Equal But Not the Same:
How Fishing Communities Vary in Their Vulnerability to Marine Management Policies

Iguales, pero no lo Mismo: Cómo Varía la Vulnerabilidad de las Comunidades Pesqueras frente a las Políticas de Manejo Marino

Égal, Mais pas la Même: Comment les Communautés de Pêche Varient dans leur Vulnérabilité aux Politiques de Gestion du Milieu Marin

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EXTENDED ABSTRACT

Collecting, analysing, and interpreting small scale fisheries data presents significant challenges for many countries because of the diversity of the fishing activities themselves and the dispersed geography of discrete fishing communities which makes both the collection and subsequent dissemination of information difficult.

The limited human and financial resources available, combined with the decentralized nature of small scale fisheries has meant that governments, especially in developing nations, have struggled to sustain long-term, consistent, data collection on their small scale fisheries sectors. The costs associated with collecting these data has been considered prohibitively expensive in relation to the assumed fisheries production and total catch value, especially when compared to recorded revenues of commercial fleets operating in the same country. The lack of priority given to small scale fisheries has led to an ongoing paradox: With little data to demonstrate the importance of this sector, collecting the necessary data remained a low priority.

More recently, there has been an increasing awareness of the importance of the small scale fisheries and in developing policies to ensure the responsible and sustainable use of fisheries resources as part of broader rural development and food security strategy. Yet, developing effective policies, establishing realistic targets, prioritising implementation, and passing supporting legislation not only requires overcoming the data collection hurdles, but also the development of tools that can help provide transparency to the decision making process and a comparative analysis of the different fisheries management proposals.

In Honduras, Central America, a partnership between the National Government, non-governmental organisations, and fisheries stakeholders has focused on address these issues. Firstly, the program developed tools and approaches to ensure the sustained collection of fisheries and socioeconomic data from coastal communities, and then began work with stakeholders to develop decision support tools and mechanisms to monitor ecological and socioeconomic changes.

From 2011, sustained data collection through a combination of community surveys using direct observation and interviews, landing site surveys, digitizing fisher log books, mapping fishing grounds, and boat tracking data, market surveys and the building of Geographic Information Systems for habitat maps and distance from communities to different resources, have been compiled (Figure 1).

These data collected from across the Caribbean coast of Honduras have helped quantify and characterize the small scale fisheries in terms of the employment, economic importance, fishing methods, spatial dependence, exploited species, and value chains. Here, we briefly describe how the use of a subset of these data (forty of the one hundred and thirty nine communities assessed) is being used to develop a framework that can distil and interpret these data into easy to understand decision support tools for the national and local government, fishing communities and other stakeholders. This is a crucial step to connect the information being collected back to decision makers not just from central government legislature but also to fisher associations and individuals who are the *de facto* decision makers for local fisheries.

By integrating the data from community surveys, fisheries characterizations and GIS we were able to define and quantify relative susceptibility of fishing communities to specific regulations in terms that local fishers found logical and understandable. We used the Poverty index, based on the social survey data on natural, physical, financial, and social capital (following the UN Poverty Index) as a mean value of the standard of living for each community. We then measured fishing dependence by using the fisher registry data on the number of active fishers as a proportion of municipal records for number of households. Vulnerability to gear restrictions was calculated by total catch value per gear type for each community over time and the susceptibility to species restrictions, by the distance from the community to five habitat types: lagoons, nearshore alluvial, coral reefs, deep shelf and open pelagic environments that each support distinct species assemblages and related small scale fisheries.

As an example of this interpretation of socio-ecological data, we tested the proposed fishery regulation to prohibit fish traps. We found that across the forty communities in the north shore sample area seven communities and an estimated 120 fishers (approximately 10% of the total number of fishers) would be affected by this legislation. The majority of communities did not use fish traps and many had little access to habitats where fish traps would be a suitable fishing technique. Of

the seven communities affected by the proposed legislation, three were only moderately affected as fish traps were an occasional or supplemental fishing gear, with few fishers in the community using them. Four communities, however, were found to be highly vulnerable to this legislation due to their dependence on this gear. One community was identified as having 30 of the 80 resident fishers using traps seasonally but deriving approximately 25% of their annual income from the trap associated catch.

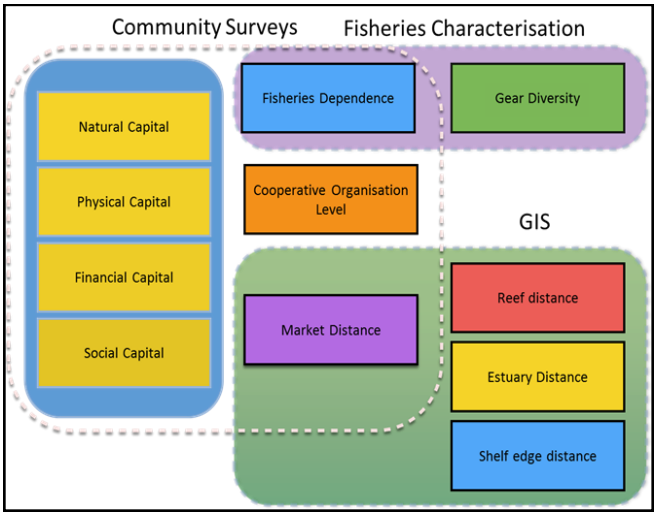

Figure 1. Diagram of data types used to define vulnerability of coastal communities to fishing regulations.

