PROGRESS REPORT

40560-2 Participatory approaches for the conservation of the mangrove forest in the coastal center of Veracruz

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Study Area

Fieldwork has been covered in the community of Mandinga y Matoza and La Aguada, Veracruz, Mexico. These villages are located on the central coast of Veracruz, and are surrounded by coastal lagoons (Mandinga Coastal Lagoon System, CLSM) and ecosystems such as mangrove forest, low subcaducifolia forest, coastal dunes, grasslands and herbaceous wetlands (Fig. 1). The economic activities of Mandinga and Matoza, an Afro-descendant people, are artisanal fishing, gastronomic and nautical tourism, commerce, and recently construction. In La Aguada, extensive cattle ranching and commerce predominate. Due to the growth of the Riviera Veracruzana development project, land use changes to human settlements have accelerated, resulting in the loss of biodiversity and an apparent cultural degradation closely related to the ecosystems present.

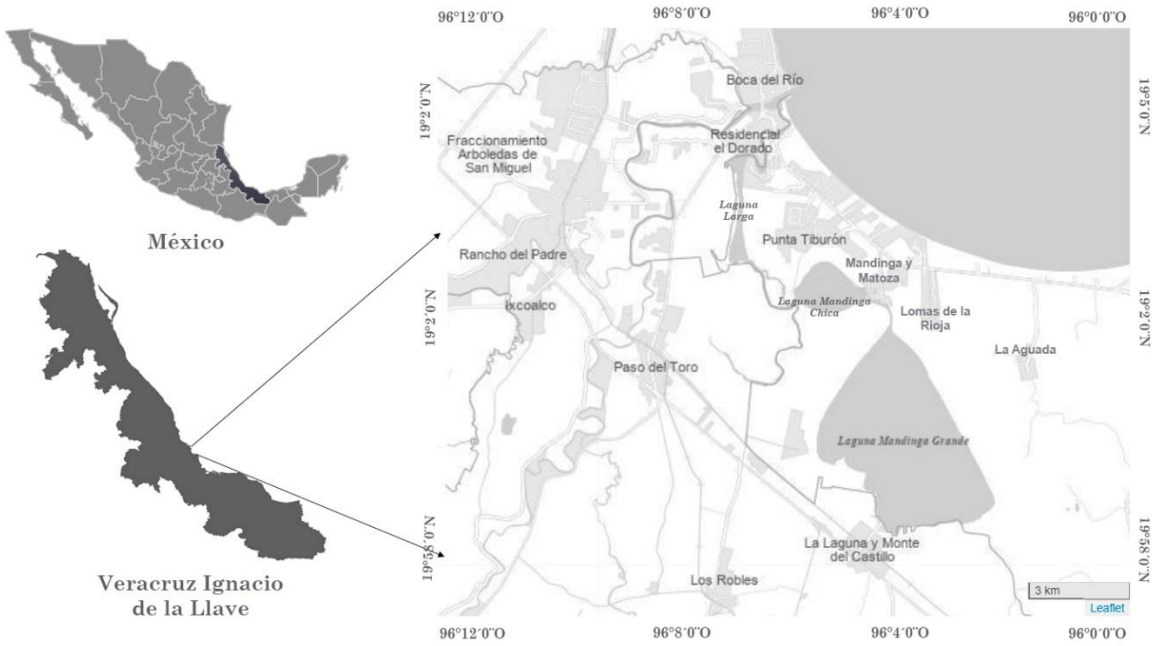

Figure 1. Geographic location of the study area in the coastal center of Veracruz, Mexico.

One of the socio-environmental problems that apparently hinders the organisation for the conservation of the mangrove forest and other ecosystems is the lack of participation, communication and dialogue of the inhabitants of the native villages. This project aims to develop participatory processes through participatory action research, environmental

education activities and biological monitoring in the CLSM. In the following, I describe the preliminary results of four objectives of this project.

Stage 1. Objective 1. To characterize and analyze the perceptions, interests, and power relations of the social actors involved in the Coastal Lagoon System of Mandinga (CLSM), Veracruz, Mexico, around conservation.

We identified six major socio-environmental problems according to the analysis of academic literature on the study area, 17 semi-structured interviews with different key actors from social sectors involved in the CLSM according to their perceptions and 4 workshops with fishermen and organised women from Mandinga and Matoza (Fig. 2). The socio-environmental problems were: (1) contamination of the lagoon water bodies of Mandinga; (2) loss of ecosystems due to conversion into human settlements predominantly; (3) conflicts over the use of lagoon resources between fishing cooperatives; (4) conflicts over access and control of lagoon spaces between cooperatives of Mandinga and Matoza and fraccionadoras of the Riviera Veracruzana; (5) disengagement and disarticulation between institutions and local actors for the solution of socio-environmental problems; (6) lack of communication, dialogue and participation by inhabitants and local sectors of Mandinga and Matoza for community improvement.

