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PRA and its complementarities with household survey methodologies

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• Introduction

We undertook research in El Salvador to estimate the returns to different mangrove management scenarios. We wanted to compare the sustainable management of the mangroves to their conversion to shrimp and salt ponds. The research was highly participatory with the community measuring and articulating the value of the mangroves and the consequences of their deforestation. PRA was a component of the valuation exercise that incorporated a community definition of sustainable management. This reflected the 'revealed preference'¹ valuations of the community and was in harmony with their management concerns.

The participatory appraisal of the mangroves in El Tamarindo in the Gulf of Fonseca was a precursor to a rural household survey that aimed to describe human-environment interactions and the local importance of the mangrove system. Initially, we had hoped to use PRA to describe the individuals' and households' relationship to resources and help develop a survey that could assess environmental inputs into the rural household economy. However, as the PRA work evolved, it became apparent that it could contribute more than a just description of the ecosystem and the use of environmental goods and services.

¹ Revealed preference describes a theoretical approach in micro-economics that is used to predict consumer behaviour and derive the 'demand' for goods and services.

PRA provided an opportunity for local residents to express their environmental preferences and describe the social and economic institutions that determined resource use. Furthermore, the PRA process helped disseminate many local resource management practices. It became apparent that the collapse of entitlement to the mangroves had provoked unsustainable resource use. As community rights to use and cultivate the mangroves were ceded to shrimp farmers, salt producers and loggers, pressure on the existing system had forced the community to abandon previously viable management strategies. It had increased the unsustainable dependency on mangrove timber and fuelwood, and shrimp and mollusc harvests in the estuary.

• The role of PRA

During the course of the data collection, PRA methods moved from being an additional tool that would furnish information about the community use of environmental resources, to providing the essential building blocks for the development of a community management strategy. What began as focus group discussions, mapping and simulation exercises, gained momentum and integrated itself into the design and application of the rural household survey and ultimately informed a sustainable mangrove management strategy.

The initial participatory work used several methods designed to encourage local residents to describe their relationship with the natural resources.

- Separate focus groups and key informant interviews were held with men and women, to explore gender specific use of

environmental inputs. The men defined their activities as being primarily fishing, although many farmed or are wage labourers on nearby farms and small public infrastructure projects. Most of the women defined their occupation as 'housewife' and not economically productive. Yet further discussion revealed that women were economically active and used environmental goods and services as inputs to generate income.

These discussions helped us redesign the time allocation aspect of the survey. Thus we were able to elicit better information on the individual and household relationships to the resource base, develop indices of resource utilisation by gender and age, and relate household income constraints to the allocation of household labour and the use of environmental inputs, most notably fuelwood, timber, molluscs and crustaceans.

- The Ecological Committee of El Tamarindo² developed a map to define the boundaries of the village and identify the resources on which the village depended. Transects were drawn of the estuary detailing depth at high and low tide, siltation areas, concentrations of fish and shrimp throughout the year and boundaries of artificial shrimp and salt ponds. The maps were also used to identify areas of mangrove deforestation by land use and summarise environmental degradation throughout the estuary.
- Calendars and timelines were developed that described local agricultural, fishing and logging activities, external pressures on

² The Ecological Committee of El Tamarindo is a grass roots group of fisher-persons and community inhabitants who are concerned about environmental degradation and have come together to promote change and raise consciousness about conservation. The committee has been in existence since 1990, although it has changed its name and increased in membership since it was legally recognised by the local authorities in 1995. The newly named Committee for Community Development has defined its twin goals as community development and environmental sustainability, linking their economic needs to their preference for sustainable resource management.

the local resource base and the loss of biodiversity over time.

Various visual techniques and graphs were used to generate information on the distribution of rainfall, water table fluctuations, and annual changes fisheries resources. Histograms and relative proportions proved useful to express changes in fish stocks and rainfall throughout the year. Non-literate individuals demonstrated a strong understanding of relational volumes, densities and proportions that allowed for the collection of surprisingly accurate rainfall and mangrove density data. This information was later compared to Ministry of Agriculture rainfall estimates and a forestry study revealing broadly similar trend lines.

Clear quality and rich quantity

These methods highlighted the limitations of research that uses only quantitative methods. Quantitative instruments can produce survey data and observations on variables that can be expressed numerically, are statistically representative and can be easily extrapolated, although not always correctly. Qualitative data produce extremely detailed, acutely site-specific, socio-cultural information that may not be representative, may be subject to significant selectivity bias and cannot be extrapolated, although not always correctly. However, in tandem these methods yield a rich picture of human activity. Furthermore, the strategic use of qualitative and quantitative methods can reduce the overall project cost and time-burden of cumbersome and extensive quantitative instruments.

One example shows these methodological complementarities. A survey, was applied to 110 mangrove households and 489 individuals in El Tamarindo in 1993 and 1994. The purpose of the survey was to document the nature and extent of the relationship men and women had with the resource base. The survey took place in the wet and dry seasons to assess seasonal variation in fishing and agricultural activities. The survey revealed that 50 percent of men in El Tamarindo fished as their primary occupation. A further 3 percent were involved in fish processing and marketing.

