

# Participatory design for environmental governance<sup>[1]</sup>:

## A fishing school in the Amazon

Diseño participativo para la gobernanza ambiental:

Una escuela de pesca en la Amazonia

Design participativo para gobernança ambiental:

uma escola de pesca na Amazônia

Conception participative pour la gouvernance environnementale :

une école de pêche en Amazonie

Fuente: Autoría propia

### Autores

Jorge De Los Ríos Anzola

Investigador Universidad Nacional de Colombia sede Amazonas  
jodean@unal.edu.co  
<https://orcid.org/0009-0002-0023-4096>

Andrea Buitrago Ospina

Consultora de la Universidad Internacional de la Florida  
abuitrag@fiu.edu  
<https://orcid.org/0000-0002-8394-0625>

Lina María Mayorga Borja

Investigadora Universidad Nacional de Colombia sede Bogotá  
lmmayorgab@unal.edu.co  
<https://orcid.org/0009-0006-0144-7797>

Camila Pérez Cubillos

Investigadora Universidad Nacional de Colombia sede Amazonas/ Fundación Grupo PROA  
Camila.perez@fundaciongrupoproa.org  
<https://orcid.org/0000-0002-7783-7074>

Recibido: 18/06/2024

Aprobado: 23/09/2024

### How to cite this article:

De Los Ríos-Anzola, J., Mayorga-Borja, L., Buitrago-Ospina, A., Pérez-Cubillos, C. (2024). Diseño participativo para la gobernanza ambiental: Una escuela de pesca en la Amazonia. *BITÁCORA URBANO TERRITORIAL*, 34(III): 196-208.

<https://doi.org/10.15446/bitacora.v34n3.115057>

[1] Document derived from work experience.

## Abstract

This article presents the participatory design experience in creating the Fishing School of the TIKÀ Artisanal Fishermen's Organization, formed by seven communities within the Yahuaracaca lagoon system in the Colombian Amazon. This organization emerged in response to environmental crises triggered by migration, small Indigenous reserves, and the adoption of new fishing techniques, factors that have led to overfishing and compromised food sovereignty in the region. Since 2011, TIKÀ has implemented a model of community governance to address land tenure inequality, improve access to ecosystem services, and mitigate the ecological imbalance intensified by peri-urban growth in Leticia. Through mobile environmental monitoring projects and community education, TIKÀ has promoted resilient solutions to confront crises derived from global change. This article explores how the participatory design process allowed the development of infrastructure tailored to local needs, offering a contextually and culturally relevant architectural response.

**Keywords:** environmental governance, land management, socio-environmental conflicts, participatory design, indigenous knowledge

## Authors

### Jorge De Los Ríos Anzola

Architect from the National University of Colombia, Bogotá campus, with a specialization in Southern Epistemologies from CLACSO and a Master's candidate in Amazonian Studies at the National University of Colombia, Leticia campus. Experience in participation and development in social housing, traditional architecture of the Coffee Triangle region, and traditional architecture of indigenous peoples in the Amazon. Currently working as an advisor in the development of the Architecture program with a territorial focus at the National University of Colombia, Amazon campus.

### Lina María Mayorga Borja

Architect with experience in housing improvement at the Popular Housing Fund. She has worked on architectural projects in the Colombian Amazon. Support professional for the PEAMA admission program at the National University of Colombia, Amazon campus. Experience in the cultural landscape of the Magdalena River, with a publication in the cultural landscapes journal at the UPC.

### Andrea Buitrago Ospina

Anthropologist with a Master's in Education. She has over ten years of experience in coordinating, implementing, and evaluating processes that contribute to community organization and adult education. Interested in developing experiences based on the theoretical and methodological perspective of popular education, especially in rural contexts. Experience in diagnosing, coordinating, and strengthening local initiatives for environmental governance and conservation processes in the Amazon biome from the perspective of organizational strengthening and community cohesion.

### Camila Pérez Cubillos

Ecologist with a Master's in Rural Territorial Development and more than a decade of experience. Her career has focused on research and project management that integrate traditional indigenous knowledge into biodiversity conservation and social welfare programs in the Colombian Amazon. She has led conservation and sustainable development initiatives, providing recommendations for public policies focused on the protection of cultural and natural heritage. Executive Director of the Proa Group Foundation and Associate Researcher at the Wetland Management and Conservation Group at the National University of Colombia, Amazon campus.

## Resumen

Este artículo presenta la experiencia de diseño participativo en la creación de la Escuela de Pesca de la Organización de Pescadores Artesanales TIKÀ[2], formada por siete comunidades del sistema lagunar de Yahuaraca, en la Amazonia colombiana. Esta organización surgió en respuesta a las crisis ambientales provocadas por la migración, los pequeños resguardos indígenas y la adopción de nuevas técnicas de pesca, factores que han conducido a la sobrepesca y comprometido la soberanía alimentaria en la región. Desde 2011, TIKÀ ha implementado un modelo de gobernanza comunitaria para combatir la desigualdad en la tenencia de tierras, mejorar el acceso a servicios ecosistémicos y mitigar el desequilibrio ecológico intensificado por el crecimiento periurbano de Leticia. Mediante proyectos itinerantes de monitoreo ambiental y educación comunitaria, TIKÀ ha promovido soluciones resilientes para enfrentar las crisis derivadas del cambio global. Este artículo explora cómo el proceso de diseño participativo permitió desarrollar una infraestructura adaptada a las necesidades locales, ofreciendo una respuesta arquitectónica contextualizada y culturalmente pertinente.

