MINISTERIO DE AMBIENTE Y ENERGÍA
GOBIERNO DE COSTA RICA

Costa Rica REDD+

PROYECTO REDD+ COSTA RICA
Pagos Basados en Resultados

GREEN CLIMATE FUND

PNUD

PARTICIPATIVE MAPS IN INDIGENOUS TERRITORIES:

a vision from the indigenous knowledge and identity

Photograph: Marco Martínez Martínez.

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In order to indicate the source, we request to do so as follows:

United Nations Development Programme [UNDP]. (2026). Participatory Maps in Indigenous Territories: A View from Indigenous Knowledge and Identity. Costa Rica.

This material is available at https://UNDP-conocimiento.cr

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We express our most sincere gratitude to the associations of integral indigenous development, to the members of the TFAP commissions and to the community leaders of the indigenous territories of Maleku, Matambú, Salitre, Cabagra, Ujarrás, Curré, Alto San Antonio, Conteburica, Abrojo Montezuma, Coto Brus, Alto Laguna, Bajo Chirripó, Nairi Awari, Tayní, Talamanca Cabécar and Kéköldí for their valuable participation, time and knowledge shared during the participatory mapping process.

Their commitment and collaboration were fundamental to the development of this work.

01. Introduction

Photograph: Marco Martínez Martínez.

Since the beginning of the 21st century, forests have been recognized as fundamental allies in the fight against climate change, thanks to their ability to absorb carbon and conserve biodiversity. However, deforestation and forest degradation continue to be responsible for a significant proportion of global greenhouse gas emissions. According to the Intergovernmental Panel on Climate Change (IPCC), the agriculture, forestry and other land use sector (known as AFOLU) accounted for between 13% and 21% of global anthropogenic emissions[1] during the 2010–2019 period (GIECC, 2023).

To address this situation, the global initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD) was proposed at the Thirteenth Conference of the Parties (COP13) held in Bali in 2007, formalized in Decision 2/CP.13 and expanded as REDD+ at the 2011 Durban Conference (including conservation, sustainable management and enhancement of forest carbon stocks). A key component of REDD+ is the active participation of indigenous peoples and local communities, who hold ancestral knowledge and historical rights to forests (Osborne et al, 2024). Their inclusion is essential to ensure effective, fair and rights-respecting conservation strategies.

In this context, the REDD+ Results-Based Payments Project (REDD+ PBR) of Costa Rica emerged, implemented by the United Nations Development Programme (UNDP) and financed by the Green Climate Fund after recognizing the reduction of 14.7 million tons of CO_2 achieved through forest conservation actions within the framework of the National REDD+ Strategy (2014–2015).

1 Anthropogenic emissions are those releases of gases, particles, and pollutants into the atmosphere that come directly from human activities, such as the burning of fossil fuels (oil, coal, gas), industry, deforestation, intensive agriculture, and waste management and are a key factor in global warming and air pollution.

As a result, in 2020 the country received US$ 54.1 million in compensation for these advances (UNDP, 2025) channeled by the REDD+ PBR Project.

This project constitutes a pillar in the implementation of the National REDD+ Strategy (ENREDD+) and aimed at strengthen the Payment for Environmental Services Program (PPSA), expanding its coverage in indigenous territories (IT) and rural areas, and incorporating key measures related to gender equity, fire prevention and participatory governance. As part of this process, an Environmental, Forest and Territorial Plan (TFAPs) was developed and built as a result of the agreement within the framework of free, prior and informed consultation (FPIC) that was part of ENREDD+. These plans allowed the IT autonomously establish its priorities in conservation, sustainable development and management of natural resources, in coherence with its cultural values and territorial vision.

Within the social and environmental analysis of the REDD+ PBR Project, TFAPs are recognized as fundamental instruments to ensure effective participation that will guide the distribution of the benefits of climate finance in an equitable, transparent and respectful way of collective rights. According to Rojas (2025), as of the second quarter of 2025, 21 TFAPs had been validated and more than $5 million had been transferred to 12 indigenous territories, thus consolidating a more inclusive and sustainable climate governance within the framework of REDD+.

This article will explore the process of creating participatory maps in Costa Rica's IT, developed within the framework of the REDD+ PBR Project and aligned with the TFAPs. The methodology used is described, which involved more than 150 indigenous people from 18 territories, focused on promoting consultation spaces respectful of their cosmovision. The methodological elaboration of these maps was carried out through collective sessions that applied participatory approaches. In them, community leaders and commissions identified milestones and significant elements of their territories, integrating local knowledge and community perspectives in the process.

Participatory mapping is a methodology that involves different indigenous leaders in the creation of collective maps. This process strengthens the knowledge and understanding of their territory, vindicating and making their social and cultural rights more visible, and facilitating resource management, all while respecting indigenous cosmovision and knowledge. It is used as an empowerment tool that combines their knowledge and modern technologies, so that participation and recognition of their autonomy is promoted.

For the systematization and formalization of the maps, Geographic Information System (GIS) programs were used to create digital maps, which integrated the geospatial dimension of the aspects mapped during the collection sessions. Validations were carried out in which indigenous people reviewed the design, placement of markers on the map and translation of the content into their own languages, to ensure that the products faithfully reflected their vision of the territory.

The key findings of this process will also be addressed, such as the recovery of toponymy (local names based on their origin, meaning and culture) written in their own languages, the role of maps in the advocacy of indigenous rights and in territorial planning and its usefulness as a tool for the oral dissemination of history, culture and sense of belonging.

Collective mapping has proven to be an effective tool for geospatial information collection in indigenous and community contexts. By integrating orality, collective memory, and ancestral cosmovision, this approach not only enriches the map's contents, but also strengthens territorial identity. In addition, it promotes respectful and transformative spaces for dialogue, in which local knowledge is recognized as legitimate and essential for decision-making on the use and management of the territory.

02.

General Conceptualization

2.1 INDIGENOUS PEOPLES AND TERRITORIES

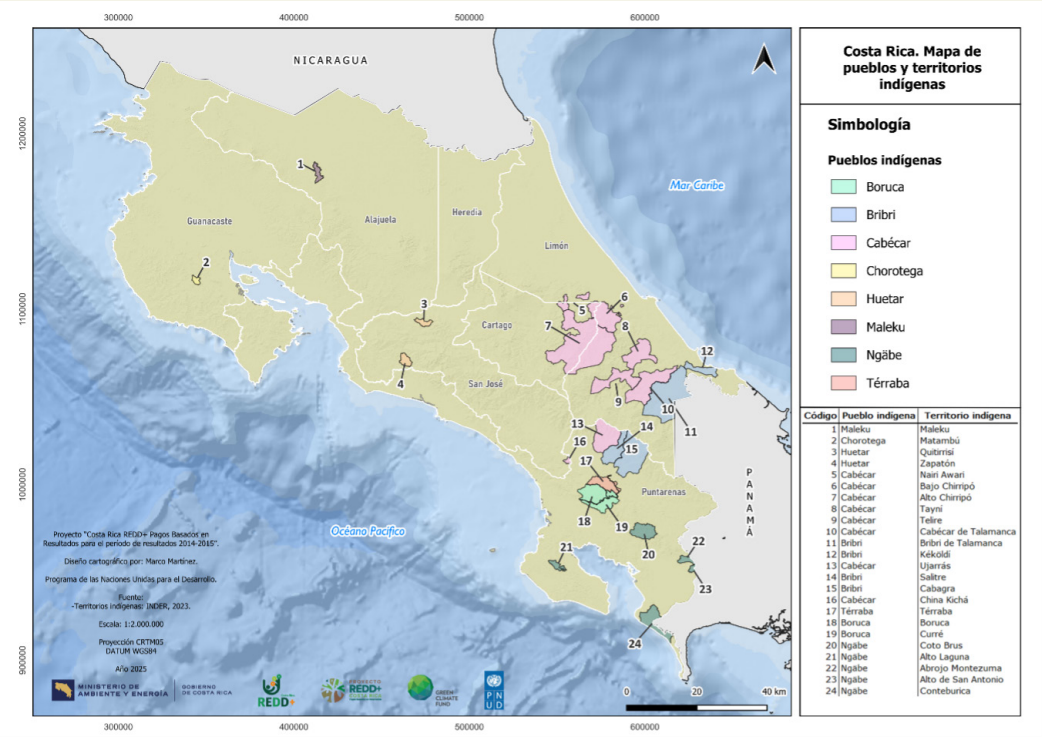
The presence of indigenous peoples in the current Costa Rican territory predates the formation of the nation-state by millennia. These peoples not only physically occupied the space, but also built it through systems of knowledge, social organization, productive and cultural practices deeply linked to their environment. This integral relationship between culture, territory and spirituality constitutes what is known as indigenous territoriality, understood as a symbolic, cultural and political construction of the territory, which is expressed in sacred places, narratives, practice of rituals and systems of meaning of their own. According to Barabas (2014), indigenous territoriality is a multifaceted category that articulates social, identity, and spiritual dimensions and allows indigenous peoples to reproduce their culture, exercise autonomy, and resist processes of territorial fragmentation. It is not only a matter of the material possession of space, but of a way of inhabiting it, signifying it and defending it from the internal logic of each culture.

