

---

VULNERABILIDADE SOCIAL DE PESCADORES ARTESANAIS NO SUL DO BRASIL:  
CONTEXTO E PERCEPÇÃO  
[dhellebrandt@yahoo.com](mailto:dhellebrandt@yahoo.com)

*Apresentação Oral-Agropecuária, Meio-Ambiente, e Desenvolvimento Sustentável*  
DENIS HELLEBRANDT; LUCENI HELLEBRANDT; PATRIZIA RAGGI  
ABDALLAH.  
*FURG, RIO GRANDE - RS - BRASIL.*

**Vulnerabilidade social de pescadores artesanais no sul do Brasil: contexto e percepção**

*Vulnerability of small-scale fisherfolk in Southern Brazil: context and perception*

**Grupo de Pesquisa: Agropecuária, Meio-Ambiente, e Desenvolvimento Sustentável**

Resumo

Este trabalho tem por objetivo fornecer material empírico que contribua com a discussão sobre como a vulnerabilidade de pescadores de artesanais é afetada pela diversidade de contextos e por mudanças ambientais, sociais e econômicas. A pesquisa foi realizada entre 2006 e 2008, no extremo sul do Brasil (estuário da Lagoa dos Patos) e combinou abordagens qualitativas e quantitativas em um design de estudo de caso. Os resultados demonstram a complexidade dos modos de vida ao contrastar contextos urbanos e rurais e apresenta a percepção dos próprios pescadores sobre os diferentes fatores que determinam seu sucesso ou falha ao suportar a mudança ou adaptar-se a ela. Práticas informais de trabalho foram identificadas como sendo resultantes de elaboradas conexões entre mercados locais e globais, assim como essenciais na geração de renda para os pescadores mais pobres. Porém, a informalidade também baseou-se na exploração de trabalhadores e na pesca não-sustentável. Esta pesquisa chama atenção para a natureza paradoxal dos processos na pesca artesanal, assim como para a relação complexa entre pobreza, vulnerabilidade e uso de recursos naturais.

Palavras-chaves: pesca, vulnerabilidade, percepção, Lagoa dos Patos

Abstract

This paper aims at providing empirical material that could shed light on a wider discussion about how the vulnerability of small-scale fisherfolk is affected by diverse contexts and environmental, social and economic change. The research was carried out between 2006 and 2008, in Southern Brazil (Patos Lagoon estuary) and combined qualitative and quantitative approaches in a case study design. The findings highlight the complexity of livelihoods by contrasting rural and urban contexts, and shows how the fisherfolk themselves perceive the different factors determining their success or failure in either coping or adapting to change. Informal practices were found to result in elaborate links between local and global markets and to make for consistent income generation among poor fisherfolk. However, informality was also often based on the exploitation of workers and on unsustainable fishing. This research draws attention to the paradoxical nature of processes in small-scale fisheries and the complex relationship between poverty, vulnerability and natural resource use.

**Key Words: fishery, vulnerability, perception, Patos Lagoon**

---

## 1. Introduction: theoretical and conceptual background

This research paper aims to contribute to the debate on the social factors underlying vulnerability, and is not primarily concerned with other - not less important - dimensions of the issue, such as the influence of environmental or economic conditions. Therefore a selective and critical review of current literature is presented in order to develop a foundation of a theoretical and conceptual framework.

Turner et al. (2003) make a valuable contribution with a comprehensive approach which seeks to address the complexity of social-ecological systems, and deals explicitly with heterogeneous systems and the consequent “differential vulnerability” of each component. The authors define vulnerability as “the degree to which a system [...] is likely to experience harm due to exposure to a hazard<sup>1</sup>[.]” (Turner et al., 2003: 8074). They propose a conceptual framework where vulnerability is a function not only of sensitivity and exposure to hazards, but is also determined by the role of institutions in regulating access to resources, the diversity of strategies adopted by people as a response to disturbances and the capacity of a system to withstand change.

On the other hand, Dercon (2005) takes a more focused perspective and offers an interesting insight by presenting risks and shocks as the “cause of poverty”. He does so with the support of an extensive analysis of quantitative data from different countries in Asia and Africa and an exploration of practical applications of poverty reduction policies. He defines vulnerability “as the magnitude of the threat of poverty” and explores how the strategies people choose in order to avoid or minimize risks have implications for poverty. Dercon (2005) points out two key mechanisms by which risks and shocks might cause poverty: the choice of low risk and consequently low return strategies, and total or partial loss of assets. He then concludes that “this clearly has important implications for the design of policies, putting policies to reduce risk and the vulnerability it entails at the core of poverty reduction efforts.”

The connection between uncertainty, risk and poverty is also explored by Ellis (2005), when analysing the rural-urban transitions in Sub-Saharan Africa. Similarly to Dercon (2005), he also links an increase in vulnerability to a heavy reliance on low risk and subsistence activities. Of particular interest to this research is the role of diversification of strategies in reducing vulnerability and, as highlighted by Ellis (2005), the consideration of mobility as “not a single movement from one occupation to another”, but as an exchange which covers “many different distances and durations and purposes that broadens and deepens trade and exchange between rural and urban areas to the benefit of growth in both sectors” (Ellis, 2005).

