACTO and the visual identity and application handbook, which are essential tools for good communication.

In this sense, in May 2021, to design the logo, the ToR was prepared for the hiring of a graphic design company. The Duo Design company was the winner offering the lowest price (R$ 7,000.00), and it developed, between June and July 2021, the new logo along with the supporting files.

It was requested that ARO brand and identity handbook be designed in line with the ACTO and the Bioamazon Project brand and visual identity handbook, in order to provide ACTO with clear and coordinated instructions for the composition of the institutional visual identity.

The products were:

- Logo in three languages and several formats as shown in the examples:

ARO
AMAZON REGIONAL OBSERVATORY

ORA
OBSERVATÓRIO REGIONAL AMAZÔNICO

OBSERVATÓRIO REGIONAL AMAZÔNICO

- Sponsors logos bar:

ARO
AMAZON REGIONAL OBSERVATORY

ACTO
Amazon Cooperation Treaty Organization

BIOAMAZON PROJECT
Conservation of species threatened by unsustainable trade

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
KFW

ORA
OBSERVATÓRIO REGIONAL AMAZÔNICO

OTCA
Organización del Tratado de Cooperación Amazónica

PROYECTO BIOAMAZONÍA
Conservación de especies amenazadas por un comercio no sustentable

cooperación alemana
DEUTSCHE ZUSAMMENARBEIT

Implementado por:
KFW

ORA
OBSERVATÓRIO REGIONAL AMAZÔNICO

OTCA
Organização do Tratado de Cooperação Amazônica

PROJETO BIOAMAZÔNIA
Conservação de espécies ameaçadas pelo comércio não sustentável

cooperação alemã
DEUTSCHE ZUSAMMENARBEIT

Implementado por:
KFW

- Logo bars with the sponsors and the countries flags:

- Handbook of Visual Identity and Application of the logo:

2.5.2. Developing the ARO's Video

The ToR prepared for the hiring of a company for the production of the ARO video, was approved in June 2021. These terms foresaw the production of three versions of a video of up to 15 minutes in length, narrated in Spanish, Portuguese, and English.

The purpose was to present a video-animation during the ARO's launching ceremony, which took place on November 10, 2021, along with its broadcast on the ACTO YouTube channel.

Request for quotation was sent to three video production companies from Brasilia, Brazil. Of the two companies that submitted their proposals, the winner was the company Coletivo Crescente/Abrate Cérebro. This company immediately began the production of the video, conducting interviews and preparing a script proposal.

All stages of pre-production, production and completion had the approval of the project team, the communication advisory office and the ACTO Steering Committee.

The total cost of the production of the three videos was R$ 41,000.00, equivalent to USD 8007.

The final 10'24" videos are published in YouTube format on the ACTO website:

- **Spanish: https://youtu.be/gpDHR5b4qcI**
- **Portuguese: https://youtu.be/n2ur8t_YySc**
- **English: https://youtu.be/uPt1OI52ymQ**

2.5.3. Developing the Video 360º

In June 2021, the ToR were approved for the hiring of 4VR Virtual Reality Canada, a company specialized in the production of virtual reality videos. It was entrusted to create virtual reality content about the Amazon Rain forest and the Amazon Regional Observatory for dissemination among ARO users. Accordingly, two immersion trips in "Virtual Reality with Interactivity" were proposed. Trip 1 - on the Amazon Rain Forest highlighted topics such as Biodiversity, Endangered Species, Forests, Water Resources, and Indigenous Peoples using an interactive panorama of 360-degree photos and videos. Trip 2 - proposed an immersion in the ACTO headquarters, in Brasilia, through interactive panoramas of photos and videos in 360 degrees in the ACTO and ARO facilities. The work was developed with a final cost of USD$19,921.30.

El trabajo fue desarrollado con un costo final de USD$19,921.30.

2.5.4. ARO domain registration

The domain name is the string of characters or word to be used (in the browser) to visit the Amazon Regional Observatory website.

They are marketed by companies specializing in the sale of international domains and also at the country level. Domains have become a key resource in the marketing strategy of organizations, which in turn makes domains scarce resources.

To ensure that the best domain is chosen for ARO, the 12 domains described in Table 9 have been acquired for ACTO. There are six pairs (two to cover the three languages). A website can have more than two domains, so several cases can be used. In addition, criteria were observed to avoid similarities in the use of domain names by some entities with names similar to ARO or ACTO.

They are composed of the following:

www.organizationname.organizationtype.country

- **www:** It is the internet protocol for web portals.
- **organizationname:** Name of company or initiative.
- **organizationtype:** Sector to which the organization belongs (state, organization, private company).
- **country:** Links the organization to some country (not always used)

Examples:

- **Ibama Web**
  www.ibama.gov.br
- **ANA Peru Web:**
  https://www.ana.gob.pe
- **UNESCO Web:**
  www.unesco.org

Table 9.
Definition and domains of ARO in the three languages

Definition	English	Spanish and Portuguese
Amazon Regional Observatory + highlighted with the word Amazon	www.oraamazonia.org	www.amazonaro.org
The word Observatory + Amazon Regional Observatory	www.observatorioora.org	www.aroobservatory.org
Observatory Concept + Amazon Concept in the domain	www.observatorioamazonico.org	www.amazonianobservatory.org
ARO Concept + ACTO Concept. Links the ARO to the ACTO	www.oraacto.org	www.aroacto.org
Amazon Regional Observatory, highlighted with the word Amazon	www.oramazonia.org	www.amazonro.org
Observatory Concept + Amazon Concept in the domain	www.observatorioacto.org	www.actoobservatory.org

The 12 domains listed in table 9 have been purchased for 5 years, for an amount of 4,502.05 reais (from August 28, 2021, to August 28, 2026). Likewise, the following are currently being used as ARO domains:

- **www.oraotca.org** and
- **www.aroacto.org**

2.5.5. ARO Trademark Registration

The Gruenbaum Possinhas & Teixeira Advogados Company was hired for the Amazon Regional Observatory's Trademark and Logo Registration service in the price of R$ 603.00. The company has already made a Priority Search Opinion and submitted the registration application to the National Institute of Industrial Property (INPI), after submitting the protocol and proof of payment.

2.5.6. Brochure design

The content of the Amazon Regional Observatory brochure was produced by the communication advisor of the Bioamazon Project and approved by the Project team and the ACTO Steering Committee.

A graphic design company was then hired to design the brochure's layout and its publication in the three versions – Spanish, Portuguese, and English. The graphic production considered the visual identity and the new logo of the ARO.

The total cost of the graphic design of the brochure was USD 312.00.

The purpose of the brochure is to call attention to the ARO by introducing essential information to understand the initiative, target audience, its objective, what to find, and how to access the ARO.

The brochure is available on the ACTO page through the following links:

- **Spanish: http://ACTO.org/wp-content/uploads/2021/06/livretoORA_es_digital.pdf**
- **Portuguese: http://ACTO.org/pt/wp-content/uploads/2021/11/livretoORA_pt_digital.pdf**
- **English: http://ACTO.org/en/wp-content/uploads/2021/11/livretoORA_en_digital.pdf**

2.5.7. Producing Content for Dissemination

In 2021, seven contents related to the development process of the Amazon Regional Observatory were produced until its launch on November 10, 2021. These contents were translated and disseminated, in three languages – Spanish, Portuguese and English - in the ACTO website, in the Bioamazon Project newsletters, and also on social media channels, such as:

25 February	The development of the Amazon Regional Observatory began http://ACTO.org/se-inicio-el-desarrollo-del-observatorio-regional-amazonico/
30 april	ACTO and Member Countries are defining the Steering Committee of the Amazon Regional Observatory http://ACTO.org/ACTO-y-paises-miembros-inician-proceso-de-definicion-del-comite-directivo-del-observatorio-regional-amazonico/
1 June	ACTO and IPEA join forces to carry out studies on the Amazon http://ACTO.org/ACTO-e-ipea-se-asocian-para-generar-estudios-sobre-la-amazonia/
29 June	The development of the water resources and integrator modules began http://otca.org/observatorio-regional-amazonico-se-inicio-el-desarrollo-de-los-modulos-de-recursos-hidricos-e-integrador/
1 September	The countries have initiated the process of providing data for the Amazon Regional Observatory http://otca.org/los-paises-inician-el-proceso-para-poner-los-datos-a-disposicion-del-observatorio-regional-amazonico/
30 October	ACTO and GBIF join forces for biodiversity http://ACTO.org/ACTO-y-gbif-unen-esfuerzos-por-la-biodiversidad/
10 November	The Amazon Regional Observatory was launched http://otca.org/se-inaugura-el-observatorio-regional-amazonico/

2.5.8. Dissemination ARO in Newsletters and Social Networks

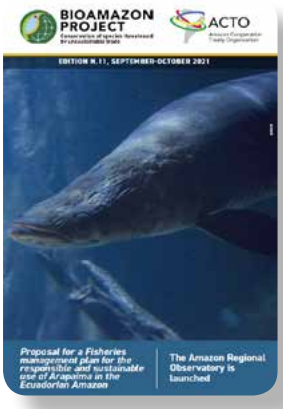
- The following Bioamazon newsletters disseminated content about ARO:

http://otca.org/en/wp-content/uploads/2021/08/2021_ACTO_Bioamazon_Newsletter-007_ENG.pdf

http://otca.org/en/wp-content/uploads/2021/08/2021_ACTO_Bioamazon_Newsletter-8_ingles.-.pdf

http://otca.org/en/wp-content/uploads/2021/09/2021_ACTO_Bioamazon_Newsletter-009_ENG.pdf

http://otca.org/en/wp-content/uploads/2021/10/2021_ACTO_Bioamazon_NEWSLETTER-010_ENG.pdf

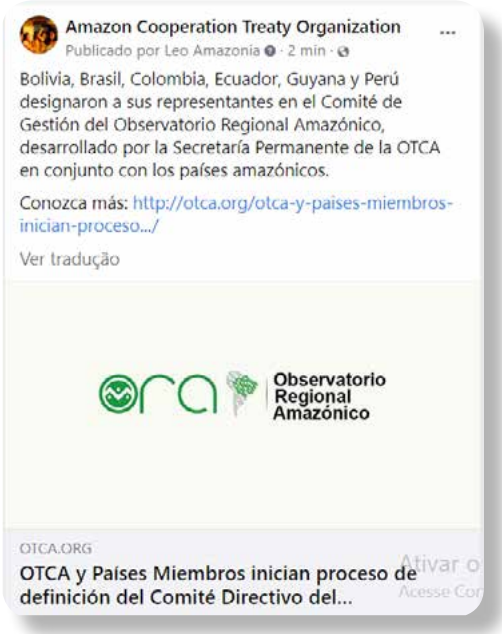


http://otca.org/en/wp-content/uploads/2021/12/2021_ACTO_Bioamazon_NEWSLETTER-011_ENG.pdf

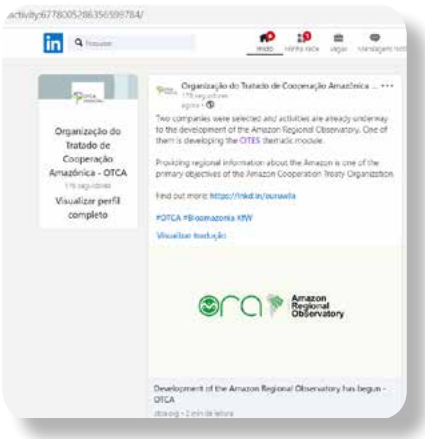
http://otca.org/en/wp-content/uploads/2022/04/2022_ACTO_Bioamazon_NEWSLETTER-012_ENG.pdf

• Some examples of posts on social networks about the ARO are introduced bellow.

