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Co-construction of Heritage Through University Extension: Fishing Dock for the Seis de Julio Association. Naranjal – Ecuador

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ABSTRACT

The Seis de Julio district, located in the Naranjal canton of Ecuador, is a community of approximately one thousand inhabitants that faces the challenges of isolation and limited access. Its economy is centered on artisanal fishing, specifically the collection of mangrove crabs. In a University Extension project, ancestral knowledge was recovered to co-construct its local heritage. This work documents and relates the importance of the academic model of action to recover and strengthen the identity of communities that require support to recognize their cultural values and forge

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their heritage in highly sensitive natural contexts and vulnerable socioeconomic conditions.

Keywords: heritage, university extension, local knowledge, mangroves

Figure 1

Cover photo

Photograph by the authors

I. INTRODUCTION

The Seis de Julio District is located in the Naranjal canton, province of Guayas, in continental Ecuador, six kilometers from the South American Pacific Ocean (Figure 2). Its population is just under a thousand inhabitants and its geographic location shows its isolation and lack of access to the main road of the province. Its economy is based on artisanal fishing and farming, especially the collection of mangrove crabs - for this reason, the community decided 20 years ago to create an association dedicated to this activity. To date, the Seis de Julio Fishing Association has 150 members, mostly men. The association has allowed them to contact both public and private organizations that provide them with support on issues related to the improvement of their organization, fishing activities, and marketing of their production.

In 2021, the association's board of directors contacted the University of Cuenca and undertook an initial outreach project in conjunction with the Faculty of Hospitality Sciences - Tourism Department. After obtaining positive results for the community, the association requested to continue with academic support in pursuit of its development. Thus, after a call for internal research projects with outreach in 2022, the group of researchers from the Faculty of Architecture became eligible for the allocation of funds for research. The project was carried out over a two year period and has created a profound impact on the researchers, students and of course on the community itself - demonstrating the importance of putting into practice the knowledge of the three tenants of the school of architecture: architectural projects, conservation and restoration of heritage; and urban planning.

This work illustrates the experiences acquired during the development of the project, evidencing the importance of developing university extension projects aimed at recovering the ancestral knowledge of the communities, the co-construction of their heritage, support in the recognition of the values of their identity, the enhancement of their landscape, and the care of their highly vulnerable ecosystem.

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Figure 2

Location of the Seis de Julio District

Note: *Photograph by the authors (view towards the west)*

The joint work was based on a fundamental principle of respect, expressed in the recognition of all people as legitimate actors in the construction and reconstruction of their cultural and natural heritage. To address this problem, the Participatory Action Research (PAR) process was applied, which consists of a strategy commonly used in community and academic engagement projects. The first objective was to actively integrate the community in the process of identifying and assessing their identity and territory to generate strategies that allow them to solve their problems using their own resources.

Initially, the expectations of the population were directed towards institutional collaboration based on the provision of infrastructure for the dock; however, through a process of awareness and assessment of the resources and knowledge existing in the community, sustainable solutions were offered instead of creating an architectural project detached from the reality and needs of the population.

The applied methodology allowed different approaches with the inhabitants to find and refine the necessary resources to generate a construction model that was based on properly artisanal techniques, fused with alternatives generated from academic tests that are not far from the resources available in the area. Thus, the construction techniques and materials corresponded to the demands of sustainability in an environment as sensitive as the mangroves. The joint construction focused on the recovery, improvement, and appropriation of techniques applied in the self-construction of the modules for the fishing dock and infrastructure for the town. The resilient atmosphere of the commune fostered the empowerment of the different dimensions of the territory: landscape and culture, evidenced for example in the use of sustainable materials such as bamboo, the renunciation of extractive exploitation techniques of its natural resources, and the implementation of technologies that do not generate harmful environmental impacts.

This intervention, within the framework of sustainable development, and in the broader term of landscape, allowed the University's actors to draw on the culture of the population to fulfill several academic purposes: raising awareness about vulnerable territories and communities, the conservation of natural heritage, the recovery of cultural heritage, and the implementation of non-colonizing academic models that may generate institutional dependency.

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Figure 3

Typical enclosures of the Seis de Julio District

Note: Photograph by the authors

II. LITERARY REVIEW

The construction of heritage and the cultural landscape

Patrimonialization is a process in which ecological and social values are fused and voluntarily incorporated into a society. These values arise from the historical and cultural context of a specific territory. These values consist of the principles and beliefs that constitute its identity - such as practices, knowledge, traditions or ways of life, and relationship with the environment (Hernández, 2010). This process needs to be evaluated, regulated, and legislated in order to be protected and preserved for present and future generations.

Previously, heritage focused on the protection of buildings and monuments but today heritage is recognized as a social construct that must include local communities who play a crucial role in identifying and managing their own legacy (KEB, 2023). Furthermore, the construction of heritage has to do with the interests of the groups that have the power to assign values to objects or spaces that have relevance in their daily lives, and that are linked to personal or collective memory (Malavassi Aguilar, 2016).

Thus, the construction of heritage is a construction of value conditioned by political and social factors and the memory associated with the history of a particular group of people. Various actors participate, define, and appropriate their own expressions of heritage (Guerrero Valdebenito, 2012).

According to the 2003 UNESCO Convention, intangible cultural heritage refers to: the uses, representations, expressions, knowledge, and techniques, together with the instruments, objects,

artefacts, and cultural spaces inherent to them, which communities, groups, and individuals recognise as an integral part of their patrimony (UNESCO, 2003). Likewise, heritage refers to the goods, traditions, knowledge and values that are considered valuable to the community, which is why their generational transmission is necessary. This fact means that their customs, stories, techniques and knowledge can be inherited and sustained over time. Within this context, it is essential to emphasise that heritage can also be recreated and reinterpreted in accordance with the changes and circumstances of its natural environment (Pontificia Universidad Católica del Ecuador & Andrade, 2016).

In this sense, the cultural-natural landscape is the space where activities related to intangible cultural heritage take place. The cultural landscape is the portion of the territory that houses natural, historical, and archaeological entities. These become representations of the historical processes or cultural manifestations that ultimately give identity to groups in relation to each other and the environment (Cuesta et al., 2009).

Artisanal fishing as ancestral knowledge and economic support for communities in Ecuador

Fishing is one of the oldest subsistence activities in the world. Humans have obtained their supplies from seawater sources because they are natural production centers for easily accessible foods with a high protein content. Artisanal fishing is still carried out in much of the world. This practice is done for subsistence or commercial purposes depending on the objective; for this reason, the environmental impact of this practice varies significantly from one place to another (Pauly, 1983).

In the case of mangroves in Ecuador, crab harvesting is still carried out through artisanal practices; the coastal areas where these ecosystems are considered natural protection areas, therefore extractive activities are regulated for their conservation (De Cock, et al., 2023). In the coastal cantons of the provinces of Esmeraldas, Manabí, Santa Elena, Guayas, and El Oro, the population that is dedicated to fishing do so almost entirely for their own subsistence (Campoverde, et al., 2021).