Following a similar line, Satterthwaite and Tacoli (2002) present a detailed analysis of the relationship between poverty and rural-urban contexts. Their central argument is that rural-urban linkages are critical to understanding poverty, but that the differences between these contexts also need careful consideration. They also highlight the importance of local context in determining poverty as it influences the range of assets available to people, their ability to acquire these assets, the nature and degree of vulnerability they are subjected to, the likelihood of exclusion from infra-structure and system of government.

---

1 Turner et al. (2003) define hazard as “threats to a system, comprised of perturbations (particular events, usually originated outside the system's boundary) and stresses (continuous “pressure”, commonly within the system), and their consequences.”

---

These considerations on rural-urban linkages have particular implications in the case of systems based on common-pool resources such as fisheries, where the resource base is shared by rural and urban locations, control of which, however, is concentrated in the urban centre. Actors in this area benefit from the proximity to the centre of decision-making and the very nature of an urban setting - easier access to goods, information and services than in rural areas – and, consequently, are likely to have more effective means to access the resource and disproportionate influence in its management process.

Issues of scale, context and the role of institutions in adaptation also deserve further attention. O'Brien and Leichencko (2000) contribute to this discussion with insights on the combined effects of climate change and globalisation, captured by the concept of “double-exposure”. The authors approach the question from economic, social and ecological perspectives and highlight the importance of research which looks carefully at the relationship between vulnerability, context and poverty, considering the wide range of factors and scales implicated in the problem. In a comprehensive application of the “double-exposure” approach to mapping vulnerability in India, O'Brien et al. (2004) discuss the methodological relevance of analysing vulnerability on a local scale, pointing out that case studies “enable [the researchers] to identify state and local-level institutions and policies that influence coping and adaptation strategies.”

Tompkins and Adger (2004) point out the relevance of the relationship between institutions, adaptive capacity, suggesting that the “flexibility” of institutions is fundamental in building resilience as in this case they are able to more readily incorporate the lessons learned by resource users and modify management structures on the basis of this learning process. Likewise, Berkes and Jolly (2001) highlight 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. These authors also discuss the methodological implications of research on adaptation to climate change, stating that “[it] provides a good example of a complex systems problem for which place-specific case studies and participatory methodologies are particularly apt. The effects of [climate] change unfold at the local level, and so do adaptive responses, creating opportunities to investigate the dynamics of the two.” (Berkes and Jolly, 2001: 12).

The relationship between trends and shocks associated to climate variability and change and fisheries has received reasonable attention in the case of large-scale systems (e.g. see Glantz, 1999 for an extensive review). Adaptation to climate change, however, is the focus of only a small number of recent papers which deal with small-scale fisheries or other coastal common-pool resources (Armitage, 2005; Grafton and Kompas, 2005; Olsson et al., 2004; Tompkins and Adger, 2004; Berkes et al., 2000). We seek to help filling this gap with the present case study by contributing with original research which is supported by the conceptual frameworks and critical appraisals presented above.

## **2. Methodology and research questions**

The research design is of the case study type (Yin, 2003), broadly defined as a study of small-scale fisherfolk with special focus on their livelihood strategies. The case has its spatial boundaries defined by the estuary of the Patos Lagoon, southern Brazil - which corresponds to the primary unit of analysis - with two embedded units representing urban and rural locations where small-scale fishing is the primary source of income generation. This research is concerned primarily with current phenomena, however, historical background is also taken

---

into account, both at the individual and group level. Furthermore, the case study is also bound by specific research interest on the institutional context, in particular the role of informal institutions in determining how fisherfolk access resources.

A combined methods approach has been applied. On the one hand, the qualitative component is a combination of techniques, with participant observation, semi-structured interviews and focus groups playing a major role in data generation (Mason, 1996; Marshal and Rossman, 1999; Punch 2005; Seale, 2004). The information has been analysed through coding (with a view to applying grounded theory) and conceptual mapping (Seale, 2004; Novak and Canas, 2006). On the other hand, the quantitative methods consist of a survey of 60 households, 30 in each study site (urban and rural locations). The sampling was partly determined by results from the qualitative studies (primary selection of households) and also followed the snowball technique. Both men and women were interviewed separately in each household. The data has been analysed using descriptive statistical techniques. Field work was carried out in 2006/2007 (qualitative research) and 2007/2008 (qualitative research and survey), from October to January.

In this paper we present the results regarding two closely related research questions: (1) how do environmental, social and economic change affect the livelihoods of small-scale fisherfolk? and (2) how do these factors contribute to increase either their vulnerability or adaptive capacity? In order to find the answers to these questions, we take a perspective which looks at, firstly, the role of context in determining livelihood strategies, that is, how different settings, in particular the contrast between urban and rural, explain the differences in livelihood strategies. Secondly, we are interested in how fisherfolk perceive the processes related to their exposure and sensitivity to threats and stresses, and by doing so we seek to build a picture which is as close as possible to the reality as it is perceived by fisherfolk. The present paper deals with selected findings and analysis of a research project funded by the Inter-american Institute for Global Change Research – IAI (SACC-HD Patos Lagoon: Climate change, oceanographic variability and the artisanal fisheries of the SW Atlantic: a human dimensions approach - CRN2076/NSF-GEO-0452325 – Addendum HD).

