

**Opinion**

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# The Fishing Communities Involved in Mangrove Restoration Promote the Productivity of its Artisanal Fisheries



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## Abstract

Ecological restoration activities with the participation of the fisherman community in a natural protected area, and the government and academic support have established the possibility to provide an ecosystem functional that benefit to the population and also allow the sustainable decision-making to management natural resources at the present and immediate future. In addition, and another sense, is promote the productivity of its artisanal fisheries, in this case is evident that the volumes of shrimp and crab catch from different years were correlated with the dates scheduled for reforestation activities, showing that productivity increases were better over time.

**Keywords:** Mangrove reforestation; Community development; Fishing population involvement; Artisanal fisheries; Natural protected area; Laguna Madre Tamaulipas

## Introduction

The estuaries are one of the most biologically productive ecosystems worldwide, specifically the mangroves are considered among the most valuable ecosystems on Earth, by the ecosystem services that bring many benefits to humankind, which represent significant increases in its economic value by surface, reaching around 194,000 \$/ha/yr, in base of fish food production, carbon sequestration, coastal protection, tourism, water purification and livelihood [1,2]. Despite their importance, the mangrove cover is reported to have disappeared globally with losses at an alarming rate, due to direct anthropogenic impacts and global changes [3]. Due in part one third of the world's population lives in coastal communities and coastal zones are twice as densely populated as inland areas [4].

Mangrove conservation and restoration are a matter of necessity especially with growing threat of sea level rise by climate change and also play a key role in human sustainability [2,3]. Likewise, are highly valuable natural resources because of their emphasized relevance in provide food, breeding grounds and nursery sites for a variety of organisms, including many commercial species like fish and seafood, and wildlife [5]. The ecological studies stand out for providing scientific answers

to environmental demands that support citizens in public participation for sustainable environmental planning [4].

The establishment of protected areas is a main policy tool to management mangrove ecosystem and prevents further loss, also contributes to conservation their environmental services and benefits to coastal people, especially fisherman [6]. These arguments support the idea expressed here, when giving an opinion on the activities of mangrove community plantation in Laguna Madre (Tamaulipas, Mexico), categorized as a natural protected area and Ramsar site 1362 [7,8]. In addition, in Mexico, mangrove species and mangrove ecosystems are protected legally for their conservation through official Mexican regulations, the NOM-059 mentions species at risk status, and the NOM-022 establishes habitat and management regulations [9,10].

In Laguna Madre Tamaulipas there are 31 fishing cooperatives, made up of 3,197 fishermen and 2,204 smaller vessels, achieving a total production of 8,037,286 tons of the most used species: shrimp, mullet, crab, oyster, and trout [7]. Is the second biggest hypersaline coastal lagoon from the Gulf of Mexico and supports the most important artisanal shrimp fishery in the country [11]. The artisanal fishery still represents a very important sector in

the region, and stand out the common use of the charanga, as a passive fishing gear for shrimp catching.

Ecological restoration activities with community participation began as of 2006, among the activities performed is the germination and propagation of mangrove seedlings in order to form growth modules, which later managed to form patches of vegetation that in the present have served as seeds dispersal centers, achieving their conservation and restoration [12]. This investigation has promoted the continuity of community reforestation practices in Laguna Madre, the local women, and men they have been trained by governmental and academic instances to replicate the initial activities of the original restoration project, thus evidencing the success of knowledge and technological transfer.

The mangrove restoration by community reforestation activities is considered essential for environmentally sustainable decision-making, and they have the possibility to provide a natural environment functional that benefit to the population in immediate future. It would be expected that mangrove ecosystem provides goods of regulating, provisioning, cultural, and supporting services, which are of fundamental importance to human well-being, health, livelihoods, and survival [13]. Also, is evident that mangrove restoration projects guarantee a support for biodiversity and ecological functionality and are successful in the initial recovery of the fish assemblage structure [3,14].

Can do establish a hypothesis in base of the actual observations that this reforested mangrove act as nurseries to different species, including fish and seafood commercial, for its connectivity with other habitats. This mangrove planting by the fishing communities involved also promote its fishery activity and artisanal capture. If considering the ejection time of the restoration project [12], the official fishery statistics to shrimp and crab, reports in 2008 captures of 3846.35 ton and 2885.47 ton, respectively, and in 2011 when the project ended and community reforestation began throughout the region, the production decrease in 2011, reporting 3102.16 ton of shrimp and 3007.48 ton of crab [15,16].

Finally, in 2015 to four years of community work, the results begin to show progress in the fishing catch, with records of 3942.01 ton of shrimp and 3350.05 ton of crab, likewise continued to increase in 2018, reaching 4093.2 ton and 3941.6 ton, respectively [17,18]. These volumes of fishery catch confirm the criterion about the benefits promoted by the reforestation actions of the local fishing communities.

## Conclusion

The mangrove ecosystem brings many services and benefits to humankind, for that its conservation and restoration are a worldwide matter of necessity. The natural protected areas and the local community involvement are essentials for environmentally sustainable decision-making, and recovery the biodiversity and ecological functionality. Also, support and promote the

productivity of its artisanal fisheries, the present opinion justifies the fact that future restoration activities increase fishing catch volumes, in addition to recovery the fish assemblage structure and guarantee a support for regional biodiversity and ecological functionality.

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