Although there was high gear diversity in the community as a whole, the number of fishers affected as a proportion of the number of households and the amount of annual income those fishers derived from it made this community the most vulnerable to this fishing regulation yet with the capacity to adapt.

Simple traffic light color coded maps with circles scaled for the number of fishers in a community (Figure 2) help pin point the vulnerable communities for policy makers and identify the relative magnitude of the issues. These areas can be the focus either for *apriori* education and awareness about the regulation or post hoc enforcement to ensure compliance depending on the managerial approach.

The results from this simple example show that these types of integrated approaches to data interpretation can help fisheries managers in developing nations prioritize scarce resources – for example, focusing on seven instead of forty communities, identifying key stakeholders who are likely to be most affected, and supporting the development of fisheries policies that are economically efficient, environmentally effective, and equitable across fishing communities. The approach aims to transfer knowledge about the fishery from the multiple sources into a tool that can be used to both improve the management of resources and lead to improved uptake of well planned changes to small scale fisheries.

KEY WORDS: Honduras, Caribbean, artisanal, fishing, displacement

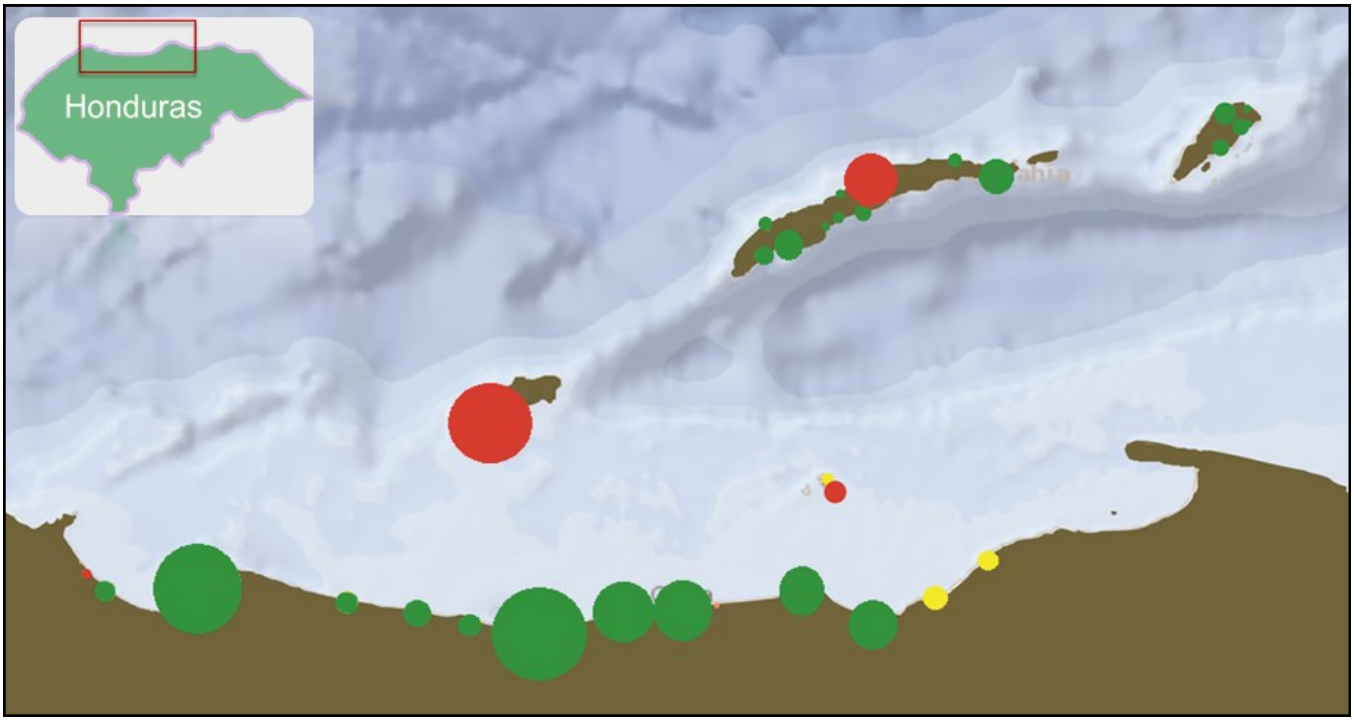

Figure 2. Graphic representation of vulnerability model of fishing communities on the north shore of Honduras to the regulation to prohibit fish traps. The vulnerability index combines socioeconomic and ecological data for the fishing communities with circles scaled for the number of fishers in a community and color coded as green not vulnerable, yellow vulnerable and red highly vulnerable to the regulation.