• facebook



- LinkedIn



- Twitter

2.6. Infrastructure and Equipment

ACTO Member Countries have been producing qualitative and quantitative information in different areas (Biodiversity, Forests, Water Resources, Endangered Species of Flora, and Fauna, among others) that are displayed in their national computer systems; however, this information had not yet been articulated and displayed at the regional level. For this reason, Component 1 of the Bioamazon Project contemplated the implementation of the Amazon Regional Observatory as a space for the articulation of information in different areas in the Amazonian countries, to ensure that in the future on-line information be generated and shared at a regional level. Its budget was divided into two items: Infrastructure and Equipment.

Accordingly, the construction of a modern Observatory was planned.
The budget for the construction of the physical space and infrastructure in the ACTO headquarters was USD 396,340.00 and USD 107,578.00 for the purchase of computer equipment and technological tools for the ACTO's system, totaling USD 503,918.00. However, due to the multiple needs and budget appraisals throughout the construction phase, these budgets were reformulated, ending up at USD 421,084.74 for construction and infrastructure and USD 155,172.47 for the purchase of office equipment.

Table 4 presents the ARO's general expenses in 2021. USD 394,834.62 were invested in the construction of ARO and USD 153,716.90 in the purchase of equipment, making a total of USD 548,551.52.

Table 10.
General expenses for the construction of ARO and purchase of equipment

Cód.	Detail	Original Budget (in USD)	Reformulated Budget (in USD)	Expenses made 2016-2020	Expenses from 2021	Balance in USD
1.6	Construction of the physical space and infrastructure in the ACTO headquarters	396.340,00	421.084,74	81.403,80	313.430,82	26.250,12
1.7	Purchase of computer equipment and technological tools for the ACTO system	107,578,00	155.172,47	370,40	153.346,51	1.455,57

2.6.1. Architectural Project

The implementation of ARO has been prioritized by the PS/ACTO since the 2019 management as a space for articulation in different areas of information in the Amazonian countries. As the ACTO facilities had its own space of approximately 600 m^2, for the operation and administration of the ARO, an architectural project was designed for the remodeling of the new PS/ACTO offices and the construction of the ARO facilities.

For the implementation of the Observatory, firstly, ACTO signed a contract with the company EXCO. The company created the operational and technical project of ARO, which involved a consultation process in the MC, together with mapping of requirements and definition of IT solutions. Secondly, the development of the ARO information systems proceeded, to start with all the functionalities and operations in a virtual platform that was installed in the new working environments of the PS/ACTO.

Subsequently, the remodeling of the new offices of the PS/ACTO headquarters, located in Brasilia, Federal District of Brazil, was carried out. In this first stage, the KfW approved the financial resources to condition the ARO room, initially placing new flooring, and installing a sliding file.

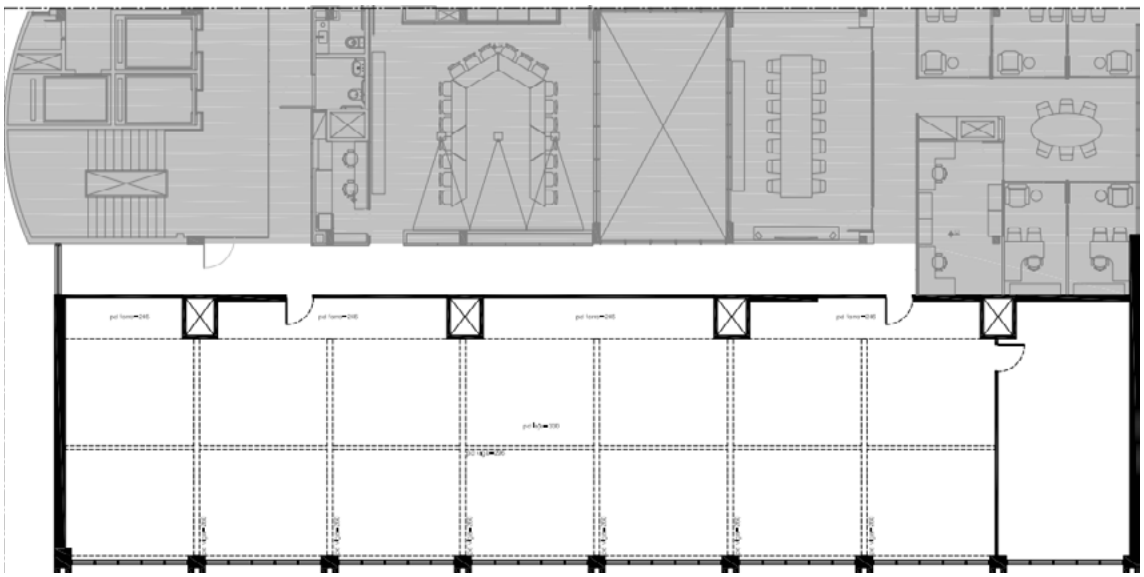
The next step was the architectural design of the ARO environment with all the elements and spaces for the proper functioning of the ARO situation room in a total area of 600 m^2.

The process for hiring a company to design the architectural project for the ARO was initially long. Two unsuccessful calls were made during January and February 2021, and finally, in March, the 3rd call was made to thirty-one architecture companies from Brasilia, of which only two participated. As a result, the Esquadra Company was selected, who carried out the architectural design for an amount of USD 18,643.00.

Fuente: Esquadria Arquitetos.

Figure 31. ORA architectural design. Conference hall

a



b

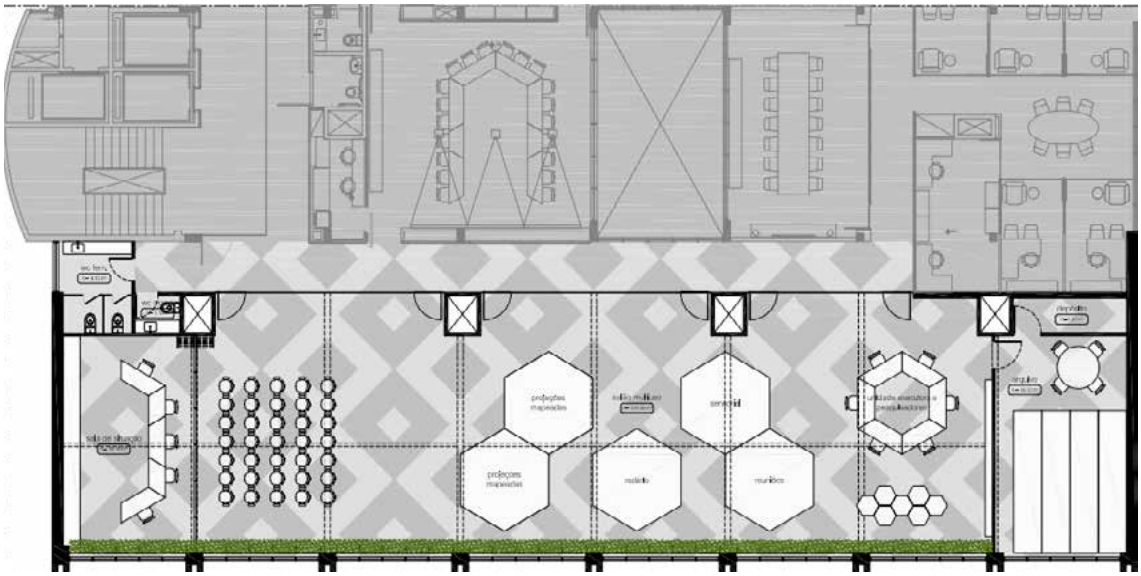


Figure 32. Floor destined to the Amazon Regional Observatory (a) available area and (b) proposal from the Esquadra Company

2.6.2. ARO facilities

After having the architectural project ready and approved by the Board of Directors of the Permanent Secretariat, in June 2021, seven well-known Architecture Companies with positive records in Brasilia were invited to carry out the construction works.

The company ENGEMAG was selected for USD 118,550.00 and, according to the evaluation committee, it offered the best technical proposal that fully met the requirements set in the ToR: a very experienced construction manager and a suitable working team to meet the needs of the construction work. In addition, it delivered an excellent, solid, and efficient technical proposal with well-calculated deadlines and schedules, at an adequate cost within the stipulated budget, for which it obtained the best rating of 97.4 points out of 100.

The work began on July 1, 2021, and ended on September 30, 2021, and included the following environments:

1) Reading Room or Library
2) Technical Coordination Room
3) Situation Room
4) Meeting Room 1
5) Meeting Room 2
6) Four Restrooms
7) Storage Room
8) Equipment Management Room

For each of these rooms were purchased equipment, office furniture, desks, round meeting tables, individual meeting tables, executive chairs, meeting chairs with wheels, fixed meeting chairs, 10 high standard i7 laptops, 10 Monitors, 16 Desks.

