

Combining Experiments and participatory rural appraisal tools in the field: Exploring new techniques to preserve the Commons in Colombia

Maria Claudia Lopez¹

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Abstract

In this paper I argue that by conducting economic experiments combined with qualitative methods in rural areas, it is possible not only to gather valuable information about institutional arrangements that might be effective in protecting the commons; but it is also an effective way to empower communities for the conservation of their natural resources. This presentation is the result of a series of field experiments, rural appraisal tools, surveys, and discussions conducted in rural Colombia with direct users of natural resources. In addition to interviews held latter in time with users participating in those activities and policy makers working directly with these communities.

The first part of the presentation describes the methodologies used in the field. In detail I explain the advantages of using experimental economics in the field without losing the internal validity of the experiments conducted in the laboratory. Then, an overview of the other methodologies is provided, in particular: participatory rural appraisal tools. This qualitative analytical tool allows researchers to understand the dynamics of the community and the natural resources that they use to sustain their livelihood. The combination of methodologies allows the research team and the community members to create bridges between what happen in the economic experiment and what happen in their daily life as users of natural resources. Finally, I introduce the results of a set of interviews conducted at a later time, not only with participants of the experiments but also with policy makers involved in designing regulations.

Key words: experimental economics, field experiments, natural resource management, participatory rural appraisal

1. Introduction

The livelihood of vast numbers of rural poor in many countries depends on local natural resources such as fisheries, forests, and watersheds. For years, researchers from various disciplines of the social sciences have studied such communities in order to learn what types of institutions are most effective at managing these natural resources. These resources are often common pool resources. Such

¹ Facultad de Estudios Ambientales y Rurales, Pontificia Universidad Javeriana, Bogota, Colombia

situations involve “a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use” (Ostrom, 1990:30). A key characteristic of a common pool resource is subtractability, the notion that anything one user takes reduces the amount available for everyone else.

This paper is the result of extensive field work conducted in rural Colombia in the past several years². I present a combination of methodologies that have been used in different cases studies where rural communities are using and managing their natural resources. Such methodologies are field experiments, rural appraisal tools, surveys, discussions conducted and interviews with direct users of natural resources. These methods have been used and adapted by an interdisciplinary group of researchers. The main purpose of our research is to study effective institutional arrangements to preserve the common pool resources. We found that these types of methodologies complement each other and have helped us in understanding how rural communities manage their natural resources.

The management of common pool resources is presented as a collective action dilemma by Olson (1965) in *The Logic of Collective Action*. He argues that users of natural resources will not be able to manage their resources effectively without some type of coercion to force individuals to make more conservative choices. Olson also states that it is difficult to exclude others from the benefits of collective goods, and that it is therefore difficult to make people work for the preservation of such goods. This point of view was preceded by Garret Hardin’s (1968) notion of the tragedy of the commons. Hardin argues that if no rules exist related to access or amount harvested, the equilibrium is a harvest rate that is larger than either the maximum sustainable yield or the maximum economic yield. As a consequence of these two articles, environmental and natural resource policies have been plagued for years by the misapplication of oversimplified policy prescriptions.

Based on these simplified models, research and policy recommendations in this area suggest that the most common solutions to social dilemmas involving natural resources is through the state (via regulations) or through the market (by allocating property rights). However, a large amount of evidence (e.g., Dietz et al, 2003 and Gibson et al 2002) has suggested that these two solutions are often incapable of preventing the over-use of natural resources.

Moreover, case studies from around the world reveal a surprising ability of people to organize with community-based initiatives to manage common pool resources sustainably using a broad array of institutional arrangements (Ostrom 1990,

² The author of this paper belongs to a group of researchers from the School of Environmental and Rural Studies at Universidad Javeriana, and the Economics Department at Universidad de los Andes, Colombia. This group of people has work in the field and in particular with users of natural resources for various years using different type of methodologies. Because of that we might say that we went from working in the field with other methods (among those rural appraisal tools, surveys and interviews) to the field using experimental economics.

