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# Local perception of territorial reality through community mapping. Seis de Julio Community, Naranjal-Ecuador

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**ABSTRACT**

This article addresses the local perception of the territorial reality in the Seis de Julio community in Naranjal-Ecuador through community mapping. The population actively participates in the creation of maps by compiling their experiences, knowledge, and specific needs. Community mapping is a valuable tool that allows one to organize the cultural and social wealth of a community. The production of this type of cartography captures the empirical knowledge of the population regarding the territory, which then allows for a more comprehensive understanding of territorial dynamics from the perspective of the residents. Several workshops were held during the production of the maps that included the participation of the local children, as well as members of the Seis de Julio Crabber Association, specifically highlighting the aspirations that the younger generations have about how they can protect their local ecosystem. By incorporating a native perception as an inclusive approach to territorial planning, the overall decision-making and design of local policies is improved. In effect, community mapping not only offers an actual representation of the environment, but also encourages appropriation and empowerment among its inhabitants.

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## 1. Introduction

Mangrove forests are critical coastal ecosystems that provide a variety of ecosystem services, including sea level regulation, supporting fisheries, and serve as buffer zones for flood protection. However, these ecosystems are exposed to various risks such as climate change. The effects of climate change exert pressure on these ecosystems, making them more vulnerable due to their slow response capacity, including the human communities living near these areas (Cinco-Castro & Herrera-Silveira, 2020).

Despite being some of the most productive ecosystems on the planet, mangrove forests also face pressure from the marine environment and human activities, thus preserving these areas is crucial for the preservation of ecological biodiversity. In this context, it is necessary to involve local communities in mangrove management, as they depend on the resources and services these ecosystems provide.

Mangroves in Ecuador cover approximately 1,571 $km^2$, from the Santiago estuary, the mouth of the Esmeraldas River, the Gulf of Guayaquil, La Isla de Puna, Puerto Bolívar and Santa Rosa, to 25 kilometers south of the border with Peru. The mangrove forests along the Ecuadorian coast are highly productive ecosystems that generate significant amount of nutrients, supporting local wildlife. They harbor a rich diversity of flora and fauna and serve as valuable natural reserves of tannin, which is used in the textile and leather industries. However, these ecosystems face numerous threats from human activities, including logging for timber, the construction of shrimp farms and housing, urban development, overfishing, violations of fishing bans, indiscriminate crab capture, and the impacts of climate change (Pernia et al., 2019).

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The Seis de Julio Community in Naranjal is a settlement located approximately 10 km from the Pacific coast, of which the last 4 km from the coast across the Churute Mangrove Reserve in the Gulf of Guayaquil. Artisanal crab fishing is the main economic activity of the local people, passed down from generation to generation. At least one member of each family in the community is engaged in this activity and belongs to the 147-member Crab Fishermen's Association. However, during the off-season, collectors must seek other means to support their households. This generates a series of difficulties, as the settlement lacks adequate infrastructure and basic services for the development of other activities. The populated center is a settlement with no road connectivity, low political-administrative hierarchy, and a lack of investment in community goods and services, which has led to neglect by the local government.

The Crab Fishermen's Association plays a fundamental role in the management of its territory and has managed to obtain from the Ministry of Environment, Water and Ecological Transition (MAE) an initial concession of almost 20 $km^2$ of mangrove for its use, conservation, and custody. However, this concession requires significant technical and governmental support to strengthen its community capacity, as well as improve the understanding of the reality and potentialities needed to foster further development.

The Project for the Fishing Pier, an institutional collaboration between the University of Cuenca-Ecuador and the Seis de Julio Crab Fishermen's Association, determined, among other methodologies, that community mapping was essential to initiate the planning and recognition processes of the territory, which are still non-existent in the commune, as part of a participatory action research model. It is important to note that the dynamics of this community are representative of many villages that depend on Ecuador's mangroves. These communities currently lack government support in terms of infrastructure and basic services, and they are also increasingly threatened by external factors such as climate change.

The implementation of community mapping is an instrument to produce maps that facilitates the collection of the local perception of the population, specifically identifying their problems and potentialities. Through self-awareness, the population was able to generate a greater understanding of their needs, identifying the critical areas that require attention from the local government and recognizing the importance of implementing policies, as well as effective resources to mitigate and prevent these problems.

This technique was applied to two different groups of the population: the members of the Crab Fishermen's Association, which is mostly made up of young and adult men and children of the association members. This division was fundamental because the researchers had previously observed a gap in the family legacy of economic activities, as the children have new aspirations and interests that motivate them to seek other opportunities through migration.