Currently, Costa Rica officially recognizes eight indigenous peoples: Bribri, Cabécar, Maleku, Boruca, Térraba, Chorotega, Huetar and Ngäbe, distributed in 24 ITs throughout the country. Each of them has a distinct cultural identity, expressed in their own languages, kinship systems, forms of political organization, and spiritual practices. The configuration of these territories responds to a complex historical process, in which dynamics of resistance to colonization, forced displacements and state policies of territorial delimitation converge, often imposed. Despite these tensions, ITs continue to be fundamental spaces for cultural reproduction, food sovereignty, and peoples' self-determination (Gutiérrez-Slon & Moya-Aburto, 2018). The geographical distribution of the eight indigenous peoples can be observed in Figure 1.

The legal recognition of these territories was formalized with the enactment of Indigenous Law 6172 of 1977, which declares reserves2[2] as lands traditionally occupied by indigenous peoples. This law establishes that such lands are inalienable, imprescriptible, non-transferable and exclusive collective property (Legislative Assembly, 1977). However, its application has been partial and uneven. Many territories face illegal occupations, lack of land titling, and absence of effective restitution mechanisms, evidencing a significant gap between the legal framework and the reality on the ground. In the international legal sphere, Costa Rica has ratified Convention 169 of the International Labour Organization (ILO) and has adopted the United Nations Declaration on the Rights of Indigenous Peoples, committing itself to guaranteeing the right to free, prior and informed consultation (Legislative Assembly, 1992). However, contradictions persist between these commitments and institutional practices, especially with regard to autonomy, political participation and territory control.

Beyond their legal dimension, IT plays a crucial role in environmental conservation and ecological sustainability. In regions such as the Talamanca Mountain Range, the Bribri and Cabécar peoples have maintained diversified agricultural systems, such as polyculture on traditional ancestral farms, which favors forest conservation, natural regeneration, and climatic resilience. This traditional knowledge, transmitted from generation to generation, constitutes a form of landscape management that is deeply adapted to local ecosystems. From a cultural perspective, territories are also scenarios for the intergenerational transmission of knowledge, languages and spiritualities. The defense of territory is, therefore, inseparable from the defense of collective identity, cultural rights and the collective identity, cultural rights and the continuity of indigenous ways of life (College of Professionals in Sociology, 2025).

Figure 1. Map of indigenous peoples and territories of Costa Rica



Source: Own elaboration based on INDER data (2023).

2 This term is used because it is established as such in the Indigenous Law No. 6172, enacted in 1977, but the use of the concept of indigenous territory is appealed to.

In this context, the concept of IT in Costa Rica cannot be understood only as a matter of land tenure, but as a living expression of the relationship between indigenous peoples and their environment. Recognizing and strengthening this territoriality implies complying with existing legal frameworks and rebuilding relations between them and the State, from an intercultural, ecological and decolonizing perspective. Only in this way will it be possible to advance towards a more just, plural and sustainable society.

Most of Costa Rica's IT is concentrated on the Caribbean and Pacific slopes of the Talamanca Mountain Range, a region characterized by its mountainous relief, humid climate, and high biodiversity. In this area, the Bribri and Cabécar peoples predominate, whose areas include extensive humid tropical forests in the cantons of Limón and part of the Puntarenas. Towards the southern end of the country, on the border strip with Panama, are located the territories of the Ngäbe people, historically linked to cross-border biological corridors.

The map shows that, in addition to Talamanca, there are ITs in other regions such as: Boruca and Térraba in the South Pacific, Maleku in the North Zone and Chorotega in Guanacaste, which reflects a cultural diversity distributed in different ecosystems. This territorial configuration responds to processes of continuous ancestral occupation, where the spiritual, cultural and ecological relationship with the land has been fundamental for conservation of forests and the sustainable management of natural resources.

2.2 PARTICIPATORY MAPS

Participatory mapping is a methodology that actively involves communities in the identification, representation and analysis of their own territory, resources and problems, using accessible cartographic tools and collective dialogue processes. Chambers (2006) defines it as a plural and creative process, in which the skills of local people to make maps are recognized and enhanced, allowing the actors themselves to be protagonists in the construction of spatial knowledge and in decision-making about their own environment. Sletto et al. (2013) highlights that participatory mapping has been used by indigenous and Afro-descendant communities in Latin America as a tool for the defense of their territorial rights, cultural conservation and self-management of resources, adapting to contexts of social and political change.

Its main objective is for the people directly affected to be protagonists in the construction of spatial knowledge, which strengthens the ownership of results and informed decision-making. From an epistemological perspective, participatory mapping differs from participatory cartography in that the former emphasizes the social and political process of the collective construction of space, while participatory cartography tends to focus more on the production of maps as an end product (Chambers, 2006; Sletto et al., 2013).

Participatory mapping prioritizes horizontality, community validation, and the integration of local knowledge, while participatory cartography -which also involves the community- may be more oriented

Photograph: Marco Martínez Martínez.

to the technical and visual representation of the territory. In short, participatory mapping is a more open, flexible and action-oriented process, while participatory cartography can be seen as one of the tools within that process.

In Costa Rica's ITs, participatory mappings have been fundamental for territorial defense, resource management, and the visibility of historical rights (Mora Calderón &

Pelz-Seyfarth, 2025). These processes allow communities to document their boundaries, sacred sites, routes of ancestral use, and problematic issues such as illegal occupation or environmental degradation. The methodology is adapted to the cultural and linguistic contexts of each people, so that it integrates oral knowledge, field trips, intergenerational workshops and even technologies such as the Global Positioning System (GPS) or GIS.

In conclusion, participatory mappings in Costa Rica's IT are not only technical tools, but also processes of empowerment, identity affirmation and the exercise of rights. Its value lies in the ability to articulate ancestral knowledge and contemporary technologies, under the principles of respect, consultation and indigenous self-determination.

03.
Methodology

The methodology implemented for the elaboration of these participatory maps in 18 ITs in Costa Rica is based on the principles of participatory action, research and social cartography, which: prioritizes autonomy, consent, and community ownership of the process and results (Chambers, 2006; Sletto et al., 2013). This approach recognizes that maps are not only technical products, but also social and political constructs that reflect the vision, knowledge, and priorities of indigenous peoples (Herlihy & Knapp, 2003).

The development of participatory maps is directly linked to the objectives of the TFAPs, since this collective process seeks to materialize territorial milestones that strengthen the identification of communal potentialities and needs, as well as the formulation of local development projects built from the indigenous cosmovision. Within the framework of the REDD+ PBR Project, implemented by UNDP, participatory mapping exercises were carried out in the territories detailed in Table 1. It is worth noting that, as of the date of publication of this document, the other territories are in the process of being mapped.