This activity has a long history and tradition, especially in the Gulf of Guayaquil, since one of the largest natural reserves in the country is located here - the Manglar Churute Ecological Reserve. Here, the mangroves are exploited by the population, the main product being the mangrove crab *Ucides Occidentalis*, which is the most important commercial crustacean in Ecuadorian artisanal fishing (Zambrano, 2022). However, these environments are constantly threatened by the invasion of shrimp farms that cause a harmful impact in the social and environmental dimensions due to the practices of territorial invasion and chemical treatment of farms (Veuthey & Gerber, 2012).

Artisanal fishing has significant value since it is considered an activity that does not exploit resources and profits, but rather a balance between humanity and nature. This activity has its own socio-cultural imprint and a generational legacy as a socio-familial practice as a manifestation of the popular culture of these areas (Fernández Espinosa, et al., 2024). Fishing is carried out in areas with different management regimes as described below (Espinosa, et al., 2021):

- Mangroves - concessions from the State to fishing organizations for the use of natural resource conservation. These have local and central government regulations.
- Protected areas - zones protected for the conservation of biodiversity and fishing resources.
- Open access areas - fishing is carried out without restrictions, except for national regulations.

It is estimated that in Ecuador more than 10,000 people are dedicated to this artisanal activity in the coastal provinces of the country, generating $16,266,990 USD annually for the Gulf of Guayaquil. In this context, on August 9, 2021, the first National Action Plan (NAP) for the management and conservation of the red crab (*Ucides Occidentalis*) was formalized. This plan was developed with the technical assistance of CI-Ecuador, in the context of the Coastal Fisheries Initiative Project, which has

the support of the United Nations Development Program (UNDP), acting as the implementing agency of the Global Environment Facility (GEF) (Conservation International, 2024).

Mangroves are vital ecosystems that not only host diverse species, but also protect coastlines and contribute to the health of the environment. Responsible crab harvesting is essential to preserve these habitats. During the off-seasons, which occur twice a year, fishermen engage in activities such as mangrove reforestation.

This practice helps restore damaged ecosystems and ensures that crab populations can recover. Despite its importance, artisanal harvesting faces various risks such as urbanization and climate change that have negatively impacted mangrove habitats. Flooding caused by rising sea levels makes access to harvesting areas difficult (Yáñez-Arancibia et al., 2010).

Furthermore, illegal fishing during closed seasons threatens the sustainability of crab populations. However, initiatives such as the creation of local harvester associations encourage practices that respect these ecosystems and seek to improve the local economy through responsible crab marketing (Iñiguez-Gallardo & López-Rodríguez, 2024).

Artisanal crab harvesting in Ecuador is a fundamental activity for both the local economy and environmental conservation. Through responsible practices and respect for natural cycles, it is possible to ensure a sustainable future for crab farmers and the ecosystems that depend on them (Orellana-Alvear, et al., 2022).

Collaboration between fishermen, authorities, and environmental organizations is key to facing current challenges and ensuring the continued health of Ecuadorian mangroves (Mendoza Avilés, et al., 2019).

Mangroves in Ecuador as a natural heritage

Mangroves are vital ecosystems found in the coastal areas of Ecuador (Figure 2) playing a crucial role in biodiversity and coastal protection. In this context, the characteristics and situation of mangroves in the five provinces of Ecuador are described, from north to south: Esmeraldas, Manabí, Santa Elena, Guayas, and El Oro.

In the country, the National Plan for the Conservation of Mangroves in Continental Ecuador (PAN-Mangroves) is in force, which was developed by the Ministry of the Environment together with various international organizations. Its objective is to strengthen policies and programs for the conservation of mangroves and improve the quality of life of ancestral actors. Its key components are based on the generation of policies and legal instruments, research, protection monitoring, the search for alternative sustainable production, education, and communication.

This plan identified threats such as illegal logging, weak enforcement of regulations, pollution, invasion, and vulnerability to climate change. For this reason, a 2019-2030 annual evaluation strategy was drawn up that aims to stop deforestation, strengthen law enforcement, recover ecosystems, and promote scientific research (Carvajal & Santillán, 2019).

Provinces:

- Esmeraldas

The province of Esmeraldas is home to the tallest mangroves in the world, located in the Cayapas – Mataje Ecological Reserve. This area is known for its vast infrastructure of mangrove forests, which extend along the Majagual River (Zambrano, 2022). According to the Map of Ecosystems of Continental Ecuador prepared by the MAE in 2013, there are 14 remaining ecosystems that cover approximately 852,939 hectares, representing 53.8% of the provincial surface area.

In regards to the ethnographic dimension, there is research around cultural ecosystem services, especially in the community of Bolívar, where the authors were able to detect the importance of the

cultural value in the mangrove ecosystem and its reciprocal relationship with the environment (Treviño, 2022).

- Manabí

The mangroves in the province of Manabí are located towards the north of the province and face a persistent problem of a proliferation of shrimp farms around the few remaining hectares of mangroves that are still preserved. Although the use of shrimp farm pools has been attempted to be regulated, it is observed that their occupation extends beyond what is permitted.

Fishing communities have turned to the Ministry of the Environment (MAE) and the Ministry of Agriculture, Livestock, and Fisheries (MAGAP); but they have not been able to control or offer effective solutions for this problem (Moreira Santos, 2024).

- Guayas

The province of Guayas has a rich diversity of protected areas, these include seven areas under the National System of Protected Areas (SNAP) and three wetlands declared RAMSAR sites. The mangroves here are less developed compared to those in the northwest part of the country, but they play a crucial role in the interface between land and sea.

The Guayas coastline presents geomorphological characteristics that include low deltaic coasts with an anastomosing network of fluviomarine arms. Deforestation has been a significant problem with a recorded rate of 4,189.98 hectares per year being cut down between 2016 and 2018.

The two large reserves present in the province are the El Salado Mangrove with 10,635 hectares and the Churute Mangrove with 49,389 hectares. Both have a high biodiversity in species of crustaceans, fish, birds, and even crocodiles in extinction. The province has undertaken specific plans for the conservation and restoration of these reserves (Burgos & Avila, 2018).

- El Oro

In El Oro, mangroves have been severely affected by the expansion of the shrimp industry since the late 1960s. This coastal ecosystem is concentrated in cantons such as El Guabo, Machala, Santa Rosa, Arenillas, and Huaquillas. Despite their ecological and economic importance, mangroves face threats from activities such as agricultural expansion and the extraction of natural resources. However, there are efforts to protect them through executive decrees and laws that consider mangroves to be state property, prohibiting their exploitation without concession.

The loss of mangroves belonging to the province of El Oro has been a concern of academia. To address this problem, universities in the region have implemented multiple research and intervention projects. In these projects, they have been able to detect mangrove losses of more than 362,802 hectares, including 18,905 hectares in this province alone (Cordero, 2012).