**Palabras clave:** gobernanza ambiental, gestión del territorio, conflictos socioambientales, diseño participativo, conocimiento indígena

[2] El nombre de la organización es tomado de “un ave (Piaya Cayana) que representa la buena fortuna, a través de su canto... la TIKÀ. Nosotros representamos ese mensaje para nuestras comunidades y territorio y nos preocupamos por la conservación de la biodiversidad íctica (peces) y el cuidado del bosque inundable”. (Tomado de la página web de la organización TIKÀ).

## Résumé

Cet article présente l'expérience de conception participative dans la création de l'École de Pêche de l'Organisation des Pêcheurs Artisanais TIKÀ, composée de sept communautés du système lagunaire de Yahuaraca, en Amazonie colombienne. Cette organisation est née en réponse aux crises environnementales provoquées par la migration, les petites réserves indigènes et l'adoption de nouvelles techniques de pêche, des facteurs ayant conduit à la surpêche et compromis la souveraineté alimentaire dans la région. Depuis 2011, TIKÀ a mis en place un modèle de gouvernance communautaire pour lutter contre l'inégalité dans la tenure foncière, améliorer l'accès aux services écosystémiques et atténuer le déséquilibre écologique exacerbé par l'expansion périurbaine de Leticia. À travers des projets itinérants de suivi environnemental et d'éducation communautaire, TIKÀ a promu des solutions résilientes pour faire face aux crises découlant du changement global. Cet article explore comment le processus de conception participative a permis de développer une infrastructure adaptée aux besoins locaux, offrant une réponse architecturale contextualisée et culturellement pertinente.

## Resumo

Este artigo apresenta a experiência de design participativo na criação da Escola de Pesca da Organização de Pescadores Artesanais TIKÀ, formada por sete comunidades do sistema lagunar de Yahuaraca, na Amazônia colombiana. Esta organização surgiu em resposta às crises ambientais provocadas pela migração, pelas pequenas reservas indígenas e pela adoção de novas técnicas de pesca, fatores que levaram à sobrepesca e comprometeram a soberania alimentar na região. Desde 2011, a TIKÀ implementou um modelo de governança comunitária para combater a desigualdade na posse da terra, melhorar o acesso aos serviços ecossistêmicos e mitigar o desequilíbrio ecológico intensificado pelo crescimento periurbano de Leticia. Através de projetos itinerantes de monitoramento ambiental e educação comunitária, a TIKÀ promoveu soluções resilientes para enfrentar as crises derivadas das mudanças globais. Este artigo explora como o processo de design participativo permitiu o desenvolvimento de uma infraestrutura adaptada às necessidades locais, oferecendo uma resposta arquitetônica contextualizada e culturalmente pertinente.

**Palavras-chave:** governança ambiental, gestão do território, conflitos socioambientais, desenho participativo, conhecimento indígena

Participatory design for environmental  
governance:  
A fishing school in the Amazon

**Mots-clés :** gouvernance environnementale, gestion du territoire, conflits socio-environnementaux, conception participative, connaissance indigène

## Introduction

*In response, the indigenous communities have organized to develop environmental governance actions, which include community coordination, the creation of management and ecosystem use agreements, territorial control, environmental education, and intergenerational dialogue, construction, and recovery of knowledge. As part of these processes, participatory design work for the Fishing School is being carried out in collaboration with the TIKÀ Fishermen's Organization.*

The artisanal fishing organization TIKÀ is located in the city of Letícia, in the southern Amazon of Colombia. Its members belong to seven multiethnic indigenous communities, primarily Magütá<sup>[3]</sup>, Kokama, and Yagua, from the cultural complex known as the “people of water.” These communities are associated with the lagoon system of the Yahuaraca stream, connected to the Amazon River. For the past 20 years, the organization has led concrete actions for the protection and conservation of the lagoon system in response to the fishing bonanzas, demographic pressures resulting from forced migration of communities from the central Amazon to the city, the introduction of new fishing techniques, and the disruption in the transmission of traditional knowledge, among others. These transformations have intensified the exploitation of natural resources, exacerbating local conflicts (Castello et al., 2015; Sánchez López et al., 2023).

In response, the indigenous communities have organized to develop environmental governance actions, which include community coordination, the creation of management and ecosystem use agreements, territorial control, environmental education, and intergenerational dialogue, construction, and recovery of knowledge. As part of these processes, participatory design work for the Fishing School is being carried out in collaboration with the TIKÀ Fishermen's Organization. This strategy seeks to create spaces that respond to the current territorial configurations, through an inclusive design that aligns with the realities of the context of the organization and is pertinent to the control activities they have been implementing in the Yahuaraca lagoon system for over 20 years.

This article focuses on this process and reveals how the design of the Fishing School becomes an exercise in governance applied to the architectural field. From the selection of its location and the definition of a needs program, to the design, building materiality, and active participation of the communities in its construction, this experience emphasizes the value of participatory design. The methodology used is conceived as a critical stance towards the socio-economic and socio-ecological reality, promoting the integration of the community's needs and aspirations.

Next, an initial context will be presented that exposes the socio-environmental crises and global change issues that the TIKÀ process responds to, as well as the community-driven governance and territorial planning practices as alternatives to these crises. The participatory design work developed in this scenario will then be addressed, highlighting the ability of this tool to incorporate the community's experience and vision. In the conclusions, the lessons learned and best practices will be synthesized to foster territorial appropriation by indigenous populations in urban spaces in the Amazon, as an alternative for the creation of inclusive and resilient architectures in response to the current socio-ecological challenges.