Table 1. Indígenous territories with completed participative maps

Indigenous people	Indigenous territory
Maleku	Maleku
Chorotega	Matambú
Huetar	Zapatón
Bribri	Cabagra
	Salitre
	Kéköldí
Ngäbe	Alto Laguna
	Coto Brus
	Alto San Antonio
	Abrojo Montezuma
	Conte Burica
Cabécar	Bajo Chirripó
	Tayní
	Nairi Awari
	Telire
	Talamanca Cabécar
	Ujarrás
Boruca	Rey Curré

Source: Own elaboration. 2025.

Below details each of the aspects and processes implemented:

3.1 PROCESS OF CALLING FOR A MAPPING WORKSHOP

The call was made in coordination with TFAPs technical people, the Associations of Integral Indigenous Development (board of directors), community organizations of the ITs and other leaders. Communication and dissemination in the local language were promoted and representatives of various groups (women, youth, elders, community leaders) were invited to promote the diversity of voices and local knowledge (Bryan, 2011; Chambers, 2006). The means used in the call were via WhatsApp digital messaging application, the invitation to communal groups, person-to-person communication and phone calls.

3.2 MAPPING WORKSHOP

3.2.1. Pre-workshop territorial reconnaissance. As a preparatory stage for participatory mapping, systematic tours of the territory were carried out together with indigenous people and local resource guards3[3]. This phase aimed to accurately identify the location of the communities, as well as to record geographical landmarks and strategic areas relevant to the management of the territory. In addition, it made it possible to establish key references to guide the dynamics of the workshop and ensure that the cartography generated adequately reflected local realities and priorities.

3.2.2. Introduction and Initial Explanation. The workshop began by explaining the objective of participatory mapping, its importance for territorial management and the defense of their rights, its relationship and complementarity with the TFAPs and clear instructions were given on the dynamics to be followed (Figure 2). It was emphasized that the process would be led by the community and that all the information generated was collectively owned (Chambers, 2006) and that then, at the end, the systematized material would be delivered to the community, to avoid extractivism of information without the return of final products, which belong to the indigenous people of each territory.

Figure 2**. Explanation of the work methodology, Matambú indigenous territory.**

Photograph: **Jorge Cole Villalobos.**

3 Indigenous resource rangers are people belonging to indigenous communities who carry out surveillance, protection and sustainable management duties of natural resources within their territories, in coordination with community structures and, in some cases, with state institutions, to prevent illegal activities and promote conservation (Vargas Mena, 2018).

3.2.3. Ownership of an outline map. The outline map4[4] was presented, that is, a satellite image that only contains base information for location and guiding reference, without any other geographical mark. The image showed the official boundary of the territory. Participants recognized the boundaries of the territory, interpreted the base image, and located relevant geographical points or landmarks, such as roads, rivers, or locally recognizable sites (such as sports fields) (figure 3).

Figure 3. **Outline map for the participatory mapping workshop showing a satellite image with the boundary of the Bribri indigenous territory of Kéköldí**

Photograph: Marco Martínez Martínez.

3.2.4. Initial indication of communities. Using sticky notes and arrows, the indigenous people marked the main communities in the territory, which provides an initial guide for the development of collective mapping (Figure 4). At this point, the technical interlocutor of the project consulted them about their origin and invited them to write each of the communities in their respective indigenous language.

Figure 4. **Photograph of people pointing out communities and geographical landmarks on the map, Alto San Antonio Indigenous Territory.**

Photograph: Marco Martínez Martínez.

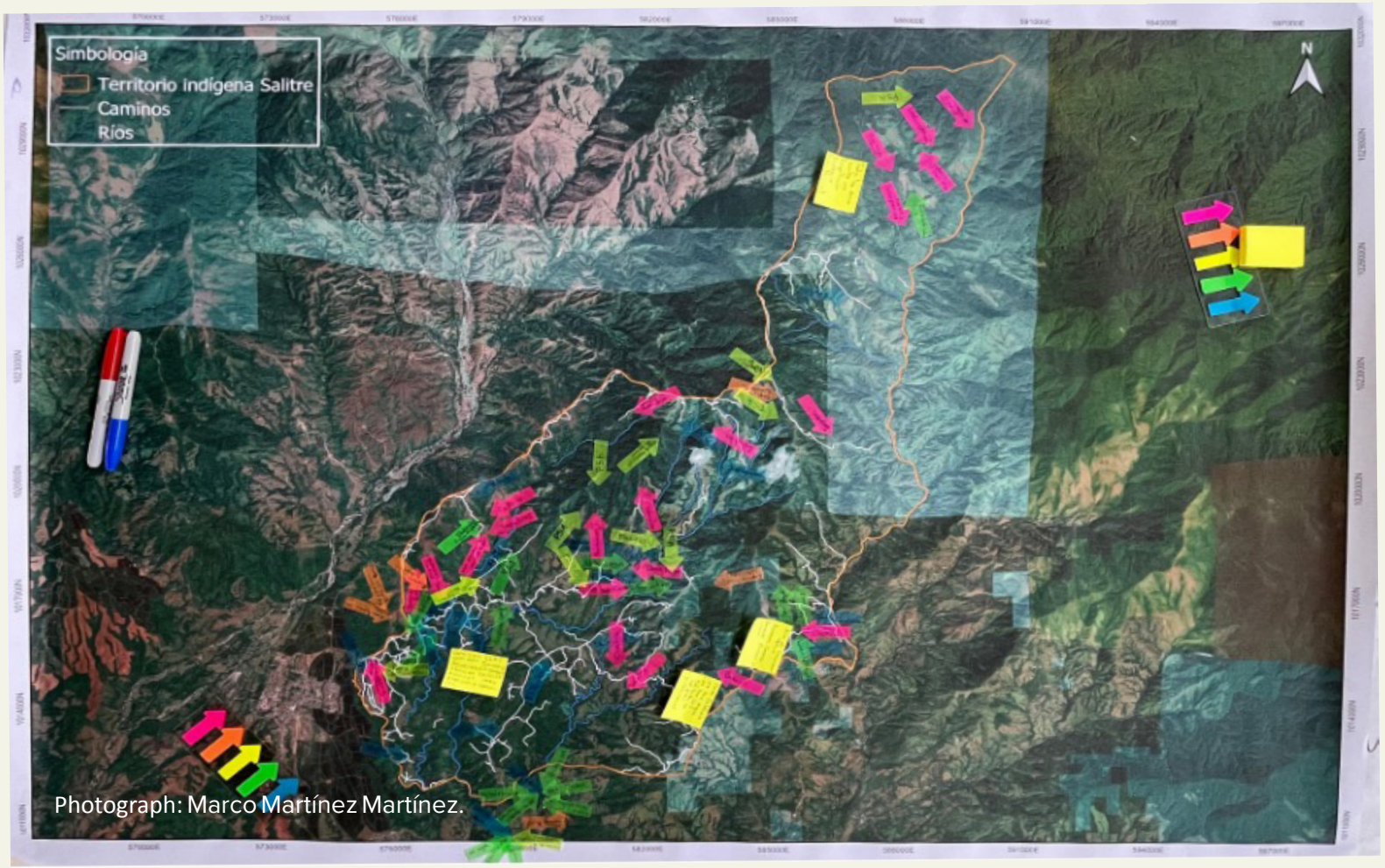
4 The outline map, as an initial tool in participatory mapping workshops, is used for participants to recognize the territory and add relevant information. It is a basemap without names or details, which serves as a support for the collective construction of spatial knowledge (Álvarez, McCall & León, 2022).