The rooms are also equipped with: Automatic Curtains, Automatic Irrigation System, Wall Green System, Central Air Conditioning, Sound System, Dimmable Lighting System, Anti-fire System, Anti-acoustic System.

Figure 33. View of the Amazon Regional Observatory in auditorium format

Figure 34. View of the ARO, in auditorium format, with the acoustic divisions closing the Water Resources Situation Room

The meeting rooms are equipped with projectors, projection screens, independent floor televisions, sound system, individual meeting tables, fixed chairs, and 80 swivel chairs, anti-acoustic system, flexible and retractable glass partitions, Air Conditioning System, Touch Screen Panels for presentations, security cameras.

The Situation Room is equipped with a video wall with 18 independent monitors, 4 High fixed computers, monitors, sound system, air conditioning, 4 Desks and 4 Executive Chairs.

All this equipment together with the detailed budget are described in the table 11.

Tabla 11.

Summary of expenses (USD) including equipment and furniture for ARO's office and expenses with construction

Item	Product Descriptions	Total Budget for Equipments (USD)		171.315,13
		UNIT	TOTAL PRICE Estimated	TOTAL PRICE
		A		
1	TECHNICAL OFFICE			
1.1	Purchase of sliding files	4	13.180,38	17.881,45
1.2	Purchase of Firewall	1	13.180,38	13.180,38
1.3	Workstation for Coordinators	2	2.114,50	951,70
1.4	Workstation for technical team	16	16.916,00	6.189,45
1.5	Round board tables	3	1.585,88	423,96
1.6	Swivell chairs	30	10.572,50	7.310,88
1.7	Chairs for the conference table	8	1.409,67	820,43
1.8	Notebook i7 10th generation 16 Gb NVIDIA Ge Force RTX 2060	10	22.907,09	26.431,25
1.9	Laser Color HP printer	2	1.762,08	3.065,67
1.10	Copier	1	8.810,42	17.268,42
1.11	Purchase of computer Monitors, Mouse and Keyboard	10	0,00	2.712,14
1.12	Purchase de storage cabinets	18	0,00	2.149,18
	SUBTOTAL		**81.038,22**	**98.384,91**
2	MEETING ROOMS			
2.1	Conference room tables	40	176,21	5.583,62
2.2	Chairs for conference rooms	90	176,21	10.879,52
2.3	Furniture for reception room	1	2.643,13	2.710,08
2.4	General sound system including amplifier, speakers for ceiling, Wireless microphones, sound table	1	736,55	15.546,33
2.5	Professional Samnsung Monitor LED 55" Flip	2	3.347,96	5.951,90
2.6	Wifi routers for ARO	12	352,42	1.678,03

continuation

Item	Product Descriptions	Total Budget for Equipments (USD)		171.315,13
		UNIT	TOTAL PRICE Estimated	TOTAL PRICE
		A		
2	MEETING ROOMS			
2.7	Smart TV 55" for floor projection	5	4.405,21	4.501,15
2.8	HDMI 8x8 video matrix	1	0,00	1.917,56
2.9	Purchase of Switch and Panels	6	0,00	2.588,15
2.10	Purchase of polishing machine	1	0,00	2.378,81
2.11	Purchase 3D vr lenses	2	0,00	1.409,31
2.12	Purchase of Cromecast	2	0,00	176,01
	SUBTOTAL		**27.131,68**	**55.320,48**
	GENERAL TOTAL		197.155,12	153.705,39
	BUDGET BALANCES		**10%**	**17.609,74**

- Construction expenses

Item	Product Descriptions	Total Budget for Equipments (USD)				324.111,01
		UNIT	TOTAL PRICE	TOTAL PRICE	TOTAL PRICE	"FINAL TOTAL PRICE"
		A	B	A&B		
1	CONSTRUCTION OF PHASE ONE OF ARO					
1.1	Construction cost – phase one	1	591000	591000	100.000,00	110.364,15
1.2	Construction cost – phase two, former file room	1	118200	118200	20.827,83	20.601,87
1.3	Purchase of dimmer regulated light fixtures	1	50000			0,00
	SUBTOTAL				**120.827,83**	**130.966,01**
2	INTERIOR FINISHES					
2.1	Blinds	8	10000	80000	14.096,67	23.462,18
2.2	Cladding and support for light fixtures in a hexagonal suspended metal structure - electrostatic black paint and partial finish in natural wood foil in American oak with satin finish. *(LED and electrical installation not included)	135	250	33750	5.947,03	6.141,92
2.3	Finish in natural wood foil American oak with satin finish on frame in metal structure with self-supporting bent sheet	42	400	16800	2.960,30	4.696,55
2.4	Structured metal panel with screen support with MDF finish (see specific project), color to be defined	1	17000	17000	2.995,54	2.318,21
2.5	MDF sideboard finished in natural wood foil American oak satin finish, swing doors, cava pullers and with shock absorber hinges	1	5000	5000	881,04	653,59
2.6	MDF Shelves with hidden support finished in natural wood foil satin finished American oak	3	5000	15000	2.643,13	1.392,72

continuation

Item	Product Descriptions	Total Budget for Equipments (USD)				324.111,01
		UNIT	TOTAL PRICE	TOTAL PRICE	TOTAL PRICE	"FINAL TOTAL PRICE"
		A	B	A&B		
2	INTERIOR FINISHES					
2.7	OCA	1	5000	5000	881,04	1.572,36
2.8	Pulpit	1	5000	5000	881,04	703,64
2.9	Additional carpentry contract includes change of measures and in situ work at OTCA	1	0	0	0,00	1.175,72
2.10	UTRAMARK Laminate Service Contract		0	0	0,00	2.801,12
2.11	Fixed room dividers	1	100000	100000	17.620,83	18.048,55
2.12	Retractable room Dividers	2	50000	100000	17.620,83	31.199,25
2.13	Wall Green	1	20000	20000	3.524,17	7.442,76
2,14	VRF Samsung Conditioning system	1	146284	146284	25.776,46	25.295,99
2.15	Air Conditiong system	26	100000	100000	17.620,83	18.416,43
2.16	Instalation of 7 monitors	1	0	0	0,00	3.499,17
2.17	Purchase of services Rack and Panels	1			0,00	175,28
2.18	Purchase of 5 floor brackets for TV	5			0,00	616,25
2.19	Construction of an additional pulpit	1			0,00	392,16
2.20	ARO signage	1			0,00	2.521,01
2.21	Construction works for the OCA's structura of the ARO	1			0,00	1.755,37
2.22	Change of copper pipes for air conditioning installation	1			0,00	732,03
2.23	Fine Work, Female restroom Glass Replacement	1			0,00	3.695,61
2.24	Lighting testing				0,00	578,90
	SUBTOTAL				**163.668,31**	**159.286,77**
3	BUILDING MATERIALS					
3.1	Acoustic linings	1	40000	40000	7.048,33	3.742,30
3.2	Vynil floor	5	2000	10000	1.762,08	3.238,47
3.3	Dimmer light of ARO	1			0,00	3.199,63
3.4	Vinyl floor in Coordinators office	1			0,00	1.214,19
3.5	Renovation of main entrance, change of windows and installation of panic exit	1			0,00	3.695,61
3.6	Additional carpentry work	1			0,00	2.801,12
3.7	ARO visual Identity	1			0,00	2.521,01
3.8	Purchase material for carpentry	1			0,00	1.217,55

continuation

Item	Product Descriptions	Total Budget for Equipments (USD)				324.111,01
		UNIT	TOTAL PRICE	TOTAL PRICE	TOTAL PRICE	"FINAL TOTAL PRICE"
		A	B	A&B		
3	BUILDING MATERIALS					
3.9	Purchase material for carpentry	1			0,00	136,32
3.10	Purchase material for carpentry	1			0,00	116,25
3.11	Purchase material for carpentry	1			0,00	120,00
3.12	Payment for closing room dividers				0,00	373,48
3.13	Purchase of plants for the main entrance	1			0,00	660,69
3.14	Purchase of wate bins fro restrooms and offices				0,00	174,64
	SUBTOTAL				**10.995,40**	**23.211,26**
	GENERAL TOTAL OF WORKS				**295.491,53**	**313.464,04**
	BUDGET BALANCES				**3%**	**10.646,96**

2.6.3. Equipment

The equipment and furniture inventoried were destined to furnish the Amazon Regional Observatory with resources from the Bioamazon Project (Table 12).

Table 12.
List of equipment and furniture acquired for ARO by the Bioamazon Project

Item	Unit	Description of the good	Cost in BRL	Cost in USD
Purchase of sliding files	4	4 metal sliding files	R$ 101.479,00	$ 17.881.45
Purchase of Firewall	1	Palo Alto Firewall Model PA-220 with 03-year warranty, technical support, installation service, and license renewal to Threat Prevention and URL Filtering	R$ 74.800,00	$ 13.180.38
Workstation for Coordinators	2	Black L-shape individual desks	R$ 5.401,00	$ 951.70
Workstation for technical team	16	Black Individual Work Stations with Central Glass Barrie	R$ 35.125,76	$ 6.189.45
Round board tables	3	Round 1 mt board tables	R$ 2.406,00	$ 423.96
Swivell chairs	30	Black executive swivel chairs - alberflex	R$ 41.490,00	$ 7.310.88
Chairs for the conference table	8	Fixed green chairs for conference room	R$ 4.656,00	$ 820.43
Notebook	10	Notebook DELL i7 10th generation 16 Gb NVIDIA Ge Force RTX 2060	R$ 150.000,00	$ 26.431.25
Laser Color HP printer	2	Multifuncional Xerox printer C405Dn A4 Duplex Laser Color Wireless RJ45 Usb 3 Ram 2Gb 35PPM - 110V	R$ 17.398,00	$ 3.065.67
Copier/printer	1	Xerox® Color C70 - Printer Speed Colors: up to 70 ppm, Black : up to 75 ppm /Xerox Integrated Color Server/ Xerox® Printer Server EX-i C70 Developed by Fiery®- Print/ Copy: 2400 x 2400	R$ 98.000,00	$ 17.268,42
Purchase of computer Monitors, Mouse and Keyboard	10	DELL monitors, mouse and wireless keyboard	R$ 15.391,64	$ 2.712.14
Purchase de storage cabinets	18	Black melamine storage cabinets	R$ 12.196,80	$ 2.149.18
Conference room tables	40	Black wooden conference room tables with iron edges	R$ 31.687,63	$ 5.583.62
Chairs for conference rooms	90	50 fixed green reclining chairs - alberfelx and 40 reclining chairs with wheels	R$ 61.742,37	$ 10.879.52
Furniture for reception room	1	Furniture set for a small room, including 2 armchairs and 3 black wrought iron tables	R$ 15.380,00	$ 2.710.08