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Figure 4

Map of Ecuador's mangroves

Self produced

Table 1

Mangroves en Ecuador

Province	**Canton(s)**	**Mangrove**
Esmeraldas	San Lorenzo	*Cayapas Mataje* Mangroves Ecological Reserve
	Eloy Alfaro	
	Esmeraldas	Esmeraldas River Mangrove Estuary Wildlife Refuge
	Atacames	*Galera San Francisco* Marine Reserve
	Muisne	Muisne River Estuary Mangrove Wildlife Refuge
Manabí	Pedernales	
		10 de agosto Estuary
	Jama	*Jama*
	San Vicente	*Canoa*
	Sucre	*Silvestre Islas Corazón y Fragatas* Wildlife Refuge
	Portoviejo	*La Boca*
Santa Elena	Santa Elena	*El Pelado* Marine Reserve
Guayas	Durán	*Isla Santay* National Recreation Area

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	Guayaquil	*El Salado* Mangrove Wildlife Production Reserve
		El Morro Mangroves Wildlife Refuge
		Isla Puná
	Naranjal	*Churute* Mangroves Ecological Reserve
El Oro	Machala	Jambelí Archipelago
	Santa Rosa	
	Huaquillas	
	Arenillas	*Arenillas* Ecological Reserve

Self produced

Associativity in communities as managers of natural heritage

Vulnerable communities require sustainable strategies for their growth and well-being. The type of external cooperation and the state of solidarity among their members depend on their level of organization. Associations in rural communities often identify, plan, and resolve local needs more effectively than government entities (Chambers, 1993), a fact that is exemplified in this project. Associations in resilient communities have been shown to favor the active participation of the population in decision-making that affects their environment, promoting local democracy and participatory governance, strengthening the sense of belonging, social responsibility and the empowerment of residents due to their involvement (Aldrich, 2012).

Figure 5

Fisherman

Note: *Photograph by the authors*

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In Latin America, this fact has become a driving force for local and regional development, generating opportunities for economic and social growth in marginalized rural areas. The creation of collaboration networks between peasant associations, agricultural cooperatives, non-governmental and public organizations has allowed the implementation of integrated projects aimed mostly at promoting productive diversification, fair trade and the conservation of cultural and natural heritage. In Ecuador, the framework of the 2030 Agenda for Sustainable Development seeks to eradicate poverty and protect the planet; for this reason, organizations are fundamental actors for the effective implementation of the SDGs (Sachs, 2006).

It is important to recognize that the cooperation they receive can entail certain risks; in many cases, the arrival of cooperation organizations can generate tensions and conflicts by disturbing the existing social balance. The introduction of new development programs can favor certain groups within the community, creating divisions and increasing social inequality.

Protected by the Constitution of Ecuador regarding the National System of Protected Areas, specifically the Network of Protected Coastal Marine Areas, the national government has managed to reach agreements with different communities to implement joint strategies for the conservation of mangroves. The Ministry of Environment and Water relies on the National Plan for Mangrove Conservation to mitigate the impacts on its ecosystems such as the construction of shrimp farms, irregular human settlements, pollution of solid and liquid waste, overexploitation of commercial bio-aquatic resources, as well as the diversion of estuary and river channels. This agreement allows fishing, breeding, or farming of fish, controlled forest management, mangrove reforestation, ecological tourism and non-destructive human activities, conservation and education, and scientific research. In 2022, fifty-three agreements were registered with 3,896 artisanal fishermen in Ecuador.

Figure 6

Mangroves, shrimp pools, and squatter dwellings

Note: *Photograph by the authors*

Vernacular construction systems and their relationship with sustainability

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The vernacular architecture of the Ecuadorian coast, like any vernacular architecture, is developed under the criteria that it be derived from the environment, achieving comfortable interior spaces from the resources and physical conditions of the environment, using only natural materials. Prior to any colonial influence, *Guadua angustifolia* has traditionally been the material for both the main structure and the enclosure of the buildings present in this region, and has remained over time a current and pertinent material. This material is adequately coupled with the enhancement of ventilation by allowing for air to circulate combined with a capacity for thermal insulation. Due to its structural lightness, it is easily used in the construction of stilt houses - raised structures that are cooled by the convective effect from the ground, the wind, and shade from the enclosure itself (Jové et al., 2013). These are concepts that, when adopted in contemporary architecture, allow for the creation of buildings with bioclimatic conditions, low construction impact, and a life cycle of reintegration into the natural environment. Ecuadorian vernacular architecture has adapted to flooding and seismic dissipation conditions, which are a recurring phenomena in the region that must be incorporated into the criteria and teaching of local architecture.

External cooperation for the preservation and strengthening of cultural identity

Every cooperation entity must begin by understanding the social and cultural dynamics of the human group with which it works. Projects must promote the active participation of community members in decision-making to ensure that the benefits of cooperation are distributed in an equitable and sustainable manner. The arrival of external funds or resources must not generate dependency and distort local economic systems, such as the creation of temporary jobs or encouragement of migration, generating imbalances in the labor market and increasing competition for scarce resources (Escobar, 2001). Another risk is the introduction of new ideas, values, and/or practices that destabilize beliefs and traditions rooted in the community, generating internal conflicts, interpersonal tensions, or the uprooting of its traditions (Sen, 2000).

Academic cooperation must act in accordance with the national reality, foster the creation of local capacities, and promote the development of sustainable enterprises that strengthen the local economy in the long term (Gupta, 2012), as well as establish evaluation mechanisms to monitor the impact of its cooperation. Ultimately, the implementation of projects will be characterized by promoting sustainable development based largely on respect for the cultural, economic, social, political, and religious sensitivity of the community (Cernea, 1989).

University Extension as a social tool

Since its beginnings in the 18th century, university extension has evolved, especially in Latin America, influenced by movements such as the University Reform of Córdoba. In Ecuador, it is known as "linkage with society," and has been connected to the political conditions of the country since the mid-20th century under a conceptualization of autonomy and participation of emerging social sectors. Between the 1960s and 1970s, linkage with society became a key instrument to address community problems, integrating students and teachers in projects that sought to improve housing, health, and education in populated areas.

With globalization, at the end of the 1990s, linkage faced a setback as an institutional policy, a fact that was reversed with the Ecuadorian Constitution of 2008 and the implementation of the Organic Law of Higher Education. Currently, the effectiveness of its incorporation into curricular models, and the significance of the impact on the territory, are being discussed (Cabrera, 2017).

In the field of architecture and urban planning, linkage with society has been recognized as a pedagogical necessity within the profession for decades (Cordero, 2012). The linkage projects, mostly in the final years of degree programs and in graduation works, constitute the critical dialogue between theory and practice, ensuring the understanding of the social, economic, and spatial context in which future architects will work. The effort of this practice transcends even more, considering the lack of

knowledge about the realities of the less favored communities of the national student body and the lack of adjacent social commitment.

The academy is also enriched through interaction with communities, teachers update their pedagogical approaches and add social and scientific value to their content. This exchange of knowledge and experiences turns future professionals into agents of social change, prepared to solve real problems guided towards sustainability and collective well-being (Nussbaum, 2006).