### **3. Case background – brief history and introduction to actors and institutions**

The fisheries in the estuary of Patos Lagoon reached a peak of productivity during the early 1970s, mainly due to the development of a heavily subsidized fishing industry sector, organised by a centralised management system which was part of a national policy aimed at maximising economic growth in all sectors. The resulting overcapitalisation and reliance on subsidies led to the overfishing and economic collapse of the fishery, both small and large-scale (Reis and D’Incao, 2000). While the industrial fishing fleet was able to compensate by changing the fishing technology and seeking different fish stocks in other regions, small-scale fishers had to cope with declining catch and incomes, as they lacked a similar capacity to adapt. The social and economic condition of small-scale fishers further deteriorated in the 1980s and early 1990s, and the so-called “crisis” triggered a radical change in the management of the estuarine fisheries in the Patos Lagoon. The nature of the management system, top-down, oriented to maximise profits and concerned primarily with large-scale industrial fishery, was perceived by all actors as the main cause of the collapse and particularly inadequate to the small-scale activities.

In 1996, a new management process system was implemented, focused specifically on

---

the small-scale fishery and explicitly aimed at promoting “sustainable fisheries” and “participation of fishing communities in policy making” (D’Incao and Reis, 2002; Kalikosky and Satterfield, 2004). The new arrangement, called “Fórum da Lagoa dos Patos”, benefited from the combination of people and institutions representing the most active and relevant actors at that time - a christian grass-roots non-governmental organisation devoted to fishing communities (“Pastoral da Pesca”), formal fishers representatives (“Colonias de Pesca” - see also comment at the end of this section) and government officials (national environmental agency responsible for natural resource management). The new management process grew stronger in this initial stage and achieved impressive results, which culminated in 1998, when a complex set of regulations (“Portaria 171”) was issued by the national government with the direct participation of fishers – the Fórum had moved from being a consultative stance to an established normative institution.

This piece of legislation dealt with several aspects of fisheries management in the Lagoon, such as limiting the fishing effort and defining fishing seasons. Most importantly, it tackled the issue of access to the fishery by “outsiders” - fishers who migrated every year from the neighboring state of Santa Catarina for the lucrative pink-shrimp season. This was perceived by fishers in the Patos Lagoon as a major cause of the collapse of the estuarine fishery, just as detrimental as, or for some worse than, the consequences of the mismanagement by the centralized system. Therefore, the new regulation strictly limited access to the estuarine fisheries to people who could prove to reside in the towns delimiting the Patos Lagoon estuary areas. Despite protests and political pressure by “outsiders” (D’Incao and Reis, 2002), since the 1999/2000 fishing season the fishery has been restricted to “locals”.

However, in spite of the design and implementation of this set of regulations being successful in effectively taking into account a major concern of fisherfolk, the catches continued to decline and the livelihoods in the fishing communities did not improve in the following years. The challenge of making the small-scale fishery sustainable and able to sustain people's livelihoods remained – now that a participatory process and comprehensive regulations were in place, lack of enforcement started to take the blame for the failure in recovering the fishery. Shortly after achieving its first visible result and supposedly “the solution” to fishery “crisis”, the Fórum started to show it also had severe limitations. D’Incao and Reis (2002) present a detailed account of the interaction between fishers, researchers and managers in the participatory management process, with empirical evidence on the conflict between two opposing sides: fishers who wish to see immediate results from the management process, and researchers and managers who favour a precautionary approach and struggle to strike a balance between attending fishers' needs and guaranteeing the long term sustainability of the fishery (D’Incao and Reis, 2002).

Although we would argue that the positions have never been so well defined and homogeneous in each group, there is certainly a considerable degree of polarisation, and, worth adding, clearly unequal power distribution among actors – fishers might have the opportunity to express their views, but it is the researchers and managers perspective which ultimately prevails<sup>2</sup>. Furthermore, the lack of legitimacy of most fishers’ representatives

---

2 Personal observations on the functioning of the Fórum and on perceptions of actors involved in the fisheries management are result of seven years of direct involvement of the first author with the small-scale fisheries in the Patos Lagoon estuary, both as researcher and participant. Specifically, attendance to Fórum meetings,

---

weakens the participatory processes. The “Colônias de Pesca”, which have represented fisherfolk in the “Fórum” since its creation, were created in the mid 1970s, during the military dictatorship period in Brazil, with specific aim of controlling fishers and their capacity for political organisation. Thus, the heads of these institutions have always been the same people who also shared the political power with right-wing parties who supported the dictatorship. Such arrangements have not changed after 1984 (when the re-democratisation of the country started), and the “Colônias” remain firmly in the hands of the those same groups. This is corroborated by Kalikosky and Satterfield (2004), who point out that currently the “Fórum” only manages to partially empower fishers, as “elite representatives” who do not effectively represent fishers have control of the decision-making process. This aspect has changed recently, with the inclusion of new members in the group of institutions with right to vote in the “Fórum” decisions. In 2005, a representative from a group of a fishers association/co-op from an urban community (see also footnote 5) was accepted as the first fisherfolk member of the Fórum who did not belong to the “Colônias”. Although most of the decision power remained with traditional fishers representatives, it meant a considerable move towards increased participation of grass-roots organisation which had direct links with fisherfolk and, most importantly, were not aligned with the political and economic elites.