McKean 1992, Baland and Platteau 1996, Berkes 1989, Agrawal 2002).³ Ostrom (1990:46) states that “predictions that individuals will not devise, precommit to, and monitor their own rules to change the structure of interdependent situations so as to obtain joint benefits are inconsistent with the evidence that some individuals have overcome these problems.” Although the literature shows many cases of successful self-governance in different parts of the world, there are also numerous cases of failures (Gibson et al, 2000). For this reason, understanding the factors that lead to success or failure of community-based initiatives concerning common pool resources is crucial.

Experimental economics has become an important tool to examine different institutional arrangements for managing common pool resources (e.g., Ostrom et al 1994, Cardenas et al, 2000 and Casari and Plott 2003, and Velez et. al forthcoming). Among the experimental literature studying the topic, the field experiments have risen in importance over the past years (Cardenas 2005, Carpenter et al 2004, Velez et al *forthcoming*, Lopez *et al* 2007). By conducting experiments in the field with real users of natural resources we are learning important information about the possible institutional arrangements that may help to overcome the destruction of the natural resources. The rural appraisal tools, discussions and interviews held after the experiments are finished help us to understand the results of the experiments. These approaches aim to incorporate the knowledge and opinions of rural people in our analysis of the experiments. These qualitative methods involved the users of the natural resources in examining their own problems and solutions using and managing the resources by comparing the results of the experiments with the problems that people face in their daily lives. Thus, this paper is a first attempt to explore if the combination of methods has an ex post effect in the behavior of the communities where we worked vis a vis the natural resources.

The rest of the paper is organized as follows, in section 2, I present the reasons to conduct field experiments, in section 3, I discuss the challenges and difficulties to run those experiments, in section 4 I illustrate the way that we present and discuss the results of the experiments and the rural appraisal tools in a workshop, finally in section 5 I conclude with some anecdotal evidence from users, NGOs and regulators.

2. From experiments in the lab to experiments in the field.

Economic experiments create an environment in which agents need to make decisions, because of that they allow us to explore the individual decision making process and analyze how the institutions influence the individual rationality (Smith, 2000). Experiments were conducted until very recent years, in laboratory setting with undergraduate students⁴. According to List, “in an ideal laboratory experiment, this

³ Ostrom (1990) has identified principles that are common to successfully managed common pool resources.

⁴ The first experiments reported with experiments in rural setting were conducted by Hans Binswanger in the late 70's in six villagers in India. The next experiments reported in the literature are from Henrich 2000 in the Amazon and Cardenas *et al* 2000 in Colombia

very sterility allows an uncompromising glimpse at the effect of exogenous treatments on behavior in the lab. Of course, making generalizations outside of the lab domain might prove difficult in some cases” (2006, page 3)

Different researchers from diverse disciplines decided to bring these experiments from the lab to the field (Henrich, 2000, Cardenas *et al* 2000, Henrich *et al* 2004 and 2005). The reason to go out of the lab was to run the experiments in a natural environment (Carpenter *et al*, 2005; Harrison and List, 2004). However, there are pretty diverse experiments that classified as field experiments. According to Harrison and List (2004) taxonomy's, the experiments we conducted in rural Colombia are classified as “*framed field experiments*” This classification implies that the experiment is conducted with “non-standard” participants or people that face in their daily lives the situation faced during the experiment. The experiment is framed in such a way that the participants can bring their own experience into the experiment. In our case all the experiments were conducted with users of natural resource that depend heavily on the extraction of those resources (fish, mangrove, water, wood, etc) and the experiments were framed saying that the experiment was recreating a situation in which each person need to decide how to use or preserve the natural resources. By using such a frame we make sure that all the participants are in the same game.

One of the biggest critics that people may have against field experiments is that some of the control from the laboratory is lost, however it is also true that there is an increased in realism (Reiley and List, 2007). Harrison (2005) argues that by conducting experiments in the field there is a tradeoff between the losses of environmental control required for internal validity and the gains from capturing more realistic aspects (the external validity)⁵.

