Final Workshop: April 8, 2014

Wrapping up

Alpina Begossi

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Adm. Unicamp: Shirley Pacheco de Souza
COMMUNITY-BASED RESOURCE MANAGEMENT AND FOOD SECURITY IN

THE INTERNATIONAL RESEARCH CHAIRS INITIATIVE

Joining forces to find answers

WIRELESS COMMUNICATIONS
FISHERIES MANAGEMENT
MANAGEMENT OF MINING AND INDUSTRIAL WASTE
BIOINFORMATICS
KNOWLEDGE TRANSFER AND EXCHANGE
CHILD NUTRITION
ENVIRONMENT AND HEALTH
INDUSTRIAL AND APPLIED MATHEMATICS

Helping fishing communities manage their resources

In Brazil as elsewhere, coastal resources are declining. In fact, some commercial species exploited by local artisanal fishers are already endangered. If this trend is not reversed, ecosystems and social systems will both suffer.

The research team will develop integrated approaches to help fishers in Paraty (Rio de Janeiro State) to manage local resources and to diversify their income sources, and thus increase food security. A first step will be to increase knowledge of the ecology, drawing on local people’s knowledge of their resources. Working with local communities, the researchers will then pilot a community-based adaptive management system for livelihood resources that could serve as a model for other parts of Brazil.
BEGOSSI, A. April 8, 2014. VideoConf IDRC Paraty.
Research Lines

- Introdução
- Capítulo 1: Silvano & Nora: Ecologia de peixes recifais na Baía de Paraty
- Capítulo 2: Begossi, Possidônio & Salivonchyk: A pesca em Trindade
- Capítulo 3: Priolli, Stabellini & Bajay: Diversidade genética de uma espécie em perigo de extinção: a garoupa Epinephelus marginatus
- Capítulo 4: Pezzuti: Conhecimento local, uso e interações entre pescadores de Paraty e as tartarugas marinhos em Paraty, Rio de Janeiro, Brasil
- Capítulo 5. Begossi, Salivonchyk, Nora & Barreto: Pesca e forrageio ótimo
- Capítulo 6. Giraldi & Hanazaki: Modos de vida e segurança alimentar em comunidades Caiçaras de Paraty, RJ – um olhar a partir da etnobotânica
- Capítulo 7: Cavechia & Peroni: O contexto das redes de trocas de variedades para conservação de agrobiodiversidade entre os Caiçaras de Parati
- Capítulo 8: Hanazaki, Idrobo, Freitas & Giraldi: Entendendo os modos de vida em sete comunidades Caiçaras de Paraty, RJ
- Capítulo 9: um olhar sobre a saúde dos pescadores, por Begossi, Cavichiolo & Gurgel (tradução de Blood Pressure and Hypertension among Coastal Fishermen in South-east Brazil, publicado em Journal of Community Medicine and Health Education 2013, 4:1 http://dx.doi.org/10.4172/2161-0711.1000261)
- Capítulo 10: Clauzet: Análise da comercialização na pesca artesanal de Paraty Capítulo 11. Souza: Pescadores de Paraty e o turismo
- Capítulo 13: Lopes, Paiva, Nora, Possidônio & Rosa: Manejando a pesca de Paraty com a participação dos pescadores
- Conclusões
Suggestions on:

• Fishing areas
• Current demands
  – (Termo de compromisso de Tarituba)
  – Trindade: courses and others
• Fishing/Fish population dynamics/ Genetics
• Operational: PES
Suggestions in published papers

a) More than only hitting fishers with regulatory sticks, carrots through rewards such as PES could provide incentives for fishers to participate in co-management (including monitoring) of the current ecological station, thus creating possibilities of moving them from being opponents to collaborators;

b) Payment could follow the existing legal framework of the defeso system, but would be paid on a year round basis, related to the opportunity costs of permanent fishing restrictions; these opportunity costs may be calculated based on average catch rates in some islands. Even if the regular value paid to fishers is less than the average income from fishing, it would be a secure and predictable source of income, while fishing is uncertain, unpredictable and also incur in costs to fishers. This could make the system cost-effective. Over time, a possible increase in catch rates in fishing spots close to no-take areas could allow for a reduction in compensatory payment to fishers, after proper negotiation.