3.2.5. Location of key sites according to thematic components. In this methodological point, the link with the TFAP was highlighted, since, based on the ideas developed in this document and in each required section, the problems, needs, challenges and opportunities that each IT had were detailed (Figure 5). Based on that, the collective mapping focused on the following topics:

- **Economic dynamics.** All those related to agricultural activities, livestock, forests with payment for environmental services
- (PSA), indigenous tourism (local gastronomy, lodging, handicrafts, entrepreneurship), among others.
- **Sociocultural characteristics.** Sites of cultural significance, ancestral routes and sacred places (being of a sensitive nature, participants
- decide whether to map them or not), as well as the identification of organized groups (women, the elderly, youth, cooperatives, the Association for Integral Indigenous Development, the Territorial Instance of Indigenous Consultation, resource guards, forest brigades, etc.) and others.
- **Access to goods and services.** All public education infrastructures -such as schools- were identified, as well as access to potable drinking water, internet, electricity, health centers, roads, trails and other state facilities.
- **Problems and needs.** Issues that threaten the territory were detailed, such as deforestation, illegal logging, river pollution, illegal fishing, non-indigenous tourism, forest fires, hunting, landslides, floods, the need for road improvements, the improvement of sewer systems, etc.
- **Strategic vision and projects.** TFAP projects and other initiatives were located and indicated, both territorial in scope, as well as in terms of more local action and implementation. It is here that all those projects that were accepted by the indigenous people of the territory in the TFAP workshops and in the validation assembly were pinpointed on the map.

During this workshop, a collective reflection on the challenges and opportunities of the territory was encouraged, integrating oral knowledge, field trips and intergenerational workshops (Herlihy & Knapp, 2003). Once the mapping was completed, the mapped milestones were discussed collectively as a summary and closure. Sessions were also held with people designated by the local authorities to follow up on the mapping and it was reported that there would be a map validation session and then a hardcopy would be delivered to them for the use and management of the territory.

Figure 5. **Photograph of the map collectively created in the Bribri indigenous territory of Salitre.**

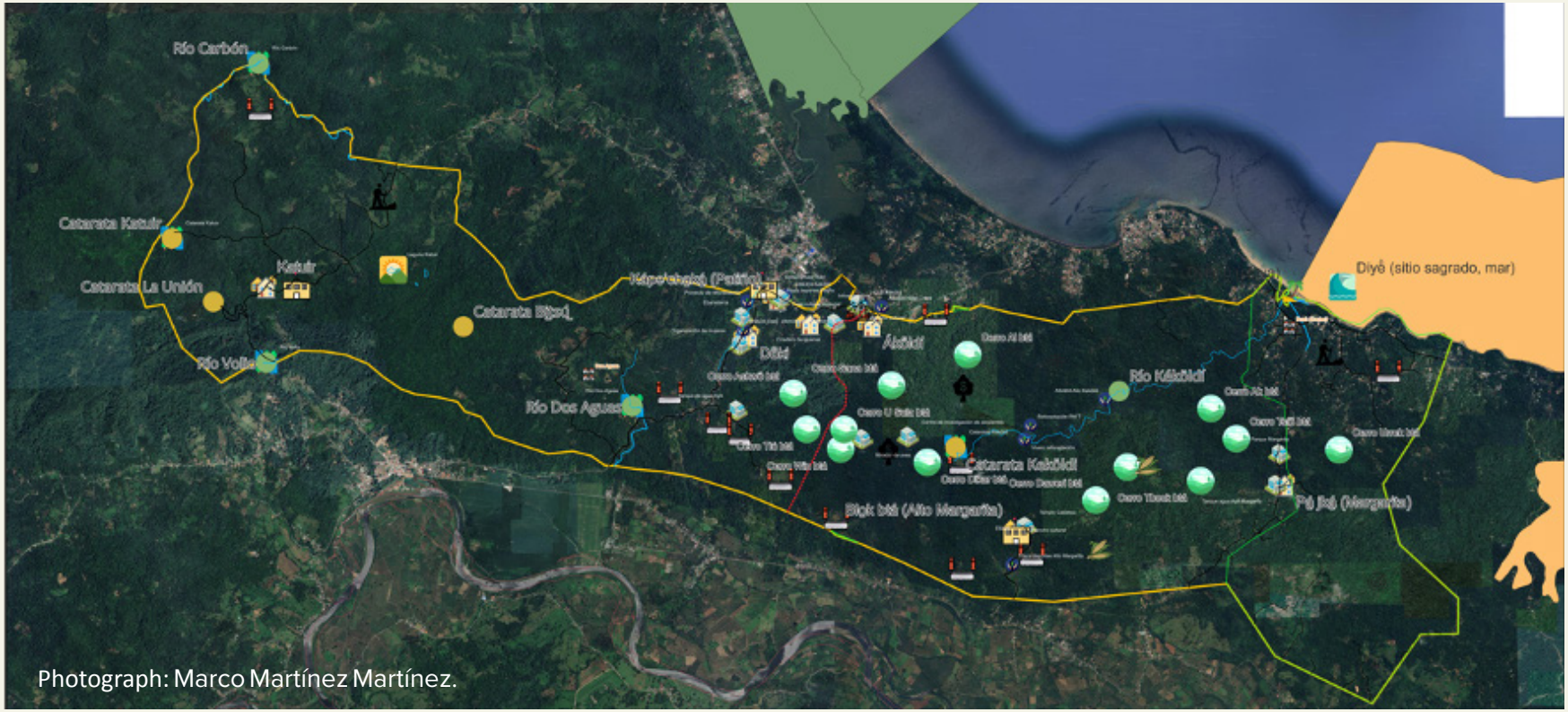


Source: own data in consultation with indigenous people in the territory. UNDP. 2025

3.3 SISTEMATIZATION OF THE PARTICIPATIVE MAP

Once the workshop on collecting basic information was carried out, all the milestones placed on the map by the indigenous people were digitized. GIS tools were used to generate a digital cartographic plan with the results obtained. Vector points were created in the locations that were pinpointed, categorized and named as they were noted on the map, that is, without modifying the marked data, especially in the indigenous language according to the territory (Figure 6). For the graphic design of the maps, the vector layers were exported in Scalable Vector Graphic format (.SVG).

Figure 6. **Photograph of the collective map digitized in GIS, Bribri indigenous territory of Kéköldí.**



Photograph: Marco Martínez Martínez.

Source: own data in consultation with indigenous people in the territory. UNDP. 2025.

3.4 PARTICIPATORY MAP GRAPHIC DESIGN

Based on the digitized items of the collective map and in the .SVG format, a map was designed with graphic details that highlighted the information and data obtained in the field in a layout version that involves appropriate iconography, color, textures and other elements according to the classification of the landmarks, information boxes and characteristics collected in the field after the conversations of the indigenous people are created. In addition, stories around a specific geographical landmark (e.g. a site of cultural significance, a hill, lagoon or the ocean) were detailed and other important local aspects that contextualize the IT were visualized, such as protected wildlife areas, border boundaries or other adjoining IT.

3.5 PARTICIPATORY MAP REVIEW WORKSHOP

For this session, the same invitation procedure developed for the call was carried out and an attempt was made to focus on the same indigenous people who were in the first workshop, in addition to other indigenous leaders, this because their participation was important for their knowledge and contribution from the territorial worldview.

The main objective of this workshop was to present the digitized and designed map to the indigenous people, to review and validate each of the mapped landmarks, as well as to add, eliminate or modify any aspect represented on the map. In addition, the writing of the toponymy in the language of the territory and the annotations that highlighted the landmarks or sites of local importance were reviewed.

3.6 SYSTEMATIZATION OF VALIDATED CHANGES AND FINAL DESIGN

Como fase técnica final, se digitalizaron y sistematizaron en el SIG los hitos que surgieron en la sesión de validación, así como aquellos que se eliminaron As a final technical phase, the milestones that emerged in the validation session were digitized and systematized in the GIS, as well as those that were eliminated or modified. These changes supported the last graphic design of the map, which was given as a printing input to be handed back to the territory (figure 7).

Figure 7. **Final participatory map of the Bajo Chirripó indigenous territory.**

3.7. DELIVERY OF THE PARTICIPATORY MAP TO THE TERRITORY

Para finalizar el proceso participativo, se convocó a personas To complete the participatory process, indigenous people from the participatory mapping sessions (ADI members, TFAP technicians) were summoned to deliver the map to them in a revised and finalized version. Some relevant results and findings of the map were discussed (figure 8).

