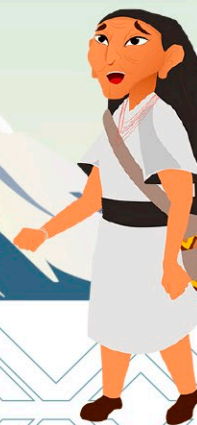


**REGIONAL MEETING  
ON EXPERIENCES AND LESSONS  
LEARNED REGARDING THE USE OF  
GEOGRAPHIC  
INFORMATION SYSTEMS  
IN THE DEFENSE  
OF INDIGENOUS  
TERRITORIES**

in South and Central America

**THEMATIC REPORT**

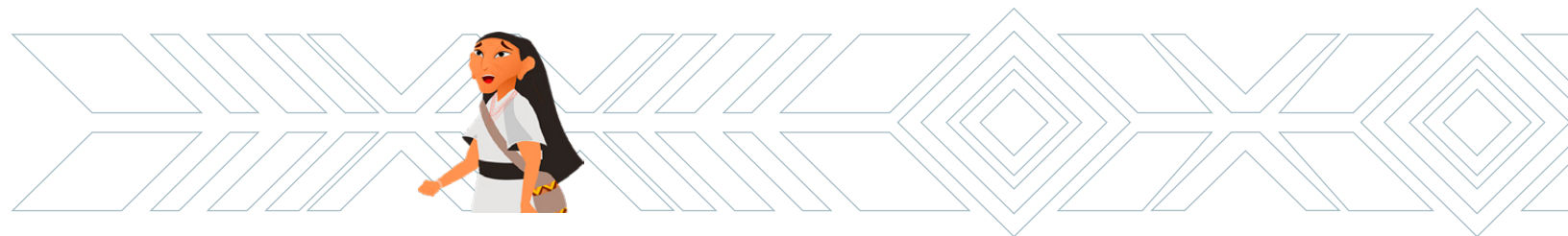




# TABLE OF CONTENTS

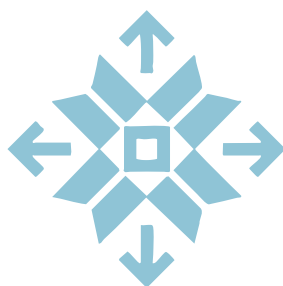
<b>INTRODUCTION</b>	<b>3</b>
<b>OVERVIEW</b>	<b>5</b>
<b>ABRIDGED AGENDA</b>	<b>6</b>
<b>GEOGRAPHIC INFORMATION SYSTEMS IN THE DEFENSE OF INDIGENOUS TERRITORIES. EXPERIENCES AND LESSONS LEARNED IN SOUTH AND CENTRAL AMERICA: SHARED CHALLENGES AND LESSONS LEARNED</b>	<b>8</b>
Geographic Information Systems (GIS) for Indigenous Territorial Defense	9
Experiences of Monitoring, Surveillance, and Autonomous Territorial Mapping	12
Training Strategies in the Use of GIS for the Defense of Territories	18
Experiences in Supporting Efforts for Self-identification and Territorial Mapping	21
Governance and Sovereignty of Indigenous Data	24
<b>AUTONOMOUS SESSION</b>	<b>34</b>
<b>CONCLUSIONS</b>	<b>38</b>





## INTRODUCTION

This document presents a summary of the main discussions, reflections, findings, challenges, and agreements arising from the meeting “Geographic Information Systems in the Defense of Indigenous Territories. Experiences and Lessons Learned in South and Central America,” held in Bogota from September 16 to 19, 2025, at the Agustín Codazzi Geographic Institute. The event, organized by the National Commission on Indigenous Territories (CNTI), together with its Observatory on the Territorial Rights of Indigenous Peoples (ODTPI) and the CNTI’s Indigenous Geographic Information System (SIG-I) in collaboration with Agustín Codazzi Geographic Institute, brought together indigenous organizations and some of their partner organizations to share knowledge and strengthen capacities in the use of geospatial tools for territorial defense. The meeting was supported by Tenure Facility and TINTA - The Invisible Thread, among other partner organizations.



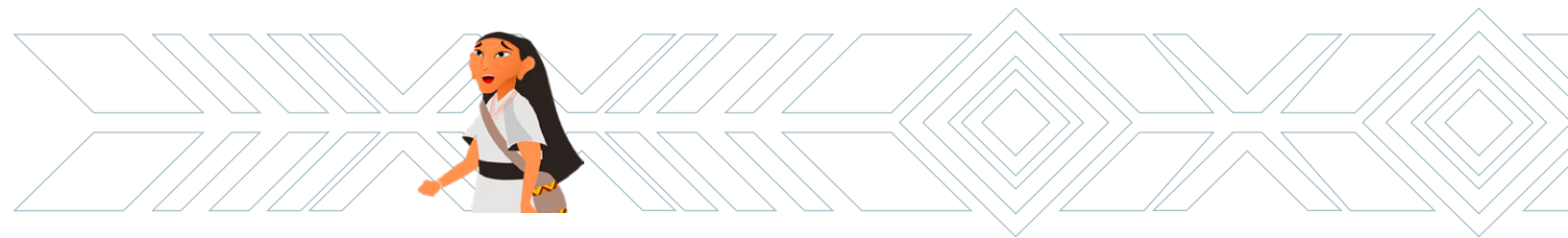
In order to guide these reflections, the meeting took place throughout four days. The first day consisted of the official opening, the presentation of guests, and an introduction to the work of the CNTI, the ODTPI, and the Indigenous Geographic Information System. Over the next two days, the agenda progressed through five discussions and three thematic panels in which the invited organizations exchanged their experiences, identifying shared challenges, opportunities, and lessons learned. The program also included presentations by CNTI’s strategic partners, such as the IGAC’s advances in native toponymy and the Amazon Conservation Team’s presentation on



the protection of PIACI in Colombia. One of the discussions that sparked the most interest was related to sovereignty and protection of data generated by monitoring systems, which was further explored on the third day with a keynote speech by Óscar Figueroa, founding member of the Global Indigenous Data Alliance (GIDA), and expanded upon in a panel discussion where several organizations showcased specific advances in this area. Finally, the meeting came to a close on the fourth day with a summarizing workshop that gathered the lessons learned and allowed for the collective construction of the meeting's political agreements.

Based on these discussions, the document outlines the key lessons learned and the challenges posed for the experiences presented in four interconnected thematic areas: 1) Geographic Information Systems (GIS) for indigenous territorial defense, focused on the experience of the host organization's GIS; 2) Experiences in autonomous territorial monitoring, surveillance, and mapping; 3) Training strategies in the use of GIS, and 4) Governance and sovereignty of indigenous data.

This document has been prepared as a training material for the political and technical teams of the participating organizations. It is intended to contribute to the internal processes of GIS consolidation, as well as to the creation and strengthening of channels for exchange, collaboration, and coordination among indigenous peoples of South and Central America concerning the development, use, and appropriation of geographic information systems as a tool for the defense, recognition, and protection of indigenous territories.



