

Cooperation, Collective Action and Natural Resource Management in Burkina Faso: A Methodological Note

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INTRODUCTION

While there has been much discussion of the factors affecting the success of collective action, little has been done to consider the practical application of these concepts in empirical settings. One difficulty is in defining certain terms such as “social capital” and in determining what observable indicators actually measure it. Even when there is agreement on certain concepts and their measurement, their impact on cooperation is often disputed. The wide range of variables over which there is disagreement about the impact on cooperation includes size of the group, profitability, isolation, and level of social cohesion.

This paper considers a study of 48 villages located in northeastern Burkina Faso and details how we conceptualized, measured, and applied different measures of cooperative capacity, how these measures relate to explanatory factors hypothesized to affect cooperation, and finally, the impact of these indicators on a variety of outcomes observed at both the community and household level.

The Situation in Northeastern Burkina Faso Burkina Faso is an agropastoral Sahelian country, where livestock production has always been an important component of agricultural activity, but crop activities are important as well. In the study region, livestock production is based on extensive and semi-extensive systems where access to common grazing lands and transhumance is heavily relied upon to provide forage resources. In such systems, there is wide scope for collective action and cooperation to influence land use and allocation patterns, resource management, investments and maintenance of community resources, and household income and wellbeing. We hypothesize that the success of collective action will be a function of individuals’ incentives to contribute to maintenance and abide by rules and regulations, the capacity of the community as a whole to cooperate and to manage these incentives, and the overall policy environment in which these institutions must operate.

THEORETICAL OVERVIEW

For the purpose of this study, we define collective action as internalizing negative externalities and/or generating positive externalities in the use and management of natural resources. Externalities occur whenever one person’s decisions affect outcomes for another. The traditional example is that of livestock on common pasture; the number of livestock one person puts on the pasture affects his/her own production and also affects livestock production of all others sharing the commons, and may potentially affect future forage condition as

well. In this case, use of the common pasture generates a negative externality. An example of a positive externality is given by soil erosion control measures, which improve soil productivity in the specific area in which such measures are employed but also generate positive spillover benefits via improved erosion control over a much wider area

The capacity of a community to cooperate is its underlying ability to create formal and informal frameworks to achieve goals of collective action. Certain variables affect both the capacity to cooperate in general as well as the incentives to undertake any particular action; one of the goals of the research was to isolate factors affecting cooperation more generally, and specific activities in particular.

The major focus, then, was to recover the underlying capacity to cooperate at the community level, which is not directly observable and is rather a latent variable. For this purpose, we use a factor analysis of variables thought to be associated with cooperative capacity to recover our main latent variable. Indicators of collective action include the density of organizations and density of household participation, the total number of rules, regulations, activities, and average participation by members in activities and at meetings. Determinants of cooperative capacity are those variables hypothesized to directly affect the capacity of a community to make and enforce collective action decisions.

SURVEY INSTRUMENTS AND DATA COLLECTION

This study is based on a survey administered in 48 communities, 209 NRM-specific institutions and organizations, and 450 households, located in four administrative regions of Séno and Oudalan during the end of rainy season of the year 2000. Given that we were working with a specific project (the Programme Sahelian Burkinabe supported by German Technical Cooperation), communities were stratified into four categories on the basis of the length of participation in various programs. Household-level information was gathered from the head of household with the primary aim of capturing individual incentives to access and use community-level resources and households’ participation in collective action. Data were also collected on the institutions and more formal organizations that dealt with NRM, including measures of the decision-making, monitoring and

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enforcement mechanisms, rules and activities undertaken, and participation by members in meetings and activities. Extensive information was collected on the community as a whole, including basic demographic information, structure and mobility of all livestock herds in the community, infrastructure, and detailed information on land allocation and resource mapping using aerial photographs as a base. Finally, data were collected at six markets identified as being important for livestock transactions for surveyed communities.

RESULTS AND DISCUSSION

A review of previous research shows that there is still a great deal of debate over the factors that determine successful collective action. Equally important is the debate over what observable characteristics actually comprise social capital, cooperative capacity, or indeed cooperation. In our case, we used aggregated information on all organizations in the community (e.g. total number of NRM-related organizations; number of members, on average; total number of rules in operation, etc.) and performed a factor analysis on these variables at the community-level in order to recover a latent measure of cooperative capacity, which is not directly observable. We chose this analysis specifically because the wider literature indicates that looking at one or two aspects of only one organization rarely seems to adequately capture cooperative capacity; even within a community, some organizations may function better than others, some may have more members or meetings or undertake more activities, etc. Our measure, relying on different summary statistics of all organizations, is intended to capture overall capacity.

Results indicate that there are two different factors that capture cooperative capacity; the first being network capacity (weighted mainly by network and membership density variables) and the second being implementation, or “agency”, capacity (weighted mainly by rules, activities, participation rates). Thus, the analysis indicates that cooperative capacity is not be a unique underlying factor, but rather capacity may itself have different components. Individuals may access networks and sustain membership in organizations primarily for private benefit in terms of increased production, improved marketing, or insurance. Individuals may also participate in organizations to undertake collective action and generate gains that accrue to the group as a whole, via the provision of public goods or mitigation of negative externalities. What is good for the individual may not benefit the group; characteristics previously associated with “social capital”, e.g. networks, may improve household welfare but may not improve the capacity of a community to engage in collective action.

This interpretation fits well with the results from analyses of the impact of cooperative capacity on land use and allocation patterns observed at the community level, investment in public goods provision in NRM (soil erosion control measures such as constructing stone bunds and reforestation), and also in terms of individual income patterns. Implementation capacity behaves more in accord with the literature on determinants of successful collective action: higher implementation capacity leads to lower stock densities, greater herd mobility and less encroachment of private cropping; it leads to greater likelihood of undertaking soil erosion control activities and it leads to greater household incomes coming from livestock production and to higher total incomes. Network capacity, on the other hand, has no impact on land use and allocation, though it does increase the likelihood of undertaking some soil erosion control and, rather interestingly, increases the efficiency with which these public goods are provided. Finally, network capacity is associated with higher household incomes coming from crop farming, but has no impact on total incomes.

Further reading:

N. McCarthy, C. Dutilly-Diane, B. Drabo. 2004. “Cooperation, collective action and natural resources management in Burkina Faso.” *Agricultural Systems* 82: 233-255.

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