

PERCEPTION OF VULNERABILITY AND ADAPTATION AMONG FISHERFOLK – A CASE STUDY IN THE PATOS LAGOON ESTUARY, SOUTHERN BRAZIL

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RESUMO

In this draft paper we seek to describe and understand the processes which determine the vulnerability of small-scale fisherfolk in southern Brazil. The analysis compares the evidence from different settings aiming to uncover how urban and rural settings influence vulnerability, and also look at how it is affected by the institutional context. The findings gradually build a picture of how exposure, sensitivity and adaptive capacity are perceived by fisherfolk. The description and understanding of these processes is grounded on empirical and context-specific knowledge, oriented by the actors views of world. Different methodological approaches are used aiming to explore how the form of inquiry can affect the way perception is reported. Funded by the Inter-american Institute for Global Change Research – IAI, CRN2076 NSF-GEO-0452325 – Addendum HD.

Keywords: fisheries, urbanisation, institutions

INTRODUÇÃO

The high variability of the local and regional climate in the Patos Lagoon (Southern Brazil) results in seasonal and inter-annual variation in the recruitment of its most important fishery resources, especially the pink shrimp (*Farfantepenaeus paulensis*) (CASTELLO and MÖLLER, 1978). The fisheries in the estuarine portion of the lagoon reached a peak of productivity during the early 1970s, mainly due to the development of a heavily subsidised fishing industry sector. Overcapitalisation and over-reliance on subsidies led to the over-exploitation of stocks and severely impacted the small-scale fishery (REIS and D'INCAO, 2000; CASTELLO *et al.* 2009). In this broad context we propose to focus on fisherfolk's vulnerability from a perspective which assumes it as a function not only of sensitivity and exposure to environmental shocks or trends, but also as being determined by the role of institutions in regulating access to resources and the diversity of strategies adopted by people as a response to disturbances (TURNER *et al.* 2003; TOMPKINS and ADGER, 2004).

METHODS

This study used a mixed methods research strategy (BRYMAN, 2008) in which qualitative and quantitative methods are combined, and followed a multiple-case study design (YIN, 2003). The boundaries of the case are defined by the small-scale fisheries in the estuary of the Patos Lagoon, and it has two units of analysis: locations in Rio Grande-RS where the fisheries are the primary source of income for the bulk of the population. Each unit represents contrasting settings: one is located in a fully urbanised area, while the other is a relatively isolated rural community. The qualitative approach consisted of participant observation (during two periods of three months in which fishery-related activities were followed in situ; fishing seasons of 2006/07 and 2007/08) and 12 in-depth interviews with fishers who had been active for at least the past 10 years (aimed at further exploring the relationship between fishery, vulnerability and climate variability). The quantitative approach was based on a survey of 60 households, 30 in each study site, done between January and March 2008. Households were selected following the snowballing technique, with assistance of key-informants identified in the qualitative stage. Questionnaires were applied in each household to both men and women, resulting in a total sample of 120 fisherfolk, 60 men and 60 women. Participants were asked to identify the best and worst fishing seasons in the last ten years, and comment on causes and consequences. "Best" and "worst" were defined as outcomes in terms of material living

conditions and well-being.

RESULTS AND DISCUSSION

Quantitative findings - causes and consequences of success or failure: There was a clear indication of environmental factors as the main causes of either successful or unsuccessful fishing seasons, especially the abundance of shrimp and the presence of salt water in the estuary (Tab. 01 – only results for the successful season shown due to space limitation). Furthermore, policy-related issues, such as high number of fishers or lack of law enforcement, were practically absent as causes of unsuccessful fishing seasons. Regarding the consequences of successful or unsuccessful seasons, they were attributed to processes directly or indirectly related to the wealth status of the household. Results showed that the success in the fishery led to the creation of strategies based on securing good housing and on reducing debt (Tab. 01). Despite an overall similarity, urban and rural sites showed relevant differences. Abundance of shrimp was more commonly mentioned as cause of success in the rural location. Meanwhile, twice as many people in the rural site mentioned paying debts and buying home appliances as consequences of a successful year.

Table 1. How fisherfolk perceive causes (A) and consequences (B) of a successful fishing season for each study site (URBAN and RURAL). N= 120. Categories simplified for clarity. All replies spontaneous, with more than one reply per respondent in some cases. “other” stands for less frequent categories, grouped and omitted for clarity. “n/a” stands for “not informed”.

(A) Causes	URBAN		RURAL		Total	
	n	%	n	%	n	%
plenty shrimp	17	23.3	29	40.3	46	31.7
salt water	22	30.1	19	26.4	41	28.3
dry weather	19	26	6	8.3	25	17.2
other causes	8	11	10	13.9	18	12.4
n/a	7	9.6	8	11.1	15	10.3
Total	73	100	72	100	145	100

(B) Consequences	URBAN		RURAL		Total	
	n	%	n	%	n	%
better or new house	11	14.5	13	17.6	24	16
better income	14	18.4	11	14.9	25	16.7
new household items	7	9.2	15	20.3	22	14.7
debts paid	6	7.9	15	20.3	21	14
other consequences	18	23.7	16	21.6	34	22.7
n/a	20	26.3	4	5.4	24	16
Total	76	100	74	100	150	100

Qualitative findings – perception of hazards: (1) Large number of fishers and its recent increase. Most frequently mentioned hazard, seen as an immediate threat to livelihoods. The steady growth of the fishery was seen partly as “inevitable” and “natural”, but a surge in the number of fishers from 2003 onwards was also explained as being result of the easy access to loans from state and national credit programs. (2) Bottom trawling was also perceived as a major hazard, with frequent mentions of the high proportion of discards and damage to the lagoon bed. Nonetheless, fishers in particular mentioned how the technique could be efficient and profitable. (3) Direct exposure to the effects of climate variability. Fishers clearly related a good shrimp fishing season to adequate weather conditions. As a result, lack of these conditions and/or inability to fish when they do occur (season closure) was seen by fisherfolk as a potential hazard with a negative impact comparable or superior to overcapacity or widespread bottom trawling. (4) Uncontrolled large-scale fishery in coastal waters. Fishers were fully aware in their accounts that the white croacker fished in the estuary is part of larger coastal stock, and considered the small-scale fishing effort negligible compared to the purse seine coastal fishery.

The depletion of the white croaker coastal stock was seen as a hazard because this fishery was considered as key to provide minimum income and food security.

Participant observation and qualitative interviews identified a strand of fisherfolk's concerns which is remarkably close to the discourse of actors involved in the fishery management. Nevertheless, the findings suggest that the narrative of a "fishery in crisis" due mostly to overcapacity and unsustainable fishing - which is found in the literature (PASCOE *et al.*, 2004; VASCONCELLOS *et al.* 2007) and was witnessed in conversations with fishery officials and in management meetings during fieldwork - should not be taken for granted as a complete description of reality. The study findings painted a more complex picture, with relevant differences in the perception of people living in urban and rural settings highlighted in the quantitative survey. Overall, fisherfolk considered ecological and climate-related processes as important determinants of their vulnerability, but most importantly they perceive environmental processes as acting in conjunction with policy-related processes, such as overcapacity and overfishing. The findings from this case study draw attention to the importance of [cross-scale] linkages, both horizontal (across space) and vertical (across levels of organization) as a means to promote alternative paths for adaptation (BERKES and JOLLY, 2001), as well as to the need for context-specific participatory studies to improve the understanding of vulnerability and adaptive responses.

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