#### 4. Results

##### **Context as a determinant of vulnerability**

###### *The rural context*

There are several rural communities on the banks of the estuarine area of the Patos Lagoon, however one of them, Ilha da Vila do Pepe<sup>3</sup>, has both historical and current features which set it apart and make it a suitable choice as a unit of analysis in the case study. Firstly, although it is called an “island” (“Ilha” in Portuguese), Vila do Pepe is not actually separated from the mainland, being accessible via dirt roads and currently with a bus service running four times a day, each journey taking about two hours to cover a 50km distance. Therefore, not an island, but nearly as isolated as one, which can be further attested by the access to public services. For example, the community's health centre has had doctors and nurses working from Monday to Friday since 2006/2007. However, locals complain about the current *worsening* of health care in the community, due to the loss of a nurse who resided permanently in the village and was “replaced” by the new system. Moreover, in case of emergencies or the need to transport someone with poor mobility to health clinics or the hospital in town, a private car has to be used.

The links between Vila do Pepe and Rio Grande have been maintained by continued contact between extended families with members in both locations. This connection was reinforced in the mid 1980s, when the leadership of the “Colônia de Pescadores” in Rio Grande was won by Marcos Silva, a fisher originally from Vila do Pepe but with links in the town. He was highly respected by fishers and other actors in the fishery, independent of their political inclination (like all the other “Colônia” leaders at the time, Marcos was a representative of conservative parties), and became something of a legend among the

---

participation in related working groups and also an active role supporting fishers representatives between 2002 and 2005. .

3 All names of neighborhoods and people are fictitious in order to preserve anonymity.

---

fisherfolk, even more after his death in the early 1990s. The legacy of his extremely influential character was that anyone from his family became the favourite to win the “Colônia” leadership position. As a consequence, an incredible political capital was developed, which has been very successfully built on by the Silva family, which has moved beyond representing the fishers to winning key positions in the town and three consecutive elections for mayor of Rio Grande.

Among other consequences, this domination of the local political arena has meant that some actors in Vila do Pepe have enjoyed unprecedented control over the access to resources. The defining feature in this community is that one single trader is responsible for almost all the fish and shellfish<sup>4</sup> caught by fishers in the village and is practically the only connection to the market outside the village, including the largest trader in the region, a fish processing plant located in Rio Grande. The same person is also a civil servant and a long-standing supporter and member of the political party which backs the Silva family. Other minor traders operate in the village (see exception in footnote 4), but are all linked directly to this main trader, and usually also play a role in local politics.

One striking result from the qualitative field work in Vila do Pepe is that this “local monopoly” - a single trader actively controlling all market practices and prices - is, firstly, openly acknowledged in informal chats or interviews with all the people in the site. In other words, no one ignores the situation and its implications, or pretend that it is a natural condition. Secondly, it is perceived by the majority as beneficial. Very few people expressed negative views on this issue, but even those who disliked the situation somehow, did not think it was worth changing. Even though evidence of opinions not being disclosed for fear of negative consequences (such as, loss of market opportunity in case the information leaked and reached the trader) was actively sought, none was found – most people in Vila do Pepe seem genuinely happy with the situation as it is.

However, even if fisherfolk in Vila do Pepe wanted to change this situation, they would hardly be able to do so. To start with, there is a basic limitation: no fisher in this location has the means to transport their catch to other markets - this would require a goods vehicle with a freezer compartment, and a specific license to carry fresh food. Moreover, even if they could take the catch to the nearest market, Rio Grande - or if traders could come from town to buy from them - they would find that most major traders in the town are already linked to the Vila do Pepe's main trader. As a result, it is unlikely that they would compromise an established business relationship by bypassing their current partner. The latter explanation is mentioned repeatedly by fishers in Vila do Pepe when asked about the possibility of developing independent market relations.

This simple network formed in Vila do Pepe has been remarkably stable throughout time – it has been in place relatively unchanged for the past 20 years. Indeed, such stability is mentioned by fisherfolk as a positive aspect of the life and fishing activity in this rural location. One of the peculiar features resulting from these relations is that illegal fishing is

---

4 There are no reliable statistics of the catch volume in Vila do Pepe (or, for instance, for any small-scale fishery in the whole country), thus we are not able to say exactly the volume which is marketed by this trader. However, it can be confirmed that he completely dominates the market for all major fisheries – there is only one trader/fisher who acts independently in the village, and he only deals with the catch of a small fleet who targets specifically juvenile fish which reach an amazingly low price of US\$ 0,10/kg and are sold for pet food processing.

---

unusual in the community (while being ubiquitous in the estuary), and although more common, the processing of the fish and shellfish catch in households during the ban period is not so widespread as in urban locations. This is related to the fact that the main local trader tends to adhere to the legal fishing season and also generally follows regulations, such as those banning the sales of juvenile of some species – a rare conduct among traders. However, it should be noted that the market practice itself is essentially informal - trade is not recorded and the trader pays relatively low taxes, as if he was a fisher himself (which he in fact used to be) – therefore essentially illegal. Alternative activities for generating income are not sought by the majority of the fisherfolk, even though the combined income from all fisheries<sup>5</sup> in a year is barely enough to meet the needs of most households.