[3] The term Magütá has recently become more popular when referring to the Tikuna people. This is part of an effort to reclaim the indigenous people's self-designation, as opposed to the name assigned to them by other ethnic groups or colonizing populations.



## The Yahuaracaca Lagoon System

The Yahuaracaca lake complex is a lagoon system associated with the Yahuaracaca creek and the floodplain of the Amazon River, spanning both the urban center and the rural area of the municipality of Leticia. This territory, approximately 1,000 hectares in size, is considered the “backyard” of the city. Here, the white waters of the Amazon River converge with the black waters of the Yahuaracaca creek, which originates in this region. Home to over 173 species of fish, this area is one of the most biodiverse fishing zones in the entire river basin (Prieto-Piraquive, 2012).

The cultural richness associated with fishing is remarkable among the people of the region. Each year, the river rises between 8 and 14 meters, flooding forested areas where fish feed on fruits that fall into the water. During the low water season, vast beaches emerge, providing areas for planting, while the fish take refuge in lakes protected by vegetation and the spiritual presence of the *boa*, considered by local indigenous peoples as the protective mother of these spaces.

Currently, around 3,500 people live in this area, belonging to different indigenous communities. People from other areas of the department, region, and countries have also arrived, presenting new challenges for coexistence. The indigenous peoples of the Amazon Riverbank form part of the cultural complex known as the ‘people of the water,’ for whom water and fishing are fundamental (Echeverri, 2023). In fact, for the Magüta people, their origin story narrates how the first members of their community were “afrecho de huito” (*Genipa americana*) thrown into the river and transformed into a group of fish, which were later “caught by Yoi, Ipi, and Techí,” two of the creator brothers of this world (Santos, A., 2022, p. 92).

These peoples possess a vast traditional knowledge of the river, the fish, and the flooded forest; they understand how the river’s flood pulse acts as a cultural and ritual calendar for the local communities. The river not only modifies the landscape but also defines the way of life in the seven indigenous communities of the Yahuaracaca lakes (see Image 1), where the members of the TIKÀ fishing organization live. Here, water sets the rhythm of life and traditional crafts, with fishing being an activity that reflects knowledge of the flooding cycles, migration, and the dietary patterns of different species.

This knowledge has been enriched over centuries and now constitutes a complex system manifested in songs, ceremonies, and origin stories. From this perspective, fishing is not only vital for subsistence but also expresses the essential territorial knowledge and practices of the ‘people of the water’ cultural complex.

## Socio-environmental Crises from Global Change

In the past three decades, the Yahuaracaca lagoon system has undergone significant deterioration. A crucial factor in this process was the fishing boom that occurred in the region during the 1970s, 80s, and 90s, when overfishing of large catfish intended for the capital cities of Colombia introduced a model of exploitation that was not typical in the area (Prieto-Piraquive, 2012; Granado-Lorencio et al., 2017). This led to significant changes: the introduction of new fishing techniques (such as nylon nets), changes in the management of fisheries in terms of species and zones, weakening of traditional knowledge in managing these ecosystems, among others (Lowe-McConnell, 1999; Begossi, 2011). Such processes resulted in the significant reduction of large species such as Pirarucu and Arawana, and a decrease in the size of fish catches, hindering the usual reproduction of fish populations and altering related cultural practices (Prieto-Piraquive, 2012). Additionally, there was a confrontation between traditional fishing practices and new practices introduced, which were adopted by the same local fishermen and women.

The three elements mentioned above — the introduction of new fishing techniques, changes in the management of species and zones, and the weakening of traditional knowledge — were the triggers for excessive exploitation of the fishing resources in the region, significantly reducing fish populations. Over time, this led fishermen to recognize that their efforts were becoming less productive. Furthermore, this also resulted in a decrease in the seed dispersal activity of the forest, which largely depends on the ecological interactions between fish, fruit-bearing trees, and the river’s flooding cycle (Goulding et al., 2003).