c) Resources could come partially from the governmental environment agency and partially from local industries in compensation for their environmental impacts, such as TAC — Termos de Ajustes de Conduta [see McGrath et al. (2008)], or from local restaurants that use Paraty Bay for acquiring fish for their touristic markets.
fishermen need to market the natural or raw products, what are the incentives for conserving biodiversity? From a fisherman’s perception, “Why not fish if I need to fish to sustain my family?” This obstacle highlights the need for short-term compensation [25].

Figure 8 The Ilha do Catimbau, anchored boats and restaurant inside the Ecological Station of Tamoios, RJ, Brazil.

would be a second economic benefit to fishermen and an ecological gain for the conservation of fish but would result in a decrease in the diversity of food consumed. Small-scale fisheries are responsible for delivering a high diversity of fish to consumers.
fishermen and it could be longer than that currently adopted for the shrimp. Our proposed approach involves a co-management process between small-scale fishermen and the government authorities in which a defeso system for E. Marginatus is organized and small-scale fishermen are compensated for their losses to encourage their participation in conservation.

a) and earn this part to d 201
b) pro

c) Marine protected areas (MPAs), or areas closed to fishing, have been useful to protect target reef fishes, including serranids, such as the coral trout (Plectropomus spp.) in Australia (Evans & Russ, 2004), and the Mycteroperca bonaci in the northeastern Brazilian coast (Francini-Filho & Moura, 2008). MPAs may also provide indirect and future benefits to surrounding fisheries, if adult fish protected inside the reserve moves out of its boundaries, or if larvae produced in the reserve are dispersed elsewhere (Gell & Roberts, 2003). However, MPAs are not a panacea, their efficacy depends on scientific ecological information available and this measure may elicit serious conflicts with local fishermen (Sale et al., 2005). In the studied region (Paraty bay) there is a MPA (Estação Ecologica dos Tamoios), but it has been created in a top-down fashion and had caused intense conflicts with local fishermen (Begossi et al., 2011b). Furthermore, such MPA was not defined following ecological criteria aimed at reef fish conservation. Therefore, the existing MPA design should be improved, including concerns to protect target reef fish, such as E.
a. Consumed

b. Sold

c. Less bony fish

d. Bony fish

e. More common

f. Less common
However, as shown here, even after an MPA is established, it is still possible to negotiate small changes to increase acceptance and compliance, which in the end could result in conservation through a less contentious alternative. The challenge is greater in this case, as it requires changing laws, but with the increasing evidence of the advantages of adopting adaptive management practices [31,32], Brazil and other countries should be more open to undergoing some changes in their general management system.
In short, the studied MPA does not yet seem to be delivering clear expected benefits to fisheries. Although the average income was higher closer to the MPA, the reasons behind it are yet to be investigated; reef fish, namely groupers, showed varied trends in abundance inside and outside the MPA in different regions; and CPUE was higher in the fishing community further away from the reserve limits. However, even if some of these findings may be inconclusive regarding the outcomes of the studied MPA, it was only possible to reach them through an integrative approach that considered ecological, social, and economic aspects. The approach of a single aspect could have led to a misleading interpretation.