The effective implementation of this project is based on a Latin American theoretical framework that defines the connection between universities and society as a fundamental aspect of higher education, which enriches and guarantees experiential learning over the acquisition of knowledge (Freire, 2004), which contributes greatly to the social and economic development of the communities that are the subject of the cooperation. The project also promotes meaningful learning that responds to the real needs of the population, thus strengthening the social fabric. In fulfillment of the proposed objective, the beneficiaries of the project profit from the expertise of the educational institution, since it acts as a catalyst that not only offers theoretical training, but also promotes practical projects that foster sustainable development (Giroux, 2011). Likewise, by integrating the opinion of experts and student work with the needs of the community in all its dimensions, a non-aggressive intervention on society, and its territory of implementation, is guaranteed (Sábato, 1998).

According to the Academic Regime Regulations issued by the Higher Education Council of Ecuador, the connection with society is established as a substantive function that generates ". . .capacities and exchange of knowledge according to the academic domains of Higher Education Institutions to guarantee the construction of effective responses to the needs and challenges of their environment." In addition, ". . .it contributes to the relevance of educational work, improving the quality of life, the environment, productive development and the preservation, dissemination and enrichment of cultures and knowledge" (Higher Education Council, 2022).

The University of Cuenca was founded in the mid-nineteenth century and has now established itself as one of the most important educational institutions at the national level. Throughout its history, it has played a fundamental role in the training of professionals and the promotion of knowledge, maintaining a constant commitment to the development of the region and the country. In this process of evolution, the university has integrated into its mission and vision the need to generate a positive impact on society through an educational model that goes beyond the simple transmission of knowledge. University outreach, known within the institution as "Linkage with Society," has become one of its fundamental pillars, recognizing that the entity cannot isolate itself from the realities and challenges facing its social, political, and economic environment.

A collaborative approach is essential to developing more effective solutions, as it allows for the integration of diverse perspectives and strengths, both academic and social. In this way, the university becomes a catalyst for change, promoting positive transformation in the communities with which it interacts. Another crucial aspect of the connection with society in the institution under study is its direct impact on the professional training of students. By promoting an education that is aligned with the real needs of society, future professionals acquire a broader perspective and a deeper understanding of the problems facing their communities. This allows them to be better prepared to contribute effectively to the sustainability and development of the region and the country.

III. METHODOLOGY

The research was based on the Participatory Action Research (PAR) methodology, where community members play a crucial role in transforming their social reality. Key PAR activities encompass not only research, but also education and action. Community members are considered essential actors in this transformative process. PAR is defined as a process by which members of a group analyze information

and address their problems in order to find solutions and promote political and social change (Espinoza Freire, 2020).

The origins of PAR can be traced back to the pioneering work of Kurt Lewin in 1946, who was the first to establish a link between research and action (RA), influenced in part by his observation of communities and religious groups in the United States that displayed a strong self-help spirit in addressing their problems and meeting the needs of their members (Velásquez et al., 2021). PAR is divided into three phases: Research, Education, and Action (Balcazar, 2003). In the initial phase, participants assess their current situation, identifying problems and conditions, as well as setting priorities and organizing action groups to plan solutions. During the second phase, participants develop a critical awareness that helps them identify the underlying causes of their problems, moving away from victimest stances, such as superstition and learned helplessness, as well as proposing possible solutions. The objective is to empower the population to recognize their capacity to act, freeing them from previous states of dependence and passivity, and making them understand that solutions depend on their own effort. This educational phase also includes training leaders in techniques to lead meetings and action groups. Finally, the action phase refers to the implementation of practical solutions to problems, using their own resources or collaborating with other groups (Zapata & Rondán, 2016). Following the PAR methodology, the project was executed in the following stages:

a. Contact with the community

With the previous experience of the tourism project with the university, the association contacted the university for the second time in 2021 requesting the development of a project for the fishing dock in the community. The group created a proposal and participated in the II Interuniversity Competition for Research Projects Linked to Society, becoming eligible for project funding.

b. Student Engagement

Student participation in the project was encouraged through community service practices, work placements, and the development of undergraduate theses. This not only enriched the students' educational experience, but also facilitated an exchange of ideas and knowledge.

c. Community mapping for problem identification

Community mapping was carried out, which consisted of identifying and analyzing the most relevant problems facing the community. This activity was carried out through group workshops with the members of the association and the youth population of the community, allowing for a comprehensive view of local needs.

d. Establishing research priorities and goals

Based on community mapping, expectations for the development of the fishing dock were determined.

e. Design of the prototype of self-construction modules

A prototype of self-construction modules in wood and bamboo was designed to respond to the needs identified in the previous phase. This design was carried out using a participatory approach, involving both students and community members in the creative process. An academic event entitled "Tectonic Days" was organized, which allowed for the exchange of knowledge between academics and students on innovation and bamboo construction techniques. The progress of the project was also presented here which served as a platform to strengthen collaboration and promote joint learning.

f. Training of association members on self-construction modules

Two training workshops were held for members of the crab fishing association on the use and construction of the designed modules. These training sessions included both theoretical and practical aspects, ensuring that participants acquired the necessary skills to carry out the project. In addition, a manual was created for the transfer of knowledge.

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g. Construction of a dock

As part of the project, the physical construction of a dock was carried out using the developed prototypes. This activity not only allowed for the application of the knowledge acquired during the training, but also served as a tangible example of the impact of the project on the community.

h. Project management plan

Finally, a comprehensive project management plan was developed, spanning from planning to final evaluation. This plan included strategies to ensure the long-term sustainability of the project, as well as mechanisms to monitor progress and make adjustments as necessary.

IV. RESULTS

Inclusion, acceptance and integration: the appreciation of culture and identity

In this project, the association allowed a group of teachers and students to accompany them in their daily collection work. To get to the boat launch site from the facility, one must travel approximately thirty minutes along a dirt road in poor condition. Once at the dock used by the associates, it was observed that it is a concrete platform, approximately two meters wide by five meters long, placed tightly between the road and the water. From the dock, it took another half-hour in boats with outboard motors, from a precarious embarkation point towards the mangrove area through an arm of the sea, where worrying characteristics of contamination in the protected area were evident. During this journey, the collectors indicated that high tide represents a significant risk, as they can get trapped in the mangrove due to the lack of power of the engines to face the tide. In addition, it was observed that the high gasoline consumption of the boat engines constitutes an economic challenge for them. Contradictorily, the landscape that unfolds inside the labyrinth of the sea arm is paradisiacal, contrasting with the difficulties they face. Once in the mangrove, it was documented that the collectors, generally organized in small groups due to the spatial limitations of the boats, tie their vessels to the mangrove trees and enter the ecosystem. With their feet submerged in mud at depths that can exceed their height, the collectors are able to detect the presence of crabs and catch them manually, using common gloves. The collection is carried out individually, with an average of 20 crabs per collector each day. It is important to note that, when finding female crabs, the collectors make the conscious decision to return them to the water to ensure their reproduction, which reflects a sustainable practice in their activity. The work day extends from the early hours of the morning until the afternoon, at which time the tide begins to make it difficult for them to get out to the ocean, increasing the risks of their work.