Figure 8. **Delivery of the final participatory map of the Maleku indigenous territory.**

Photograph: Jorge Cole Villalobos.

04.
Results

4.1. IDENTIFICATION OF ALL COMMUNITIES WITHIN THE TERRITORY

One of the most significant achievements of participatory mapping was the accurate identification of all the communities that make up each IT. This process not only made it possible to geographically locate the settlements, but also to recognize their existence from the perspective of those who inhabit them. In many cases, these communities were not officially registered or were invisible on institutional maps. As it was the indigenous people themselves who pointed out their communities, the legitimacy of the territory as a lived and organized space was strengthened. This identification is key to local planning, resource management, and the implementation of public policies that respond to territorial realities. In addition, these maps allow strengthening other sections developed and described in the TFAPs, which allows the reader to have a closer view of what the territory is like in its holistic conformation.

In total, for the maps that were developed, more than 150 indigenous communities were identified in this participatory process. Based on conversations with indigenous people, and after reviewing the official geospatial layers of Costa Rican settlements (taking data from the National Institute of Statistics and Censuses and the National Geographic Institute as a reference), several of these communities are not georeferenced correctly or do not exist in the records.

On the other hand, it was possible to evidence communities that are part of an IT but that, according to the official boundaries decreed by the Institute of Rural Development (INDER) are not within this area.

In other words, the participatory maps represent the communities that indigenous people collectively decided and acknowledge are part of their territory, also materializing an expression of defense and antagonistic struggle for their territoriality and belonging. As Sletto et al (2020) points out, these cartographies not only represent physical spaces, but also materialize local knowledge, collective memories, and forms of territoriality that challenge hegemonic logics of representation. This reinforces the idea that these maps represent the communities that indigenous people collectively decided and recognize as part of their territory, in an act of political and cultural affirmation.

4.2. TOPONYMIC RECOVERY IN INDIGENOUS LANGUAGES

The recovery of toponymy in the indigenous language represents an act of cultural resistance and affirmation of identity. During the workshops, it was encouraged that the names of places were written in the language of each IT, which made it possible to rescue geographical and local terms that reflect the cosmovision, history and spiritual link with the territory. This practice contributes to linguistic revitalization and collective memory strengthening. According to Herlihy & Knapp (2003), maps made by indigenous peoples are also visual narratives that preserve knowledge. Incorporating indigenous toponymy into maps is a way of recognizing the territory as a cultural space, not just a physical one.

Toponyms were obtained in the Maleku, Jaica, Ngäbere, Bribri, Cabécar and Boruca languages, in which the most representative landmarks are the communities, then the names of the territories, followed by environmental sites such as hills, rivers, lagoons or lakes and sites of cultural importance. In some of the territories, the indigenous people present at the workshops mentioned that the proper name of the territory had no translation into the local language, as is the case of Salitre, Alto San Antonio and Alto Laguna, or some of the indigenous communities in several of the territories only knew their name in Spanish and not in the local language. According to the mappings carried out, all the communities of the IT of Bajo Chirripó, Tayní and Alto Laguna are in the language of their indigenous people.

Photograph: Marco Martínez Martínez.

4.3. IDENTIFICATION OF PROBLEMS AND OPPORTUNITIES

The collective identification of problems and potential elements of development within the ITs was one of the methodological pillars of participatory mapping, as it allowed communities to express, from their lived experience and their cosmovision, the challenges they face on a daily basis, such as illegal logging, river pollution, land usurpation, unregulated fishing and lack of access to basic services such as drinking water, health, education and road infrastructure. As it is a collective exercise, these problems were not imposed externally, but rather emerged from community reflection, which gave them legitimacy and relevance. In addition, specific threats in border territories were made visible, such as forest fires and territorial boundary situations, demonstrating the ability of mapping to capture territorial complexities from a local perspective.

The main anthropogenic problems demonstrated in all the ITs are illegal logging or deforestation, illegal poaching and land usurpation, which demonstrates the serious environmental and social damage that some people exert within the territories, as a method of ownership of natural resources and land rights. The most affected sites are river banks, water springs, areas of dense forest (primary and secondary) and extraterritorial boundaries or frontiers and that, consequently, collaterally damage local and zonal biodiversity, which are important within the indigenous cosmovision.

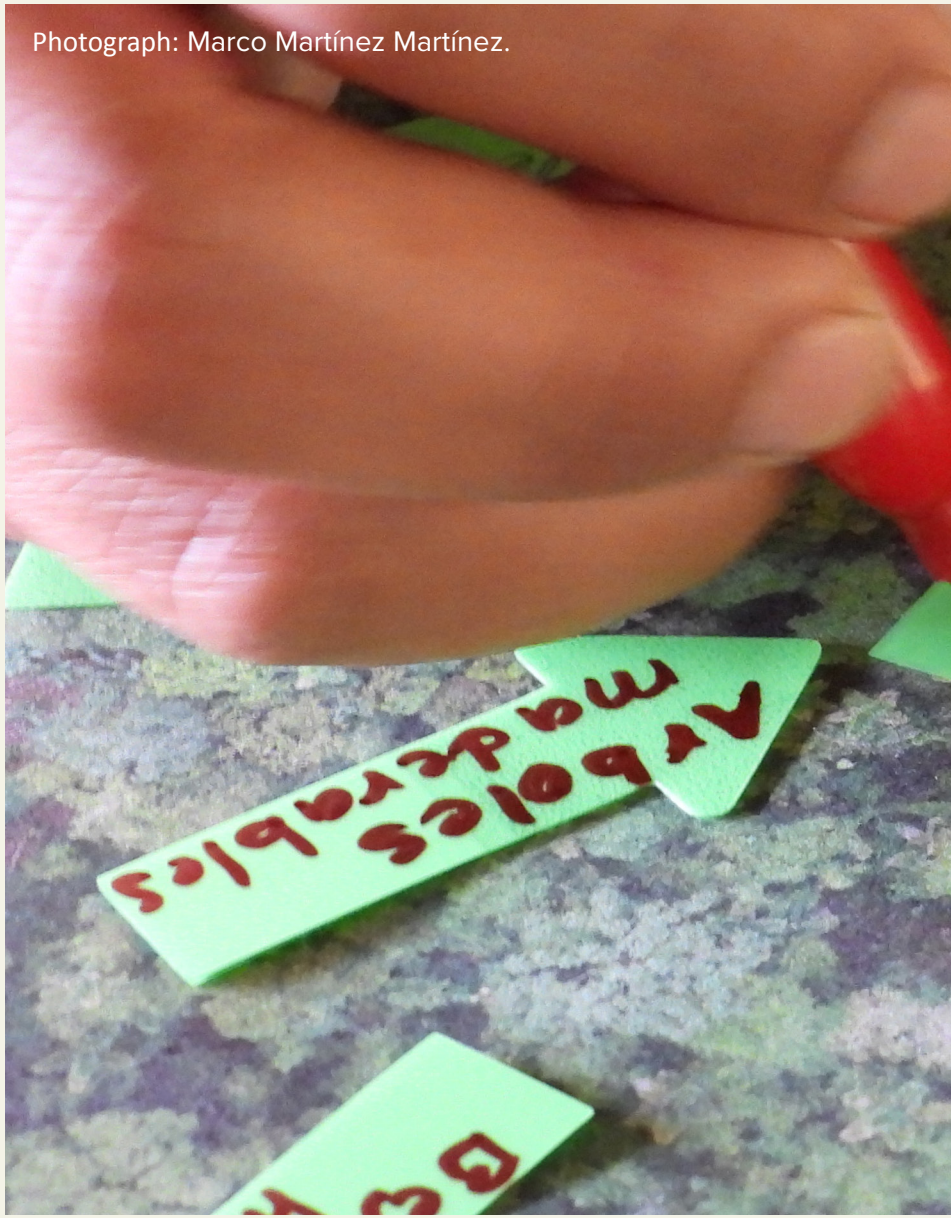
At the same time, the process made it possible to identify multiple social, cultural and economic competencies that exist in the IT. These include tourism and indigenous gastronomy, reforestation projects with native species and those used in cultural expressions, women's and youth initiatives, and forestry/monitoring or resource guarding brigades. These strengths, often invisible in institutional diagnoses, were represented on the maps as key elements for sustainable development from the indigenous cosmovision. The articulation of these potentialities with TFAP projects made it possible to build a strategic vision of the territory, oriented towards resource management, environmental conservation and the strengthening of identity.

