

**METHODS FOR STUDYING COLLECTIVE ACTION IN RURAL  
DEVELOPMENT**

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## **ABSTRACT**

With renewed recognition of the importance of collective action in many aspects of agriculture, natural resource management, and rural development programs in developing countries, there is a need for research on the factors that affect its emergence, as well as its performance. Yet because of its dynamic nature, collective action is difficult to measure and study. This article discusses ways of conceptualizing collective action to provide researchers from various disciplines with a basic framework for understanding and studying collective action. It highlights specific features of collective action that are relevant to identify best practice methodological approaches and research techniques. The main part of the paper then describes how collective action can be operationalized, highlighting the strengths and weaknesses of different methods, as well as discussing complementarities among methods. This discussion provides an overview on the use of qualitative, quantitative, experimental, and action research methods for studying collective action.

Keywords: research methods; collective action; institutions; social capital

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# METHODS FOR STUDYING COLLECTIVE ACTION IN RURAL DEVELOPMENT

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## 1. INTRODUCTION

Cooperation has always been fundamental for human society, and plays a particularly prominent role in rural development programs. Successes with formal cooperatives in Europe and North America in the early twentieth century<sup>4</sup> led to many state-sponsored cooperatives in developing countries, from the 1960s onwards. But, as Seabright (1997) reminds us, the development paradigms of the 1970's were based on the presumption that communities would fully engage collectively over a large range of activities, with little attention given to what types of activities were best managed at the community level. Dissatisfaction with the performance of many of these programs led to greater emphasis on either the state or markets to deliver services. However, there were also many instances of state and market failures, particularly in meeting the needs of the poor, while instances of small-scale community collective action—either through indigenous institutions or external programs—provided renewed interest in involving local groups in many spheres of agricultural and rural development. These include watershed management programs, integrated pest management, participatory breeding, extension groups, farmer-managed irrigation systems, and a range of microfinance groups.

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<sup>4</sup> For an early and insightful discussion of the roots of the cooperative movement and its application from Germany to the United States, see Tubin, 1912.

The failures of the earlier community-based development programs and projects rests with the fact that very little attention was given to understanding how collective action arises to deal with different issues, and how it is sustained. Without attention to this critical question, the current policies to devolve natural resources to communities, empower women through self-help groups, or deliver a range of services through community-based organizations also risk failure. But how do we understand where collective action emerges and where it is unlikely to emerge or persist? How do we define and measure the willingness and ability of people to work together? This paper focuses on collective action for self-governance and management of rural development projects, agricultural practices and natural resource management, which are the topics of a number of preceding CAPRI working papers. We would like to stress that collective action is also very important for political action and social movements. For space limits we do not discuss the relevance of collective action for political purposes here.

Whereas the last several decades have produced an increasing amount of research on collective action, including that which is directly linked to natural resource management, much has focused on collective action theory, describing the conditions that foster or inhibit effective collective action (e.g. Olson 1965; Axelrod 1981; Ostrom 1990, 1992; Ostrom, Gardner, and Walker 1994; Runge 1992; Sandler 1992). Empirical studies on collective action are largely comprised of case studies or syntheses across disparate case studies (Uphoff 1986 and 1990; Ostrom 1991; Bromley 1992; Tang 1992; Bardhan 1993; Baland and Platteau 1996; Agrawal 2001). Often collective action is not defined in these studies, and when it is, definitions are usually loose and rooted in other concepts that are not clearly defined. The result is that collective action is used to mean many different things, so that its analysis often produces results

that do not lend themselves to comparison and hinder researchers' ability to gain new understandings and advance the frontiers of research on collective action.

Even when researchers are clear about the definitions of collective action and the concepts that underlie it, without sound methods to measure it, good empirical research that enables cross-cutting analysis will not emerge. Much research on collective action has not gone as far as measuring net benefits or impact, but where attempts have been made, little has been done to evaluate those methods. Nevertheless, some methods for measuring collective action that have been undertaken thus far have actually been shown to be fairly crude and fail to capture important dimensions. More rigorous methods are beginning to emerge, but as yet they are quite new and have not been widely disseminated in the research community.

The appropriate approach to collective action studies depends on the purpose of the study. Is it an exercise to identify the determinants of a specific collective action? Assess the outcomes and impact of collective action? Identify the importance of collective action relative to other factors? Will the focus be on collective action for one particular purpose (e.g. natural resource management), or all forms of collective action in a community? Each of these can contribute to general knowledge, and have practical applications for development projects, by showing the contexts in which group-based approaches are likely to succeed or the extent of impact that can be expected. However, such studies tend to be detached, in contrast to more engaged studies seeking to catalyze or enhance collective action for a particular purpose. The research methods for each of these types of studies will differ.