continuation

Item	Unit	Description of the good	Cost in BRL	Cost in USD
General sound system for ARO	1	Includes JBL ceiling speakers, 2 sound tables, equalizer, 24 wireless table microphones	R$ 88.227,00	$ 15.546.33
Professional Samsung Monitor LED 55” Flip	2	SAMSUNG FLIP Touch Screen monitor with pedestal Routers Intelbras TS40 ID	R$ 33.777,60	$ 5.951.90
Wifi routers for ARO	12	Intelbras TS40 ID Routers	R$ 9.522,99	$ 1.678.03
Smart TV 55” for floor projection	5	TV 55" Samsung 4K and vertical floor pedestals	R$ 25.544,45	$ 4.501.15
HDMI 8x8 video matrix	1	HDMI 8x8 video matrix	R$ 10.882,34	$ 1.917.56
Purchase of Switch and Panels	6	Purchase of Switch and Panels	R$ 14.688,00	$ 2.588.15
Purchase of polishing machine	1	polishing machine Alfa Tennant A135 Compact Cable Floor Washing Machine	R$ 13.500,00	$ 2.378.81
Purchase 3D vr lenses	2	Purchase de lentes 3D Oculus Quest All-in-one VR Gaming Headset 64GB	R$ 7.998,00	$ 1.409.31
Purchase of Cromecast	2	Purchase de Cromecast	R$ 998,90	$ 176.01
VRF Samsung Conditioning system	1	VRF LG Air Conditioning Equipment with 9 broadcast cassets	R$ 135.460,00	$23.869.18
Air Conditiong system	26	LG Inverter Air Conditioning Equipment	R$ 98.620,00	$17.377.67
Structured metal panel with screen support with MDF finish (see specific project)	1	Structured metal panel with support for video wall (see specific project)	R$ 12.414,00	$2.187.45
MDF sideboard finished in natural wood foil American oak satin finish, swing doors, cava pullers and with shock absorber hinges	1	MDF sideboard finished in natural wood foil American oak satin finish, swing doors, cava pullers and with shock absorber hinges	R$ 3.500,00	$ 616.73
MDF Shelves with hidden support finished in natural wood foil satin finished American oak	3	MDF Shelves with hidden support finished in natural wood foil satin finished American oak	R$ 7.458,00	$ 1314.16
OCA	1	OCA structure in designed wood clad	R$ 8.420,00	$ 1483.67
Pulpit	2	Designed in wood	R$ 3.768,00	$ 663.95
Fixed room dividers	1	Metal structure, with anti-acoustic duplex glass	R$ 96.650,00	$ 17 030.54
Retractable room Dividers	2	Metal structure, with anti-acoustic duplex glass	R$ 167.072,00	$ 29 439.48
Automatized blinds	8	Vertical blinds with automatized blackout	R$ 125.640,00	$ 22 138.82

2.6.4. Water Resources Situation Room

This situation room was conceived for implementing effective management of critical situations in the Amazon. It was created in partnership with other institutions from the countries that are part of the Amazon River basin and that have competencies in forecasting extreme hydrometeorological events.

It has, among others, the following powers:

- plan, coordinate and execute actions in the field of Meteorology, Climate and Hydrology;
- support research and technical studies aimed at mitigating and adapting to climate change, improving water availability, and minimizing the effects of adverse hydrological events;
- support the actions of environmental services;
- maintain the hydrometeorological surveillance and alert system;
- structure, implement and keep updated the Water Resources Information System, including the management of the hydrometeorological network.

- **Overall objectives**

  - Monitor and report the occurrence of extreme hydrological events;
  - support actions to prevent and mitigate extreme events; and
  - forecast and monitor weather and climate.

- **Specific objectives**

  - Prepare reports describing the situation of the hydrographic basins, monitoring stations, as well as collect information on extreme hydrological events;
  - Monitor the operation, and propose necessary adjustments to the specific hydrometeorological network for the monitoring of extreme hydrological events;
  - Identify, systematize, and update the information on alert levels and attention of the fluviometric stations or other reference levels; and
  - Prepare and keep updated the operational inventory of the Situation Room, with data from the fluviometric stations and reservoirs used in the day-to-day operation of this Room.

- **Operation of the Situation Room**

  Requirements for the preparation of reports and bulletins derived from the operation of the Situation Room are established, as well as the routing protocols for the detection of anomalous and potentially critical situations.

  Although the Situation Room is open all year round, some adjustments would optimize its operation. It is recommended that spatial and temporal distribution of extreme hydrological events and the vulnerability of the basins to the effects of droughts and floods be considered when

Figure 35. . Water Resources Situation Room of the Amazon Regional Observatory (ARO)

defining the period of operation and the regions monitored. In addition, the operation of the Situation Room should be adjusted to the number of team members and the available technological resources.

Thus, it is expected to prepare an Annual Action Plan for the Situation Room that will at least indicate priority regions or basins to be monitored in the period; actions to be developed by the Situation Room by region or basin; period of development of each action; and division of activities among the team in charge, considering the technological resources available.

- **Technical Team**

At present, the ARO Situation Room has a senior professional meteorologist hired through the Amazonas Project, with experience in meteorological and climate forecasting, hydrological monitoring, assembly, and maintenance of Data Collection Platforms - DCP (pluvial and fluvial stations) among others.

However, for its full operation it is recommended that the following professionals be incorporated:

- 1 hydrologist (with a minimum of 2 years of experience in hydrological monitoring, who can be a meteorologist or civil engineer)
- 1 Geoprocessing analyst (in any training area, with a minimum of 2 years of experience in mapping and database development, preferably within the area where the work will be carried out)
- 1 programmer/developer (IT Professional, with a minimum of 2 years of expe-

rience in Python, R Language, PostGIS, PostgreSQL, HTML, CSS, JavaScript, Linux)

- **Physical Structure of the Situation Room**

The Situation Room comprises:

- A room of 40.92m² (approximately) with a mobile wall in case it is necessary to expand it to place more people in a crisis room, for example;
- 1 video wall with 18 independent monitors;
- 4 workstations with 2 monitors each.

Webcams, 4 telephone points and some DCPs are being acquired.

The products and the operation of the Situation Room should be adjusted to the number of team members and the available technological resources.

Table 13 presents some products from the Water Resources Situation Room.

Table 13.
Types of products, periodicity, and objectives from the ARO Water Resources Situation Room.

Type	Frequency	Objective	Adoption of Measures
Critical Event Notice	Extraordinary (pre-event)	Indicates the possibility of occurrence of a critical event.	*
	Content: place and date/time of possible occurrence; indication of probable magnitude of the event.		
Critical Event Report	Extraordinary (during-event)	Describe the evolution of the critical event.	*
	Content: map/figure/diagram indicating the region/basin; graphs and/or tables illustrating the evolution of the magnitude of the event, indicating when possible, the reference values (levels of care, extravasation, etc.) and expected short-term events based on simulation or trend models.		
Critical Event Report	Extraordinary (post-event)	Describe the critical event and its impact	*
	Content: map/figure/diagram indicating the region/basin; graphs and/or tables illustrating the evolution of the magnitude of the event, indicating when possible, the reference values (levels of care, extravasation, etc.); recurrence and event impact analysis (flood patches, photographs and summary of news items taken from the press or technical inspection data); forwarded actions.		

continuation

TYPE	FREQUENCY	OBJECTIVE	ADOPTION OF MEASURES
Daily Hydrometeorological Bulletin	Daily	Present the current and expected situation of the basin	*
	Content: map/figure/scheme indicating the region/basin, cities, telemetry stations, rivers, and reservoirs; graphs and/or tables illustrating the hydrometeorological aspects (precipitation, level, and flow) indicating, when possible, the reference values (levels of care, extravasation, etc.); and short-term hydrometeorological forecasting, based on forecast or trend models.		
Monthly Hydrometeorological Bulletin	Monthly	Present the current and expected situation of the basin	*
	Content: map/figure/scheme indicating the region/basin, cities, telemetry stations, rivers, and reservoirs; graphs and/or tables illustrating the hydrometeorological aspects (precipitation, level, and flow) indicating, when possible, the reference values (levels of care, extravasation, etc.); and medium/long-term hydrometeorological prediction or forecast; summary of notices issued.		
Monthly Operation Report of the Hydrometeorological Network	Monthly	Present monitoring network status	*
	Content: map/figure/scheme indicating the region/basin, cities, telemetry stations, rivers, and reservoirs; total number of telemetric stations installed and operational status; spreadsheet indicating the percentage of data transmitted per station each day.		
Operating inventory of the Situation Room	Yearly	Consolidate operational information of stations and reservoirs	*
	Content: report subdivided by hydrographic region; map/figure/scheme indicating the region, cities, telemetry stations, rivers and reservoirs; flows and levels of attention, alert and emergency for each city; hydrological characteristics of the rivers (flows of recurrence interval scenarios at points of interest, flood points, etc.); reservoir characteristics (storage capacity, quota x area x volume, hydraulic structures, regularization curves, etc.); and reservoir operating rules (restriction levels and flows, guide curves, risk aversion curves, etc.).		
Ten-year history of critical events	Decennial	Consolidate history of critical events	*
	Contenido: consolidation of all extraordinary reports issued on critical events.		

* The measures to be adopted will vary and will depend on the protocols that are developed with the MC.

2.7. Strategic partners

2.7.1. IRD - French National Research Institute for Sustainable Development

A Memorandum of Understanding was signed in September 2020 aiming to improve collaboration and exchange of information in activities related to health; climate change; indigenous peoples and local communities; biodiversity and ecosystems; and sustainable development. A Working Group for Information Systems (ARO-HYBAM) was formed.