## OVERVIEW

**HOST ORGANIZATION:** National Commission on Indigenous Territories (CNTI), together with its Observatory on the Territorial Rights of Indigenous Peoples (ODTPI) and the Indigenous Geographic Information System (SIG-I), in collaboration with the Agustín Codazzi Geographic Institute

**DATE OF THE MEETING:** From September 16 to 19, 2025

**LOCATION OF THE MEETING:** Agustín Codazzi Geographic Institute and Hotel Inter, Bogota, Colombia

**FORMAT:** In-person

**INTERPRETING:** Spanish, English, and Portuguese

### **PARTICIPATING ORGANIZATIONS:**

**12 international indigenous organizations:** Confederación Nacional de Mujeres Indígenas de Bolivia (National Confederation of Indigenous Women of Bolivia, CNAMIB) - Bolivia, Coordenação das Organizações Indígenas da Amazônia Brasileira (Confederation of Indigenous Organizations of the Brazilian Amazon, COIAB) - Brazil, Confederación de Nacionalidades Indígenas de la Amazonía Ecuatoriana (Confederation of Indigenous Nationalities of the Ecuadorian Amazon, CONFENIAE) - Ecuador, Asociación de Pueblos Amerindios (Association of Amerindian Peoples, APA) - Guyana, Coordinadora Nacional de Pueblos Indígenas de Panamá (National Coordination of Indigenous Peoples of Panama, COONAPIP) - Panama, Federación Nativa del Río Madre de Dios y Afluentes (Native Federation of the Madre de Dios River and Tributaries, FENAMAD), Gobierno Territorial Autónomo de la Nación Wampís (Autonomous Territorial Government of the Wampís Nation, GTANW), Gobierno Territorial de la Nación Awajún (Territorial Government of the Awajún Nation, GTAA) - Peru, and Association of Indigenous Village Chiefs of Suriname (VIDS) - Suriname.

**3 civil society organizations:** Centro de Estudios Jurídicos e Investigación Social (Center for Legal Studies and Social Research, CEJIS) - Bolivia, Centro de Distinción (Centre for Distinction) - Guatemala, and Instituto del Bien Común (Institute for the Common Good, IBC) - Peru.

**10 national indigenous organizations:** Autoridades Tradicionales Indígenas de Colombia – Gobierno Mayor (Traditional Indigenous Authorities of Colombia – Mayor Government, GM), Confederación Indígena Tayrona (Tayrona Indigenous Confederation, CIT), Consejo Regional Indígena del Cauca (Cauca Regional Indigenous Council, CRIC), Organización Nacional de los Pueblos Indígenas de la Amazonía Colombiana (National Organization of Indigenous Peoples of Colombian Amazon, OPIAC), Organización Nacional Indígena de Colombia (National Indigenous Organization of Colombia, ONIC), and Autoridades Indígenas de Colombia (Indigenous Authorities of Colombia, AICO).



**6 partner organizations:** Agustín Codazzi Geographic Institute, Colombian Ministry of Agriculture, World Bank, Food and Agriculture Organization of the United Nations (FAO) Colombia, Tenure Facility (TF), TINTA - The Invisible Thread, Amazon Conservation Team (ACT), Rainforest US (RFUS), and Global Indigenous Data Alliance (GIDA)

## ABRIDGED AGENDA



### DAY 1: SEPTEMBER 16

- Meeting opening
- Presentation of national and international guests
- Introduction to the CNTI and ODTPI
- General panel discussion on the challenges and opportunities of Geographic Information Systems (GIS) and presentation of the Indigenous Geographic Information System
- Welcome and social gathering

### DAY 2: SEPTEMBER 17

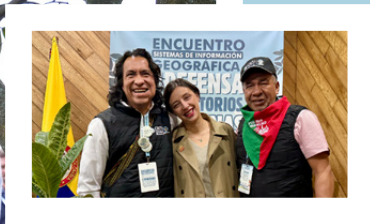
- Roundtables and panel discussions on experiences with autonomous territorial monitoring and surveillance systems, territorial monitoring and identification systems, and training strategies
- Conference on territorial defense by PIACI

### DAY 3: SEPTEMBER 18

- Lecture on indigenous data governance and CARE principles
- Discussions and roundtables on indigenous data governance and sovereignty; mapping for political advocacy; native toponymy and territorial protection; and monitoring, training, and proprietary data
- Cultural closing ceremony featuring a musical event

### DAY 4: SEPTEMBER 19

- Workshop on summary of lessons learned and identification of next steps
- Formulation of agreements and collective political positioning





# **GEOGRAPHIC INFORMATION SYSTEMS IN THE DEFENSE OF INDIGENOUS TERRITORIES. EXPERIENCES AND LESSONS LEARNED IN SOUTH AND CENTRAL AMERICA: SHARED CHALLENGES AND LESSONS LEARNED**

This section summarizes the exchange of experiences during the meeting, identifying shared lessons learned, challenges, and opportunities. It begins with a summary of the experience of the CNTI's SIG-I and its development in partnership with the IGAC, highlighting the progress and challenges discussed on the first day. Next, the experiences of the invited organizations are integrated into four thematic blocks (autonomous territorial monitoring, surveillance, and mapping systems; training strategies in geographic information technologies and systems for territorial defense; initiatives to support self-identification and territorial mapping; and indigenous data sovereignty and governance), showing how each process strengthens territorial autonomy, data management, and the organizational capacities of indigenous peoples. Each thematic section provides a summary of the cases and experiences discussed, followed by a comprehensive overview of the common lessons learned from these experiences, as well as the shared challenges and opportunities in the region in relation to strengthening geographic information systems. Overall, this structure allows us to move from specific cases to a comparative analysis that highlights shared patterns, lessons learned, and challenges.



## Geographic Information Systems (GIS) for Indigenous Territorial Defense

Based mainly on ideas shared about the CNTI's SIG-I, this section highlights the challenges, opportunities, and strategies presented regarding its use as a political tool for the defense of territorial rights and the visibility of indigenous peoples' territorial demands.

The Indigenous Geographical Information System (SIG-I) driven by CNTI and IGAC represents a political and technological milestone that took several years to materialize. The first three years were mainly spent building trust and reaching consensus on how a geographical information system specific to indigenous peoples should work. This timeframe was crucial because it allowed for the establishment of solid relationships and an understanding that IGAC's technical knowledge needed to be complemented by the ancestral and territorial knowledge of indigenous peoples. In 2014, an agreement was reached with the national government, and a crucial need was identified: Colombia lacked a system that would allow for the centralization, protection, and management of geographic information on Colombia's indigenous territories from a multi-ethnic and participatory approach. More than a repository, SIG-I is a shared governance architecture: it articulates ancestral knowledge with modern cartography, enabling the planning, legal defense, and management of ancestral territories.

Among the lessons learned from this experience, it is worth noting that the institutional trust built between IGAC and CNTI has been as important as the development of technical infrastructure. Interoperability between public entities and indigenous peoples has made it possible to validate official data, legitimize indigenous information, and recognize this information as a legit source for the Colombian government.



Decree 746 of 2024, which establishes the **Inter-institutional Coordination System for the Unification of Indigenous Territories in Colombia**, aims to provide legal certainty for existing information on indigenous collective property, consolidating the legal recognition of SIG-I and setting a regional precedent for the creation of consensual intercultural regulatory frameworks.