Figure 7

Platform

Note: Photograph by the authors

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Figure 8

Photographic documentation of accompanying harvesting tasks

Note: Photograph by the authors

Active participation and participatory models: serving to build together

The project was developed under the research and linkage scheme, thus it was necessary to incorporate students with the objective of learning through the recognition of a concrete reality and the implementation of the solution to the problem. In this two-year process, a total of 30 students participated in the pre-professional internship modality, two students in the degree thesis modality, and fifteen students in the community service hours modality. Student participation was characterized by their semester-long presence. The students were assigned to various activities, among the most important were support in the design of prototypes, the organization of academic events, transportation and food logistics, training of community members, and the construction of the fishing dock. Likewise, six teachers participated in research and outreach hours. On the one hand, the teachers with outreach activities were in charge of coordinating field visits, community workshops, information gathering, and maintaining constant contact with the community. Meanwhile, the research teachers developed the methodological processes of the research and the data analysis. Students from the Faculty of Architecture actively participated in the project, integrating their academic learning with practice in a real-life context, which gave them a deeper understanding of the socio-economic realities of the community.

The project helped raise students' awareness of the realities of vulnerable communities, promoting a sense of social responsibility and commitment to sustainable development. The Research-Action-Participation (PAR) methodology implemented proved to be effective in integrating the community into the research and problem-solving process, promoting mutual learning between academics and residents. Thus, as Gamboa (2008) indicates, the university is configured as a node that, through exercising the teaching function, preserves and transmits knowledge and connects with society by applying and disseminating knowledge, giving substantial weight to university extension as a service to the community.

The proposed methodology allowed the creation of a model of engagement with society, based on the idea that university education offers future professionals the opportunity to connect with social reality and its diverse contexts, thus promoting the creation of specific solutions. This approach requires that communities assume an active and leading role in the development of their improvement processes, and in addressing their own needs. The engagement model also reflects the instructors' interest in forging new professionals with leadership skills and development in spaces of participation. The students developed the capacity to motivate focus groups, their peers, and themselves. Facing situations

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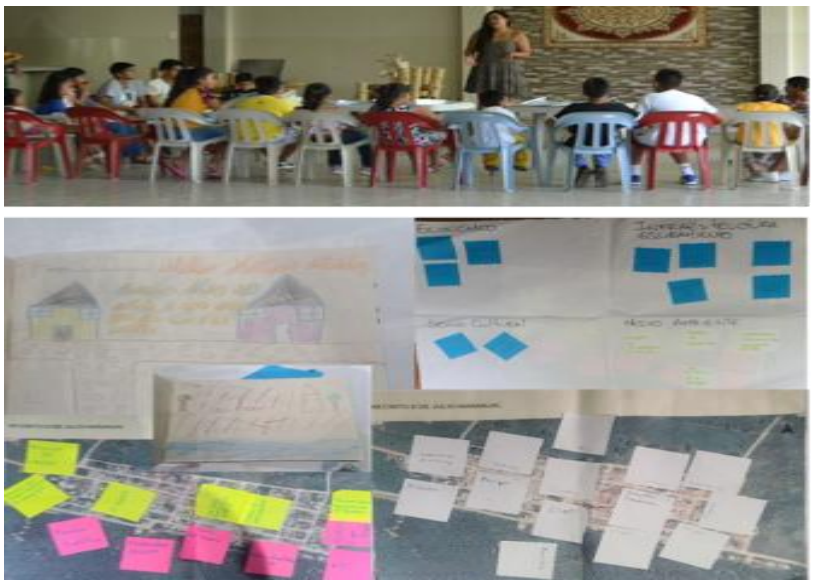
of extreme vulnerability raises their awareness regarding their performance as students and future professionals. Conversations were frequent to delve deeper into topics on territorial imbalances, economic and social development, citizen participation, gender and development, etc. For the teaching staff, effective engagement provided new paradigms on the treatment of materials and resources. Working in the climatic conditions of another region represented an important stimulus for the researchers, since the university is characterized by its regional approach, and this project collaborates with the national scope that the institution seeks. It is essential to emphasize the human support that is generated within the group. Coexistence and experiences in spaces that require special empathy consolidate the human group even after the support phase has ended. It is gratifying to note that the students who participated, after completing their pre-professional internship semester, still came to the project office with curiosity and a desire to support its achievement.

Community mapping: A tool for identifying natural and cultural resources

The community mapping exercise carried out in the Seis de Julio community allowed the creation of maps that reflect perceptions, experiences and local information, showing the reality and diversity of the territory. The mapping was developed with the children and adults of the community. The maps highlight productive and social activities and serve as an important iconographic discourse for the community. They also empowered the children, increasing their knowledge of the territory and their awareness of problems and needs. Community mapping revealed differences in the perception of the territory between children and adults. Children prioritized the conservation of mangroves, while adults focused on improving infrastructure and basic services. Mapping helped generate consensus on the importance of protecting mangroves and encouraged concrete actions such as the construction of the fishing dock. It also highlighted internal and external risks, such as the loss of economic traditions and disconnection from other urban centers due to the poor condition of roads. It was also observed that the new generations show less interest in traditional activities, influenced by urban aspirations and social networks. The process strengthened the sense of belonging and connection with the territory, promoting community relations and a greater capacity to demand their needs from the local government.

Figure 9

Community mapping



Photographs by the authors

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Prototype design and training workshops

The thesis “Approach to an urban-architectural intervention in the 6 de Julio District, Naranjal,” develops a schematic proposal for the repowering of the existing infrastructure through self-construction systems. This research was carried out with the aim of generating an effective connection between the mangrove and the town, to the benefit not only of the collectors, but also of the entire population.

Determined to tackle sustainable construction, the School of Architecture, led by the research group, held an international conference, for which it obtained external competitive funding from Grupo La Rabida. With these funds, the conference called Sustainable Construction with Fibers and Bamboo was held; this not only brought together experts on the subject, but also workshops on student prototype construction were held. This event contributed to carrying out mechanical and durability tests on the materials proposed in the original design.

Designs were developed that use a construction system based on the tradition of the community's artisans, and at the same time is structurally improved, adaptable and careful with the environment, as well as with a programmed duration for eventual maintenance and easy replacement of materials. Composed of bamboo columns and beams (*caña brava*), joints with threaded rod or bamboo plugs, and a floor of recycled pine pallets, it included a flexible module that adjusts to the unevenness of the terrain to facilitate construction and adaptation for multiple uses.

The bamboo, with its hollow but resistant tubular structure, was externally reinforced with a hard layer rich in silica and rings that give it rigidity. For its use, it is essential to follow specific cutting and handling instructions that were detailed in the printed guide called “Self-construction Manual, fishing-tourism dock project in the 6 de Julio District - Naranjal, Ecuador.” Once the modules were designed, training workshops were held for the members of the Crab Fishermen's Association, which allowed them to acquire practical skills in the construction of the modules and a manual for the transfer of knowledge.