2.7.2. GBIF - World Biodiversity Information Facility

A Memorandum of Understanding was signed, in October 2021, to contribute to the general purpose of GBIF and some of its goals through i) articulating and coordinating with all its Member Countries, participating actively within GBIF in accordance with its role as a participating organization, and as a node, especially with Member Countries that are not part of GBIF (i.e., Guyana, Suriname, Venezuela, and Bolivia); ii) ensure adequate technological conditions for the exchange of information from ARO's biodiversity databases; iii) provide access to the CITES and biodiversity module reports produced by the ARO analysis tools; and iv) provide access to the tools and/or protocols developed by ARO for the standardization and visualization of biodiversity databases built with different standards; actively participate in the implementation of the GBIF Work Program, and establish a Participating Node.

2.7.3. Oi Agua – International Water Organization

A Memorandum of Understanding was signed in February 2021 to strengthen the integrated management of Water Resources in the Amazon Region through the sharing of information, knowledge, experience, and good practices. The BIO-PLATEAUX project is co-financed by the European Union through the Amazon Interregional Cooperation Program. Its objective is to share data, information, and experiences on water and biodiversity in aquatic environments between French Guiana, Brazil, and Suriname. A Working Group for Information Systems (ARO-BIO-PLATEAUX) was formed.

3
Results

Indigenous community. Puerto Ayacucho, Venezuela.
Photo: ©iStock

Indigenous housing in the Amazon.
Photo: ©iStock

3. Results

3.1. Constitution of the ARO Team

After a public hiring process, Mr. Isaac Ocampo was selected as ARO's Data Science Specialist. Also, through an internal memorandum, the ACTO Permanent Secretariat appointed Mr. Mauro Ruffino to be coordinator of all ARO activities within his functions as General Coordinator of the Bioamazon Project.

In September, Mr. Lelis Saraiva was hired as support staff for the manual and automated upload of ARO information.

In November, the ARO team was completed with the hiring of Mr. Stephano Flores as a consultant for the management and maintenance of the graphic content of the ARO and its website.

The current composition of the ARO team is detailed below:

- **Mauro Luis Ruffino**
  General Coordinator of the Bioamazon Project and the ARO.
- **Isaac Ocampo**
  Administrative Consultant and Specialist in Data Sciences of ARO.
- **Lelis Saravia**
  Support the loading of manual and automated information of the ARO.
- **Stephano Flores**
  Consultant for the management and maintenance of graphic content of ARO and its Website.
- **Vicente Guadalupe**
  Technical Specialist for the Bioamazon Project and the ARO.
- **Denise Oliveira**
  Communication Advisor for the Bioamazon Project and the ARO.
- **Diego Silva**
  Senior Meteorologist of the Amazonas Project, responsible for the ARO Water Resources Situation Room.

3.2. Inauguration of the ARO and its Facilities

In compliance with the guidelines set in the Amazon Cooperation Treaty signed by the eight Amazonian countries, the Amazon Cooperation Treaty Organization inaugurated, on November 10, 2021, the Amazon Regional Observatory, as a center of reference for regional information of the Amazon Region on Biodiversity, Species Listed in the CITES Convention, Forests, Water Resources, and Indigenous Peoples.

The Observatory was installed at ACTO headquarters to promote access to information and data generated and shared by the eight ACTO Member Countries – Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela. Scientific institutions of the Member Countries share data that is fed into the ARO.

The ARO promotes the flow and exchange of information among institutions, government authorities, the scientific and academic community, and civil society of the Amazon Countries. The information will be presented through reports, dynamic panels, and geographic viewers. In addition, data and thematic indicators of the Amazon Region are offered. The ARO will be in permanent evolution according to the needs of the countries and the provisions of the ASCA. The Biodiversity and CITES modules are complete, and the Water Resources and Forests modules are being validated in terms of functionality and databases. In 2022, the development of the Indigenous Peoples and Climate Change module will begin.

The ARO's main objectives are to facilitate and promote access to information generated by the Member Countries through a virtual space for the storage, exchange and socialization of information on the Amazon Region; prepare and disseminate regional reports and documents on priority thematic content; establish an information flow mechanism to carry out a process of disclosure, visibility and standardization of the information that will be available at the regional level; and monitor thematic indicators and produce predictive models.

The resources for the development and installation of the ARO implemented by ACTO through the Bioamazon Project come from the Ministry of Economic Cooperation and Development (BMZ) of the Federal Republic of Germany through the KfW – Development Bank. Between 2019 and 2021, nearly 1 million dollars were invested in the Observatory for infrastructure works, purchase of equipment and development of the platform. The Brazilian Cooperation Agency (ABC) and the National Water and Basic Sanitation Agency (ANA) will support ARO with investments of around 180 thousand dollars.

Figure 36. Secretary General of ACTO, Alexandra Moreira, and the Ambassador of Germany, Heiko Thoms, during the inauguration of the ARO

Figure 37. Secretary General of ACTO, Alexandra Moreira, speaks at the inauguration of the Amazon Regional Observatory, held at ACTO headquarters

Figure 38. The director of KfW in Brazil, Martin Schröder, speaks at the launching of the ARO

The Launching Ceremony

A face-to-face event was held, with a live broadcast on ACTO's social media channels. It was attended by the Secretary General of ACTO, Ms. Alexandra Moreira; the German Ambassador in Brazil, Mr. Heiko Thoms; the Director of KfW in Brazil, Mr. Martin Schröder; in addition to authorities of the Diplomatic Corps based in Brasilia, among which are the ambassadors of the ACTO countries.

Alexandra Moreira explained that the Amazon Regional Observatory is a desire of the countries since the conception of the Amazon Cooperation Treaty. "In 1978, the Member Countries understood the urgency and the need to sustainably manage the region's natural resources through the monitoring and control of wild flora and fauna species, the exchange of information, good practices, and the establishment of joint management and cooperation systems at the various governmental, academic, scientific levels, and of society in general", she highlighted.

The German ambassador, Heiko Thoms, in his speech, highlighted the importance of the Amazon Regional Observatory for the ACTO and its potential to contribute to the conservation of Amazon forests and species through integrated and sustainable management. "Cooperative relations with ACTO began in 2002 aimed at supporting the implementation

of CITES, and today's inauguration of the Observatory should be seen as an important contribution to the sustainable development of the Amazon," stated the Ambassador Heiko Thoms, during the inauguration of the ARO.

Martin Schröder, director of KfW in Brazil, said that the Amazon Regional Observatory increases transparency in terms of knowledge management related to the Amazon. He also highlighted the importance of ACTO in the articulation of the various issues within the countries of the region. "We appreciate the technical dialogue with ACTO towards promoting the conservation and sustainable use of biodiversity," he said.

The Secretary General of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), Ivonne Higuero, and the Executive Secretary of GBIF (Global Biodiversity Information Facility), Joe Miller, sent their messages through videos congratulating the inauguration of the Observatory. Recently, ACTO became part of the GBIF as an associated institution.

Ivonne Higuero commented that "the center will serve for the exchange of information among institutions, government authorities, scientists, academics, and civil society from the Amazonian countries, and in this way it will support our common work. We also very much welcome that CITES is one of the thematic modules of the Observatory."

GBIF Executive Secretary Joe Miller highlighted that the fund currently has 41 voting participants and 20 partner countries, in addition to ACTO as associated body. "GBIF looks forward to working with the Amazon Cooperation Treaty Organization to increase the amount of valuable data that is available to the Amazon Regional Observatory, which will inform evidence-based decision-making," he said.

Thematic examples were also presented. The Acting Deputy Superintendent of Operations and Critical Events of the National Water Agency (ANA) of Brazil, Alessandra Daibert Couri, presented the Water Resources Situation Room and the Regional Water Quality Monitoring Network (RR-MCA). On the other hand, the Deputy General Coordinator of Earth Sciences of the National Institute for Space Research (INPE), Luiz Eduardo Oliveira e Cruz de Aragão, presented INPE's monitoring systems.

CLIMATE CHANGE
BIODIVERSITY
FORESTS
WATER RESOURCES
INDIGENOUS PEOPLES
CITES

4
Challenges

Giant Otter (*Pteronura Braziliensis*)
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Negro River, Brazil.
Photo: ©iStock

4. Challenges

4.1. Sustainability Strategy of the Amazon Regional Observatory

The active participation of the institutions and political actors of the Member Countries is required for the functioning, operationality, growth and sustainability of the ARO. In this sense, a Strategic Plan is being built to direct its sustainability. However, the establishment and consolidation of some processes or articulations at the political level with the MC are necessary.

The observatory should become, in the medium term, a support tool for unilateral and bilateral political decision-making and should also support joint actions at the basin level. It is extremely important to establish participation mechanisms or protocols to promote the permanent support of governments. In all the MC, the Amazonian agenda should be strengthened, which should include everything from political decisions to the articulation of investments and economic activities, scientific collaborations, and academic exchange.

The ARO's sustainability encompasses the following aspects: financial, technological infrastructure, operability, and technical (thematic). It is important to emphasize how complex it will be to address the sustainability of the ARO without the articulated and synergistic political support of the Member Countries.

4.1.1 Financial Sustainability

It comprises a set of actions and/or strategies that guarantee the funds for ARO's operation, in the short, medium, and long term. It should be noted that the current size of the ARO, added to its operational needs and potential, requires the search for or establishment of various financing mechanisms. In the context of this document are considered:

- **Search for funds from cooperation projects:** Currently, this mechanism is being used by ACTO resulting in the implementation of the ARO and its main modules, being the main sources of financing KfW and the GEF. It is recommended that the ACTO continue to establish mechanisms for the constant search for funds.

The projects can be executed or not by ACTO, as long as they include financing and activities that are relevant to the operation of the ARO.

- **Financial Contribution from Member Countries:** This is a mechanism with relative potential for ARO's sustainability, and could be established based on the political support of the MC. The contribution of the countries could be monetary or non-monetary (for example, an institution in a country could assume the hosting rental costs by hosting the ARO on its servers, and another institution could provide its parallel computing equipment for data processing). It is expected to seek and analyze possibilities taking advantage of the strengths of the MC institutions.

Likewise, the minimum cost of operation and functioning of the ARO must be defined, in addition to establishing a contingency strategy, with the collaboration of the MC, in case ACTO does not have the minimum economic capacities to operate it.