SIG-I is also a political instrument that promotes inter-institutional coordination between IGAC, the Ministry of Agriculture, CNTI, and indigenous organizations, and is a groundbreaking model for Latin America.

The panel discussion *Challenges and Opportunities of Geographic Information Systems for the Defense of Indigenous Territories* brought together three complementary perspectives: institutional (IGAC), indigenous (CNTI), and academic-international (GIDA). Building on the lectures on SIG-I, this panel pointed that information systems are strategic tools for territorial defense, the enforcement of rights, and the articulation between indigenous and technical knowledge.

Some of the challenges and opportunities in relation to the system are identified below, presented along with the main feedback from the audience.



- **CHALLENGES:** The challenges of SIG-I are related to technical sustainability, the protection of sensitive information, and institutional continuity. There are still information gaps regarding territories that have not been formalized or recognized by the State, which prevents full recognition of rights. In turn, the system opens up unprecedented opportunities, such as its interoperability with national platforms and the development of a mobile application for gathering information in indigenous languages, which strengthen community ownership and digital inclusion. However, attention should be paid to the following aspects: lack of inter-institutional coordination beyond the IGAC-CNTI link; gaps in technical capacities between communities; data security and sovereignty; financial sustainability; and the cultural relevance of the information.



- **OPPORTUNITIES:** Strengthening indigenous autonomy and territorial governance; developing indigenous data infrastructures; coordination with State policies and international cooperation; indigenous technical training in GIS management; and recognition of ancestral territories and languages through projects such as native toponymy.
- **QUESTIONS AND FEEDBACK FROM THE AUDIENCE:** Topics discussed included the choice between physical servers and cloud servers (with the former being chosen on the grounds of autonomy and security), the inclusion of urban indigenous peoples such as the Muisca in toponymy and recognition processes, the need for clear criteria for training and decentralization of data management, and the challenges of security and digital governance.

Although many challenges remain, the CNTI's experience shows that inter-institutional cooperation and data sovereignty can make SIG-I a real link between territories, rights, and the lives of indigenous peoples.

## CASE STUDY 1.

### **Native Toponymy as a Tool for Territorial Protection Based on IGAC's presentation and the panel discussion on experiences**

Among the actions that IGAC is also supporting, a presentation was given on the work carried out in coordination with the Amazon Conservation Team (ACT) on native toponymy as a fundamental tool for strengthening the identity, autonomy, and territorial protection of indigenous and Afro-descendant peoples in Colombia. For IGAC, the management of geographical names has become an intercultural practice that brings together geography, linguistics, and ancestral memory, allowing for "geography with the people".

The toponymic survey process—which includes geographical coordinates, pronunciations in indigenous languages, and community narratives—was carried out in partnership with indigenous peoples such as the Cofán, Andoque, Kogui, Wiwa, and Kankuano, integrating the worldview and spiritual meanings of sacred places into national cartography.

## MAIN FINDINGS

- Toponymy is not limited to naming the territory: it vindicates memory, spirituality, and ancestral knowledge.



- For peoples such as the Cofán, the territory is life itself; their spirituality revolves around yagé, a sacred plant that articulates the connection with the three worlds of their worldview.
- For the Andoque, place names reflect their relationship with water and the natural elements; each river or stream is a living being with a spiritual guardian.
- The registration process prioritizes autonomy, allowing each community to define which places are shared publicly and which remain sacred.
- These recognition efforts strengthen the harmony between ancestral knowledge and modern technology, linking official maps with the indigenous worldview.
- The territory transcends titles and should be understood as a living space of relationship and spirituality.
- The coexistence of multiple names in the same place reflects the cultural plurality of the country and should be respected in the national database of geographical names.
- Gender-sensitive toponymy highlights the role of women as guardians of memory.
- In peoples who have lost their language, this process becomes a tool for cultural revitalization.

## **Experiences of Monitoring, Surveillance, and Autonomous Territorial Mapping**

During the discussions about experiences, advances were presented regarding processes promoted by the invited indigenous organizations: CONFENIAE (Ecuador), ONIC and CRIC (Colombia), CNAMIB (Bolivia), FENAMAD, the Awajún Autonomous Territorial Government (GTAA) and the Autonomous Territorial Government of the Wampís Nation (GTANW) (Peru), VIDS (Suriname), and APA (Guyana). These processes show that autonomous monitoring systems are tangible expressions of self-government, protection of the territory, and defense of life.



Through the strategic use of tools such as satellite navigation systems or GPS, drones, GIS, and mobile platforms, these efforts have successfully identified threats and risks to territories, documented invasions, monitored illegal mining, and produced reports based on their own data. Below are the main actions promoted by each process, followed by a summary of the lessons learned and common challenges arising from these experiences.

- **FENAMAD (Perú):** It set up a forest oversight body and a technical unit with surveillance committees that monitor natural resources and illegal activities in real time. Its community-based application allows for autonomy in decision-making and a direct contact with the Public Ministry. FENAMAD faces the challenge of strengthening the centralization of data on titling, toponymy, and ancestral territories, and expanding the use of technologies such as drones and satellite monitoring systems (Geobosques).
- **CONFENIAE (Ecuador):** It comprises 11 organizations and has been working for a decade on land titling, monitoring, and demarcation. Its platform ONA and other conflict-resolution platforms enable the mapping of threats such as deforestation and pressure from the oil industry. The organization focuses on youth participation, technical training, and the creation of a territorial monitoring unit as key steps for influencing public policy and protecting sacred sites. Their aim is to generate data using their own codes, such as the Amazon Atlas with native names.
- **ONIC (Colombia):** It works on multi-purpose land registry processes and data sovereignty, strengthening indigenous governance over information in 57 territories. This organization sees monitoring systems as core functions —not temporary



projects— linked to the exercise of autonomy. ONIC emphasizes the protection of data generators, interoperability between organizations, and the need for long-term technical and financial sustainability.

- **GTAA (Perú):** It brings together 19 communities that have made progress in land titling, but still have areas that have not been recognized. They have implemented a community control and surveillance system with members acting as a sort of “territorial police” and using technologies (GPS, drones, GIS, and physical landmarks) to self-demarcate, monitor, and protect their territory. The areas of use are classified based on ecological, cultural, and socioeconomic functions. The goal is to halt forest loss (estimated at 2 million hectares) and guarantee food, economic, and cultural sovereignty.
- **GTANW (Perú):** It established the Territory in Perpetuity as a socio-political and spiritual conservation pact, based on their worldview (Iwanch, Etsa, Arutam) and the Wampis Penal Code. Since its self-government was recognized in 2015, the organization has promoted sustainable bio-economies, women’s participation, and its own education focused on its territorial defense system (known as “Charip”). Its so-called Green Army monitors illegal mining with drones and acts as a socio-environmental control body, reinforcing indigenous justice and autonomy from the State. The Wampis territory is a model of indigenous sovereignty and the articulation between ancestral knowledge and modern technology.
- **APA (Guyana):** It promotes a governance model based on the Amerindian Act (2006), which recognizes indigenous district councils. They use GIS, community maps, and data collection systems to identify environmental threats, extractive concessions, and deficiencies in essential services. This information is presented to the State to demand sustainable policies and recognition of territorial rights. The organization emphasizes the need for permanent funding and decent working conditions to ensure the continuity of monitoring and prevent staff turnover.
- **VIDS (Surinam):** It has developed a territorial mapping process initiated in 1990 in response to the lack of State recognition of indigenous rights. By means of a participatory approach, communities have identified villages, sacred sites, and areas affected by mining, producing maps that have become legal and political pieces of evidence. These maps were presented to the Inter-American Court of Human Rights, which recognized them as evidence in a landmark ruling on territorial rights violations. Currently, VIDS continues its training in geospatial tools and the generation of community information to strengthen its autonomy.