Figure 10

Photographic Documentation: Student Involvement

Note: Photograph by the authors

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Figure 11

Photographic documentation of the results

Note: Photograph by the authors

Work party for the construction of the prototype

After training the community members, the prototype was built on the mangrove dock. This was done through a one-day community work party. For this purpose, the population, the students, and the materials and tools were brought to the site. The project began with a careful clearing of the land, taking into account the natural characteristics of the mangrove. The holes for the piles were dug. The piles were made from eucalyptus wood, which is a renewable and fast-growing material. The piles were edged to fit the canes. The assembly of the canes consisted of selecting the most suitable and custom-made canes, which were drilled to proceed with their joining and reinforced with ropes. From these processes, the modulation manual was followed to structure them to a specific standard.

The process faced several difficulties: first, accessibility to the site and the transfer of materials, due to the rough physical environment, and two, the lack of basic services such as electricity, water, and telecommunications, which complicated the logistics of food, rest, hygiene, communication, and prevented the use of electric tools for cutting or fastening. In this sense, the participation of students and members of the association was essential for carrying out the assembly activities in such a short time.

Strategies for Asset Consolidation

A management plan was developed to ensure the long-term sustainability of the project, including monitoring and evaluation mechanisms to adapt actions to the needs of the community that lead to consolidating its heritage. The fishing-tourism dock project in the 6 de Julio District - Naranjal, Ecuador, was developed as an initiative to improve local infrastructure, preserve its natural resources, and ensure the economic sustainability of the community. This settlement, which is home to approximately 145 families dedicated primarily to crab harvesting, faces significant challenges due to the lack of an adequate dock to facilitate their productive activities. The creation of this dock not only seeks to optimize the working conditions of the harvesters, but also has the potential to become a tourist attraction that diversifies sources of income and promotes local fishing culture aimed at strengthening their identity.

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The project management model is based on active community participation, ensuring that members of the 6 de Julio Crab Farmers Association are involved in all stages of the process, from planning to execution. This participatory approach is essential to foster a sense of belonging and shared responsibility among the inhabitants. In addition, the project incorporates sustainable practices through the use of materials such as bamboo, which not only respects the natural environment, but also contributes to the conservation of the surrounding mangrove ecosystem. Some key axes for the sustainability of the project were raised: first, it is expected to significantly improve the local economy by facilitating safer and more efficient access to the sea for fishermen, without falling into economic or political debt. This will allow a sustainable increase in catches and, therefore, in community income. Secondly, the dock will promote sustainable tourism by offering visitors an authentic experience related to local fishing activities by appealing to environmental awareness. In addition, the development of the dock is expected to encourage the creation of complementary infrastructures of equal significance and on various scales as structural systems for markets, health centers, recreational centers, processing centers, etc., appealing to organizational systems for their construction such as work parties.

The management model proposes the organization of a project that includes a diverse team composed of community members and local representatives, as well as the establishment of specific committees to address critical aspects such as construction, environment, and safety. Each of these groups will have clearly defined roles to ensure efficient and coordinated execution of the project.

Constant communication between all the actors involved will be essential to address any challenges that arise during the development of the dock. Finally, it is necessary to have a permanent evaluation of the project based on success indicators that will allow the impact of the project to be assessed in economic, social, and environmental terms. This continuous evaluation will ensure that the dock not only meets its initial objectives, but also contributes to the sustainable well-being of the community and the preservation of the local ecosystem.

Figure 12

Photographic documentation of the construction of the dock

Note: Photograph by the authors

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V. DISCUSSION

University Extension or Linkage with Society has been instituted as an essential component in the curriculum of Ecuadorian universities as an academic response to community development. Cooperation must be guided towards promoting sustainable cultural, social, and economic development. In this case, a community was found that has traditions and landscape resources of high value that had not been identified, related, or recognized as heritage.

Within the framework of these projects, it is the duty of universities to seek not only the academic training of their students but also the strengthening of local capacities. Therefore, extension must be understood fundamentally as a process of social transformation that arises from the involvement of the university and the community" (Gutiérrez, 2011).

This approach highlights the importance of collaboration and equal dialogue between both parties, which allows for constant feedback and adaptation of interventions to local realities. It would be important to catalogue the projects that have not presented the required duality and may have a unilateral interpretation for the fulfillment of their objectives. This is dangerous because they can translate into projects that aim to respond to electoral commitments by rural town leaders that do not respond to their own needs.

When University Extension aims to solve community needs, convinced by the response of the counterpart actors, there is evidence of an improvement in the living conditions of these populations (Pérez, 2012). For this reason, it is essential to adopt a participatory approach, where local actors are considered as co-creators of knowledge and effective solutions that achieve the strengthening of the social construct, the economy with a solidarity approach, and a sustainable approach to its resources. All this translates into an improvement in the quality of life of the community (Salazar & Martínez, 2018).

On the other hand, the difficulties faced by university outreach or linkage are directed towards the possible resistance that a community may show (Torres, 2015), therefore it is essential to work on the credibility of the Institution in the local, regional, and national views, as well as to recognize and develop the teaching and research staff that show aptitudes focused on working with different sectors and organizations, since the fulfillment of the project objectives largely depends on their acceptance in the community. Higher education institutions must act as agents of change that promote territorial sustainability in all its dimensions. There is a latent risk that the intervention of universities perpetuates colonialist dynamics through the imposition of external models that interfere with the economic and social dynamics of the towns (Castro, 2017).

If cooperation based on sustainable development principles is based on seeking the desired social cohesion as a primary objective, it must, as a foundation, promote the active participation of the community in decision-making and project development (López, 2019). The involvement of the actors contributes to the empowerment of the project and the sense of belonging of the inhabitants. The Latin American territory, throughout its history, can be characterized as a fertile laboratory for the testing of development models that did not consider the cultural particularities of the communities (Martínez, 2020). In short, the cooperation of institutions within the framework of university extension must have a reflective and contextual connotation characterized by being a facilitating actor in the different development processes, but not an entity of impositional solutions that replicates colonialist models of domination.

Effective university involvement is a task that has the obligation to ensure the sustainable development of vulnerable communities. The community initially expected the university to design and build the dock, as well as to provide support in obtaining state funds for this purpose. The researchers found that for proper appropriation of the site, construction techniques, and filling labor gaps, it was preferable to provide them with the mechanisms that allow them to solve their own basic infrastructure needs, whether in the mangroves or in the settlement.

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Figure 13

Woman from the community. Extraction of crab meat for processing

Note: Photograph by the authors

VI. CONCLUSIONS

Community involvement shows that it is a driving force for the transformation of society. The fishing dock project in the Seis de Julio district managed to empower residents to identify and build their intangible heritage through solutions based on their own capabilities and limitations. In addition, it revealed self-construction as a support for artisanal fishing activity and became a feature of their identity.

Regarding external cooperation, and in agreement with Erreguerena (2020), it is necessary to address the problems of the territory, in consideration of power relations, in order to promote anti-capitalist and decolonial political and social processes, to strengthen disadvantaged sectors and subjects of social change. In this sense, university extension is positioned as a key agent in the construction of heritage to avoid cultural alienation.