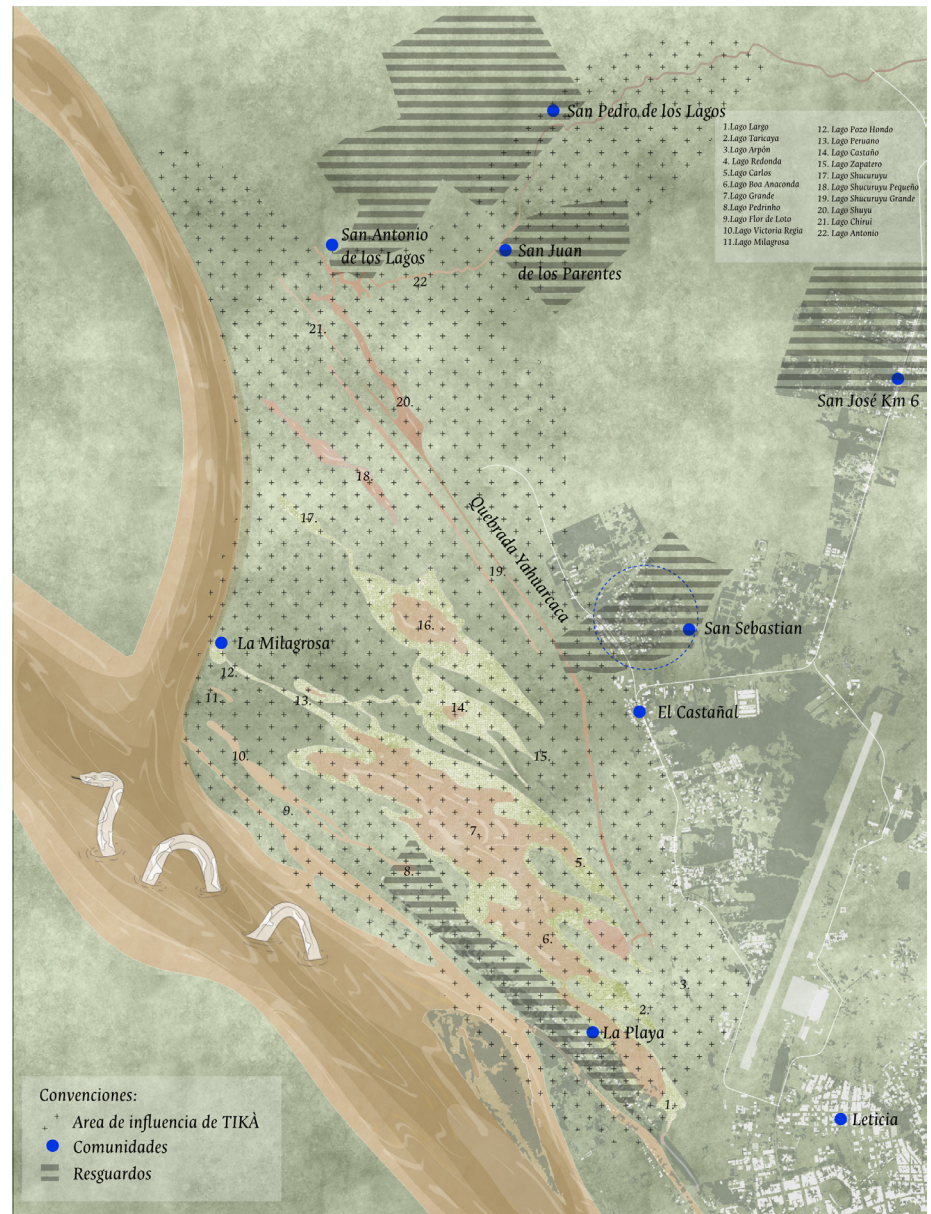
Following the Colombian Political Constitution of 1991, a process was initiated that allowed for the mass creation of indigenous reserves<sup>[4]</sup>; however, as will be mentioned later, these reserves do not necessarily correspond to the territory configuration of the TIKÀ organization (see Image 2). This process marked a shift in the development perspective proposed for the Colombian Amazon region, especially in the eastern parts (departments of Amazonas, Vaupés, Guainía). Since then, there has been a push for migration toward processes of self-governance, autonomous territorial control, and the recovery of strategic ecosystems, led primarily by indigenous communities.

In the case of TIKÀ, the organization brings together six indigenous reserves, a rural area (*vereda*), private proper-

[4] In the case of the Yahuaracaca lagoon complex, only five of the seven communities have small reserve areas, and two do not have established reserve areas.

## Falta texto traducido de las imágenes

**Image 1.** Ubicación: El sistema lagunar de Yahuaracaca  
**Fuente:** Elaborado por Lina Mayorga Borja (2023)



ties, lands designated for conservation under the possession of the Amazonas Governor's Office and the Leticia City Hall, and lands under the control of the National Army. In this complex exercise of coordinating various territorial planning figures, TIKÀ has consolidated concrete actions for recognizing the socio-environmental issues faced by the ecosystem, while also generating knowledge and raising awareness among residents about the mitigation alternatives the organization has been developing through education, territorial surveillance, the organization of fishing activities, and the creation of its own organizational structure in defense of the lagoon complex.

In this context, the TIKÀ Organization has its origins in 2004, with the first organizational efforts to generate local responses that would allow for the recovery of the

Yahuaracaca lagoon system (Sánchez López et al., 2023), stemming from the active participation of the seven indigenous communities living in the lagoon system: San Pedro, San Antonio, San Juan, San Sebastián, El Castañal, La Playa, and La Milagrosa.

Unlike other initiatives, TIKÀ has consolidated itself as the only entity encompassing the entire lagoon system, integrating a territory previously fragmented by various planning structures, as mentioned earlier. Despite the different historical processes that led to the fragmentation of the territory — such as extractive booms and state consolidation through colonization — the organization has managed to reconcile local interests. This has allowed for the implementation of key agreements on issues such as sustainable fishing, monitoring and surveillance of natu-



ral resources, and the development of its own educational programs, focused on protecting traditional knowledge and environmental management.

## From Territorial Planning to Land Management

At this point, the case of TIKÀ is interesting for analyzing the definition of planning in the “Dictionary of Development,” written by Arturo Escobar (1996). He relates the concept of planning to the concept of development, and thus to colonial mechanisms of social control, where “the concept of planning embodies the belief that social change can be manipulated and directed, produced at will” (Escobar, 1996, p. 216), that is, from a central authority. This concept is framed in the need for European cities at the end of the 19th century to plan their development after their uncontrolled growth due to industrialization.

In the Amazonian context, planning as an instrument of control and homogenization goes against the way indigenous peoples relate to the territory. Territorial planning in terms of economic zoning and land use excludes a whole network of traditional knowledge, which is the basis of land management in indigenous communities (Pérez-Cubillos, 2022). However, it is important to highlight that in Colombia, since the 1991 Constitution, the concept of territorial management has developed more than that of planning, allowing for the necessary updating of existing figures, the inclusion of environmental protection policies, and the formation of autonomous territorial entities with participation in this new framework. In this way, the need to integrate indigenous traditional knowledge into these processes is evident, and paths are being opened to make it effective, especially in regions like the Amazon (Pérez-Cubillos, 2022).