- **CNAMIB (Bolivia):** Its work combines political, environmental, and technological training through the School of Governance, where indigenous women are trained as experts in environmental justice and territorial monitoring. These female monitors influence public policy, denounce hydrocarbon pollution, and face pressure to sign illegitimate prior consultations. Through the coordination of seven regional offices, CNAMIB’s approach defends collective rights and the role of women as guardians of the territory against mining, transgenics, and deforestation.
- **CRIC (Colombia):** With more than 50 years of history in territorial defense, the indigenous movement in Cauca has consolidated the use of GIS and social cartography for planning and advocacy. Through data collection, oral history, and territorial tours led by the elders, it has trained indigenous technicians who are devoted to devising comprehensive maps of the ancestral territory. Today, it has 73 recognized territories, although official recognition is still pending for the remaining 85%. The strategy combines ancestral knowledge, technology, and territorial pedagogy, and is confronted with threats from armed conflict and drug trafficking.

Based on these experiences, lessons learned, challenges, and shared opportunities have been identified that allow for an understanding of the factors that strengthen or restrict autonomous monitoring systems. These elements are summarized below to facilitate comparison and analysis.



## Lessons Learned

### 1. Data and personal protection

- Territorial information should protect not only the data, but also the safety of those who produce it.
- Monitoring is a political and spiritual practice that requires ethical and community protocols for information management.

### 2. Institutionalization and sustainability

- Sustainability relies on transforming monitoring systems into permanent roles within organizations.
- It is essential to ensure technological and financial continuity, avoiding exclusive dependence on external funding.

### 3. Data management autonomy

- Data sovereignty is key to exercising territorial rights and defending self-determination.
- There needs to be clarity on data ownership, use, and circulation to avoid internal and external conflicts.

### 4. Organizational strengthening and alliances

- It is crucial to strengthen alliances between organizations to expand capacities, share methodologies, and coordinate regional responses.
- Models such as the Wampis People's Green Army or the FENAMAD's surveillance committees show how technology strengthens indigenous justice networks and early warning systems.

### 5. Inclusion of women and youths

- The active participation of women and youths expands the legitimacy, sustainability, and continuity of autonomous systems.
- Training should combine ancestral knowledge with modern technology.



## 6. Relationship with the State and territorial threats

- Tensions with States persist due to the lack of recognition of autonomous monitoring systems.
- Threats to monitors and leaders, alongside extractive expansion, require specific protection and defense strategies.

### Challenges

- Lack of State recognition of autonomous systems
- Threats and criminalization of monitors and leaders
- Dependence on external funding
- Technological gaps and difficulty accessing equipment
- Conflicts regarding data ownership and use.



### Opportunities

- Strengthen data sovereignty and enable indigenous peoples and States to make decisions based on their own information.
- Consolidate cooperation agreements, exchange networks, and regional alliances.
- Develop community data management protocols to ensure safe and ethical use.
- Promote training programs on climate change, territorial governance, and protection of monitors.



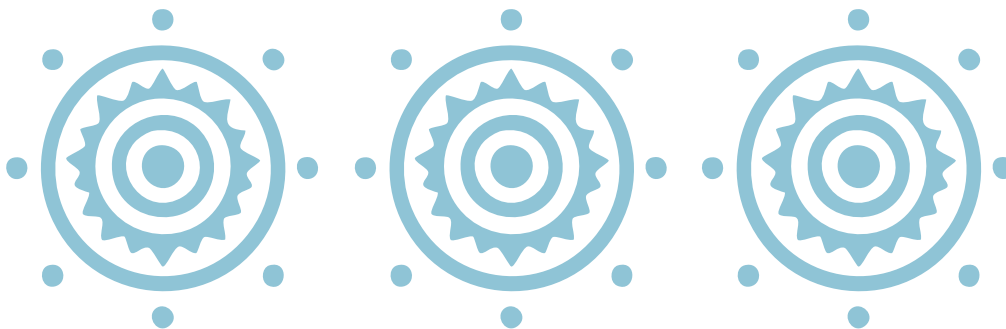
## Training Strategies in the Use of GIS for Territorial Defense

GIS training is a political process of technological appropriation and organizational strengthening. Throughout the meeting, various organizations shared how training in GIS and monitoring technologies has become a strategic cornerstone for reinforcing territorial autonomy. Organizations such as FENAMAD (Peru), APA (Guyana), CEJIS (Bolivia), and CONFENIAE (Ecuador) promote territorial schools, community technical units, and mentoring programs that integrate formal education with ancestral knowledge. Other organizations, such as COIAB (Brazil) and COONAPIP (Panama), invest heavily in training and engaging their youth in monitoring and surveillance processes. Training addresses strategies that are not limited to technical aspects, but emphasize a political, cultural, and community process that strengthens autonomy and territorial defense. Additionally, CNAMIB (Bolivia) has trained women as environmental experts and territorial monitors, combining technical training with political leadership. In Ecuador, CONFENIAE promotes the participation of young people and mothers in dual training with universities. These experiences demonstrate that the inclusion of women and youths enhances the sustainability and legitimacy of territorial defense strategies.

This section covers some of these experiences, which were presented during the panel discussion “Training Strategies in Monitoring,” and illustrates how training processes have become political, organizational, and cultural spaces that strengthen community leadership, above and beyond technical training. These reflections are complemented by the experiences shared by other organizations, which demonstrate that the active participation of women and youths not only enriches, but also ensures the sustainability and legitimacy of territorial defense strategies.



- **FENAMAD (Perú):** This organization runs a community training program with oversight teams of 6 to 10 people per community, trained in the use of GPS, drones, and satellite analysis. The monitors are State-certified drone pilots and work in collaboration with other entities. Training is ongoing, although it faces risks due to illegal activities taking place in the territory.
- **APA (Guyana):** APA promotes a collaborative model with indigenous communities in order to identify environmental challenges and strengthen local capacities in GIS through practical workshops with QGIS and open platforms. The approach combines traditional knowledge with digital maps, facilitating governance and political advocacy. The entity provides ongoing support and mentoring to maintain active learning over time.



- **CEJIS (Bolivia):** This organization has deployed a territorial monitoring strategy in 11 indigenous territories, training community monitors on the use of free apps and field data collection. The monitors act as the technical branch of the organizations, validating information and generating early warnings of threats, strengthening decision-making and territorial legal action.
- **CONFENIAE (Ecuador):** It promotes technical training for indigenous youth in drones, GIS management, and territorial governance. The organization signs agreements with universities to deliver dual education (virtual and in-person) and expand opportunities in a context where less than 1% of the population attends university. Priority is given to the inclusion of women and mothers, as well as to fostering intergenerational leadership and love for the lands.