The university not only trains competent professionals, but also promotes significant change in its social, cultural, and economic environment. University extension must be understood as an integral process that transcends education and knowledge transfer. University extension as an instrument allows the university to respond effectively to the current challenges of poverty, environmental deterioration, and territorial imbalance. The adoption of extension models that prioritize social relevance, respect for identity, and sustainable development implies not only adapting programs to regional realities, but also fostering a culture of social responsibility that promotes communities that strengthen their cultural values, promote equity, and practice inclusion. All this will generate an environment conducive to sustainable human and social development for the communities (Cedeño Ferrín & Machado Ramírez, 2012).

In this process, Participatory Action Research (PAR) was crucial as it allowed the community to be integrated into the research process as well as the project design. This approach also allowed mutual learning between students and residents and for the proposal to be adapted to the local reality. As

Wursten (2022) mentions, the involvement of academia in real problems allows the social circulation of knowledge and citizen participation.

In terms of sustainability, the project proposed the use of sustainable materials and construction techniques based on ancestral knowledge appropriate to the local environment, which allowed the community to develop it's "self-construction" capabilities. This makes the inhabitants themselves the workforce of the project and avoids dependence on external agents in the locality, thus efficiently managing monetary resources. In addition, it promotes environmentally friendly development and strengthens a sense of belonging and responsibility towards natural and cultural heritage.

When it comes to building heritage, it should be understood as a phenomenon that integrates the natural and the cultural, as well as the understanding of our collective identities. This process not only involves the conservation of material and immaterial elements, but also the creation of inclusive spaces to achieve a heritage that is truly representative and meaningful for all communities. The key is to recognize that heritage is more than objects or places; it is a living narrative that is woven through our daily interactions with the world around us.

The fishing dock project has highlighted the interconnection between cultural and natural heritage. Fishing activity, deeply rooted in local culture, is intrinsically linked to the health of the marine ecosystem. Through university outreach, sustainable practices have been implemented that not only benefit fishermen but also contribute to environmental conservation. This underlines the need to approach heritage from a holistic perspective that considers both cultural and natural aspects.

Finally, this project serves as a replicable model for other communities in Ecuador. The experience gained demonstrates that collaboration between universities and communities can lead to significant results in the preservation of cultural and natural heritage. By fostering an inclusive and participatory approach, a lasting legacy can be built that benefits both present and future generations.

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BIBLIOGRAPHY

[1] Aldrich, D. P. (2012). Building resilience: Social capital in post-disaster recovery. University of Chicago Press.
[2] Balcazar, F. E. (2003). Investigación acción participativa (iap): Aspectos conceptuales y dificultades de implementación.
[3] Burgos, G. P., & Avilá, P. (2018). Situación de los manglares de la ciudad de Guayaquil-provincia del Guayas-Ecuador. Desarrollo local sostenible, (31).
[4] Cabrera, H. A. S. (2017). La vinculación con la sociedad en el Ecuador: Reflexiones sobre su itinerario curricular. Revista Vínculos ESPE, 2(1).
[5] Campoverde, J. A. Z., Ordoñez, L. A. G., & Cacay, M. H. V. (2021). La pesca artesanal en Ecuador: Miradas desde el desarrollo sostenible y la globalización. Revista de la Universidad del Zulia, 12(34), 239-260.
[6] Carvajal, R., & Santillán, X. (2019). Plan Nacional para la conservación de los manglares del Ecuador.
[7] Castro, R. (2017). Ética y responsabilidad social en la educación superior. Editorial Universitaria.
[8] Cedeño Ferrín, J., & Machado Ramírez, E. F. (2012). Papel de la Extensión Universitaria en la transformación local y el desarrollo social. Humanidades Médicas, 12(3), 371-390.

[9] Cernea, M. M. (1989). Organizaciones no-gubernamentales y desarrollo local. Banco Mundial.
[10] Chambers, R. (1993). Participatory rural appraisal.
[11] Consejo de Educación Superior, C. E. S. (2023). Reglamento de régimen académico.
[12] Conservation International. (2024). Plan de acción cangrejo. https://www.conservation.org/docs/default-source/ecuador-documents/plan-de-accion-cangrejo-digital.pdf?sfvrsn=6398ee49_2
[13] Conservación Internacional. (2024, 19 de julio). Proyecto Manglares para el clima recibe luz verde para proteger y restaurar ecosistemas costeros de Ecuador. Conservación Internacional. https://www.conservation.org/ecuador/noticias/2024/07/19/proyecto-manglares-para-el-clima-recibe-luz-verde-para-proteger-y-restaurar-ecosistemas-costeros-de-ecuador
[14] Continental. Recuperado de http://conservation.org.ec/wp-content/uploads/2019/07/PAN-Manglares-Ecuador.pdf
[15] Cordero, O. (2012). Vinculación con la colectividad en la carrera de arquitectura [Trabajo Final de diplomado, Universidad de Cuenca]. Repositorio o URL https://dspace.ucuenca.edu.ec/bitstream/123456789/4533/1/TESISFINAL.pdf
[16] Cordero, P. Q. (2012). Los manglares de la provincia de El Oro: Experiencias en áreas concesionadas. Revista Electrónica de Ingeniería en Producción Acuicola, 6(6).
[17] Cuesta, A. V., Dimuro D, J. J., García, C. G., & Muttoni, M. (2009). De la investigación a la construcción participativa del patrimonio. Un programa de educación patrimonial y divulgación de la cultura científica en Uruguay. https://d1wqtxts1xzle7.cloudfront.net/13360271/1657-6414-1-PB-libre.pdf?1390862525=&response-content-disposition=inline%3B+filename%3DDe_la_investigacion_a_la_construccion_pa.pdf&Expires=1733322987&Signature=YjlVIc6WBGC6BlDRFby3-X6jamMJrBcTB4YNlWV0JdvMl~putdB1ecyHPsSKU7EPebipOQdVejzjjjrbaIG-VAV1q1CWFvAgZMraYxBI7K187MMgkfpStiupaUoAu5PS2T0VKGYNuRyuXXo5W~MQzOmIADDmQSVjtwaQoQ0pxMFs1-wB56SRQ3Zi-WtCCuKlL2-o1rlQ4pXkLvlBQq-xk7nRJQ2iADWPJkknv8yJXCRVeLEuBbklGn2AP2rrPFRAhy0KBYZaNhe0jaG9kcNnXz2o5PC~Y-UYKvP-N-050foofgSnRMYwgl1xmSg1hf-fkwWNDiBAggr3tmszHelbdg__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA
[18] De Cock, A., Forio, M. A. E., Croubels, S., Dominguez-Granda, L., Jacxsens, L., Lachat, C., ... & Goethals, P. L. (2023). Development of local communities in Naranjal-Ecuador. In Human Factors in Architecture, Sustainable Urban Planning and Infrastructure (pp. 58).
[19] Escobar, A. (2011). Encountering development: The making and unmaking of the Third World (Vol. 1). Princeton University Press.
[20] Erreguerena, F. (2020). Repolitizar los territorios. Reflexiones sobre los conceptos de territorio y poder en la extensión universitaria. Revista de extensión universitaria, 13, 3-3.
[21] Espinosa, C. E. F., Paredes, P. B., Torres, G. M., & Aguilar, C. E. V. (2021). Tradición pesquera artesanal e identidad sociocultural de Puerto Bolívar: Contexto del Golfo de Guayaquil-Ecuador. Revista de ciencias sociales, 27(2), 386-400.
[22] Espinoza Freire, E. E. (2020). Reflexiones sobre las estrategias de investigación acción participativa. Conrado, 16(76), 342-349.
[23] Guerrero Valdebenito, R. M. (2012, enero 10). Patrimonio cultural mundial, territorio y construcción de ciudadanía. Construcción y apropiación social del patrimonio cultural de la ciudad de Valparaíso-Chile. XVI(388). https://www.ub.edu/geocrit/sn/sn-388.htm
[24] Hernández, F. M. (2010). Patrimonio y turismo en la construcción de nuevos territorios: El partido de Coronel Dorrego, provincia de Buenos Aires, como caso de estudio. https://repo.unlpam.edu.ar/handle/unlpam/2561. https://repo.unlpam.edu.ar/handle/unlpam/2743
[25] Fernández Espinosa, C., & Villavicencio Aguilar, C. (2024). Características socioeconómicas de la población pesquera artesanal del perfil costero de la provincia de El Oro.
[26] Freire, P. (1996). Pedagogía de la autonomía: Saberes necesarios para la práctica educativa. Paz y Tierra.