4.1.2. Technological Sustainability

It includes the uninterrupted availability of the group of technological capabilities and human resources for the operation of the Amazon Regional Observatory, such as the following aspects:

- **Hosting:** It includes the analysis and establishment of technological capabilities for the proper functioning of ARO. The parameters or computational resources to consider are:
  - Number of Servers
  - Operating systems
  - Processors
  - Memory Size
  - Disk Storage size
  - Connectivity (data transfer)

  Currently four servers have been defined for ARO (web server, database server, map server, file server); however, according to the demand for new modules and functionalities, it is likely that the needs will increase. It is necessary to periodically review and analyze the demand for the use of computational resources, which are to be necessarily linked to the availability of funds and capacities.

  On the other hand, it should not be ruled out that the hosting of the ARO could be done in some of the MC institutions.

- **Software web:** cSet of applications that includes the web computing platform of the ARO, designed in a modular way to increase or grow over time. ARO's computing infrastructure (servers and other capabilities) should respond to and support the characteristics, scope, and limitations of web software.

  Adequate documentation and user handbooks should be available to

allow proper management and growth in the medium term. Likewise, it is necessary that ACTO have backup copies of the source code and files.

- **Specialized software: :** It is a set of applications that are not necessarily part of the ARO web platform, but that are required for processing, analysis, simulations, and modeling. These tools are associated with research and reporting activities using ARO data and reports. They are used by various specialized user groups.

- **Training for the use of specialized tools and software:** It includes training activities for the management of ARO tools, as well as the use of specialized software for data processing and analysis. The technological sustainability of the ARO depends, in part, on the managers and users of the different computer tools appropriately.

- **Domains:** It includes the payment to the service of the names that ARO uses to be accessed from the web. Currently, ARO has 12 domain names for a period of 5 years (the costs of each domain are relatively minimal, near 30 dollars per year).

- **Support for data and information management:** It refers to the support for the set of data types and contents available or handled in the ARO. Currently the main types of data are: Tabular databases, spatial information, documentary information and indicator information, which are formed, mainly, from tabular or documentary information.

These types of data are structured according to some thematic standards such as:

- Darwin Core and Plinian Core for biodiversity information management.
- ISO19115 for managing spatial information.
- Dublin core for managing documentary information, images, videos, etc.

It is relevant that, in the event that there is a need for a new type of information, the state of the art should be analyzed or reviewed, the proposal submitted to the ACTO, and then approved and implemented. For the sustainability of the ARO it is important that the system be prepared to adapt to various types and standards of data; otherwise, it will not be able to support future content types.

- **Operational sustainability:** It is the set of actions and strategies to ensure the operation and fulfillment of the goals and objectives defined for the ARO. This depends completely on the financial resources, collaborations of the MC institutions and the basic human resources of the ARO.

It is necessary to analyze three areas:

- **Institutional scope:**

It includes the set of actions, directions, fulfillment of goals, actions, agreements, or joint decisions on the operation of the ARO, at the level of

the ACTO, with the institutions of the Member Countries. Although it is intended to develop a Strategic Action Plan for the sustainability of ARO, which will be based on the interests and guidelines of the MC, it is recommended a permanent institutional cohesion to operationalize the ARO.

Considering that ARO is not only a technological instrument, but also responds to the interests and agreements of the MC's institutions, it should be nurtured by them and become an essential and useful instrument for managing issues related to the Amazon.

There is already a multi-institutional technical committee of the ARO that still needs to be consolidated and articulated in the context of the operation, collaboration, use and exploitation of the ARO. Likewise, ACTO should strengthen its relations and interactions with the Permanent National Commissions, as well as with the university networks of the Member Countries (UNAMAZ and other networks). It will be a challenge for ACTO to operationalize the ARO without the appropriate cohesion among its technical committee, the permanent national commissions, and the university networks, so it is important to consolidate, strengthen and operationalize them.

- **Technical-thematic scope:**

  Corresponds to the actions or works related to the use, exploitation of data, and scientific research based on the data, maps, or documents available in ARO.

As ARO is a computer tool that collects data, which in turn facilitates access to various types of content and at the same time generates reports with certain levels of complexity, it is intended that researchers, teachers and students use the content for new research or for shortening of costs and time in various Amazonian studies.

It is important to promote the thematic groups with researchers from the MC. These would be related to the Modules on Biodiversity, CITES, Forests, Water Resources, Indigenous Peoples, etc. At the same time, for each thematic line, more than one specialized thematic group will probably be promoted, considering the relevance of the problem, the number of researchers and interested parties, and possibly, considering the political, environmental, or social situation.

- **Technological scope:**

  Comprises the activities or actions of the base team for the operation of the ARO. This team deploys actions for the continuous and correct functioning of the observatory, they interact and guide users, as well as they implement, provide feedback, and expand the services offered by ARO.

  The operation of the ARO requires:

  - A Manager.
  - An Administrator for databases and contents.
  - Support and monitoring staff for proper operation.

- A communication expert in charge of content analysis and information dissemination.
- For each module or thematic group, a thematic specialist is needed.

Should the increase of content and services be required, the following will be necessary:

- Personnel in charge of digitizing, analyzing, and uploading information.
- Geographic information expert.
- Graphic design expert.
- Video production expert.

4.2. Incorporation of the ARO in the structure of the PS/ACTO

The incorporation of the ARO in ACTO's organizational structure is foreseen in the Conceptual Design of the Information and Knowledge Management System (IKMS) and the Amazon Regional Observatory, SIGC/ARO. Based on the mandates of the Amazon Cooperation Treaty and the agreements from the multiple regional meetings held with authorities and technical groups, the Permanent Secretariat of the ACTO has the mandate to implement ARO as manager of the IKMS. ARO as a permanent forum for the exchange of information, will bring together institutions and authorities related to the subject, with emphasis on the study of Amazonian biodiversity.

The ARO should function in an organized manner to respond to the demands of the Member Countries and the different interest groups (users), therefore it must follow a management model. The definition of the (organic) management model for IKMS/ARO will give it a flexible structure in which the different interest groups will be the architects of change and can quickly adapt to the adverse conditions that are a characteristic of the Amazon Region, due to the constant fluctuations in environmental, political, cultural, and economic factors. This management model is expected to be one of the results of the consultancy for the Strategic and Action Plan, which will be hired in 2022.

According to the conceptual design of the management model that is defined for the IKMS/ARO, it must propose an organic decentralized structure for the articulation with the different public and private actors in the generation, dissemination, and communication of Amazonian information, consistent with the priorities and situation of the region. In this way, three levels can be determined as part of the systemic structure: Regional Level, Central Level and Work Teams.

The first level - **Regional**, refers to the management level of the ACTO authorities; the second level – **Central**, corresponds to the Technical Support Unit

(UTA) where the strategic and technical guidelines for knowledge management in the Amazon Region are defined; and the third level - **Work teams**, includes the focal points of the eight Member Countries, along with their work teams made up of political and technical focal points, appointed in each country. Likewise, as the management model (being selected) is aligned to the administrative cycle (which performs the planning, integration, direction, and control), the fulfillment of its administrative cycle or process, along with the definition of instruments and tools will enable the management of the services/products identified by the organization. Through a planning process, the strategic and operational axes and objectives are identified, as well as the institutional, functional, and operational strategies to guide the Organization's achievement of its higher purpose and will also enable the definition of the strategic management model. The IKMS strategic management model, according to the typology of levels mentioned above, would have the following strategic alignment:

It is important to note that the level of operational strategies is shared by the central level and the work teams, under the powers of each of these. In this way, the central level coordinates and executes the processes and projects corresponding to the operational level, ensuring the achievement of short- and medium-term objectives.

The structure required to guarantee the institutionalization of the model and its sustainability, based on the ACTO organization chart, is a mixed structure (functional – matrix); it is functional since it responds to process management; and matrix, for it reflects the relationships and dependence of processes and activities between the ACTO support units.