Based on these cases, we present lessons learned, challenges, and opportunities that show how training in GIS strengthens community capacities and territorial autonomy. This summary allows us to compare approaches and understand the factors that sustain these training processes:



### **Lessons Learned:**

- Indigenous technical education is a tool for self-determination and governance, as well as intergenerational learning that ensures cultural continuity.
- Technical training should serve the community as well as be linked to ancestral knowledge.
- Training young people and women enhances the sustainability and equity of the processes.
- Communities can generate their own technical units, thus avoiding dependence on external experts.
- It is essential to further support learning processes with equipment, monitoring, and ongoing motivation.

### **Challenges:**

- Limited resources and equipment, and language barriers
- Financial and technical sustainability of training programs
- Difficulty in retaining active monitors due to lack of remuneration
- Shortage of infrastructure and technological materials
- Need to set up permanent centers for training and professionalization of indigenous people in technologies.

### **Opportunities:**

- Strengthen partnerships with educational institutions, government agencies, and international cooperation organizations.
- Consolidate GIS community centers that guarantee continuity and autonomy.
- Promote indigenous technical education as a tool for self-determination and territorial governance.
- Integrate technology with the worldview and defense of collective rights, promoting a new generation of indigenous leaders trained to protect territories.



## Experiences in Supporting Efforts to Identify and Map Indigenous Territories

As well as the invited indigenous organizations, the meeting brought together experiences from civil society organizations that have supported mapping, monitoring, and self-demarcation efforts led by indigenous peoples and organizations with the aim of strengthening territorial governance, political advocacy, and the conservation of their ancestral lands. These participating organizations shared their experiences in supporting the generation of their own information for legal recognition, sustainable management, and the defense of the territorial rights of indigenous peoples.

- **Instituto del Bien Común (Perú):** It manages the Information System on Native Communities (SICNA) and SICCAM, which georeference communities and overlapping rights. It oversees more than 4 million hectares under communal management, promoting regional planning and conservation models in the face of extractive threats.
- **CEJIS (Bolivia):** It has supported the land titling registration of 24 indigenous territories and the formation of local environmental monitoring networks. With more than 6,000 reports drafted by community monitors, self-mapping has become a legal advocacy tool to demand compliance with rights and regulate extractive activities.



- **Centro de Distinción (Guatemala):** It promotes participatory and culturally relevant mapping, integrating worldview, toponymy, collective memory, and resource management. Communities map their territories to record sacred sites, risks, and boundaries, generating tools for environmental management and autonomous decision-making.

## Lessons and Challenges

- Decisions should be based on locally validated information and participatory processes.
- Community mapping strengthens identity, governance, and inter-institutional coordination.
- Technical and political sustainability is required to keep systems up to date and protect data.
- In Bolivia, the political context and the reduction of indigenous territories pose risks to autonomy.

### CASE 2.

#### **Territorial Defense of Indigenous Peoples in Isolation and Initial Contact (PIACI) in the Amazon and Great Chaco. Based on a presentation by the Amazon Conservation Team.**

At a conference, the Amazon Conservation Team addressed indigenous cartography applied to the defense of peoples living in voluntary isolation and initial contact (PIACI), considered the most profound expression of the right to self-determination of indigenous peoples: the right to exist without contact. The United Nations defines them as clans or families that have decided to maintain an ancestral, permanent, and absolute isolation. In Latin America, they are known by various names (“free peoples”, “autonomous peoples”, “peoples in a natural state”), which reflects their definition always in relation to others.

Thus, the main challenge lies in mapping the invisible, making visible territories that are sustained precisely by their invisibility. These peoples inhabit the last remnants of tropical forests in the Amazon and the Great Chaco, regions that contain the most well-preserved ecosystems and, at the same time, those most



threatened by deforestation, mining, fires, and infrastructure projects such as roads. According to data presented by the Amazon Conservation Team, there currently exist 60 officially recognized isolated peoples, although indigenous organizations identify more than 120, occupying between 30 and 50 million hectares of invisible land, which could increase the recognized indigenous area in the region by up to 30%.

In Colombia, the most significant experience has been the declaration of 1.4 million hectares as an intangible zone on the Puré River, under the motto “to protect is to not disturb”. This was achieved through collaboration between indigenous authorities and Parques Nacionales Naturales (Natural National Parks, PNN), combining historical cartography, ancestral knowledge, and modern satellite observation. Women, the elderly, young people, and children alike participate in educational activities ranging from the use of compasses and ropes to the operation of drones and GPS, understanding cartography as a tool for memory, governance, and territorial defense.

### **Main Challenges:**

- Guarantee protection protocols for disseminating information about PIACI, especially in border areas.
- Adopt appropriate legal measures to ensure intangible zones free from cultural or administrative impositions.
- Strengthen coordination between contacted peoples and State authorities, avoiding exposing neighboring communities to risks and violence.
- Promote the principle of territorial precaution (“Protect first, investigate later”) in the face of rapidly advancing extractive threats.

### **Questions and Feedback from the Audience:**

- Discussions took place on the ownership of territories inhabited by isolated peoples: whether they should be included as extensions of reserves or remain under State protection without land allocation.
- Experiences in Peru (indigenous reserves) and Brazil (protection fronts) were highlighted as legal frameworks of reference.



- In Colombia, Decree 2333 allows for the protection of intangible ancestral territories as a precautionary measure until the ownership of the territories for indigenous peoples is formalized.
- It was agreed that, although the State has the primary obligation to protect PIACI, neighboring communities are the most effective guardians, but they require institutional support and security guarantees.

### **Conclusion:**

The defense of peoples in isolation is not only a matter of human rights, but also a key strategy for the protection of the Amazon and planet life itself. When combined with technology and ancestral knowledge, indigenous cartography becomes an act of sovereignty, respect, and caution in the face of the limits of contact and the borders of the territory.

## **Governance and Sovereignty of Indigenous Data**

The sovereignty of indigenous data is an essential dimension of self-determination: it entails that peoples are guardians and owners of their information, ensuring that data feeds their own processes of life, resistance, and territorial governance. In the digital age, protecting data means protecting the memory, identity, and continuity of indigenous peoples. This topic, which is becoming increasingly important due to the advancement of proprietary geographic information systems, was addressed in three dimensions: first, a lecture that provided a conceptual and historical framework, followed by a panel discussion that explored the subject at three levels (global, national, and territorial), and finally, a round table of experiences that discussed the integrated challenges of proprietary systems at the territorial level.

The lecture on the CREA Principles for Indigenous Data Governance, presented by PhD Óscar Luis Figueroa (GIDA), outlined the progress made by the Global Indigenous Data Alliance since its creation in 2015, promoted by academics from Canada, New Zealand, the United States, and Australia in response to the misuse of indigenous data that did not generate benefits for communities. In the presentation, it was explained that indigenous data sovereignty is the right of peoples to decide how information related to their territories, cultures, and ways of life is collected, used, and interpreted, emphasizing that it is not a technical issue, but rather an essential com-



ponent of self-determination and governance. In 2019, the CREA Principles (CREA being the acronym in Spanish for “Control, Responsibility, Ethics, and Collective Benefit”) were consolidated, which complement the FAIR principles logic for open data and remind us that, in indigenous contexts, information is not freely available, but should comply with community decisions and generate shared benefits. The conference emphasized that the central challenge is to adapt these principles to local contexts through culturally relevant protocols. During the exchange, opportunities were highlighted, such as strengthening the global data sovereignty network, promoting the use of bio-cultural labels to ensure traceability and recognition of indigenous knowledge, and advancing the harmonization of criteria, dissemination of experiences, and creation of spaces for regional exchange. Collectively, these elements outline a path toward more robust data governance, capable of protecting ancestral knowledge while promoting new forms of cooperation and solidarity among indigenous peoples on a global scale.