Although the results about the efficacy of the studied MPA are not clearly encouraging, there is still time to build trust among reserve managers and fishers. This is not an easy step in a region marked by animosity between the governmental environmental agencies and fishing communities, but efforts such as a temporary agreement allowing limited fishing and anchoring in some of the islands have been made toward a greater interaction among all the parts (Begossi et al. 2011). If the chosen islands are not the most relevant to increase fish abundance and to improve fisheries, the MPA could eventually change the islands to be protected, with the support of fishers on the choice of new areas (Le Fur et al. 2011; Silvano and Begossi 2012). Fixing the problems of an old coastal MPA could help turn other problematic coastal MPAs into functional ones and establish new ones based on collaborative and trustworthy interactions among managers, fishers, and other stakeholders.
1. Management should be included in their livelihoods, that is, in their household activities. Caícaras, as the current artisanal fishers of the Atlantic Forest coast, have economic and social ties that are linked to family ties, and they are connected among communities on the coast through intermarriage (Begossi 2006). We can estimate that within their major activities, from their poly-varietal agricultural system of manioc (Peroni et al. 2008) to the fishing spots used, kinship ties support exchanges and local rules.

2. Exchange and distribution are important factors to consider for local management. In this regard, kin groups could be the main loci of negotiations. The current locus of negotiation between individuals and formal organizations, such as ‘Colonias de Pescadores’, probably does not represent the most efficient form of negotiation. Negotiations should be decentralized into interest and kin groups.

3. There is a need to study, in more detail, the market processes of the fishery outputs to analyse it through kin ties. The data we have, based on Begossi et al. (2010), are not sufficient to address the distribution process from the fish market. How fish are distributed after being caught and how the fish market is related to family groups is important information to be addressed when managing fish resources, as we can deal better with demands and with the choice of prey for consumption and for commerce.

4. Fishing agreements and payments for environmental services should be negotiated and addressed through family groups that are involved in specific activities. Often associated with kin groups, gear uses and preferences (as well as associated target species) should be taken into account for different management procedures. A fishing agreement in Brazil is an ‘instrução normativa’ that can turn into a decree, and it has been a form of co-managing aquatic resources in the Amazon (Begossi 2010). Payments for environmental services are payments for avoiding extracting resources so as to maintain biodiversity. Earlier studies by Vinha et al. (2010) and Begossi et al. (2011a, b) have addressed this marketable mechanism, which could take the form of a ‘defeso’, or a payment given to fishers in Brazil when they are off-duty to maintain certain fish stocks. (for details of fishing agreements in the Amazon and on payments for environmental services, see, respectively: McGrath et al. (1993) and Engel et al. (2008)). These suggested human-ecological-economic mechanisms can be applied at
Researchers Contributions

Master’s thesis:

Laura Cavechia: UFSC
Mariana Giraldi: UFSC
Fernanda Mesquita: UNISANTA
Vinicius Nora: UNISANTA
Priscila F. M. Lopes


1. Rethink the permissions and access to 13 protected points: 4 belonging to Tamoios Park (red) and 2 to its buffer zone (blue)

2. Use the participatory process developed here as a kick start to improve these suggestions.

### MAIN SUGGESTIONS

<table>
<thead>
<tr>
<th>Spot</th>
<th>Anchor</th>
<th>Line</th>
<th>Gillnet</th>
<th>Shellfish</th>
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<td>Restrict</td>
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</tbody>
</table>

Priscila Lopes (UFRN)
OTHER FINDINGS

1. The further away from Tamoios Park, the higher the CPUE (based on samplings from Trindade, Praia Grande and Tarituba)

2. The closer to Tamoios, the higher the fishers’ income. Intensive and profitable snook fishing?

3. Fish biomass: higher inside southern Tamoios Park, but lower than the outside in the northern side of Tamoios (closer to Tarituba)

4. Trade-off between biodiversity conservation and tourism and fisheries (it does not have to be this way!)

5. Synergistic effect between fisheries and tourism: higher income and improved livelihoods for fishers who associated activities.
Renato A. M. Silvano
1. Silvano, RAM; Nora, V; Barreto, TA; Lopes, PFM; & Begossi, A. The ghost of fishing past: fishing pressure, management and conservation of threatened groupers in subtropical reefs. Submitted to Coral Reefs.