Figure 2. Semi-structured interviews and workshops with fishermen and organised women from Mandinga and Matoza.

The actors involved in the CLSM were classified into five sectors and 19 subsectors as follows: (1) local sector (subsectors: fishermen organised in cooperatives; tourism and gastronomic service providers; education subsector; organised women including the

municipal agency and junta de mejoras; ejidatarios; native and neolocal local inhabitants); (2) governmental sector (subsectors: state, municipality, federal and state environmental agencies); (3) non-governmental sector (subsectors: academia, non-governmental organisations); (4) private sector (subsector: business and cattle ranching); (5) non-governmental sector (subsector: academia, non-governmental organisations): state, municipality, environmental instances at federal and state level); (3) non-governmental sector (sub-sectors: academia, non-governmental organisations); (4) private sector (sub-sector: business and livestock); (5) other (sub-sector: police and marines, organised crime). This information was obtained from bibliographic sources in the study area and from field observations.

Stage 1. Objective 2. To identify the interests and rationalities of the social actors in the CLSM that support the conservation of the area.

This objective derives from the first. We characterise the social actors in the CLSM according to their interest and actions in conservation and relative powers (power in political ecology refers to the capacity of social actors to advance their interests around the use and control of natural resources and territories, within a framework of political and institutional discourses and structures in an area or region). Fig. 3 shows the map of actors according to the interests and rationalities of social actors around conservation and their level of incidence reflected in relative power (economic, social, political, legal, moral, informational and physical).

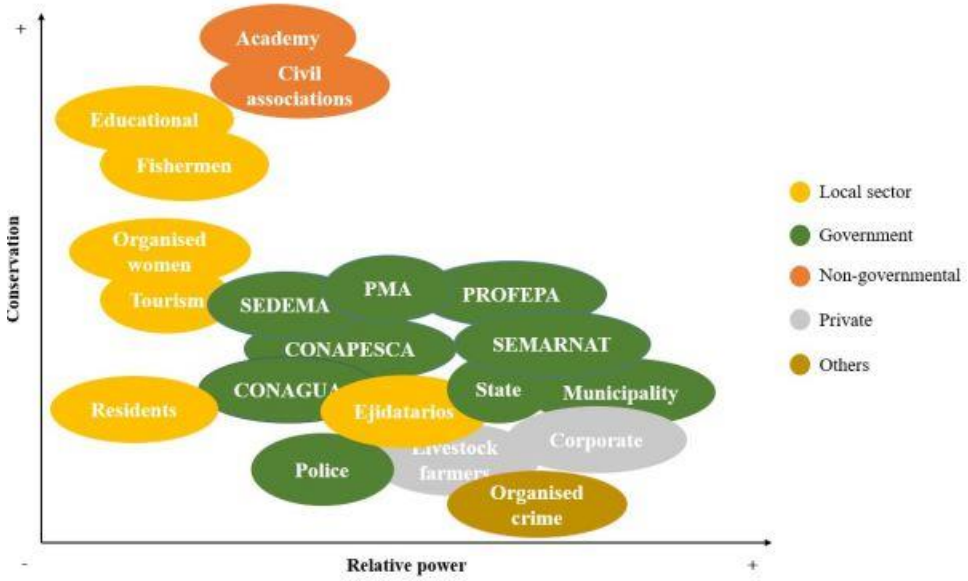

Figure 3. Map of actors involved in the CLSM according to their interest and actions around conservation and relative level of power.

This map indicates an asymmetry of relative power among the actors involved in the CLSM. On the one hand, there are the actors most interested in conservation, which are the local and non-governmental sectors, but with a low level of power (incidence in conservation

decision-making). On the other hand, there are the actors less interested in conservation and with a higher level of power, such as the municipality of Alvarado, which belongs to the governmental sector, as well as the private sector.

For the communication of field findings in scientific communities, we prepared two texts. One corresponds to a book chapter from the perspective of peace that addresses the socio-environmental conflicts in the CLSM, the violence exercised in these conflicts, some obstacles to the conservation and resolution of conflicts, and a final reflection to sow the culture of peace from everyday life in Mandinga and Matoza. The second publication is a scientific article that describes the socio-ecological scenario of the CLSM using political ecology and ethnography as theoretical and methodological axes.

