

Environmental Pressure, Stakeholder Perception and Productive Strategy in an agricultural Region bordering a Nature Reserve (La Dalia, Nicaragua)

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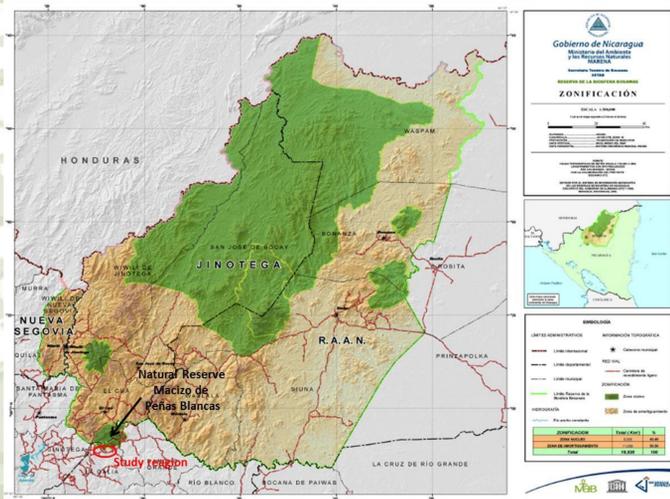
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Environmental pressure:

"A pressure produced by an entity on another entity, in the form of speech, a set of arguments or an objective aiming to preserve the environment" (Sibelet, 2013).

Agriculture in Nicaragua has been historically carried out through agricultural land expansion. This expansion has led to deforestation and in many cases, to natural resource degradation. Nowadays, the last primary forests are localised in protected areas. The Natural Reserve of Macizo de Peñas Blancas is one of them (Castillo y al., 2011). It is also part of the largest protected area of Central America, the Bosawás Biosphere Reserve, a keystone in protecting the Meso-American Biological Corridor. Even though formal rules regulating natural resource access and use in the Reserve exist (Fréguin-Gresh et al., in press), deforestation still occurs and endangers the area's natural resources. As deforestation is closely related to agriculture (mostly coffee plantations and food crops), another issue is the contamination of the water of the Reserve. Consequently, the provision of drinking water for the population localised in the surrounding areas of the Reserve is also at risk. In this context, users of natural resources are under the influence of various environmental pressures.

Objective

The present research study aimed at understanding the influence of environmental pressures on stakeholders' perceptions and strategies in natural resource management (NRM).



Methods

19 semi-structured interviews of organisation leaders
40 farmers semi-structured interviews
Participative observation



Results

The study showed that NRM in the area has globally improved in the last decade. However, state agencies in charge of NRM at the local level haven't succeeded in enforcing effectively laws and regulations in the area. Their main intervention consisted in (incompletely) informing the population about the existing legal and regulatory frameworks in order to better control NR use, in particular regarding forestry (e.g. illegal timber extraction). They mostly relied on public denunciations to enforce formal rules, as they seriously lack human and financial capital to implement effective actions in the field. Private NGOs joined efforts with the local authorities to improve NR use (e.g. by promoting environmentally-friendly agricultural practices). Nevertheless, these organizations were still facing major challenges in coordinating their actions.



Most farmers were conscious of the importance of improving the use of natural resources in the area and preserving the forest in the Reserve which is also the main source of water for drinking purposes in the entire watershed. However, their agricultural practices were in contradiction with their awareness of these issues, as they were seriously limited in capital endowment, in particular physical (land) and financial capital (cf. Figure 1). For many, the intensive use of inputs, which was required to produce food crops in degraded, small-sized plots of land, had negative implications on NR. The low level of land productivity (maize yield $\approx 1.5 \times 103$ Kg/Ha) forced them either to cultivate their entire land area (they could not save a plot for conservation purposes) or to use more fertilizer, with limited results in terms of production. Due to this vicious circle, farmers did not manage to implement environmentally-friendly practices (such as organic agriculture, tree planting...) which are labour intensive or correspond to long-term investments they could not afford.



Farmers' productive strategies

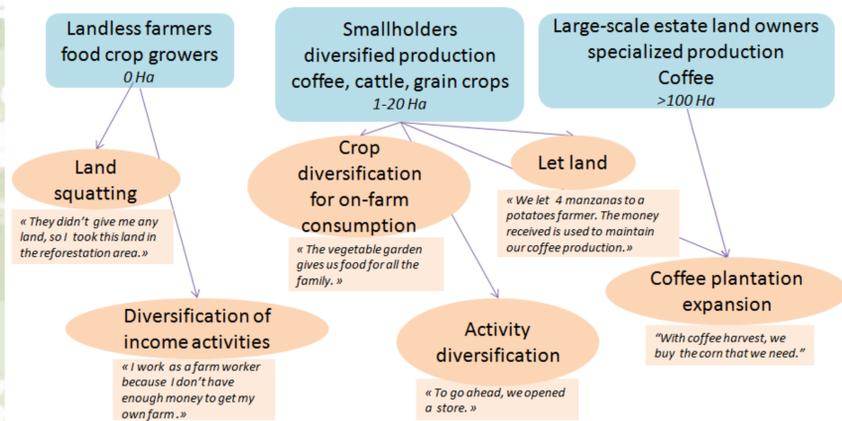


Figure 1 : Farmers' productive strategies

Conclusion

Environmental pressures in La Dalia did not impact significantly farmers' behaviour regarding their use of NR. The reason was that other factors influence farmer's productive strategies. The two most important were the urge to satisfy basic needs in a context of overwhelming poverty and food insecurity, and the lack of security of land tenure. Securing rights and access to land, reducing poverty and implementing environmentally-friendly practices appear to be the solution to ensure sustainable NRM, including preserving primary forest in the Reserve. However, improving governance of natural resources requires a better understanding of the situation of farmers and a better participation of all stakeholders in the elaboration and enforcement of local rules regulating NR.



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