Ledyard (1995) pointed out that in a regular lab experiment it is very difficult to control for group context and identity. By conducting experiments in the field, we are able to replicate similar experiments in different locations (Henrich *et al* 2004 and 2005, Carpenter 2004, Rodriguez-Sickert *et al* 2007, Velez *et al* forthcoming) . All the differences found across communities help understanding how social norms, social preferences, context (beliefs and culture) and group identity affect people behavior in the experiments. By bringing the experiments to the field we are enriching the results of the experiments and therefore explaining the behavior of the participants during the experiment.

Different participants behave differently; people doing a particular activity will have more skills to make decisions in their own environment. (Reiley and List, 2007).

Because the participants are not only familiar with the tasks we are asking them to perform during the experiment, but they also know the other participants of the experiment, they will bring that external information into the game. Cardenas and Ostrom (2004) created a framework to understand how people will use the information (material incentives, group context, and individual characteristics) when they

⁵ Cardenas, (2003) respond to that argument.

participate in a field experiment .They found that users use the different layers of information depending on the structure of the game and the context.

Some of the considerations that we already explained, help to understand why it is possible to argue that lab experiments are not fully representative of the situations that happen in the field (Bohm, 1972; Harrison and List,2004; Levitt and List, 2007; List, 2007). Moreover the subjects that participated in the lab experiments are in general more or less the same age, college student from American universities, then by running experiments in the field we are gathering information from a more wider demographic population.

3. Challenges and Difficulties from running Experiments in the Field.

One of the biggest challenges that as researchers we need to face when running experiments in Colombia is a security problem. Because of that we work directly with NGOs and local governments that know the community members. Thanks to the credibility these organizations have in the community we do not need to deal with people not trusting in the research team.

The relation with the participants in the field is much closer, more personal and in many cases much longer that in university based experiments. We are aware that this relation can create some biases.

By conducting experiments in the Colombia field we need overcome some challenges that are not present when running experiments in lab. In the field we face illiteracy problems, the users of the natural resources are a population with very low levels of education. In some cases we would find people having numeracy problems, although not when they are ask to do simple mathematics problems⁶, but when asked to think in terms of probabilities for example (Cardenas and Carpenter, 2008) Because of that in all our experiments we will have research assistants ready to help the participants⁷. All the experiments we conduct are done with paper and pencil, which also implies that they will last longer than experiments in the lab (in between 2 and 3 hours instead of 1).

When conducting field experiments, we use instructions that are as simple as possible but also as graphically as possible. The use of figures and graphs is strongly recommended. We utilize posters with all the decision sheets that participants are going to use during the experiment. People in the field are not use to think abstractly, that requires special attention when writing the instructions. After the instructions are read aloud it is necessary to use several examples to make sure that all the participants understand how the experiment works. However, it is difficult to know how

⁶ Even though some of the participants are illiterate, since their activities required them to add and calculate units of products, they do not have problems with basic mathematic problems.

⁷ Because of this to try to run experiments in the field with computers will be out of the question

many examples you need to use and the type of examples you must show. It is clear that the examples you use might determine people's behavior during the experiment.

Furthermore, there are still some difficulties that we faced when we run experiments in the field. As when conducting experiments in the lab, we have a recruitment and sampling problems. In general, the recruitment is done by word of mouth between the users of the natural resources. After we run the first set of experiments more people will volunteer to participate knowing that they will get some money based upon the decisions they make. The sample can be not representative and for the research team that is something very difficult to control. We avoid "peer effects" when two relatives show up to participate in the experiments we do not allow them to participate in the same group. Since everybody participates in the experiment voluntarily, we have the behavioral information of that people, but we do not know anything about the people that did not want to participate.

In the same way that the recruitment process is done by people telling other people about the experiments, people also tell other people about what is the experiment about. In our instructions we read aloud a sentence saying "*Today's exercise may be different from the exercise that other members of your community have already participated in. For that reason, any comments you might have heard about the exercise may not apply to what we are doing here today*" but besides that we are aware that people leave the experiment and will talk with others about it. To try to prevent this kind of behavior is almost impossible.