Stage 2. Objective 3. Document and analyze the process of dialogue, reflection, and collective action aimed at the management of participatory strategies for the conservation of the CLSM ecosystems, mainly the mangrove.

According to the analysis of the social actors involved in the CLSM that correspond to the first two objectives, I identified two actors related to conservation, with a commitment to participate/collaborate in the project, with a good level of organisation and incidence in the community of Mandinga: organised women (municipal agency and improvement board) and the educational sector (directors of basic academic education that includes pre-school, primary and secondary education). In order to initiate the participatory processes, we took participatory action research (PAR) as the theoretical and methodological axis. The first stage was initiated with the presentation of the doctoral project, its interests, objectives and methodological proposals for collaboration between these actors (Fig. 4).

Figure 4. Presentation of the project with organised women and the education sector in Mandinga and Matoza, Veracruz.

The PAR scheme has been carried out with the complementary tool of strategic planning for non-profit organisations. This has allowed for: (1) a self-diagnosis with the two organised groups; (2) reflection sessions that included perception, belonging and role in the community of Mandinga and Matoza; (3) a diagnosis related to the level of presence or absence of ethical values in the population that influence participation and organisation for conservation (Fig. 5). For both organised groups, the product is a collaborative document still under construction that will contribute to the improvement of internal organisation in order to have a greater impact on community improvement and thus on the conservation strategies of the mangrove and other ecosystems present in the CLSM.

Figure 5. Workshops and meetings with organised women and the education sector in Mandinga and Matoza.

As part of a second stage of the project's participatory processes with both organised groups, I presented the doctoral research progress at the "Feria del Ostión", an annual cultural festival held in Mandinga and Matoza. This was aimed at communicating the project to the general public and included a timeline and an outline of the collaborative work with both organised groups (Fig. 6). We also organised the first meeting of the "Red del Corredor Arrecifal del Suroeste del Golfo de México región centro" (Reef Corridor Network of the Southwest Gulf of Mexico Central Region) to articulate efforts in the protection and conservation of the reefs, their territories and associated ecosystems in the central Gulf. The venue was in Mandinga and Matoza, which allowed the organised women to link up with other organised groups in Veracruz (Fig. 7).

Figure 6. "Feria del ostión" 2024 in Mandinga and Matoza, Veracruz, Mexico. I presented project progress and a photo exhibition of people over 80 years old who helped to reconstruct a socio-environmental timeline of the CLSM.

Figure 7. First meeting of the Southwest Gulf of Mexico Reef Corridor Network in Mandinga and Matoza, Veracruz, Mexico.

Stage 2. Objective 4. sensitize and train local staff in the monitoring of mangrove associated birds such as Boat-billed Heron (*Cochlearius cochlearius*) and Muscovy Duck (*Cairina moschata*) in the CLSM.

We recorded the nesting of Boat-Billed Heron (*C. cochlearius*) in the CLSM mangroves. We conducted direct observation of the Heron in the mangrove with the use of binoculars, field sheet for recording individuals, nests and nestlings, and camera (Fig. 8). We trained 3 local people in basic bird monitoring skills. We estimated a peak of 81 Boat-Billed Heron individuals in August 2023, a total of 68 nests (45 active) and a peak of 30 chicks in September 2023. The breeding success rate was 98 %, we recorded only one dead adult (Fig. 9).

Figure 8. Monitoring of Boat-billed Heron (*C. cochlearius*) nesting in CLSM mangroves and training of local people in monitoring.

Figure 9. Boat-billed Heron (*C. cochlearius*) nesting in CLSM mangroves. Adults, juveniles and chicks are observed.

Figure 10. Workshops with basic education students in Mandinga and Matoza, Veracruz, Mexico.

As part of the project, I have conducted 9 workshops with elementary school students on Boat-billed Heron monitoring, Muscovy Duck nest box placement, mangrove and wetland monitoring, and bird monitoring (Fig. 10). As a complement to the workshops, we conducted boat tours of the Mandinga lagoons to raise awareness among the participants.

Finally, we constructed and placed 8 nest boxes for Muscovy Duck (*C. moschata*) in the wetlands south of CLSM and near La Aguada. We recorded the presence of bird droppings in 3 nest boxes, 3 other nest boxes had their lids dislodged, one was invaded by bees and one was stolen (Fig. 11). The literature mentions that generally, during the first nesting season of the Muscovy Duck, the boxes are not used, but in later years until individuals become familiar with these structures.

Figure 11. Construction and placement of nest boxes for Muscovy Duck (C. moschata) south of CLSM, Veracruz, Mexico.