This collectively constructed territorial diagnosis becomes a powerful tool for project formulation, fund management and political advocacy. As Bryan (2011) points out, participatory maps can be used to negotiate with the State and other actors, by evidencing local needs and capacities. Along these lines, Sletto et al. (2020) states that social cartographies have been fundamental in Latin America as instruments of struggle against dispossession and extractivism and as ways of producing territorial knowledge from communities. Participatory maps, by representing what indigenous people recognize as part of their territory, materialize an expression of defense, belonging, and self-determination. Thus, this process not only generated geospatial information, but also strengthened territorial governance and the capacity of communities to influence decisions that directly affect their lives and their environment.

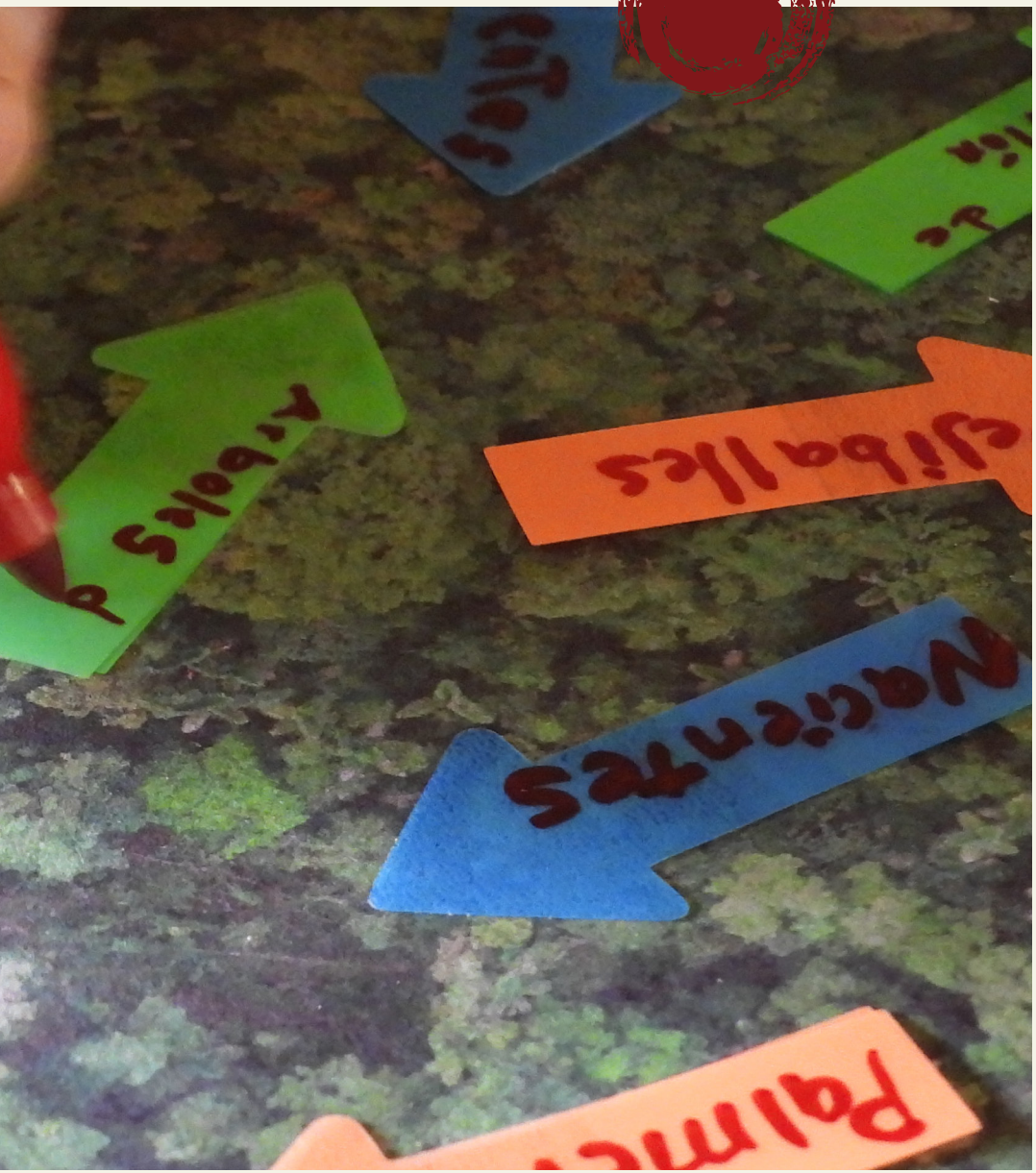
4.4. OWNERSHIP OF RIGHTS

Participatory maps, as Chambers (2006) argues, empower communities by allowing them to represent their reality and make informed decisions about their environment. This process demonstrates that this is a key tool for the ownership of rights in IT, by allowing communities to represent their territory from their own knowledge, languages and Cosmovisions. This process not only generates maps, but also strengthens the recognition of territorial, cultural, and environmental rights, by making visible elements that have traditionally been excluded from official records. This ownership translates into a greater capacity to influence planning, conservation and development processes, from its own and situated perspective.

Some of the participatory maps express territorial defense processes, especially in contexts of conflict over boundaries, illegal occupations or environmental threats. As Braceras (2012) argues, participatory maps should not focus only on technical accuracy, but also on their ability to activate collective processes, unite communities, and enhance the participation of historically excluded groups, such as indigenous women. This same author highlights that collective mapping allows communities to “generate change” by turning the act of mapping into a form of organization, reflection, and territorial action. Thus, participatory mapping is not only a technique, but a political and cultural practice that contributes to territorial justice and the strengthening of indigenous governance.



Photograph: Marco Martínez Martínez.



4.5. A TOOL FOR INDIGENOUS LAND USE PLANNING

Indigenous land use planning requires tools that respect not only the physical dimension of the space, but also its symbolic, spiritual and cultural dimensions. Participatory maps fulfill this function by integrating elements such as ancestral routes, sacred sites, traditional use areas, community gathering spaces, and local projects. Unlike conventional technical maps, these products are built from the indigenous cosmovision, which allows the territory to be represented as a living space, inhabited and relevant for generations. This form of representation strengthens territorial planning from its own logic, in which there is no fragmentation by administrative criteria, but is organized according to the cultural, ecological and social ties that the communities recognize.

Within the TFAP framework, participatory maps have been fundamental in defining conservation zones, productive areas, low-emission projects, spaces for common cultural use, and strategic sites for community development. This information is being used by communities to make decisions about land use, project location, protection of sensitive sites, and natural resource management, such as the indigenous territory of Cabagra, which implements TFAP projects also based on the sites mapped. In addition, these maps have the potential to be used as an input for dialogue with public institutions, allowing territorial planning to be articulated with the principles of full, active and effective participation, which recognizes the right of indigenous peoples to decide on the use of their lands and resources. In this sense, participatory mapping not only generates geospatial information, but also strengthens territorial indigenous governance.

Various studies have supported the use of participatory cartography as a tool for territorial planning in indigenous contexts. For example, Herlihy and Knapp (2003) highlight that maps made by indigenous communities in Latin America have been used to document traditional bounderies, areas of ancestral use and sites of cultural importance, contributing to autonomous planning and the defense of territorial rights. Similarly, Mora Calderón and Pelz-Seyfarth (2025) points out that, in Costa Rica, participatory mapping has made it possible to make socio-environmental conflicts visible and propose

solutions from the community perspective. Taken together, these experiences demonstrate that participatory maps are not only technical outputs, but also instruments of planning, resistance and territorial affirmation, built from local knowledge and the active participation of communities.