However, only one woman declared herself to be a fisherperson and only 6 percent stated that

they were actively involved in fish processing and marketing. Had we used only the information derived from the initial household survey, we would be forgiven for concluding that women did not fish or gather estuarine resources.

The focus group discussions and key informant interviews, however, revealed a more complex picture. The qualitative data demonstrated that women do fish. While men fish in the open seas, the majority of female fishers confine their activities to the estuaries and shoreline. Some women also fish in the open sea, accompanying other members of their families to catch shrimp in the coastal waters.

Although most women perceive their tasks as purely domestic, it was obvious from the focus group discussions that women are heavily involved in processing the catches. They prepare and dry fish for sale in local and regional markets; they, dehead and pack the shrimp in ice; and they gather shellfish and crab, providing essential nutrients and proteins to supplement the family diet of maize and beans.

The time allocation component of the survey facilitated the collection of data that would not have been gathered otherwise. It consisted of detailed questions about how all members of the household spent their days, breaking down different household and market activities into specific tasks. Using these data, we were able to determine that: 29 percent of women regularly earn income from fishing and fish-processing activities, approximately 60 percent of all women clean fish and process the catch, 42 percent clean boats and help their husbands moor and haul the catch in from the beach, and 17 percent sell produce in local markets, restaurants or bars.

For those members of the community who had become involved in the PRA process, it provided a forum for discussion, negotiation and demonstration of the roles, responsibilities and relationships of men, women and children to the mangroves. It helped define what the community considered to be their inalienable rights to participate in the management of these resources.

The community defined its environmental concerns and preferences, and provided

examples of how to manage the mangroves sustainably. Having outlined the potential management system, the community analysed the main impediments that prevented its implementation at the international, state and village level. The people described the incentives to deforest, to over-fish and to harvest the resources unsustainably. They analysed the existing state institutions that were responsible for the allocation of use rights to the mangroves for conversion to shrimp and salt ponds and to loggers and commercial fuelwood vendors. They discussed the failure of these institutions to enforce existing legislation and to curb illegal deforestation, and identified how poverty prevents some people from harvesting resources sustainably.

● Application of the research

As the research project progressed, it became clear that the informal group, that had formed around the participatory appraisal and had reactivated the pre-existing Ecological Committee of El Tamarindo, had expectations of the research. One of the pressing needs was for local education initiatives and materials, especially as 46 percent of the community did not know how to read and write, and another 18 percent who claimed they could read, did so with extreme difficulty. Since the local school had virtually no books or materials for either children or adults to learn from, they suggested that we produce an educational tool that was relevant to their lives ourselves.

Everyone decided to use the PRA and household survey information to develop an educational document. It would describe the community of El Tamarindo and its history; document the lifestyles of the inhabitants, their households and their livelihoods; list the tasks that men, women and children perform; and demonstrate the value that they place on their environment.

Certain criteria were set. It would have pictures so that anyone who could barely read would be able to make sense of the story. It should have numbers so that it could be used to teach Mathematics, Spanish, and Social Studies. It would talk about environmental degradation, due to the loss of mangrove extension through conversion to shrimp ponds and as a result of logging activities. It would talk about the loss of

biodiversity in the estuary and the sea. It would have information about the growth cycles of fish, molluscs and crustaceans from which the community made a living. It would talk about poverty and its effect on the community, individuals' decisions to stay by the coast or migrate to the city, to send their children to school or to have them work alongside their parents.

The objectives of the document were clear: to provide a history of the community of El Tamarindo that would not only pay testament to their lives, but would inform others about the environmental and economic concerns faced by that community; and to furnish the local school with a valuable educational tool. It was an ambitious project with a small budget but we managed. The information to be included was identified by the members of the PRA team and a popular education group was invited to draw the cartoons.

We drew heavily upon peoples' goodwill and unpaid contributions in producing the booklet. Two hundred copies of the document were given to the local school and others were circulated among the community. What follows are a few abstracts from the booklet '*Como es la vida en El Tamarindo*', which is currently being used in the school in El Tamarindo to teach everything from mathematics to biology.

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NOTES

PRA methods were initially used in a rather unstructured way, largely as we were learning about participatory approaches as we undertook the study. Each method was adapted to project to explore evolving questions. We learned, as the project progressed, that the explanatory and descriptive power of PRA techniques can be greatly enhanced if they are used in a systematic and sequential manner.

Photocopies of '*Como es la vida en El Tamarindo*' (in Spanish) can be obtained from Sarah Gammage at the address listed above.

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• **Como es la vida en El Tamarindo³**

El Tamarindo is a coastal community in La Unión in the west of El Salvador. It is a beautiful village situated at the mouth of an estuary near a mangrove forest.