Afterwards, the panel on Indigenous Data Sovereignty and Governance discussed experiences from COIAB (Brazil), CNTI (Colombia), and the Global Indigenous Data Alliance (GIDA), highlighting that information management should be governed by the CREA Principles (Control, Responsibility, Ethics, and Collective Benefit), as a basis for developing community protection protocols and sovereign databases. The participating organizations warned of the risks posed by the expansion of artificial intelligence for the misappropriation of indigenous knowledge, and pointed out that,



although AI can support linguistic preservation, it also threatens autonomy if data is used without consent. The entities further suggested the creation of a Latin American indigenous data network to promote the strengthening of indigenous approaches and initiatives on the issue. There was consensus across the discussions on the following aspects: protecting data means protecting memory, identity, and the future; protocols should be community-based and binding; and information sovereignty requires economic and technological autonomy. Overall, the panelists agreed that control of information is a deeply political and cultural issue, closely linked to the self-determination of peoples.

- **COIAB - Brasil:** The entity explained that one of the biggest challenges has been the concentration of information in the hands of public entities without open access. In response, COIAB strengthened self-generation of data through community protocols for the collection, management, and protection of sensitive information. These protocols, based on self-demarcation and autonomy, incorporate technologies such as cell phones, drones, and proprietary applications, ensuring that data remains under community control. The organization highlighted the creation of a sovereign database that ensures the continuity, security, and strategic use of information for territorial monitoring.
- **CNTI - Colombia:** CNTI pointed out that international mechanisms (the UN, UNESCO, ILO, and FAO) recognize free, prior, and informed consent as a central principle for the use of indigenous information. In Colombia, the National Development Plan is advancing in the recognition of collective copyright, which allows for the protection of traditional knowledge against misappropriation. Gustavo Ulcué, on behalf of CNTI, emphasized that protocols should emerge from the territories, integrating community safeguards that guarantee intellectual property and local governance of data.
- **GIDA - Global:** GIDA warned that artificial intelligence (AI) poses new risks and opportunities. It can be an ally in preserving languages, systematizing documents, and strengthening governance, but can also be a threat if indigenous data is used without consent. The organization emphasized the need for regulatory frameworks that recognize collective rights and promote community technological empowerment, so that AI is used as a tool for cultural and political strengthening, not as a form of digital extraction.

Based on these discussions, key challenges and opportunities for strengthening indigenous data governance and sovereignty have been identified. The following summary allows us to compare common elements and understand the factors that either support or threaten the informational autonomy of indigenous peoples.



## Challenges:

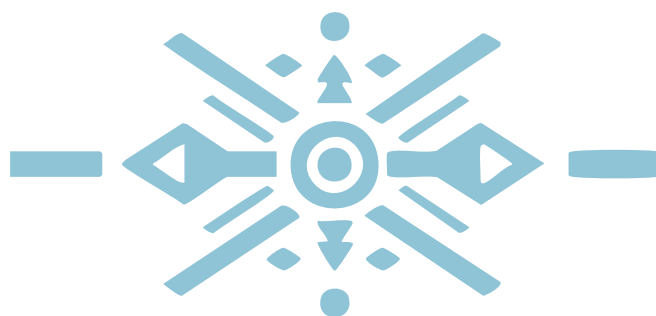
- Consolidate community data protection protocols based on informed consent.
- Regulate the transfer of rights, images, and collective knowledge to prevent misuse.
- Address the risks of AI and massive data exploitation without recognition of indigenous authorship.
- Enforce binding international instruments that oblige States to comply with data sovereignty.

## Opportunities:

- Create a Latin American indigenous data network that brings together communities, academia, and international organizations.
- Harmonize regional legal frameworks and promote technical and legal cooperation.
- Strengthen the technological capacity of peoples to manage their own databases.
- Reinforce the protection of information as part of the territory and the right to decide on the memory and future of peoples.

## Questions and Feedback from the Audience:

- The formulation of protection protocols should be based on the recognition of data as a collective right, backed by ILO Convention 169 and the Escazú Agreement.
- The difference between public and private information was discussed, with emphasis on the fact that indigenous authorities define the use of territorial data.
- Concerns were raised about the dependence created by external funding and the need for economic autonomy to preserve information sovereignty.
- In Colombia, the work of indigenous association Gobierno Mayor (Mayor Government) was mentioned, as well as the urgent need to move towards a legal framework that recognizes collective data as a legal category.



During the last of the meeting's discussions, entitled *Experiences in monitoring, training, and proprietary data*, participants addressed how indigenous peoples in the Amazon and Central America are moving toward autonomy in the production and management of territorial data, strengthening their monitoring systems, technical training, and environmental surveillance. The participants agreed that proprietary data is a strategic tool for territorial defense, indigenous governance, and political advocacy in the face of threats such as illegal mining, deforestation, and land use conflicts. Participants from Brazil, Panama, and Colombia emphasized the need to develop their own technologies, such as applications for information collection and management, that allow for data protection under information security protocols and community monitoring networks that integrate traditional knowledge and geo-spatial tools.

There was a consensus among these cases that the strategic use of GIS allows for the consolidation of regional indigenous data networks and the coordination of cross-border advocacy efforts. Even though legal loopholes persist, community territorial knowledge is a legitimate and powerful tool for defending land and life. The use of GIS in indigenous territories is not limited to the generation of maps: it is a political and cultural practice of self-determination. Each georeferenced point is an affirmation of existence, an act of resistance against projects that threaten life and nature.

Other participating organizations shared some of their progress and challenges in generating their own data for territorial defense and management during the question and answer session, highlighting the importance of strengthening technical capacities, technological autonomy, and community monitoring mechanisms.

- **COIAB (Brasil):** The organization consolidated an indigenous monitoring network in 9 Amazonian territories that uses tools such as GAYA, GPS, and KUTARY to map fishing, forests, and the impacts of mining. It promotes data sovereignty and usage protocols that strengthen governance and territorial protection by



fostering sovereign data production for territorial and agroforestry management. Georeferenced data is systematized on community platforms and serves as the basis for complaints and territorial protection actions. COIAB also highlighted the importance of establishing protocols for data access and use, resolving tensions over the ownership of satellite images, and strengthening monitoring capacities with technological autonomy and indigenous governance.