### *The urban context*

The urban fisherfolk<sup>6</sup> community of São José, is a fully urbanised<sup>7</sup> neighborhood in the town of Rio Grande, with its origins in a new housing scheme created in the early 1950s as a response to industrial development in the town and the consequent need to both accommodate newcomers attracted by job opportunities and relocate people from areas where factories would be installed (Martins, 2006). The area would only become characterised by the fishing activity in the late 1970s, when the small-scale fishery enjoyed its peak in terms of productivity and became the best alternative for generating income for those not participating in the industrial labour force. This was the area in the town where most migrants coming from rural areas would settle, and, due to its proximity to the estuary banks, was particularly attractive to people from rural fishing communities who saw a chance of keeping their livelihood based on the fishery even after moving to town. These settlers occupied the areas right next to the banks, in a strip of land which was not supposed to be used for housing, characterised by wetlands and unstable ground, and was not included in the housing development scheme. However, precisely for these reasons, the area could be occupied informally and for a very low cost, if any at all. Most of this land was considered worthless and could be literally occupied for nothing – it is important to note that this is only true for the very first settlers, as all subsequent arrivals had to negotiate access to the plots, which started to be valued according to improvements made to the plot, mainly stabilisation of the banks, draining and leveling of the terrain. Some of the current plots were created or expanded where once there was only water by the people living near the banks, through gradual deposit of rubbish, aggregate and construction refuse.

Although there are not specific statistics, it is estimated that this neighborhood alone is home to approximately 1500 fisherfolk. They live mainly in the areas next to the banks, as mentioned above, but also occupy the “properly” developed areas of the neighborhood. In general, however, they tend to live in the most precarious housing conditions when compared to other people living on the area. Conditions in the zone nearer to the banks is worse, with access to basic services such as water and electricity only becoming common as recently as in the early 1990s in most households. Still, there is no sewage treatment at all and rubbish

---

5 The most important fishery is the pink shrimp, which can reach up to US\$ 3/kg on average (not processed – processed shrimp can reach up to US\$6/kg on average). There are currently three other estuarine fisheries (white croaker, mullet and silverside) which still yield profitable catches, although the price rarely exceeds US\$0,50/kg average (not processed – processed fish can reach up to US\$0,70 on average).

6 people directly related to fishing as a primary source of income, including those who go to the sea and also others who work on land.

7 high density of people, totally built environment, no dependency on agricultural activities.

---

collection is only partial. The poor access to services and infrastructure is due partly to the way the space has been organised, as narrow and winding paths connecting the houses make most of the area inaccessible by any vehicle larger than a small car (usually only wide enough to allow for a small motorbike or scooter) – this pattern is direct result of the way the area was developed, absolutely without control or planning, led by the convenience of each settler who naturally maximised the plot size in detriment of keeping and organised street layout.

However, this only part of the problem, as perhaps the most relevant cause for the precariousness of this place is its informal nature. With few exceptions, the plots are not formally recognised by the local authority as they are in an area which is not supposed to be occupied by houses (national and state legislation prohibits any urban development in river or lagoon banks), therefore they are not eligible to receive funds or infrastructure. Actually, if services and infrastructure are developed in these areas, the local authority will find itself in a legal conundrum, by acknowledging and promoting essentially illegal settlements which it is supposed to eradicate. Nevertheless, the market for public services has its own logic, which can be seen, for example, in the way electricity reached the area: the energy company installed posts along the narrow passage ways and has taken energy cables to nearly every house, and even though there are no proper streets, thus no addresses, the company was able to assign street names and numbers to each household, so that bills could be issued. A similar process is under way with regards to equally profitable telephone lines, while is almost non existent for the relatively less rewarding water pipes.

In spite of the aforementioned difficulties faced by people living in São José, the location presents clear advantages from the perspective of the local fisherfolk, most importantly, the proximity to the centre of town (20 minutes bus ride, which runs every half an hour), which means access to both public and private services, and to job opportunities in alternative activities such as temporary jobs in construction or low skilled jobs in middle class households. The access to health care and education right at the heart of the neighborhood is also mentioned as one of the main reasons for choosing to come or live in São José: there is a local health centre with doctor and nurses working from 9 to 5, Monday to Saturday, plus a team of health assistants who are local residents and give basic care at the home of the elderly and those with poor mobility and there are two schools, one primary and other secondary. However, of all features, the existence of a nearby fishing processing factory and several smaller informal processing facilities are perhaps the most important feature in explaining why people thrive there in spite of all difficulties and they are the defining characteristic of the location as a major regional hub for those involved in small scale fisheries.

#### *The link between global market and local community*

In 2005, a fish processing factory located next to São José (20 minutes on foot from the banks of the estuary) started operating under a contract to export shrimp and blue crab to the United States. It has provided fisherfolk in the urban area with unique opportunities to access markets, which otherwise would not be available to them. The factory increases the opportunities for fishers to sell the catch efficiently and obtain good prices for it, mainly due to the large quantities bought - particularly relevant for small-scale fishers, who have limited or no storage capacity and are frequently forced to sell the catch with low profit to avoid risking total loss. Furthermore, although traders play a dominant role as intermediaries

---

between factory and fishers, sales to the factory can also be done via the local fishers association<sup>1</sup>. For these reasons, the factory is perceived as “essential for sustaining livelihoods” by most fishers in the urban community.

