

## **Final Progress Report**

Sustainability Science Program

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**Field(s):** Development Economics, Experimental Economics

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Expected graduation date: academic year 2010-2011

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### **Description of SSP-related research activity**

#### ***Activity 1: Social norms for environmental protection***

##### *Abstract*

Research on social norms shows their role in sustaining pro-social behaviour even in the absence of formal institutions. Norms are especially relevant in settings where individual behaviour generates negative externalities and no formal enforcement mechanism exists to sanction it. An example to such type of situation in the area of environmental protection is at the centre of this study. Sustainability of any intervention beyond its specific duration depends on its ability to generate stable social norms. The research project I have been working on at SSP offers an analysis of the mechanisms supporting pro-social and conservation behaviour in a region where deforestation threatens people's livelihoods. By applying experimental economics methods to conservation behaviour, this study aims at providing a useful tool to design sustainable interventions for the protection of the environment. The significance of this study lies not only in its relevance to policy design, but also in its theoretical and methodological contributions to the literature on social norms. The experimental design that I plan to use is ambitious, combining different treatments which have so far been tested separately in the literature. The resulting experimental design will produce a comprehensive analysis of the relative influence of the key mechanisms supporting social norms. Moreover, although the experimental literature on social norms is extensive, few studies look specifically at norms for environmental protection in a developing country setting. My research will contribute to the literature that takes experimental games to the field and possibly show fruitful methodological complementarities between laboratory and other methods of empirical analysis in the field.

##### *Identification of the problem you address*

In a setting in which deforestation threatens the future of communities relying on the forest for water, but at the same time people's livelihoods depend on their farms, thus on land clearing for agricultural use and cattle grazing, there is a clear conflict between short and long term gains, individual and social costs. Social norms are key in fostering pro-social behaviour and their role in supporting the creation of norms for the conservation of common environmental resources will be the main object of this study.

*Key question asked about the problem*

What influence each of the mechanisms, identified in the social norm literature as sustaining pro-social behaviour, has on social norms for environmental conservation?

*The methods by which you answered that question*

This question will be addressed through the collection of laboratory experimental evidence. Laboratory experiments are one of the main tools through which economists have investigated the nature and effect of social norms. The difficulty of systematically observing behaviour and isolating the influence of social norms on it is behind the choice of this methodological tool.

*Principle literature upon which the research drew*

The research draws from three strands of the experimental economics literature: the first is the literature on social norms and charitable giving, especially the work of Ernst Fehr, Iris Bohnet, James Andreoni; the second is the literature on application of laboratory experiments in field settings, whose main contributor is John List; and finally, the literature on common resource use in developing countries, with the work of Joan Camilo Cardenas being particularly relevant for this study.

*Empirical data acquisition description*

The empirical strategy will combine the collection of survey and experimental data. Gathering both types of information is relevant for two reasons. First, each set of tools is more effective in eliciting reliable information on different variables, and triangulation of results from survey and experiments can be used to assess the relative quality of the information collected through each method. Second, while laboratory experiments will be the primary tool of analysis, heterogeneous experimental outcomes may arise based on a wide range of variables which can only be collected through survey questions.

*Geographical region studied*

The research presented here is the result of a collaboration with a Bolivian non-profit organization, Fundación Natura, to explore the nature of social norms sustaining environmental protection. Although the study has been designed with the Bolivian context in mind, one key advantage of the experimental methodology that I plan to use is that it identifies mechanisms that should be at work in a wide range of settings in which individuals face social dilemmas in the use of common resources.

*Recommendations that might be relevant for your problem*

My ability to pursue this research project is constrained by funding issues. Any suggestions on possible funding sources or potential partner institutions to help me further my research would be welcome.

*A description of the final product(s) you are aiming to produce*

I hope that my research will feed into an article, to be published in an economic journal.

**Activity 2:            *Multiple use water systems project***

*Abstract*

The goal of this project is to understand how access to water for rural households can be improved in a sustainable way. In rural Kenya, where the project is located, only 43% of

households have access to safe drinking water (Kenya DHS, 2004). This project will address one particular issue related to water access and availability, focusing on the role of multiple-use water technologies in improving access to water both for domestic use, and for income generating activities. Multiple-use technologies may be more sustainable and effective in the long run as they help improve incomes. Agricultural and livestock productivity may benefit from the adoption of multiple-use technologies both directly and indirectly as household members' health improves. Dual-use systems may also have longer term health effects since households will be able to spend more on healthcare and prevention as incomes rise. The project therefore aims to study the effectiveness of a multiple-use technology on availability of water, its impacts on household productivity and health, as well as on household decisions about technology adoption.

*Identification of the problem you address*

Over the past semester my activity has focused on assisting Tavneet Suri in analyzing the effects of dual-use systems on time allocation of different household members.

*Key question asked about the problem*

Does the availability of a water source within the compound benefit differentially household members depending on the allocation of tasks, particularly that of fetching water, within the household?

*The methods by which you answered that question*

We conducted analysis of the data coming from the field, where the project is in the pilot stage. By exploiting the set up of the project as a randomised intervention, we compared time allocation patterns among different individuals in treatment and control households.

*Principle literature upon which the research drew*

The research draws from the literature on intra-household decision models and on the development economics literature that tests different models of the household. We also studied the methodological literature on time allocation data collection and the research conducted on this topic in developing and developed countries.

*Empirical data acquisition description*

Survey data is being collected in the field. After ten pilot rounds of survey with 150 households, the project is currently in the scale up phase.

*Geographical region studied*

Kenya, Central Province. Participants are members of a rural dairy cooperative near the town of Ndaragwa.

*Recommendations that might be relevant for your problem*

Redefinition of my tasks and research agenda now that my fellowship is coming to an end.

*A description of the final product(s) you are aiming to produce*

Conditional on my ability to find a research topic that will build on the set up of the randomized field experiment, I hope that I will continue analyzing the data to produce a research paper, to be published in an economic journal.

**Description of major other intellectual or professional advancement activity(ies) over the past academic year, including working title(s)**

I took advantage of the incredible resources found at Harvard to broaden my understanding of experimental methodologies in economics. In the first semester, I attended Esther Duflo and Abhijit Banerjee's class in Development Economics, Sendhil Mullainathan and David Laibson's class in Psychology and Economics. In the second semester, I attended Al Roth's class in Experimental Economics, Nava Ashraf's class in Field Experiments, and Josh Angrist's class in Applied Econometrics. Being at HKS also gave me the opportunity to establish contacts that may be useful in my future research and career. In particular, I collaborated with SSP fellows Kelsey Jack and Nigel Asquith in the design of the social norm research study.

**Principal collaborators outside Harvard**

Tavneet Suri (MIT Sloan School of Management); Eliana La Ferrara (Bocconi University).

**Contact information after leaving SSP**

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