The majority of the people live from artisanal fishing. Although there are people who don't work directly in fishing, everyone depends on the fortunes of the catch: the men, women, girls and boys. Thus, the entire economy of El Tamarindo depends on fishing in the same way as the fisher-people depend on the tides.

If the fishing is good, there is money in the village, but if the fishing is poor and the catch is not plentiful everyone has to resort to whatever small savings they have. For those who have no savings, the only option is to wait for a new cycle and a better catch.



³ 'What is life like in El Tamarindo'. These pages are taken from 'Como es la vida en El Tamarindo' an educational booklet for the people of El Tamarindo in El Salvador. See the preceding pages for an explanation of how this educational booklet came to be.

• **How many people have had access to education?**

Almost half of the inhabitants who were interviewed never had the possibility of attending school. Those who had received education, didn't manage to finish their studies. The majority only managed to finish 2 years of primary school.



Almost half of the boys went to school, whereas only a quarter of the girls went to school. This is because, if people want to educate their children, they have to go hungry.



Or spend more time in the open sea to see if they can catch more fish.



Como es la vida en El Tamarindo Como es la vida en El Tamarindo Como es la vida en El Tamarindo

• **How many hours each week do people work in El Tamarindo?**

The investigation showed that the people of El Tamarindo are very hard-working, but that the catch is very variable: sometimes there is plenty of fish, sometimes there isn't. For this reason, in many periods, the men don't have work, but when there are fish, they work very long days without rest. The majority are watching their nets during the night, they

barely sleep for 24 or 42 hours because they must keep fishing.

Our sample showed that 18 percent of the young men hadn't worked the previous week. The majority who worked, only did so for 40 hours. This meant that the fisherpersons of El Tamarindo were experiencing a bad spell and that the catch was poor. Meanwhile the majority of the women worked between 0 and 90 hours, and only 4 percent said they had done no work last week.

Members of the family who earned money last week



What are the wages and incomes?



- And what is it like for women?



What is the future of the fishing?

As a fishing village, the population of El Tamarindo know very well that the abundance of the catch depends upon the care and management of the resources. The community also know the importance of the mangroves, and

that they guarantee the survival of the fish and shrimps.

The catch depends intimately on the existence of the mangroves, which form part of a unique and fertile ecosystem. The leaves of the mangrove fall, producing matter that decomposes to form a rich mud. There are

Como es la vida en El Tamarindo Como es la vida en El Tamarindo Como es la vida en El Tamarindo

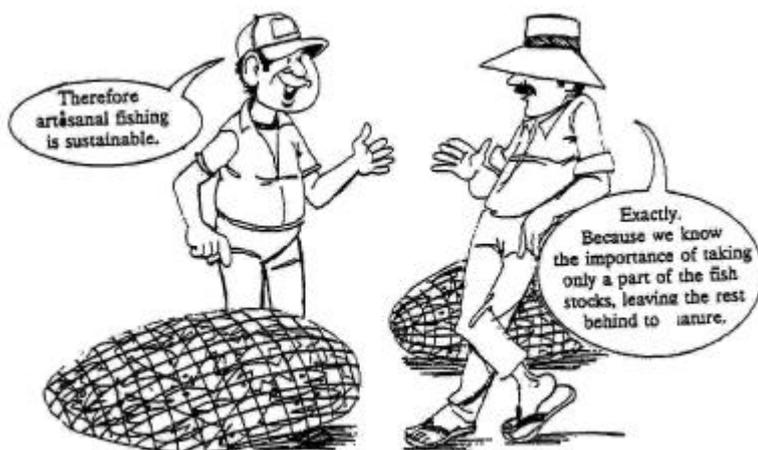
numerous animals, bacteria and simple organisms in this mud which become food for the shrimp larvae in the estuary. Beneath the roots of the mangrove in the thick mud, live crustaceans, mussels, crabs and shellfish. The shrimp larvae grow in the estuary in the roots of the mangrove. Fish also enter the estuary seeking food. As a result, all the species of fish and shrimp depend directly or indirectly on the good health of the mangroves.



Because of this, the community has organised a reforestation project through the Ecological Committee with the help of the Canadian Government and the Maquilishuat foundation.

The industrial shrimp boats threaten the survival of the fish population because they use large densely woven nets. This means that they capture many sea-creatures including the fish and shrimp that have just been born and are not yet mature.

The artisanal fisherpersons always adjust the size of their nets and the density of the weave to whatever fish type they wish to catch. The artisanal fisherperson fishes for a fully grown catch, leaving the younger littler fish and shrimp behind, so that they might mature, ensuring that there will be fish for the future.



What is sustainable fishing?

Fish and shrimps are assets, like money in a bank account. To maintain people's livelihoods, one should only live on the interest generated by the money, leaving the capital behind so that it continues to generate more interest.

The same principle applies to fish. If they are all fished at one time, none are left behind to mature. With no fish left to reproduce, there would be no fish, and no fishing industry, left in the future.

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