Accordingly, the participatory design carried out for the Fishing School fits into this process of reconfiguration of territorial management for several reasons. Firstly, TIKÀ has consolidated itself as the only governance figure that encompasses the entire area of the Yahuaraca lagoon system, from monitoring fishing, hunting, and logging to developing community and educational activities. Additionally, it has created itinerant spaces to disseminate its fishing agreements, using artistic expressions such as dances, paintings, and games in each community, so that families can approach these responsible use agreements in an environment of understanding and respect. This area, encompassing several indigenous reserves, is governed by the regulations defined for collective ethnic territories, which implies that it must be organically integrated into a community context and under the authority of the traditional leaders of the region.

The land donated by a member of the Organization for the construction of the TIKÀ Fishing School infrastructure is privileged due to its proximity both to the urban center and the ecosystem of interest. It represents an opportunity for the seven communities of the lagoon system, historically marginalized from urban infrastructure improvements, to appropriate the periurban space. For the fishermen’s organization, this location facilitates access to the entire lagoon system by road, boat, or on foot. Additionally, it is close enough to the urban area of Leticia to act as an appropriation of the periurban space from a collective work scenario, community gathering, aesthetics, and materiality characteristic of indigenous peoples. This is in a city that, until now, has grown with its back turned to its ecosystem and its original inhabitants. The territorial configuration of this area, a transition zone between urban and rural, strengthens the role of TIKÀ as a governance and preservation manager, promoting the recognition and strengthening of these communities in their own territory.

## Fishing as Governance

This exercise in reclaiming indigenous territories promotes their integration, strengthens their environmental processes, and enhances their spatial logics within the area of the city of Leticia. This is made possible by the commitment to Community Environmental Governance by the TIKÀ Organization. Therefore, it is essential to recognize that this governance exercise integrates various aspects: one associated with formal forms of government, another with the regulations of a specific political system, and a third that includes grassroots social organization, which enables an organic coordination of civil society in managing public and environmental affairs (Montoya-Domínguez and Rojas-Robles, 2016). The TIKÀ Organization integrates these aspects by promoting governance systems originating from the communities for the planning and control of their territories—systems that national governments could not offer on their own.

In relation to natural resource governance, some theorists have defined the concept as “the norms and rules of interaction between groups of actors involved in the use of natural resources and the resulting power relations between these actors” (Hurni and Wiesmann, 2004; Meadowcroft, 2004; cited in Rist et al., 2007, p. 22). In this line, **Elinor Ostrom** (2010) developed a pioneering approach that challenges the idea that natural resources can only be managed effectively through privatization or state regulation. Ostrom demonstrated that through local norms and agreements, communities can self-manage common resources such as forests, fisheries, and water

systems sustainably. Her concept of **polycentric governance**, which advocates for cooperation among different levels of authority and emphasizes the role of local actors, strengthens communities' adaptive capacity and promotes long-term sustainability. A clear example of this is the community fishing agreements built and implemented by TIKÀ, which were later recognized by the **National Aquaculture and Fisheries Authority (AUNAP)**. These agreements thus constitute an emerging form of community organization for the sustainable use of fishery resources and have been central in rebuilding relationships between the various actors related to the lagoon system: the community, territorial entities, government authorities, private sectors, academia, among others.

Rist et al. (2007) propose understanding the transition from management to governance of natural resources as a social learning process, in which dialogue and interaction of various forms of knowledge—from communities, the scientific sector, and public institutions—allow for the alignment of priorities, analysis, and actions. This approach, aligned with **Habermas's communicative action** (1984), highlights the importance of governance structures where multiple levels of authority collaborate and where communities play an active role. In this regard, the TIKÀ organization has implemented a social learning process by creating itinerant spaces for outreach. Through artistic expressions such as dances, games, and paintings, they have ensured that each community participates—not only appropriating the fishing agreements but also reclaiming the knowledge of local inhabitants, their experiences, and practices, which are key to understanding this ecosystem and building measures for its protection and management. This approach emphasizes the emancipatory nature of interactions in environmental governance processes, challenging the historically inequitable relationships between scientific knowledge and local communities' knowledge (Brenan, 2022; Linke et al., 2020).

## Dreaming of a School for TIKÀ

Thus, the governance process of TIKÀ has solidified as an environmental care exercise that integrates traditional knowledge, scientific insights, diverse research methodologies, indigenous pedagogies, and artistic cultural activities. These activities encourage the integration of more and more community members into the process. In this journey, an increasing number of young people have joined the efforts, recognizing and valuing the participation of elders in decision-making. For example, one such decision was defining lakes dedicated exclusively to conservation, where fishing is banned year-round due to their cultural and ecological importance within the Yahuaraca lagoon system.

The integration of young people into TIKÀ's exercise has been a priority in recent years, strengthening work with local schools and promoting *mingas* (collective work) to facilitate intergenerational dialogue. This is crucial for renewing the organizational process, given that most members are adults or elderly people. Moving forward, specific efforts will be made to involve young people as apprentices in monitoring processes, audiovisual production, visual and sound materials, as well as artistic creation and community education activities. These efforts will be adapted to their context and interests.

This brings us to a fundamental point motivating the formalization and structuring of TIKÀ's **School of Fishing**, where the pedagogical and curricular organization of these processes, which have developed organically as TIKÀ has evolved, can now take a more formal step. The goal is to actively engage youth in this process and thus further strengthen the organization as a whole.