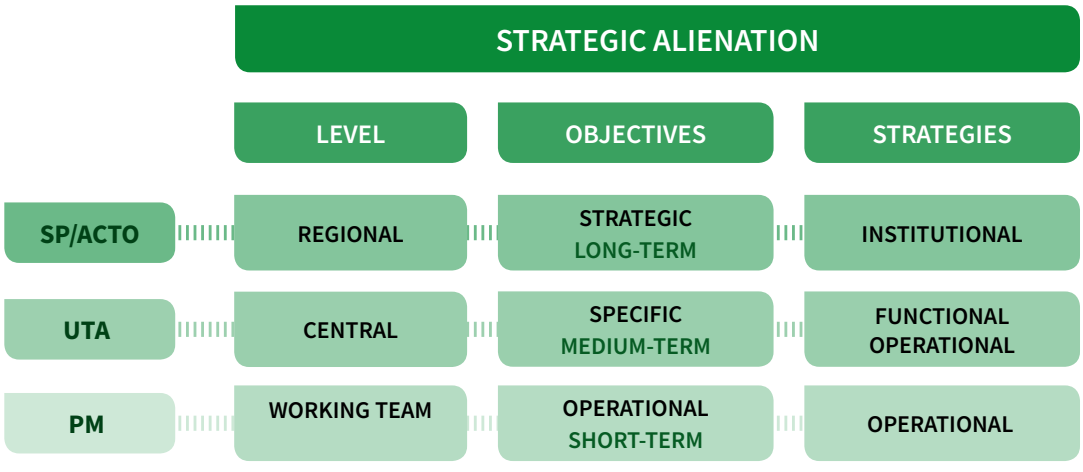


Figure 39 - ARO management model and systemic structure levels

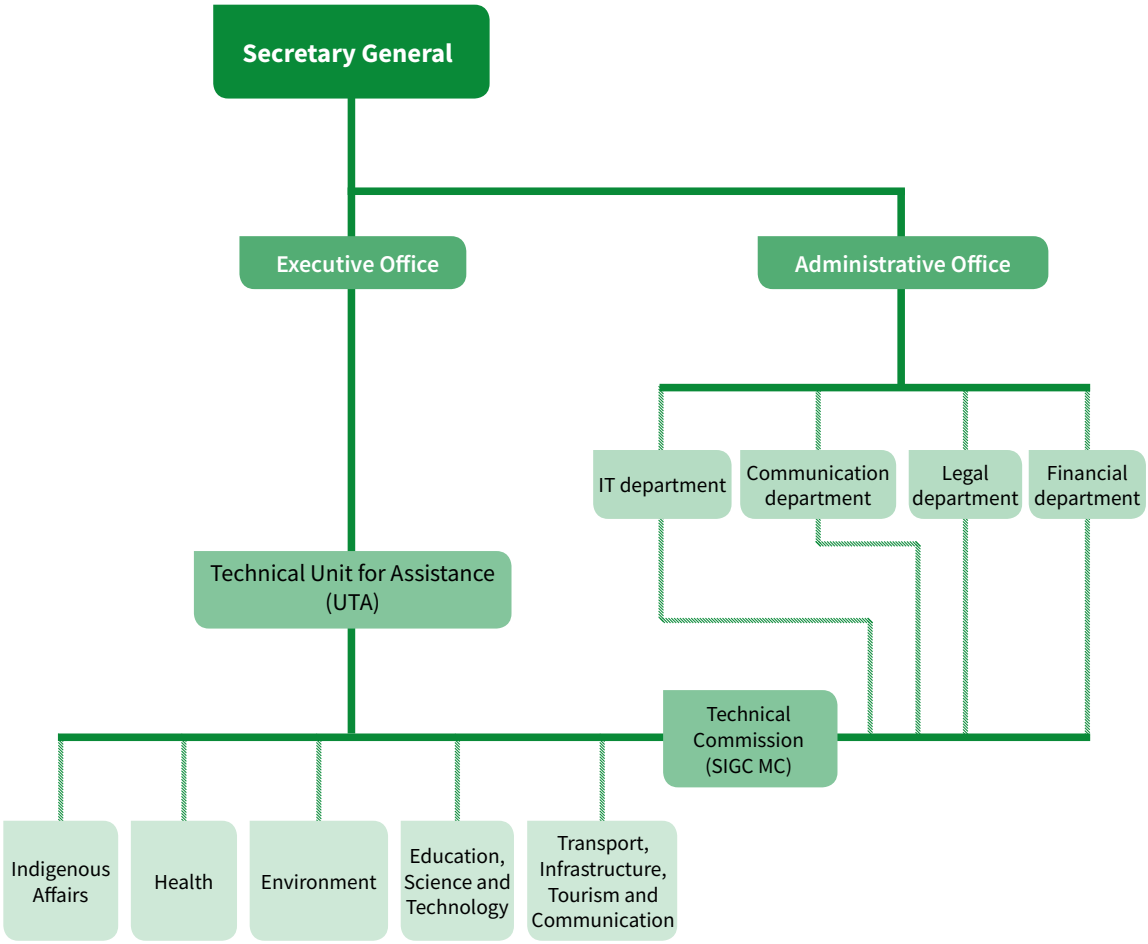


Figure 40 - Organization chart of the PS/ACTO that includes the Amazon Regional Observatory

In the organization chart presented below, the IKMS – ARO functions will be executed by its technical team, which will report to the Technical Support Unit and will have a direct relationship with the support units, reporting to the Administrative Directorate.

Under this organizational chart proposal, divided by functions, the organization has the freedom to determine the required positions, internal rotation of personnel between functions in accordance with the installed capacity. Thus, it provides the dynamism required by the region's demands.

The profiles required for the first stage of implementation and operation of IKMS - ARO, are shown below:
Profiles required for the implementation and operation of the IKMS/ARO:

- Expert in knowledge management (1)
- Communicator (1)
- Media educators (1)
- Data Science Analyst (>=1)

- Software Development Specialists - GIS - BI (>=2)
- Theme expert (>=1 per Theme)
- Portal Administration Specialist (1)
- Web Designer (1)

According to this table, IKMS/ARO is currently operating with more than 50% of the required profiles. The thematic specialist profile should be incorporated into the first stage. This could be identified and appointed by the MC in a selective process based exclusively on their training, experience, and professional career. It should be noted that changes, and the increase or reduction of the professional profiles, will be subject to management dynamics and others that may be introduced in the institutional management model and the IKMS/ARO. On the other hand, these profiles respond to the minimum installed capacity required for process management, the effective achievement of services/products, and compliance with the quality criteria expected by the different stakeholders of the Amazon Region, within the proposed management model.

5
Goals for 2022

Açaí palm (*Euterpe oleracea*)
Photo: ©iStock

Açaí palm (*Euterpe oleracea*)
Photo: ©iStock

5. Goals for 2022

According to the implementation phases of the ARO, in 2022 its 3rd phase will be executed improving the platform. The Indigenous Peoples and Climate Change Modules will be developed, as well as the ACTO Information and Knowledge Management System, the Learning Network, and the Amazonian Research Centers Network (RedCIA), and MSMEs (micro, small and medium enterprises) with sustainable production of species of wild fauna and flora within the scope of CITES and non-timber forest products (NTFP).

5.1. Platform Improvements

At present, ARO shows significant progress in the implementation of phases 1 and 2, especially in relation to the development and operation of the CITES species and Biodiversity thematic modules. Likewise, the development of the Intranet has progressed, as well as in the collection and loading of a relevant amount of information and content in different formats, which can be viewed through the geobios of the Geoamazon integrating module, and also through reports in interactive boards (dashboards) that allow to visualize data and indicators of the prioritized themes of the ARO.

However, it is necessary to consolidate the achievements in the implementation of phases 1 and 2, which will allow an agile development of phase 3, and thus, finalize the implementation of all phases, for the sake of the full operation of the Observatory. Accordingly, the PS/ACTO will hire during 2022, through the Bioamazon Project, the consulting services of a company specialized in computer development of web platforms with experience in the area of natural resources, biodiversity conservation, water resources, etc., within the Amazon Region. Among the specific objectives of the consultancy are:

- Conclude the Intranet, including the IT aspects of integration of the thematic modules and interoperability processes;
- Update ARO's information content;

- Carry out functional improvements to the Geoamazon module and to the Map Catalog;
- Build a bulletin sub-module, and improve the functionality of the Indicators and Country Window sub-modules;
- Feed the databases of the different modules of the ARO with new information and content, through the different available means;
- Socialize and validate the new developments, adjustments and changes made in the different components of the ARO platform.

5.2. Developing New Thematic Modules

5.2.1. Indigenous Peoples Module

ACTO signed an agreement with the Inter-American Development Bank (IDB), in January 2021, to implement "Contingency plans for health protection of highly vulnerable Indigenous Peoples and in Initial Contact", with a focus on COVID-19. The regions foreseen for the activities are located in the triple borders among the ACTO Member Countries: Ecuador/Peru, Napo-Tigre; Peru/Brazil, Loreto/Javari; Brazil/Colombia, Loreto, Putumayo; Brazil/Guyana/Suriname; Bolivia/Peru, Madidi-Bauaja Sonene Park; Brazil/Peru, Mamoadate-Madre de Dios Indigenous Land.

One of the components of the Project aims to **strengthen the articulated response capacity of the health services,** nationally and locally with cultural relevance, in the face of the emergency and post-emergency of COVID-19 in Indigenous Territories in border regions, and existing health coordination mechanisms in border regions; and includes the development and implementation of a dashboard with harmonized data on indigenous health at the local level.

In this sense, the consultancy that will be hired in 2022 will design, develop, and validate the computer implementation of the Indigenous Peoples Module of the observatory, with an emphasis on Health-Covid19. Among the specific objectives of the consultancy are:

- Analyze, design, and arrange with ACTO the services and reports of the Indigenous Peoples Module, with an emphasis on Health-Covid19.
- Compile and review the information resources collected in the "Diagnoses about the health situation and how to face COVID-19 in Indigenous Peoples in Amazonian border regions".
- Develop integration strategy with ARO, based on existing tools, functionalities, and content.
- Analyze ways of adapting the ARO's Intranet to guarantee the loading of interoperable, tabular, cartographic, and documentary information.
- Develop software tools for viewing

reports, content, and interoperability with other sources.

- Compile and upload relevant data to the databases of the Indigenous Peoples Module, with an emphasis on Health-Covid19.
- Validate reports and information services with ACTO specialists.

5.2.2. Climate Change Module

This module supplements the lack of a climate change information repository to help public management through a technological and information tool for the Amazon Region, based on the Amazon Cooperation Treaty priorities and the ASCA Agenda.

Climate Change is a crosscutting theme in the different lines of work of the ACTO. To adequately respond to the climate crisis, climate mitigation through the reduction of greenhouse gas emissions, resilience, and climate adaptation, are a priority for the Amazonian countries and the ACTO. This proposal is aimed at promoting the different actions taken by the region to respond to the challenges of climate change. The sustainable management of the Amazon Forest and biological diversity are included, taking into account ecosystem services/functions to promote the integration of synergistic solutions based on the potential of the Amazon.

Thus, during 2022, the PS/ACTO will make every effort to hire the creation of the Climate Change Module that will be based on technical and official information from the MC and; it will strengthen ARO's Forests and Biodiversity modules, to generate operational tools oriented to assist the public management of the eight Member Countries on a database for an information system of these countries. The system will serve as a substantial basis for the development of the "Resilient Amazon Initiative," and for the generation of financial facilities for its implementation.

5.2.3. IKMS Module

The ToR for the development of the Information and Knowledge Management System will be prepared during 2022. The IKMS has been conceptualized as an electronic platform for information, collaboration, learning and exchange services, applied in the creation of integral solutions for the management of Amazonian knowledge. It will allow ACTO to increase the flow of information among institutions and intergovernmental authorities of the MC linked to the study of the Amazon, thus becoming a reference center for regional scientific, technological, and sociocultural diversity information in the Amazon. Likewise, with this tool ACTO will cover four the countries dimensions of action: political, diplomatic, strategic, and technical (SP/OTCA, 2020).

Coordination meetings will be held on the functionalities and services that the IKMS will offer to consolidate the terms of reference to start its implementation.

5.2.4. Learning Network and RedCIA Module

Since 2013, there is a mandate from the MC to support the implementation of the ARO and the creation of the Amazonian Research Centers Network (RedCIA). Currently, ARO implementation has progressed through in actions developed by the PS/OTCA.