However, the factory has played more than only a beneficial role in the lives of this fishing community - due to its links to national and global markets, it is able create and maintain fishing and market practices that have re-structured the “traditional” lives of fisherfolk, based on strategies originally constructed in a rural context and only partly adapted to the urban setting. A clear example of the paradoxical effects of urbanisation and globalisation is that catch rewarded by high prices and guarantee of sales to the factory has resulted in the development of fisheries completely based on techniques which are both illegal and contradict fishers' knowledge (eg use of fishing gear which kills high proportion of unwanted species). The processing of almost all the shellfish catch is carried out in the community, in improvised facilities, without either minimum food safety requirements or proper working conditions. The processed shrimp or crab can enter the factory to be packaged and receive the stamp with the health safety certificate, ready for export, or be transported by informal traders to metropolitan markets in RS, SC or SP, also meant to be export.

The urban context provides ideal conditions for this process to take place. Firstly, there is abundant and highly skilled workforce (fundamental for fish and shellfish processing) concentrated in a small area. Secondly, the improvised facilities are easily built and kept hidden in backyards and narrow alleyways, which coupled with the informal labour arrangements makes it possible to turn into profits financial resources that would otherwise fund contracts, taxes and maintenance of proper infra-structure. Finally, the proximity of the facilities to the factory minimise risks of the catch being identified by enforcement officials during transport, as it can be done in small quantities and does not require refrigeration – not to mention the role of enforcement officials, either turning a blind eye for lack of commitment to their tasks, or profiting from the informal market<sup>3</sup>.

As a result of these conditions, several complex networks of traders, fishers and informal workers are formed - but all sharing a direct link to the fish factory. These networks affect the livelihoods of urban fisherfolk in contradictory ways. On the one hand, they are essential in facilitating the access to otherwise non-existent labour opportunities, by linking fisherfolk to national and global markets. On the other hand, the informal and illegal nature of these networks deny fisherfolk the access to basic rights, among other mechanisms, by maintaining unfair work relations which cannot be challenged. Moreover, these arrangements seriously constrain the lives of all those involved, as there is almost no accountability, therefore trust is seldom developed, relations are unstable and there is permanent risk of loss of any gain, either material or financial, without means for recovery.

### **Perception among fisherfolk of factors affecting vulnerability and adaptation**

By looking at the perception of fisherfolk of causes and consequences of successful and unsuccessful fishing seasons we can build a picture of which factors determine living conditions in fishing communities *in the view of the men and women who make up this*

---

*communités*. The factors leading to favourable living conditions offers us a hint on which process contribute to decreasing vulnerability in this population, and likewise, the aftermath of favourable seasons tell us about how fisherfolk use the advantage in order to not only become less vulnerable but also prepare for the uncertainty of coming seasons, that is, adapt to change.

The analysis of perception among fisherfolk of factors related to the failure in a fishing season and its consequences can help to confirm the insights obtained with the analysis of those events perceived as positive – that is, we would expect that if dry weather is mentioned as cause of a good season, then too much rain should come up as the cause of a failed fishery. Furthermore, processes such as those determining vulnerability and adaptive capacity are not necessarily and simply extreme positions in a linear gradient. Thus, by also interrogating the causes of failure a more complex picture turns up of how fisherfolk perceive vulnerability.

These issues were approached as follows: each participant in the survey was asked to identify in the past ten years the best and worst fishing seasons they had. “Best” and “worst” were defined during the interviews as a season in which living conditions improved or degraded, either in the material sense (such as, being able or not to buy new home) or in any other meaningful sense to the individual (such as, being able or not to get married) Then, they were asked to explain why this season in particular was considered as a successful / unsuccessful one. The summary of these results is shown in Tables 1 and 2 (pages 14 and 15), and the relevance of specific findings is explored below.

As causes of success or failure are concerned, there is a clear indication of environmental factors as the main determinants of either successful or unsuccessful fishing seasons. The abundance of shrimp and the presence of salt water in the estuary are the predominant causes. This result shows the overwhelming importance of the shrimp fishery for the small-scale fisherfolk in the estuary, as there was almost no mention of other fish targets (except for three cases out of 145, Table 1a), as well as indicates that, firstly, fisherfolk clearly link the availability of shrimp to the dynamics of the estuary, and, secondly, there is almost no mention to policy-related issues, such as high number of fishers or lack of law enforcement, as causes of unsuccessful fishing seasons (again, with exception of three cases out of 145, Table 1a).

This result shows how fisherfolk perception differs from the discourse of fishers representatives and other actors involved in the in fishery management – as it can be witnessed in official meetings and in the press, the discourse of a fishery in crisis due to overcapacity and poor enforcement is taken for granted as a genuine description of reality. Although we acknowledge that these processes do occur, if fisherfolk's perception is to given any value, it can be argued that they are less important in determining fisherfolk's vulnerability than a ecological and climate-related process.