A second key point driving this 'formal' organization of the **School of Fishing** stems from the educational experiences for over one hundred fishing members. Participating in and exercising leadership within TIKÀ has constituted a school in developing communication and organizational skills, interacting with authorities and actors from various sectors, managing territories, enriching knowledge of the biocultural ecosystem, and fostering trust and self-awareness. In this sense, the organization itself has served as a school. The organizational, investigative, and advocacy processes have helped develop skills and competencies among the members, as challenges have emerged. TIKÀ's educational work initially focused on its members and, secondarily, on the seven communities in its area of influence.

Both internal and external educational efforts, as well as intergenerational dialogue exercises, reinforce the organization's commitment to an adaptable, participatory governance model. This model promotes the sustainability and resilience of the Yahuaraca lagoon system. It creates a two-way relationship where the organizational process benefits from the knowledge and life experiences of the communities, while the communities learn from the conservation and governance efforts led by the organization.

Thus, TIKÀ's **School of Fishing** has evolved organically within the community process. The organization functions as a mobile, itinerant school that is rooted in the territory—in the lakes, in the floodplain forest, and in the shared word that takes on meaning through practice. There is no other way to learn to fish than by fishing. Additionally, this proposal has made use of various spaces for its development: in **malocas** (traditional communal houses), educational institutions, or in the homes of members that facilitate gathering.



Over time, TIKÀ's evolution has shown the need to collect and document its own pedagogical model, developed from experience and adapted to the learning styles of the Amazonian peoples. This model has been strengthened with contemporary methodologies, tools, and perspectives that are constantly updated according to the socio-environmental context and the interests and motivations of young people and communities. Alongside this growth, there has been a growing need for a dedicated space to house and consolidate this educational journey—a place where formal and informal training plans, particularly for the youth from the seven communities, can be formalized.

The need for infrastructure for the development of the **School of Fishing** is framed from the design and participation principles unique to TIKÀ. This space must meet the needs, projections, and experiences of a fishing organization involved in environmental monitoring, community research, pedagogical activities, and welcoming visitors and partners. The organization is expanding its teams and tools to perform its tasks with greater professionalism. From this point, the participatory design process has unfolded as a transdisciplinary dialogue.

Initially, the collaboration with professionals who advised the project—architects, ecologists, and anthropologists who had previously supported TIKÀ in other processes—stemmed from a request by TIKÀ itself. The organization already had a clear understanding of its requirements and considerations for architectural design. Their request was centered on support for developing the technical plans for the project, aimed at obtaining funding and construction. Thus began the design process, following TIKÀ's explicit request and general guidelines drafted by its own members.

## The Process is the School

After agreeing on the collaborative work, the first step in the participatory design was to socialize a draft of the structure created by members of the Organization during the general assembly, the highest decision-making space in which most of the 109 registered members participate. In this initial meeting, agreements were made among the members regarding the basic requirements for the project. Notable among them was the need for a large, versatile meeting area that could accommodate all 109 members for gatherings, but also serve for group work, exhibitions, etc. Additionally, there was a need for an office where a computer and printer could be safely placed, and where small meetings of no more than five people could be held; bathrooms, including showers for people coming from mo-

onitoring and control activities in the lakes; a storage space to keep a 10-meter boat, outboard motors, paddles, life jackets, and other equipment essential for the organization's functioning; a counter space for drinks and snacks during meetings, which could also be used for measuring fish in monitoring activities; and rooms to host visitors or any members who may need to stay for a few nights.

In this assembly, the team and work to be carried out were also presented. The support for the process was unanimous, setting the foundation for the continued design of the school.

Continuing with the dialogue channels characteristic of TIKÀ, the next meeting involved a joint visit to the land, with the presence of the organization's board of directors, to carry out an initial survey (see Image 3). Discussions centered on the best location for the structure on the plot, taking into account the members' views on how the school would interact with the San Sebastián reserve and the connection to the Yahuaraca stream, as well as their knowledge of local conditions, such as wind patterns or the trajectory of the sun. Then, on a large sheet of paper, a collective ideation exercise was carried out, testing different ideas about the building's volume and orientation. The day ended with a fish stew, a tradition in the organization's assemblies and *mingas*, where food is shared after the work is done.

Once a possible program and design were defined, along with an area of the plot and its occupation, the focus shifted to taking the project to a new level of detail. The key principle was that the school should be capable of hosting the different lines of governance that guide the organization's work: the biocultural monitoring system, organizational strengthening, and the **School of Fishing**.

The challenge was to materialize in a space the required functionality, the initial aspirations of the members, the community's decisions, and the first designs made by the community. Another determining factor was to embody the ecological dynamics of the lagoon system, including the river's pulses (high waters, descending waters, low waters, and rising waters) and integrate an understanding of these water cycles as guides for TIKÀ's work. All these premises were expressed by the community as part of the foundation of the school; hence, fishing, water pulses, and fishing agreements had to be reflected in the spatial design of the project.

To integrate the water pulses and the ecological calendar, a masonry wall was proposed that interprets the sinusoidal curve commonly used to describe the water pulse in an annual ecological cycle. This curve would serve as a seating area for meetings and also have a pedago-

gical purpose by materializing time in space, within the context of the hydrological cycles of Yahuaraca and the Amazon River (see Image 4).

The final project centers around a communal space, with closed dependencies requested by the organization, as well as a second floor of rooms, projected as a future need and a second phase of construction. The architectural proposal and its expanded program can be narrated through longitudinal and transversal cuts, which highlight the relationship between the building and its surroundings along the collective axis. Each of these cuts emphasizes different traditional indigenous activities integrated into the architecture.