Between 2016 and 2017, a Steering Committee of ARO and RedCIA was formed to guide its implementation, and regional meetings with the MC were organized by the PS/ACTO to advance with the implementing regulations, procedures, and decisions. At that time, the PS/ACTO decided to carry out the first phase of the Observatory through other projects to initiate and/or support the ARO or the projects information systems.

The first meeting of the Amazon Regional Observatory and the RedCIA, held from November 21 to 23, 2017 in Iquitos, Peru, had the following objectives: (i) define management and sustainability mechanisms for the ARO and RedCIA, (ii) prepare a draft agenda to implement research, thematic areas, strategic axes, and actions, (iii) identify actions to strengthen human talent for the Amazon Region.

The countries have recognized the need to accelerate the implementation processes of the RedCIA, especially now that the ARO is already fully operational. For this reason, the PS/ACTO and the Steering Committee are expected to increase efforts towards holding regular meetings at least twice a year.

The challenge is to resume the RedCIA process broadly. The RedCIA was created following the indications of the MC's research institutions. However, there are many more public and private research institutions that are conducting research in the Amazon. In this sense, it is necessary to map these institutions and their respective researchers by thematic area to identify existing potentials and establish a new RedCIA, which can collaborate with ARO using its database for analysis and generation of products. The PS/ACTO understands that the ARO database can serve as subsidies for the development of Amazonian studies, at the level of master's and PhD thesis, and also respond to the information demands of the MC.

5.2.5. MSMEs Modules

It is proposed that this module consolidate the progress made within the framework of Component 3 of the Bioamazon Project, through the establishment of a Regional Window for micro, small and medium-sized enterprises (MSMEs) of Amazonian products, for which it is expected to develop the following activities:

- The virtual regional window, which consists of a virtual platform that includes:

  i) a Catalog of Amazonian products of CITES species, as a virtual commercial window of Amazonian products with export potential, to facilitate the promotion and visibility of the products of the MSMEs of the Amazon Region;

  ii) identification of existing and potential markets for Amazonian products with updated and automatic online information on the historical behavior of these markets and product prices; and

  iii) an articulation mechanism for producers and buyers of Amazonian products linked to CITES species (links with local, national, regional, and global fairs and platforms). The regional window will contemplate the exhaustive and complete inclusion of relevant information and data, ensuring a mechanism for its updating and management.

- Virtual seminars. At least three virtual conferences for the promotion of Amazonian products (during 2022), to position the initiative and with the participation of the most representative entities at the national and regional levels, and in coordination with CITES and other regional organizations.

- Preparations of guidelines or the structuring of a Regional MSME Forum. A study will be carried out to identify options for the establishment of a Regional MSME Forum for the Amazon Region. The experience of the SMEs Forum of the Italo-Latin American International Organization (IILA), and others from the global arena, will be taken into account.

5.3. Integration of REPIK

Within the framework of the ITTO/CBD/ACTO Project and the activities of phase 3 called “Consolidation Phase”, the development of a Regional Platform of Information Exchange and Knowledge (REPIK)[8] started, focused on the management and exchange of information, mainly, on the forest issue; however, in

[8] One of the products of the ITTO/CBD/ACTO project was the creation of an IT platform focused on forestry: Regional Platform of Information Exchange and Knowledge (REPIK) for the strengthening of sustainable forest management and the conservation of forest biodiversity.

internal technical dialogues it was decided to broaden its focus to other topics and projects of the PS/ACTO[9].

Thus, the REPIK improvement and its integration into the ARO are envisaged, and for this, it is expected to carry out:

- Evaluation of the functionality, services, and tools available in the REPIK.
- Improvements to this platform, aimed at its consolidation as an Amazon regional training and knowledge exchange platform.
- Integrate REPIK to ARO

5.4. Strategic and Action Plan

Despite the substantial progress achieved in the implementation of the first and second phases of the ARO, it has not yet been possible to start with concrete actions for the implementation of the RedCIA, which is a complementary initiative to the ARO. RedCIA's objective is to strengthen national scientific and technical capacity around themes and lines of research and action that affect the Amazon Basin, through interconnection among the research centers of the eight ACTO Member Countries and the government institutions responsible for the theme at the national level.

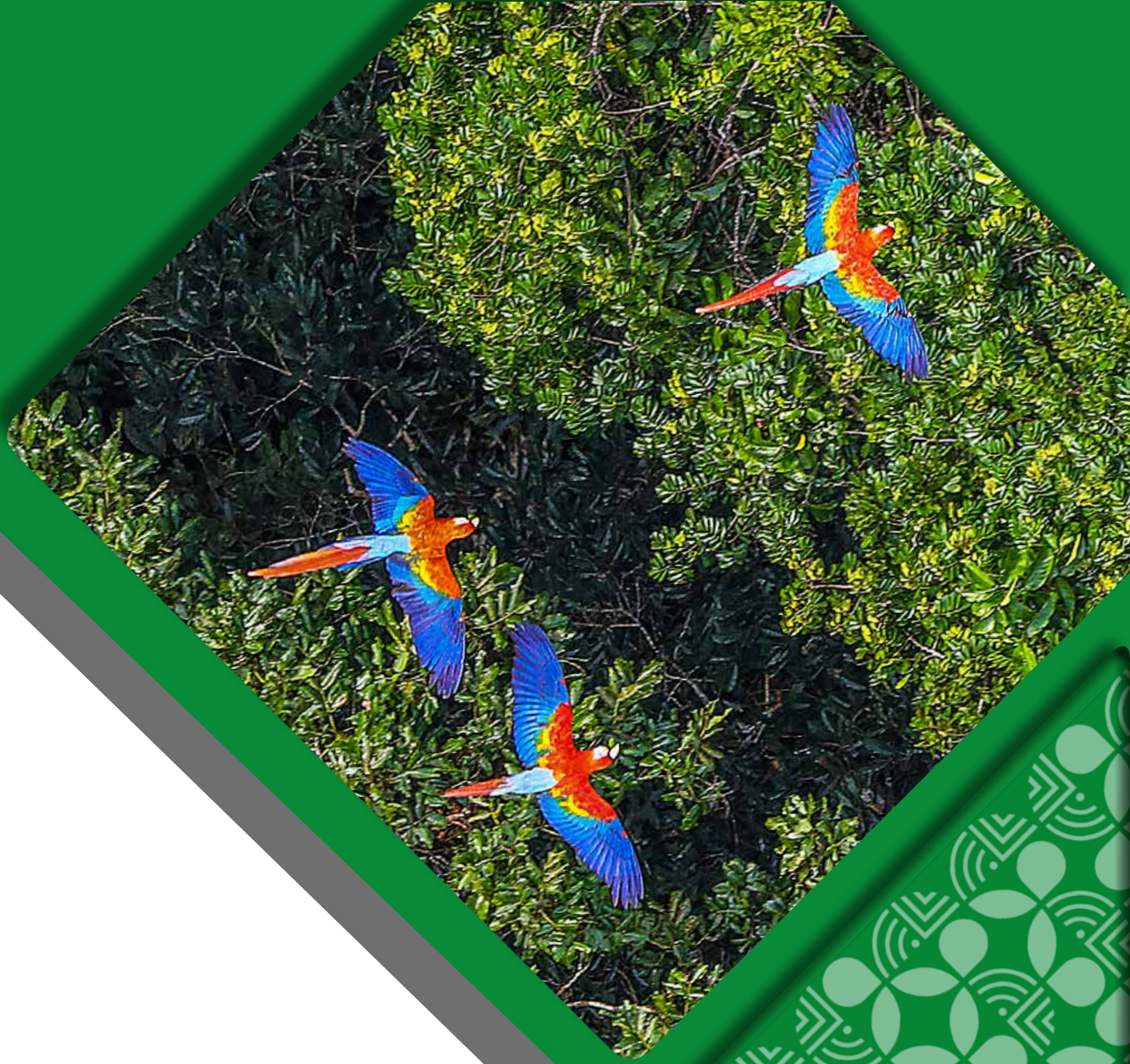
The PS/ACTO is aware that, on the one hand, it is necessary to have a guiding document for the work of the ARO after the completion of the Bioamazon Project, defining the actions to be implemented at a strategic level to keep the ARO functioning, in coordination with the RedCIA; and considering the objectives of creating the ARO, the national circumstances of the MC in relation to the availability and capacities to generate information, as well as the essential technical, technological and financial resources for the operation of the ARO in a time horizon of five years. On the other hand, the PS/ACTO is aware of the urgency to resume the implementation of the RedCIA, since the ARO's sustainability, to a large extent, is linked to the operation of this network.

However, the sustainability of the ARO not only depends on the establishment of political-institutional agreements among the MC, but also on other aspects that will guarantee its long-term operation, such as technological, organizational, financial and communication aspects; and the interaction with the sociocultural dimension is also crucial, which is related to meeting the demands of ARO's users in different sociocultural contexts.

Therefore, the PS considered it important to hire the consulting service to prepare a Strategic Plan and Action Plan,

[9] The Coordinator of Science, Technology, and Education, the Executive and Administrative Directors of the PS/ACTO, and the Coordinator of the ITTO/CBD/ACTO project decided to broaden the objectives and scope of the REPIK forestry IT platform and include all the information of the ACTO Projects, and to become the ARO IT platform, initiating the first phase of ARO implementation.

with the participation of the eight Member Countries. The plans should include the diagnosis of all these dimensions, in addition to considering the institutions and government agencies, universities, research centers, and civil society organizations of the MC, as well as potential collaborators of the ARO and the RedCIA, who act from outside the region, developing relevant research and knowledge for the Amazon. The objective of the consultancy is to generate information inputs for decision-making to guarantee the ARO's sustainability, and resume the actions carried out by the different Working Groups for the establishment of the RedCIA, within a temporary vision of evaluation and fortnightly renewal of actions, and to consolidate the ARO as an Information Center of Reference on the Amazon.



ARO
AMAZON REGIONAL OBSERVATORY

ACTO
Amazon Cooperation Treaty Organization

BIOAMAZON PROJECT
Conservation of species threatened by unsustainable trade

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
KFW

Bolivia | Brazil | Colombia | Ecuador | Guyana | Peru | Suriname | Venezuela