- **COONAPIP (Panamá):** This organization has developed a multi-ethnic surveillance system with three levels of operation (basic, intermediate, and advanced), integrating cartographic maps, remote sensors, and technical commissions. COONAPIP highlighted that the seven indigenous peoples of the country are making progress in creating a territorial surveillance system based on volunteer work and ancestral knowledge. Their priorities include deforestation, the protection of sacred sites, and the resolution of territorial conflicts. Monitoring combines cartography with remote sensors, multi-ethnic maps, and technical commissions, organized into three levels (basic, intermediate, and advanced), with the aim of ensuring the control and protection of indigenous territories through coordination with the Environmental and Ecological Police and other institutional mechanisms.
- **Traditional Indigenous Authorities – Gobierno Mayor (Colombia):** It pointed out that data generation should serve as a tool for real-time assessment, management, and decision-making. Currently, efforts are being made to integrate geographic information that reflects the realities of the 462 indigenous communities, ten of which lack official recognition, which restricts their legal protection.





- **OPIAC (Colombia):** The organization highlighted the use of monitoring and recording modules in Putumayo, incorporating community meetings, geographic point surveys, and technology training processes. These efforts strengthen self-determination and territorial surveillance, especially in the face of illegal mining and armed conflict.
- **Gobierno Mayor and OPIAC (Colombia):** It carries out training processes and surveys of geographic points in Putumayo, coordinating territorial information to strengthen legal security and community control. The data is used for advocacy purposes and indigenous planning.

As a result of these experiences, lessons learned and common challenges are presented that allow us to understand how monitoring, technical training, and proprietary data strengthen indigenous territorial autonomy. This summary makes it easier to compare approaches and recognize the factors that support or limit these systems:

### Lessons Learned:

- Proprietary data strengthens internal decision-making and the political advocacy of organizations.
- The use of technological and geospatial tools should be integrated with the indigenous worldview in order to preserve harmony between ancestral knowledge and modern science.
- Autonomy in data production and custody is a core pillar of territorial sovereignty.



## Challenges:

- Guarantee the security and sovereignty of the data collected.
- Address the intrusion of private actors and the lack of compliance with prior consultation.
- Strengthen local technical capacities to maintain databases and monitoring systems.
- Overcome institutional fragmentation and the lack of State recognition of territorial rights.
- Ensure the safety of monitors, especially in areas affected by mining, drug trafficking, or armed conflict.
- Protect monitors and territorial defense advocates from external threats.
- Ensure the technical and financial sustainability of monitoring networks and information systems.



## Opportunities:

- Proprietary data are key tools for self-determination, decision-making, and territorial control. Developing protection strategies and protocols is an opportunity to strengthen territorial governance.
- There is room to strengthen the safety, sustainability, and protection of community monitors.
- Focused on ensuring autonomy and alignment with indigenous worldviews, information systems have the potential to harmonize ancestral knowledge and modern technologies.

In conclusion, the organizations agreed that producing, analyzing, and safeguarding data from communities is key to political advocacy, indigenous governance, and the protection of life against threats such as illegal mining, deforestation, and climate change.



**TABLE 1.**

**CREA Principles for Indigenous Data Governance. Based on the keynote speech by Óscar Figueroa.**

CREA principles is an adaptation into Spanish of CARE Principles, a set of guidelines developed by networks of indigenous peoples, scholars, and partners for guiding the protection, governance, and ethical use of their data. The name sums up the four central pillars of data governance: a) Collective benefit, b) Relevance to peoples, c) Ethics in its use, and d) Autonomy in its management.

These principles have been articulated as a political and technical basis for indigenous data sovereignty, developed by the Global Indigenous Data Alliance (GIDA).

**Collective**

Data and information generated in indigenous territories should be recognized as collective, rather than individual, assets. Their management and use should conform to the decision-making structures of the peoples themselves, respecting the authority of traditional governments and community institutions.

**Relevant**

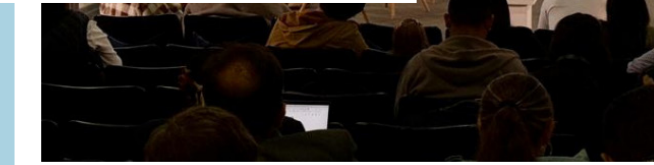
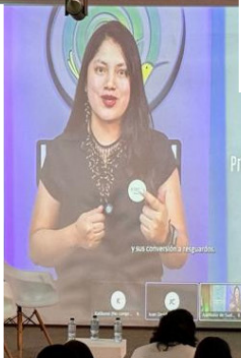
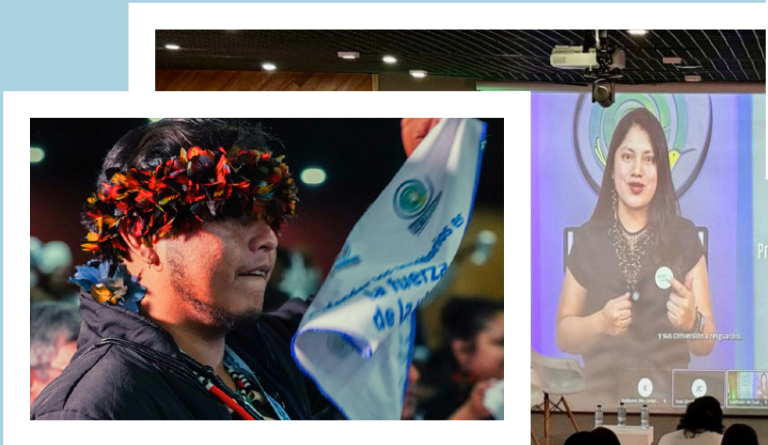
Data should be produced, analyzed, and disseminated based on the priorities, needs, and realities of indigenous peoples. It should not respond solely to external interests, but rather contribute to strengthening territorial governance, self-determination, and collective well-being.

**Ethical**

Any collection, storage, and use of data must be guided by ethical principles, ensuring free, prior, and informed consent, confidentiality, and respect for traditional knowledge. Efforts should be made to prevent the misappropriation, manipulation, or commercialization of indigenous information.

**Autonomous**

Indigenous peoples must have the capacity and means to manage their own information systems, deciding what is shared, with whom, and under what conditions. Autonomy in data management is a key pillar of sovereignty and self-determination.





## AUTONOMOUS SESSION

On the fourth day, the Autonomous Session consolidated the lessons learned, reflections, and agreements of the participating indigenous organizations on strengthening their own systems of information, self-government, and territorial defense. The space also served as a forum for discussing the proposal to establish a regional network of Indigenous Geographic Information Systems, as well as continuing programs for the exchange of experiences and knowledge, the development of protocols for information management, and dialogue and outreach with national and international governments for the recognition and validation of the territorial rights of indigenous peoples.

Initially, the organizations were asked to answer the question: *What are we taking home?* The main key lessons learned are summarized below.

1. Unity and collective coordination: strengthening partnerships between indigenous peoples, sharing ancestral knowledge and experiences.
2. Proprietary knowledge and technology: integrating ancestral wisdom with technological tools such as Geographic Information Systems (GIS) to strengthen autonomy, governance, and territorial defense.
3. GIS as a political tool: although at different stages in the process, efforts have been recognized as strategic for the defense of rights, the visibility of demands, and informed decision-making.
4. Interaction with the State: building relationships of trust and spaces for dialogue on an equal footing with public agencies.
5. Sovereignty and generation of proprietary data: prioritizing the autonomous collection and control of territorial information, establishing data sovereignty protocols.
6. Ancestral monitoring: acknowledging that territorial monitoring has ancestral roots, now strengthened by new technologies.