The longitudinal cut highlights the calendar wall and the masonry space designated for storing fishing implements, as well as a surface that will function as a laboratory for measuring specimens, checking the stomach contents of fish, sexing, determining gonadal maturity, and recording other variables in community biological monitoring. This space has direct communication with the Yahuaraca stream and serves as the exit point for river navigation from the School of Fishing. Here, the connection between the school space and the practical settings where activities take place is highlighted—an immersive classroom that relates what is learned to practice.

In terms of defining materials for the project, this was also a dialogue exercise. The materials proposed by the TIKÀ members included wood, masonry for boat storage areas, and zinc roofing. This last choice raised concerns among the team, prompting them to ask the community about the possibility of using traditional materials for the roof, such as woven Caraná palm leaves (*Lepidocaryum tenue*). While this material seemed appropriate for the environment, the current economic demand and pressure on the environment made it less accessible and less durable compared to external materials, which are now preferred by indigenous communities—except in traditional structures like malocas. This required abandoning an exotic or romanticized vision of the territory and its architecture.

As the final stage of the design process, the school project was socialized during an assembly of the organization. The architectural plans were presented, the initial budget was jointly evaluated, and the project model was handed over (see Image 5). Thus, the project, which had started in the hands of TIKÀ, returned to them after a participatory design process, with joint decisions and evaluations. At this point, a new stage begins for the organization, involving the collaborative work needed to manage the resources required to bring this space to life. Once again, the design socialization ended with a fish stew.



**Image 2.** Ubicación: El diseño participativo en la enseñanza tradicional

**Fuente:** Fotografía tomada por Jorge De Los Ríos (2023).

## Participatory Design in Traditional Education

The TIKÀ School of Fishing was conceived through a participatory design exercise that guarantees active community involvement. It is a possible response to a current crisis where architectural design, primarily conceived from large urban contexts, has become a tool for optimization, massification, and homogenization of space. This approach often excludes the specific visions and needs of communities and individuals, such as those within the Organization.

In this context, design from an urban and capitalist perspective seems to obscure the fact that we are all designers (Manzini, 2015), as it is “a unique human capacity” (Sarmiento, 2020) that manifests constantly because it is an act present in almost everything (Escobar, 2017). On the contrary, designing for others often leads to failure, because, according to Ingold, designs are bound to fail (2012). They stem from assumptions about the users’ qualities without necessarily considering or receiving their approval.

In this sense, participatory design focuses on ensuring that both the process and its results are grounded in reality. If we consider design as a form of research, it allows for the integration of aspects important to the collective, producing more relevant outcomes and fostering empowerment by incorporating people’s experiences into the process. The initial premise is that if design affects people, they must reflectively participate in it. As previously discussed, participatory design is also an exercise in applied governance in architecture.

Through this approach, the community’s active participation in the creation of the TIKÀ School of Fishing



**Image 3.** Ubicación: El diseño participativo en la enseñanza tradicional

**Fuente:** Fotografía tomada por Jorge De Los Ríos (2023).



**Image 4.** Ubicación: El proceso es la escuela

**Fuente:** Render realizado por Jorge De Los Ríos y Lina Mayorga (2023).



not only shaped a structure suited to their needs but also ensured that the space would be a true reflection of their values, practices, and ecological understanding, ultimately reinforcing their own capacity to govern and care for their environment.

## Conclusions

To conclude, we highlight several lessons learned from this process, from an intercultural and multidisciplinary perspective.

First, this entire exercise has been a mutual learning experience. For the supporting professionals, it has provided deeper insight into the processes and challenges faced by the TIKÀ Organization and the Yahuaraca lagoon system territory. It has also allowed for the exploration of the possibilities that infrastructure development, designed by, for, and with the community, can offer in terms of functionality, relevance, and ownership in designing a space for communal gathering. For the TIKÀ members, it has been an experience in the materialization of a dream,

the steps, planning, and work necessary to move from an idea to a concrete proposal, with plans and a budget that can be managed and carried out.

Second, and after understanding the Organization's governance approach, this architectural project, rather than confining TIKÀ's process to the community of San Sebastián de los Lagos, will serve as a starting point for broader expansion. The itinerant and empirical school process that has been carried out so far now needs a space to protect, organize, and project itself from a new perspective, with greater strength and transformative capacity.

Third, the School of Fishing and all of the organization's work represent a process of re-appropriation of the peri-urban spaces of Amazonian cities like Leticia. These processes show how Amazonian cities can stop turning their backs on their aquatic ecosystems and instead propose innovative and contextualized architectural solutions that not only rescue traditional practices and knowledge but also integrate contributions from Western traditions in an enriching and mutually transformative symbiosis.

Fourth, this has been a process that bets on a design where people's participation gives it relevance and per-



**Image 4.** Ubicación: El proceso es la escuela**Fuente:** Render realizado por Jorge De Los Ríos y Lina Mayorga (2023).

tinence, and where multiple perspectives are included, particularly those that have been marginalized. This is a political action to ensure that what is designed contributes to transforming realities; “we design our world, and by doing so, our world designs us—in short, design designs” (Escobar, 2017).

Lastly, it has been a particularly enriching experience because, on few occasions, there has been the opportunity to work on infrastructure with the Organization and its supporting professionals. There had been prior experience in constructing a monitoring raft for a protected lake, but with poor results in its maintenance. Now, with this participatory design exercise, greater maturity in the organizational process is evident, along with greater clarity about why and for what this space is needed. This also indicates a greater capacity to plan the joint work required to carry out this construction and maintain it over time.