4.6. A MEANS TO STRENGTHEN ORAL TRADITION, DAILY LIFE, CULTURE AND BELONGING

During the collective workshops, the indigenous elders shared stories about ancestral routes, sacred sites, traditional agricultural practices and historical events that marked the territory. These stories were incorporated into the mapping process, allowing children and young people to learn about their environment directly from the voice of their elders. Thus, the map becomes an educational resource that articulates memory, identity and belonging and strengthens the link between generations.

As an example of this, on the Kéköldí indigenous territory map there is the following story about what the sea signifies for the indigenous people:

“The sea and the beach are considered sacred sites. They usually did not sail much out to sea since it is a place of great respect. They preferred to settle inland, in the mountains and high areas. Sibö (supreme being) turned an indigenous girl into the sea (Mülur). In the indigenous cosmovision, the sea is a woman, mother of species that inhabits it. It is for this cosmogonic respect that indigenous people cohabit with natural ecosystems”.

(Taken from collective annotations of indigenous people from Kéköldí. 2025. UNDP)

Or the explanation of what Kámuk Peak means for the indigenous people of Cabagra:

“It is a Bribri mythological hill. It is the house of Támi Ù, the owner of the animals, who takes care of them and protects them. This site was a place of refuge in the colonial era of the XV century”.

Laudencio Rojas Ortiz, Cabagra Indigenous Territory.

This narrative dimension of the participatory map allows the territory to be understood not only as a physical space, but as a fabric of meanings, experiences and bonds. In many cases, the maps have been used in school activities, community assemblies and guided tours for non-indigenous people, as a way of transmitting the cultural richness of the territory. Orality, being a central component in the transmission of indigenous knowledge, finds in the map a visual support that facilitates teaching and collective reflection. As Ospina Mesa (2023) points out, emerging cartographies in Latin America make it possible to articulate epistemic diversity and processes of territorial memory, by recognizing that knowledge is not limited to the written or technical, but is also expressed in stories, symbols, and everyday practices.

In addition, the use of maps as a means of oral dissemination has contributed to strengthening community self-esteem and a sense of belonging. By seeing their spaces, names in indigenous language, sites of cultural importance and local projects represented, the participants recognize the value of their territory and their role in its historical construction. This symbolic ownership of the map reinforces collective identity and allows the territory to be narrated from within, as opposed to external representations that often simplify or distort it.

4.7. INDIGENOUS PEOPLE'S PERCEPTION OF MAPS

The delivery of the participatory maps generated a deep sense of pride and satisfaction in the indigenous communities. For many people, seeing their territory represented on a collectively constructed map was an unprecedented and meaningful experience. They expressed gratitude to the REDD+ PBR Project for having promoted a process that respected their vision and cosmovision, stressing that maps are not simply technical products, but symbols of identity and tools for the defense of their rights. The ownership of the marked landmarks – communities, sacred sites, ancestral routes and strategic projects – reinforced the sense of belonging and the legitimacy of the territory as a cultural and political space.

During the feedback sessions, the participants stated that these maps allow them to recognize and narrate themselves from within, strengthening collective memory and community unity. For leaders, women and young people, the map became a tangible resource for planning, education and territorial management, as well as a means to transmit intergenerational knowledge. As Neri Ríos, from the Conte Burica indigenous territory, pointed out, "we had never seen the territory from this point of view and we had never had such a beautiful map that reflects our territory", which shows that participatory cartography not only provides geospatial information, but also activates processes of empowerment and social cohesion.

Photograph: Marco Martínez Martínez.

05.
Indigenous Learning and Voices in the Mapping Process

Participatory mapping is not just a technique: it is a dialogue between territory, memory and future. The experiences shared by indigenous people reveal that each map is a living narrative, where ancestral knowledge, collective decisions and aspirations for the next generations are intertwined. This section collects testimonies that show how participatory cartography becomes a tool for defense, cohesion and education, reaffirming that the territory is not drawn only with coordinates, but with histories, identities and rights.

The reflections presented here are organized in three dimensions:

- Listening and legitimacy, where diverse participation strengthens the community governance.
- Territorial defense and affirmation, which turns the map into a political and cultural instrument.
- Educational projection, which ensures the intergenerational transmission of knowledge and the continuity of identity.

Below, are testimonies and reflections from three ITs, illustrating how participatory mapping is lived and projected by those who build it.

BAJO CHIRRIPÓ: THE VOICE THAT IS HEARD AND RESPECTED

Farlen Artavia Pino described the process as an experience where the community felt heard and respected, reflecting on the principle of participatory action research that underpins the methodology. The call included women, the elders, children and indigenous leaders, guaranteeing a plural representation that strengthened the legitimacy of the exercise. This inclusive nature coincides with the intercultural approach of the TFAPs, where the diversity of voices is essential for territorial planning from the indigenous cosmovision.

The most significant thing for Farlen was to integrate indigenous knowledge as the central axis of the map. This integration was reflected in cultural landmarks, ancestral routes and toponymy in the Cabecar language, practices that the article recognizes as acts of cultural resistance and affirmation of identity. Thus, the map transcends the technical to become a territorial memory and a tool for governance, reinforcing the ownership of collective rights.

Farlen also stressed that the process allowed reflection on the challenges and opportunities of the territory, generating a space where the elders shared stories and knowledge with young people and women. This intergenerational interaction strengthened community cohesion and reaffirmed that the defense of the territory is not only a present action, but a shared responsibility for the future. The map, in this sense, becomes a bridge between generations, where history and planning meet.

Finally, the experience in Bajo Chirripó shows that participatory cartography is not extractive, but devolutive: the products generated are collective property and are delivered to the territory as inputs for decision-making. This ethical principle reinforces trust between communities and institutions, consolidating indigenous governance as the basis for sustainability.

SALITRE: THE MAP AS AN ACT OF DEFENSE AND CULTURAL CONSTRUCTION

For Abigail Rodríguez Calderón, participatory mapping was a strategic tool for the defense of indigenous rights over territory, lands and resources. The map included communities that, although outside the official boundary, maintain a sense of belonging to Salitre, which reflects indigenous territoriality as a cultural and political construction.

Abigail stressed that the map is not only a technical product, but an instrument of claim and affirmation of collective rights. During the process, social and environmental challenges and problems were identified — such as land usurpation and ecosystem degradation — which were assumed as lines of action for improvement. This exercise in community reflection coincides with what was proposed in the article on the capacity of participatory mapping to materialize territorial diagnoses built from the indigenous cosmovision, strengthening governance and autonomous planning.

Another relevant aspect was the inclusion of organized groups of women and the integration of various social sectors, which generated spaces for the creation of networks and the active participation of young people and territorial defenders. This inclusive dimension turns participatory mapping into a political and cultural practice that enhances territorial justice and community cohesion. As Abigail points out, “the map unites us and gives us strength to reclaim what belongs to us”, a phrase that synthesizes the symbolic and practical power of this instrument.

This process in Salitre shows that the map is not static: it is a living document that can be updated and serve as a basis for TFAP projects, negotiations with institutions and educational processes. Thus, participatory cartography is projected as a tool for advocacy and social transformation.

ALTO SAN ANTONIO: MAPS THAT EDUCATE AND PROJECT THE FUTUREO

Meliz Mora Montezuma imagined that, in 10 or 20 years, participatory maps will be identifiers of territorial landmarks and living stories that narrate the history of the territory. Each map expresses indigenous identity, depicting sacred sites, ancestral routes and toponyms in the Ngäbere language, which coincides with indigenous territoriality as a cultural and spiritual construction.

Meliz stressed that these maps are also a means to encourage education among children and youth. By integrating ancestral knowledge with modern tools, they become pedagogical resources that strengthen collective memory and intergenerational transmission. As pointed out in the article, participatory cartography not only delimits spaces, but also activates learning processes and community cohesion, ensuring that future generations assume the defense of the territory as part of their identity.