MANAGEMENT SUGGESTIONS

1. Include local fishers in fisheries management decisions in a co-management system.

2. Rebuild populations of fish species sensitive to fishing pressure and that have been possibly overfished, such as the dusky grouper (*Epinephelus marginatus*): the population in Paraty bay consists mostly of small individuals (juveniles).

3. Reconsider the design and restrictions of the MPA (ESEC Tamoios), which had caused conflicts with fishers and seemed not to have increased abundance of commercial reef fishes.

4. Allow some degree of fishing activity in currently closed islands of the MPA, while also increasing protection of other islands not regularly used by fishers.

5. Negotiate the above management measures with local fishers, especially regarding protected areas and increased compliance with minimum size restrictions of some fishes, such as the dusky grouper.

BEGOSSI, A. April 8 2014. VideoConf IDRC Paraty
Natalia Hanazaki
PUBLICATIONS

• Giraldi, M. e Hanazaki, N. Use of cultivated and harvested edible plants by Caiçaras – what can ethnobotany add to food security discussions?. Submitted to Human Ecology Review.


MAIN SUGGESTIONS

• Management actions may take into account the different livelihoods in a regional scale (between regions and between communities) and in a microscale (within communities)
• Small-scale fisheries cannot be seen in isolation from the diversity of activities that make up the livelihoods of coastal communities
• Consider neglected spaces such as homegardens as important places related to food security
• Stimulate food-generating activities to enhance food sovereignty
Nivaldo Peroni


MANAGEMENT SUGGESTIONS

1. Include community biodiversity management methodology to promoting conservation of plant genetic resources related to agrobiodiversity.
2. Enhance awareness of the value of local agrobiodiversity and the ecological services associated.
3. Enhance awareness among local farmers about farmer's rights, their scope and the Brazilian legislation that protect local varieties and knowledge associated.
4. Strengthen exchange network of manioc (cassava) to promoting in situ on farm conservation
5. Include local farmers decisions in management and co-management system of agrobiodiversity.

Nivaldo Peroni /UFSC, Florianópolis, SC, Brazil
Mariana Clauzet


Main suggestions

• Consider Paraty restaurants as part of the fishing chain;
• Local fishermen should organize themselves to establish direct forms of marketing with some of the restaurants in town.
• In this case, fishermen can get better initial price of the product (compared to currently paid for fish markets) and we can expect a reduction in fishing effort, if local fishermen prioritize the “premise” that the quality of the catch may be a more important and profitable than the amount attribute, especially in relation to local commercial species in extinction risk.
• At the context, restaurants may be used in the "banner" of contributors to the socio-ecological resilience of the city of Paraty.
Shirley Pacheco de Souza
MAIN SUGGESTIONS

• Improve fishers’ access to capacity building courses related to touristic activities, such as:
  – basic communication in English,
  – ecotourism and cultural tourism guides,
  – customers’ services at hotels and restaurants,
  – nautical activities (marine and fishing tours, beach transportation).
• Stimulate community based tourism initiatives also started at Trindade village and Araújo Island, involving familiar hostelling, forest trekkings, visit to cultural sites.
• Spread community based touristic practices in other communities studied in this project.

Shirley Pacheco de Souza/IFSP, Caraguatatuba, SP, Brazil
Helping fishing communities manage their resources

In Brazil as elsewhere, coastal resources are declining. In fact, some commercial species exploited by local artisanal fishers are already endangered. If this trend is not reversed, ecosystems and social systems will both suffer.

The research team will develop integrated approaches to help fishers in Paraty, Rio de Janeiro State, to manage local resources and to diversify their income sources, and thus increase food security. A first step will be to increase knowledge of the ecology, drawing on local people’s knowledge of their resources. Working with local communities, the researchers will then pilot a community-based adaptive management system for livelihood resources that could serve as a model for other parts of Brazil.

In doing so, the team seeks to empower and integrate local groups into the management process and to build local capacity to engage stakeholders in governance processes.