It has also highlighted the motivation of TIKÀ members, as they feel a greater sense of authority to voice their opinions and participate in a project that they are directly involved in. Most of the members have knowledge and experience in construction. In this sense, this type of architectural project has stimulated new dialogues, which have been interesting for all involved, and has made room for the different life experiences and valuable contributions of the participants.

## Bibliographic references

- BEGOSSI, A. (2011). Small-scale fisheries in Latin America: Management models and challenges. *Mast*, 10(2), 5-11. [https://www.marecentre.nl/mast/documents/Mast2010\\_9.2\\_Begossi.pdf](https://www.marecentre.nl/mast/documents/Mast2010_9.2_Begossi.pdf)
- BRONDIZIO, E. S., OSTROM, E., & YOUNG, O. R. (2009). Connectivity and the governance of multilevel social-ecological systems: The role of social capital. *Annual Review of Environment and Resources*, 34, 253-278. <https://doi.org/10.1146/annurev.envi-ron.020708.100707>
- BRENAN, R. (2022). Making space for plural ontologies in fisheries governance: Ireland's disobedient off-shore islands. *Maritime Studies*, 21, 35-51. <https://doi.org/10.1007/s40152-021-00257-8>
- CASTELLO, L., MCGRATH, D. G., HESS, L. L., COE, M. T., LEFEBVRE, P. A., PETRY, P., & ARANTES, C. C. (2015). The vulnerability of Amazon freshwater ecosystems. *Conservation Letters*, 6(4), 217-229. <https://doi.org/10.1111/conl.12008>
- ECHEVERRI, J. A. (2023). Leticia indígena: Construcción territorial indígena en la ciudad. *Mundo Amazónico*, 14(1), 49-79. <https://doi.org/10.15446/ma.v14n1.101673>
- ESCOBAR, L. (2020). *Ecología política de la pesca artesanal: Configuración y transformación de la gobernanza pesquera en los lagos de Tarapoto en la Amazonia colombiana* (Tesis de maestría, Universidad Nacional de Colombia, Sede Amazonia).
- ESCOBAR, A. (2017). *Autonomía y diseño: La realización de lo comunal*. Tinta Limón Ediciones.
- ESCOBAR, A. (1996). Planificación. En W. Sachs (Ed.), *Diccionario del desarrollo: Una guía del conocimiento como poder* (pp. 399). PRATEC.
- GOSS, S. (2001). *Making local governance work: Networks, relationships, and the management of change*. Palgrave.
- GOULDING, M., BARTHEM, R., & FERREIRA, E. (2003). *The Smithsonian Atlas of the Amazon*.
- HABERMAS, J. (1984). *The theory of communicative action: Volume 1* (T. McCarthy, Trans.). Beacon Press.
- INGOLD, T. (2012). *Ambientes para la vida*. Ediciones Trilce.
- LINKE, S., HADJIMICHAEL, M., MACKINSON, S., & HOLM, P. (2020). Knowledge for fisheries governance: Participation, integration, and institutional reform. En P. Holm, M. Hadjimichael, S. Linke, & S. Mackinson (Eds.), *Collaborative research in fisheries: Co-creating knowledge for fisheries governance in Europe* (pp. XX-XX). Mare Publication Series.
- MANZINI, E. (2015). *An introduction to design for social innovation*. MIT Press.
- MONTOYA-DOMÍNGUEZ, E., & ROJAS-ROBLES, R. (2016). Elementos sobre la gobernanza y la gobernanza ambiental. *Instituto de Estudios Ambientales, Universidad Nacional de Colombia*. <https://revistas.unal.edu.co/index.php/gestion/article/view/58768/60939>
- OSTROM, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review*, 100(3), 641-672. <https://doi.org/10.1257/aer.100.3.641>
- PÉREZ CUBILLOS, C. M. (2022). El conocimiento tradicional ecológico indígena y su papel en el blindaje de territorios étnicos y en el ordenamiento territorial de Leticia, Amazonas – Colombia. *Espacio y Desarrollo*, 39, 1-35. <https://doi.org/10.18800/espaciodydesarrollo.202201.004>
- PRIETO-PIRAQUIVE, E. F. (2012). *Peces de la quebrada Yahuaraca (Amazonas, Colombia): Aproximaciones ecológicas*.
- RIST, S., WIESMANN, U., CHIDAMBARANATHAN, M., ESCOBAR, C., & ZIMMERMANN, A. (2007). Moving from sustainable management to sustainable governance of natural resources: The role of social learning processes in rural India, Bolivia, and Mali. *Journal of Rural Studies*, 23, 23-37. <https://doi.org/10.1016/j.jrurstud.2006.02.006>
- SÁNCHEZ-LÓPEZ, D., PÉREZ-CUBILLOS, C., & DUQUE, S. (2023). Environmental and territorial governance in the Yahuaraca lake system (Leticia, Amazonas): The organization of local fishermen La TIKÁ, 2003-2021. *Environmental Justice*, 17(5), 360-368. <https://doi.org/10.1089/env.2022.0068>
- SANTOS ANGARITA, A. (2022). *Socialización y adquisición del lenguaje Magüta*. Universidad Nacional de Colombia, Sede Amazonia.
- SARMIENTO, M. P. (2020). Editorial. *Bitácora Urbano Territorial*, 30(2), 7-10. <https://doi.org/10.15446/bitacora.v30n2.86969>

### Listado de abreviaturas:

AUNAP: Autoridad Nacional de Acuicultura y Pesca