Likewise, Meliz emphasized that maps are useful for long-term planning, especially in TFAP projects. By identifying conservation zones, productive areas, and cultural sites, these inputs make it possible to design strategies that respect the indigenous cosmovision and promote sustainable development. In Meliz’s words, “the map is our guide to take care of what we are and what we will be”, a statement that reflects the prospective dimension of participatory mapping.

Therefore, the voices from the territories reveal that participatory maps are much more than graphic representations: they are instruments of governance, identity and future. Each experience shows how participatory cartography strengthens autonomy, social cohesion and the transmission of knowledge, becoming a tool for the defense of rights and territorial planning from the indigenous cosmovision. These maps not only draw the territory: they narrate it, claim it and project it to future generations.

Photograph: Marco Martínez Martínez.

06.
Conclusions

The participatory mapping experience developed within the framework of the REDD+ PBR Project and the TFAP in IT in Costa Rica has shown that participatory mapping is much more than a spatial representation technique. It is a profoundly transformative methodology that allows geospatial information to be collected from orality, collective memory and the indigenous cosmovision. This approach recognizes that territory is not just a delimited physical space, but a cultural, spiritual, and political construct, inhabited and signified for generations.

One of the main achievements of the process has been the high acceptance by IT. The participating indigenous people not only actively contributed to the development of the maps, but also appropriated them as legitimate tools for planning, education, territorial defense and project management. This ownership translates into a daily use of maps as instruments for consultation, teaching and decision-making. As Peluso (1995) points out, maps can be used as “weapons of defense” in contexts of territorial dispute, by allowing communities to represent their vision of space in the face of official or external narratives.

Likewise, the REDD+ PBR Project has proven to be a catalyst for participatory and intercultural processes, by generating spaces for dialogue that respect local knowledge and by strengthening climate governance in IT. Through the TFAPs, a more inclusive territorial planning was consolidated, in which participatory maps were integrated as key inputs to define conservation zones, productive areas and spaces for cultural use. This experience is in line with what was documented by Rivadeneira and Tamburini (2025) in

Bolivia, where cartography was used as a tool for governance and defense against extractivist threats, and with the contributions of Fox (2002), who highlights that participatory processes strengthen the legitimacy of territorial decisions when they are based on local knowledge.

The role of UNDP Costa Rica has been fundamental in strengthening the bonds of trust with ITs, demonstrating that it is possible to carry out collective processes that respect one's own vision, cultural diversity and territorial rights. The implementation of the participatory mapping methodology has contributed to consolidating a more horizontal relationship between communities and public institutions, based on mutual recognition and the joint construction of solutions. This experience reinforces what Harley (1989) argues, that maps are not neutral, but reflect power relations; In this case, power is redistributed to the communities, which become the protagonists of the representation of their territory.

Participatory maps will undoubtedly contribute to public institutions and indigenous territorial governance. They have become tools for consultation, planning and monitoring, useful for environmental management, intercultural education and the formulation of public policies. By integrating ancestral knowledge with modern technologies, these maps represent a powerful synthesis between tradition and innovation, and constitute a solid basis for moving towards more just, sustainable and culturally relevant development models. As Wood (2010) points out, critical cartography allows maps to be used to tell stories from below, from those who have been historically excluded from the processes of official representation.

The indigenous voices expressed in this process provide a qualitative dimension that reinforces the depth of the results. Beyond the technical, the maps are consolidated as spaces for dialogue and social cohesion, where the inclusion of women, young people and elders guarantees legitimacy and diversity. The communities not only appropriated the final product, but they conceive it as a political tool for the defense of rights, a strategic input for planning and a pedagogical resource to transmit identity and knowledge to future generations. This perspective confirms that participatory cartography is not static: it is a living instrument that narrates the territory from within, reclaims it against external visions and projects it into the future as a symbol of autonomy and cultural resilience.

In conclusion, Costa Rica's participatory IT mapping process has been an exemplary experience of how mapping can be used as a tool for empowerment, planning, and social transformation. The maps generated not only represent the territory, but also vindicate it, narrate it and project it into the future, from the voice and vision of those who inhabit it.

Photograph: Marco Martínez Martínez.

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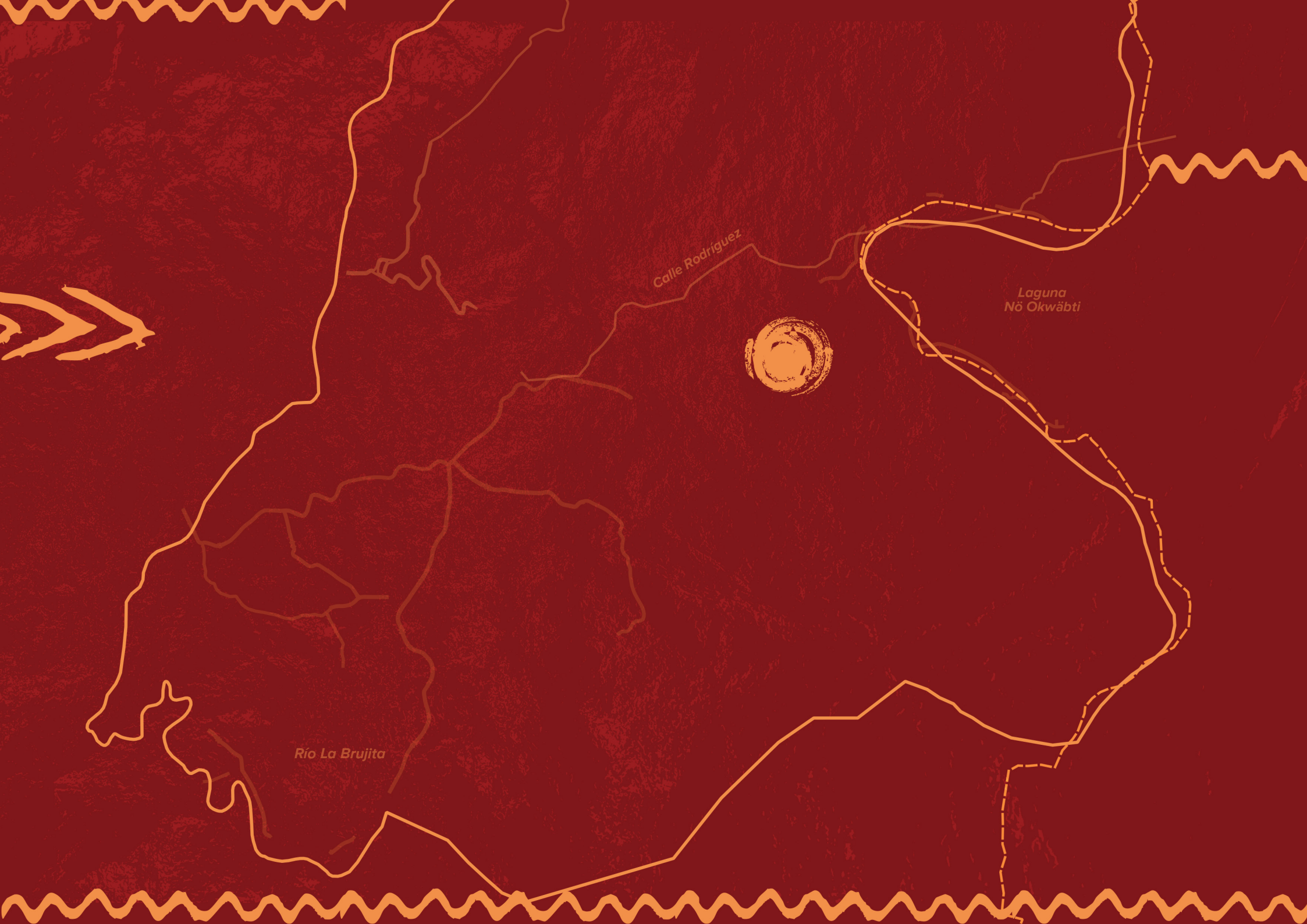
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