## 7. Networks and continuous learning: consolidating regional spaces for sharing insights, building training, and jointly developing methodologies.

In a second stage, participants were randomly divided into working groups, which allowed for a balanced geographical and linguistic representation. The question to be answered by all groups was: What do we want to do together? After the group discussion, a thematic systematization was carried out, collecting the main points of agreement between the different groups and organizing them into themes.

**TABLE 2.**

### **Thematic Areas Identified for Collaborative Work**

#### **Collective Action and Communication**

- Create an indigenous communications network to share experiences, translated materials (Spanish, English, Portuguese), and indigenous sovereignty protocols.
- Promote territorial self-demarcation and training for young people in technology and monitoring.
- Set up spaces for dialogue with governments to demand collective rights.
- Draft regional statements on the situation of territorial defense advocates.

#### **Strengthening Governance**

- Strengthen territorial and data governance by linking GIS to political processes.
- Reaffirm the defense of nature from a spiritual and ancestral perspective.
- Use the Escazú Agreement as a legal tool for environmental defense and the protection of defense advocates.
- Promote public policies based on indigenous knowledge and cultural revitalization.



**TABLE 2.**

## **Thematic Areas Identified for Collaborative Work**

### **Self-demarcation and Data Governance**

- Develop a regional map of self-demarcated territories and shared standards.
- Create information protocols and interoperable systems that guarantee data sovereignty.
- Promote a political advocacy roadmap for State recognition of self-demarcations and zone divisions.
- Strengthen local capacities in monitoring, security, and intercultural communication.

### **Regional Exchange and Technologies**

- Promote face-to-face meetings to share experiences on geotechnologies.
- Promote the concept of a global indigenous GIS and annual follow-up meetings.
- Use artificial intelligence to detect changes in land use.
- Design national protocols and strategic alliances in indigenous communication.

### **Learning Network and Repository**

- Build a learning and exchange network with agreements and protocols between organizations.
- Create a common repository of information to document processes and enable territorial monitoring.
- Design inclusive technology platforms with clear rules for access and updating.
- Advance protocols for interoperability and validation of indigenous data along with governments.
- Address common challenges concerning land tenure and equal access to information.

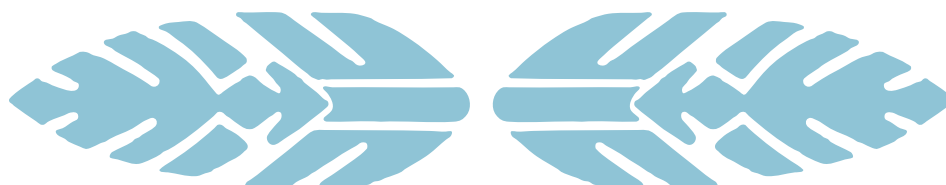
### **Interculturality and Continuity**

- Reinforce the importance of using local and community languages in technical processes.
- Promote proper participation in decision-making spaces and community outreach.
- Create an immediate agenda and a commission coordinated by the CNTI to ensure continuity.
- Hold future on-site meetings in indigenous territories.

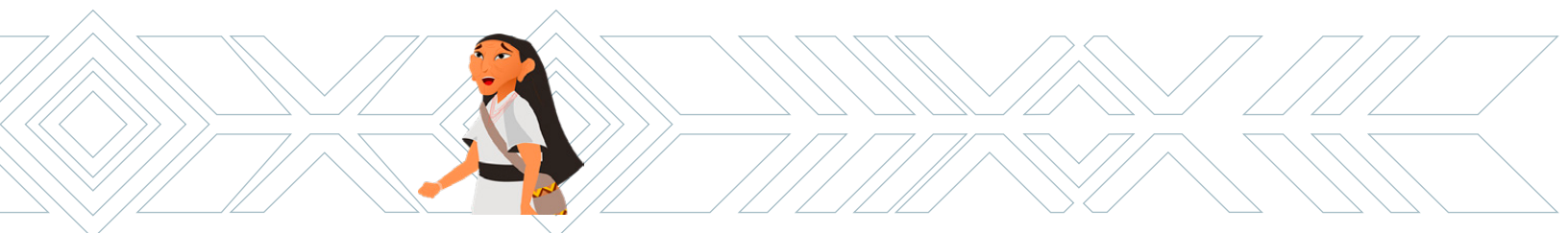


Finally, during the plenary session, the above topics were shared, which then led to a discussion on the next steps to be taken to achieve these objectives. It was agreed that a facilitation group would be set up, with the CNTI coordinating overall activities, and it was decided that the possibility of holding the next meeting on indigenous territory would be explored once delegates had been appointed. The main conclusions of the plenary session are summarized below:

1. The creation of the Regional Indigenous Network of Information Systems and Programs was agreed upon, to be administered by the peoples themselves, with the aim of strengthening autonomy and the exchange of knowledge and methodologies.
2. It was agreed that the development of proprietary information systems would be promoted as tools for consolidating strategic information on the territories, and that the possibility of moving towards the development of a regional information system and coordination between peoples would be considered.



3. Joint protocols and access restrictions were defined regarding data sovereignty and governance.
4. The strategy of continuing political advocacy and strengthening the indigenous voice in national and international processes (including UN and climate change) was identified.
5. The need to continue strengthening technical, legal, and technological capacities was reinforced, as well as the training of women and young people, with the aim of achieving economic and social sustainability in these processes.
6. It was acknowledged that efforts should be made to strengthen communication and exchange of methodologies between organizations.
7. Emphasis was placed on exploring emerging connectivity services and promoting access to enhanced communication tools.



## CONCLUSIONS

During four days of work, participants identified common challenges posed by the expansion of extractivism, deforestation, illegal mining, criminalization, and the lack of legal recognition of their territories. In light of these contexts, they reinforced their collective commitment to protect their territories, revitalize ancestral knowledge, and strengthen their technical capacities by developing information, monitoring, and mapping systems managed by indigenous peoples.

This meeting helped to highlight the value of Indigenous Geographic Information Systems as tools for policy and governance, land management, and protection, which can make demands visible, support processes for enforcing rights, and guide dialogue with governments and the international community. The experiences shared showed significant progress in the use of geospatial information for autonomous planning, legal advocacy, and rights-based environmental management.

One of the main agreements was to promote the creation of the Regional Network of Indigenous Geographic Information Systems, administered by the peoples themselves, to promote the exchange of methodologies, protocols, and experiences; the training of young people and women; the generation and protection of their own data; and coordination with public policies and international commitments on climate and biodiversity. The network's governance modalities are to be discussed in follow-up activities, based on the thematic proposals indicated in Table 4 on the thematic areas identified for collaborative work.

Finally, the organizations renewed their commitment to keep working together, strengthening strategic partnerships with institutions, universities, and cooperation agencies, as well as positioning the voices of Indigenous peoples as key players in the management and defense of their territories.

**Document systematized and prepared by the Learning and Collaboration Program of TINTA – The Invisible Thread.**









Comisión Nacional de  
Territorios Indígenas



CNTI\_Indigena



CNTI\_Indigena



Comisión Nacional de  
Territorios Indígenas



Comisión Nacional de  
Territorios Indígenas

[www.cntindigena.org](http://www.cntindigena.org)