Regarding the consequences of successful or unsuccessful seasons, another clear pattern emerges, in which predominate factors directly or indirectly related to the wealth status of the household. We can confidently infer that the consequences of success in the fishery lead to the creation a strategy based on firstly on securing good housing and general living conditions (building or renewing the home, buying new or better appliances and investing in food storage) and secondly, on reducing debt. This pattern is confirmed when the causes of failure in the fishery are looked at (Table 2b), although when compared to the

---

results above less detail was given by the participants, who mentioned simply the general hardship caused by dramatic decrease in income as the main consequence of an unsuccessful fishing season. Additionally, these results suggest that leaving the fishery to generate income in other activities is a strategy sought by a relatively small number of fisherfolk, and which apparently is only used *after* failure, and not as a way *to prepare for* the consequences of unsuccessful seasons.

As for the comparison between gender, the perception was remarkably similar, specially regarding the most commonly mentined causes and consequences, either when successful or unsuccessful seasons were looked at. The only two notable exceptions are “salt water” being mentioned as cause of success in the fishery by twice as many men than women in the urban location (Table 1b), and “debts” as consequence of failure in the fishery, again with two times more men quoting this than women (Table 2b).

On the other hand, when the urban and rural sites are compared we can identify more relevant differences, despite the overall predominance of similarities. More people in the rural location mentioned the abundance of shrimp as the main cause of success in the fishery, with relatively fewer mentioning the link of such abundance to the presence of salt water in the estuary (Table 1a). By contrast, in the urban site the perception is that favourable weather and currents bringing salt water in the estuary are the cause of a successful year. As for the consequences of a “good year”, twice as many people in the rural site mentioned paying debts, buying home appliances and food storage than in the urban site, while buying new fishing gear is more commonly quoted in the urban location (Table 1b).

A striking difference appears when we look at the cause of failure in the fishery, and only fisherfolk living in the rural site mentioned “flood” as being determinant of an unsuccessful season - it was also the most common cause quoted in this site, being quoted almost as many times as all other causes combined. Similarly, several causes of an unsuccessful year were only mentioned in the urban site, although by fewer people and indicating isolated and localised events, therefore relatively less relevant. Finally, its worth noting that less people replied to the question regarding failure in the fishery than to the one dealing with a successful season, suggesting that contrary to the commonly held view, “bad things” are not the ones which are more easily remembered. At least ion this case study, fisherfolk clearly tended to be better at (or enjoy more) thinking and remembering “good” events.

## 5. Concluding remarks

The findings of this case study highlight the complexity of both the rural and urban context and how the several interweaving processes – natural resource use, social networks and markets – can result in an elaborate social structure totally based on informal and illegal practice. Although the networks in the rural location are much simpler than those in the urban area, with fewer actors and more straightforward interaction, the underlying political and social components that make this arrangement possible are actually the result of a complex process which is developed beyond the spatial boundaries of the rural village and is also a consequence of a specific historical background, which again links rural and urban contexts.

The flow of benefits from the fishery is almost totally determined by informality,

---

regardless of the fact that at every step there is an existing formal mechanism which could control who benefits from the fish and shellfish resources and how. There is a perception shared by the majority of fisherfolk that formal mechanisms of access represent in fact barriers to access and are for this reason “avoided whenever possible”, a phrase frequently used by fishers. On the other hand, the ability to operate the informal mechanisms is perceived as key to gaining and maintaining access to all fisheries-related resources, from fish to credit.

Nonetheless, it is worth noting that fisherfolk do not perceive the informal system as wholly beneficial. There are plenty of accounts and evidence of how issues such as unsafe and unfair working conditions, and dependency on traders or illegality are seen as sources of insecurity and as directly responsible for increased vulnerability. The ingenuity of the system and how it is the responsible for keeping small-scale fishing activity as the foundation of people's livelihoods is remarkable. By doing so, it makes possible such breakthroughs as fishers organising themselves outside illegitimate institutions and gaining unprecedented access to resources, if only for a small number of them. This is only possible because the members participate actively in the informal system. However, it should also be noted that such social structures based on and creates injustice, and seldom benefits the poor. On the contrary, it serves as the basis for, at worst, severe exploitation or, at best, a constraint on change. This case study suggests that a better understanding of how people gain, maintain and control access to resources should consider the complexity of urban contexts and their connection with markets, both at local and global levels, but more importantly, that the paradox of processes which at the same time sustain livelihoods and increase vulnerability requires our attention.

**Table 1.** How fisherfolk perceive causes (a) and consequences (b) of a successful year or fishing season. Results organised by study site (urban and rural) and by gender. Survey of 60 men and 60 women done between January and March 2008. All replies were spontaneous and in some cases more than one reply was given by each respondent. Replies were codified in simplified categories for clarity. The category “ns” stands for cases in which the reply was either “cause or consequence not known” or “no specific cause or consequence”.

**a**

Cause of a “best year”	URBAN			RURAL			Row totals
	female	male	Total	female	male	Total	
plenty shrimp	8	9	17	14	15	29	46
salt water	7	15	22	8	11	19	41
dry weather	9	10	19	4	2	6	25
good price	1	1	2	4	3	7	9
plenty fish	2		2		1	1	3
fewer fishers	1		1		2	2	3
nature	1	1	2				2
cheap supplies		1	1				1
ns	4	3	7	4	4	8	15
<i>Column Totals</i>	<i>33</i>	<i>40</i>	<i>73</i>	<i>34</i>	<i>38</i>	<i>72</i>	<i>145</i>