[27] Gupta, A. K. (2012). Innovations for the poor by the poor. International Journal of Technological Learning, Innovation and Development, 5(1–2), 28–39.
[28] Gutiérrez, J. (2011). La extensión universitaria como proceso de transformación social. Editorial Universitaria.
[29] Health risk-benefit assessment of the commercial red mangrove crab: Implications for a cultural delicacy.Science of The Total Environment, 862, 160737.
[30] Iñiguez-Gallardo, V., & López-Rodríguez, F. (2024). Gobernanza participativa para manglares en Ecuador.Madera y bosques, 30(SPE).
[31] Jové, F., Solano, J., & Cedeño, L. (2013). La Arquitectura Vernácula en el medio rural y urbano de Manabí. In Hábitat social, digno, sostenible y seguro en Manta, Manabí, Ecuador (pp. 135–143). http://www5.uva.es/grupotierra/aecid/publicaciones/2013/4b.pdf
[32] KEB. (2023). PATRIMONIO CONTEMPORÁNEO EVOLUCIÓN DEL CONCEPTO DE PATRIMONIO Y NUEVA GESTIÓN. https://www.euskadi.eus/contenidos/noticia/keb_argit_ondare_garaikidea/es_def/adjuntos/KEB_2023_Patrimonio-contemporaneo.pdf
[33] López, A. (2019). Participación comunitaria y cohesión social en proyectos de desarrollo.Revista de Estudios Sociales, 12(1), 40–50.
[34] Malavassi Aguilar, R. E. (2016). El patrimonio como construcción social. Una propuesta para el estudio del patrimonio arquitectónico y urbano desde las representaciones sociales. Diálogos Revista Electrónica, 18(1), 249. https://doi.org/10.15517/dre.v18i1.25122
[35] Martínez, P. (2020). Descolonizando la intervención universitaria: Nuevas perspectivas en el desarrollo comunitario.Journal of Latin American Studies, 15(3), 85–95.
[36] Mendoza Avilés, H.E., Betancourt Vera, A.S., & Murillo Erazo, F.Y.(2019). Factores productivos que inciden en el desarrollo económico y comercial de la "Asociación de cangrejeros 6 de julio" en el Golfo de Guayaquil.Revista Universidad y Sociedad, 11(2), 387–394.
[37] Moreira Santos, J.Y.(n.d.). Expansión de la industria camaronera en los ecosistemas de manglar: Su influencia en las relaciones socioecológicas y medios de vida locales: El caso de Sucre [Master's thesis]. Flacso Ecuador.
[38] Nussbaum, M.(2006). No citizen left behind. Harvard University Press.
[39] Orellana-Alvear,B., Hidalgo-Cordero,J., Ordoñez,A., & Zalamea,E.(2022). Mangrove infrastructure for the economic development of coastal communities in Ecuador.[Publication].
[40] Pauly,D.(1983). Algunos métodos simples para la evaluación de recursos pesqueros tropicales.FAO Vol.(234), pp.(1–49).
[41] Pérez,L.(2012). La participación comunitaria en la extensión universitaria.Revista Latinoamericana de Educación, 5(2), 75–85.
[42] Pontificia Universidad Católica del Ecuador, & Andrade, S. (2016). La construcción del discurso sobre patrimonio intangible y las políticas culturales en Ecuador. Boletín de Antropología, 31(52), 221-247. https://doi.org/10.17533/udea.boan.v31n52a14
[43] Sachs,J.D.(2006).The end of poverty: Economic possibilities for our time. Penguin.
[44] Salazar,M., & Martínez,R.(2018). Impacto de la extensión universitaria en la calidad de vida: Un estudio de caso.Journal of Social Development, 10(1), 95–110.
[45] Sen,A.(2000). El desarrollo como libertad.Gaceta ecológica, (55), 14–20.
[46] Treviño,M.(2022)."The Mangrove is Like a Friend": Local perspectives of mangrove cultural ecosystem services among mangrove users in northern Ecuador.Human Ecology, 50(5),863–878.
[47] UNESCO. (2003). UNESCO - El texto de la Convención para la Salvaguardia del Patrimonio Cultural Inmaterial. https://ich.unesco.org/es/convención
[48] Velásquez,L.A., Alvarado Mendoza,S.Y., & Barroeta,V.(2021). Investigación acción participativa: Alternativa metodológica para el estudio de las comunidades; La visión de Orlando Fals Borda.Revista Scientific, 6(21),314–335.
[49] Veuthey,S., & Gerber,J.F.(2012). Accumulation by dispossession in coastal Ecuador: Shrimp farming, local resistance and the gender structure of mobilizations.Global Environmental Change [Publication].

Research Article

[50] Wursten, A. G. (2022). Ciência, tecnologia e sociedade: O potencial da extensão universitária como interface mediadora. 17.

[51] Yáñez-Arancibia,A., & Day,J.W.(2010). La zona costera frente al cambio climático: Vulnerabilidad de un sistema biocomplejo e implicaciones en el manejo costero.Impactos del Cambio Climático Sobre la Zona Costera, Yañez-Arancibia,A.(Ed.), pp.(12–35).

[52] Zambrano,D.E.B.(2022). Valoración económica ambiental del ecosistema Manglar majagual en la Reserva Ecológica Cayapas Mataje de la provincia de Esmeraldas.Sapienza: International Journal of Interdisciplinary Studies, 3(1),1249–1271.

[53] Zambrano,R.(2022). Seguimiento participativo: Lecciones aprendidas en la pesca del cangrejo de manglar Ucides occidentalis (Ortmann,1897) en Ecuador.*The Biologist,*20(2),331–337.

[54] Zapata y,F., & Rondán,V.(2016).LA INVESTIGACIÓN - ACCIÓN PARTICIPATIVA Guía conceptual y metodológica del Instituto de Montaña. Instituto de Montaña https://pdf.usaid.gov/pdf_docs/pa00n1qh.pdf