All the experiments have a payment involved. However the discussion about the payment done in cash or with durables need to be had. In only some of our experiments we have paid in a combination of a good like *machetes* and cash. In all the other cases we only gave cash.

4. A workshop after the experiments.

When we go to the field we conduct first all the experiments we want to do. Then we analyze some of the information we gather from the experiments to be capable to give that information back to some of the participants that are invited to a final discussion. Before we present the results from the experiments, we want to learn from the participants how they use and manage their natural resources, as well as what are the biggest problems the community is facing towards those. To be able to do that we use a methodology call participatory rural appraisal.

The participatory rural appraisal⁸ (Chambers, 1994) emerged in the late 70s in South Asia in response to the perceived problems of development practitioners missing or miscommunication with local people. This qualitative methodology aims to facilitate collection and analysis of information by and for community members. The participatory rural appraisal emphasizes in local knowledge then, the data collection and analysis is done by local people, with researchers as facilitators⁹.

In our case, we use the participatory rural appraisal methodology, to discuss and learn with community members about how they use and manage their natural resources. At the same time that allows the community the opportunity to evaluate the way they are managing their resources. We gather information about the resources, institutions to manage those and the users. The uses of the rural appraisal tools help us to understand what happens in the experiment

After we finish the participatory rural appraisal, we open a discussion with the participants to understand how the experiments are related with the management of the resources in the community. We finally, explain the results from the experiments. After we present the results we ask them about their behavior during the experiment. We aim to find better institutional arrangements to manage the natural resources, for that reason we are always intrigued to know what people think about that. These discussions with villagers help us asking new research questions and new hypothesis to be tested through experimental data.

5. Anecdotal evidence from users, NGOs and regulators.

As I explained in an early section, to avoid people talking about the experiment despite the confidentiality and the anonymity maintain by the research team is almost impossible. After we left the field the first times we were running experiments we were not expecting to have any changes in people's behavior. However now after years of conducting these experiments we are aware of some changes. These changes are happening only in communities where ONGs and local governments are working close to community members in the management of the natural resources.

After the discussion in the workshop when participants are in meetings with local authorities and NGOs discussing new regulations to manage the natural resources they bring sometimes the experiments as an example of how collective action could work.

"After the experiments, it is common to hear people say things in meetings such as "remember this is like the game, if we all help we will all gain"". Adriana Fresneda, Incoder

⁸ Originally PRA was developed for use in rural areas, however it has been used in urban areas as well.

⁹ The data collection is done through group discussion. This facilitates information sharing and discussion.

We have been told also that the experiment showed community members the benefits of cooperation and because of that they feel they are empowered.

“The games changed my life and the life of my community. Thanks to those games I am able to stand in front of you today. The games taught us to cooperate to manage the piangua.” Dona Onoria, participant from Sanquianga

“After the games, it is easier for leaders of the community to promote a “closed” season of the piangua among the users. Now they understand that they will benefit from that.” Luis Carlos, participant from Bahia Malaga

The experiments seem to be a pedagogical tool that we were not aware off.

“With the games, I learnt that I should leave the small ones and extract only the big ones (referring to piangua) and if I see someone of my group extracting small ones I should advice her not to do that” Participant from Rios de Buenaventura

“The experiments and the rural appraisal tools are excellent tools for us (INCODER) to discuss with users of the natural resources how to preserve them” Juana Murrillo, Incoder

WWF- Colombia used the combination of field experiments and rural appraisal tools in 4 different regions of Colombia to raise the awareness of the users of different resources about the challenges of cooperation. After these activities, community members started a process of community empowerment in order to claim the State for some of their rights.

More research needs to be done; first we need to find an appropriate way to measure the effects of the combination of the methodologies. In particular we need gather more information about the changes communities are experiencing after the experiments and the workshop. A survey was already designed and need to be implemented. Second, it is needed to explore the pedagogical value of the experiments; although they were not created with that purpose it is clear that they can become a valuable way tool for environmental education.

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