This article presents the results of three community mapping exercises carried out in the Seis de Julio community in Naranjal-Ecuador. Said exercises have allowed us to compare the perception of the territory from the local children's perspective with that of the adults. The work also allowed us to understand the needs of the population and the challenges they face as their main economic support comes from crab fishing. This activity is threatened by climate change and environmental pollution of the local mangroves, which adds even more loss of cultural tradition among future generations of crabbers. Lastly, the overall contribution of this work is to demonstrate the importance of community mapping as a tool to promote the self-management of resources and to achieve empowerment based on the community's needs among vulnerable communities, such as those in the mangrove areas of Ecuador.

## 2. Literature review

The participatory creation of maps and their interpretation has gained importance since the 1980s, especially in the participation of the rural population, which includes methods such as sketch mapping and scale mapping, among others (Di Gessa, 2008). Starting in the 1990s, the use of geospatial information technologies (GITs) has facilitated the integration of information and social learning in communities (Rambaldi et al., 2006). Participatory cartography is used as a tool that allows the community and territory to dynamically represent the processes of the area that the community identifies as common; this tool is based on an epistemic base that contrasts Western research (Saravia-Ramos et al., 2021).

Epistemologically, community mapping is supported by an approach in which the construction of reality is collective and based on the participation of the actors; as Fals Borda says (1979 in Carrión & Albert, 2022), the object thinks and feels, that is, it is sentient and therefore, abstract realities do not exist. This is where the current Participation Action Research (PAR) is born, by promoting the development of the community and stimulating a sense of cooperation and organization among its members, based on the psychological experience of the subject who knows and the "individual" is known (Carrión & Albert, 2022).

Cartography is a tool that links comprehensive knowledge with the expectation of knowing about others through the use of concepts, points, positions, symbols, etc. (Martínez-Vérez & Montero-Seoane, 2020); thus, participatory maps allow the population to be heard by connecting the inhabitants to the space. Analysis of these aspects of an area can be therefore used as inputs for better territorial planning. Proper territorial planning helps to satisfy human needs. However, taking into account that satisfaction is different depending on the culture and time (Max-Neef et al., 1994) the population itself must be the one who directs the processes. With this, it is necessary to respond to the needs of the geographical space susceptible to transformations and with limitations of its use in which the interests, aspirations, and expectations of its population are considered to achieve sustainable development.

Sustainable Development must include sustained and inclusive economic growth, social development, environmental protection, and progress towards the eradication of poverty and hunger. The application of technologies must respect the climate and biodiversity and promote a world where humanity lives in harmony with nature, including wild flora and fauna, and where other species of living beings are protected (Nations, 2015). In this sense, citizen participation is important since in the space in which we live, both formal knowledge and popular knowledge must converge, allowing us to understand the multi-dimensionalities of a social, cultural, political, economic, and environmental nature. Arnstein (1969) describes citizen participation as the redistribution of power that allows citizens to share the benefits of society, differentiating between a simulacrum of participation and real power to affect the outcome of a process. This is the real capacity of citizen participation - to redistribute power between those who hold it and those who want it.

Social cartography is presented as a tool that allows participation in territorial planning processes, particularly in rural areas where the population does not necessarily know how to understand traditional maps. Social cartography on the other hand facilitates the creation of maps through reflection, perceptions, experiences, and knowledge of socio-environmental conditions that characterize the reality and diversity of the community (Vanwindekens et al., 2013). According to Mendoza Ledezma (2023), community mapping allows one to capture local knowledge about natural resources, land use, and relevant historical milestones; all the while supporting the identification of the common needs and priorities of the population. Because community mapping compiles the cultural and social diversity of the territory, residents are empowered and heard in territorial planning, promoting more equitable processes and sustainable development.

## 3. Method and data

### *3.1. Method*

Analysis of the territory in planning allows us to identify the problems to be solved, and potentialities that can be used, for decision-making and adequate development of the population. Awareness of local perception of the community helps planning processes be closer to reality, which is why it is necessary to incorporate the population's empirical knowledge about their community (Han et al., 2023). Collaborative mapping is a method used in participatory action research (PAR). According to Díaz-Arévalo (2022) PAR contributes to the production of knowledge based on a horizontal subject–subject relationship, that is, research by, with, and for the population affected by a specific problem. The population participates together with academic researchers, allowing for the democratization of information, as well as the involvement and empowerment of local inhabitants (Kindon, Pain, & Kesby, 2009 in Rosado-González et al. 2023).