**b**

Consequence of a “best year”	URBAN			RURAL			Row totals
	female	male	Total	female	male	Total	
better or new house	6	5	11	7	6	13	24
better income	7	7	14	4	7	11	25
paid debts	2	4	6	7	8	15	21
new household items	1	6	7	8	7	15	22
food security	3	2	5	7	4	11	16
new fishing gear	3	7	10		2	2	12
saving or investment	1	1	2	1	1	2	4
new clothes	1		1				1
moved to new home				1		1	1
ns	12	8	20	2	2	4	24
<i>Column Totals</i>	<i>36</i>	<i>40</i>	<i>76</i>	<i>37</i>	<i>37</i>	<i>74</i>	<i>150</i>

**Table 2.** How fisherfolk perceive causes (a) and consequences (b) of a unsuccessful year or fishing season. Results organised by study site (urban and rural) and by gender. Survey of 60 men and 60 women done between January and March 2008. All replies were spontaneous and in some cases more than one reply was given by each respondent. Replies were codified in simplified categories for clarity. The category “ns” stands for cases in which the reply was either “cause or consequence not known” or “no specific cause or consequence”.

**a**

Cause of a “worst year”	URBAN			RURAL			Row totals
	female	male	Total	female	male	Total	
no shrimp	8	8	16	6	7	13	29
rainy weather	8	7	15	5	4	9	24
flood				10	13	23	23
no salt water	4	6	10	2	2	4	14
fresh water	3	3	6				6
Bahamas accident		2	2				2
unable to stock catch	1		1				1
bad health		1	1				1
ns	1	3	4	2	1	3	7
<i>Column Totals</i>	25	30	55	25	27	52	107

**b**

Consequence of a “worst year”	URBAN			RURAL			Row totals
	female	male	Total	female	male	Total	
low or no income	11	9	20	7	10	17	37
debts	4	9	13	8	9	17	30
left fishery	1	2	3	2	1	3	6
material loss				4	5	9	9
used banned gear		1	1				1
ns	5	5	10	3	2	5	15
<i>Column Totals</i>	21	26	47	24	27	51	98

---

## References

Armitage, D. 2005. Adaptive capacity and community-based natural resource management, *Environmental Management* 35: 703-715.

Berkes, F. and D. Jolly. 2001. Adapting to climate change: social-ecological resilience in a Canadian western Arctic community. *Conservation Ecology* 5(2): 18. <http://www.consecol.org/vol5/iss2/art18>

Berkes, F., Colding, J. and Folke, C. 2000. Rediscovery of traditional ecological knowledge as adaptive management, *Ecological Applications* 10: 1251-1262.

Dercon, S. 2005. Vulnerability: a micro perspective. University of Oxford. mimeo

Glantz, M. H. 1992. Climate variability, climate change, and fisheries. Cambridge, Cambridge University Press.

Grafton, R.Q. and Kompas, T. 2005. Uncertainty and the active adaptive management of marine reserves, *Marine Policy* 29: 471-479.

Martins, S.F. (2006). Cidade do Rio Grande: industrialização e urbanidade. Rio Grande: Editora da FURG.

Marshall, C. and Rossman, G.B. (1999). Designing qualitative research. London: Sage.

Mason, J. (1996). Qualitative researching. London: Sage.

Novak, J. D. & Cañas, A. J. (2006). The Theory Underlying Concept Maps and How to Construct Them, Technical Report IHMC CmapTools 2006-01, Florida Institute for Human and Machine Cognition. Retrieved 30/01/08, from

<<http://cmap.ihmc.us/Publications/ResearchPapers/TheoryCmaps/TheoryUnderlyingConceptMaps.htm>>

O'Brien, K.L., Leichenko, R., Kelkar, U., Venemad, H., Aandahl, G., Tompkins, H., Javed, A., Bhadwal, S., Barg, S., Nygaard, L., West, J. 2004. Mapping vulnerability to multiple stressors: climate change and globalization in India. *Global Environmental Change* 14, 303–313.

O'Brien, K L. and Leichenko, R. M. 2000. Double exposure: assessing the impacts of climate

---

change within the context of economic globalisation. *Global Environmental Change* 10, 221-232.

Olsson, P., Folke, C. and Berkes, F. 2004. Adaptive comanagement for building resilience in social-ecological systems, *Environmental Management* 34: 75-90.

Punch, K. (2005). *Introduction to social research: quantitative and qualitative approaches*. London: Sage.

Seale, C. (2004). *Researching society and culture*. London: Sage.

Satterthwaite, D. and Tacoli, C. "Seeking an understanding of poverty that recognizes rural-urban differences and rural-urban linkages". in: Radoki, C. and Lloyd-Jones, T. (eds.), 2002. *Urban livelihoods: a people-centred approach to reducing poverty*. London, Earthscan, pp 52-70.

Tompkins, E.L. and Adger, W.N. 2004. Does adaptive management of natural resources enhance resilience to climate change?, *Ecology and Society* 9.

Turner, B.L., Kasperson, R.E., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L., Eckley, N., Kasperson, J.X., Luers, A., Martello, M.L., Polsky, C., Pulsipher, A. and Schiller, A. 2003. A framework for vulnerability analysis in sustainability science, *Proceedings of the National Academy of Sciences of the United States of America* 100: 8074-8079.

Yin, R.B. (2003) *Case study research - Design and methods*. Third Edition. London: Sage.