This paper provides an overview on methods for studying collective action in natural resource management and rural development. It draws lessons from a number of case studies with specific focus on methods presented at the workshop on methods for studying collective

action held in Nyeri, Kenya in February 2002, convened by the CGIAR System-wide Program on Property Rights and Collective Action (CAPRI) and hosted by the World Agroforestry Centre.

There are three major problems that researchers encounter when studying collective action:

- conceptualizing collective action,
- developing an analytical framework for studying collective action
- operationalizing the framework for empirical research

In the next sections we address each one of these in turn.

## 2. CONCEPTUALIZING COLLECTIVE ACTION

It is not our intention here to restrict the definition of collective action to one possible wording. Nonetheless, it is important to define the domain of the concept of collective action, so that when researchers from various disciplines interact they have a common understanding. Marshall (1988) defines collective action as an “action taken by a group (either directly or on its behalf through an organization) in pursuit of members’ perceived shared interests.” This is not the best and only definition; numerous other definitions have been suggested in the literature (see CAPRI glossary<sup>5</sup>). For example, during workshop discussions the following working definitions were also suggested: “joint action for the same goal” and “actions to achieve a common objective, when the outcomes depend on interdependence of members”.

What most definitions have in common is that collective action requires the *involvement of a group of people*, it requires a *shared interest* within the group and it involves some kind of

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<sup>5</sup> <http://www.CAPRI.cgiar.org/glossary.asp>



*common action* which works in pursuit of that shared interest. Although not often mentioned, this action should be *voluntary*, to distinguish collective action from hired or corvee labor.

Examples of collective actions include collective decision-making, setting rules of conduct of a group and designing management rules, implementing decisions, and monitoring adherence to rules. Members can contribute in various ways to achieve the shared goal: money, labor or in-kind contributions (food, wood).

The action can take place directly by members of a group, or on their behalf by a representative or even employee. The coordination can take place through a formal organization, through an informal organization, or, in some cases, through spontaneous action. Thus, an organization may contribute to collective action, but the two concepts are not the same. In the context of natural resource management the collective action of deciding on and observing rules for use or non-use of a resource can take place through common property regimes or by coordinating activities across individual farms.

Collective action is easiest to identify when there is a clearly defined group that takes part. Moreover, “clearly defined boundaries” is the first of Ostrom’s (1992) “design principles for long-enduring, self-organized irrigation systems,” which have also been applied to many other cases of natural resource management. This indicates that boundedness of the group, which allows people to know who else is (or should be) contributing, fosters collective action. At the same time, in many instances of collective action it is not clear how the group is defined nor are the boundaries necessarily fixed or rigid. Some people may participate one time, others another, with none of them knowing exactly who is involved, but all identifying with the collective action. For example, neighborhood clean-up activities may be done periodically

without clearly defining who is in the “neighborhood.” Thus, there is a gray area between organized and bounded collective action and action within more amorphous social networks.

Formal or informal organizations may be helpful in coordinating collective action, but it is important to distinguish between organizations and collective action. Many organizations exist on paper only, and do not lead to action; conversely, collective action may occur spontaneously. Moreover collective action can manifest itself and can be understood as an event (a one time occurrence), as an institution (rule of the game applied over and over again), or as a process. While many previous studies analyze the institution of collective action, others (Sultana and Thompson 2003) focus on the process of collective action. The ‘event’, e.g. collective response to a flood versus ‘institution’ (collective maintenance of an irrigation system) presents by itself a very interesting question: when does an occurrence become institutionalized and what are the implications? Institutionalization depends on the object of collective action; any kind of collective action for routine maintenance will likely become institutionalize because it is a recurrent need in a community or group of users, while collective action for seed exchanges is likely not to be institutionalized where the need to exchange seed occurs only sporadically (Badstue et al., 2002). One the one hand institutionalization reduces transaction costs of renegotiation, as well as uncertainty, but on the other hand the more institutionalized collective action, the less flexible and adaptable is becomes.

## RELATED CONCEPTS

*Agency:* Within groups, it may be important to look at the role of certain key individuals. Marwell and Oliver (1993:4) point out that institutional analysis of collective good provision should not overlook the role of individual entrepreneurs. While collective action may be facilitated by an individual entrepreneur who bears risks and meets up front costs of organizing

cooperation, this concept is distinct from collective action itself.<sup>6</sup> When an individual enters into a contract to provide services to the group, so that his or her interest is in the remuneration—tangible and intangible—himself and less in the groups’ common interest per se, it might be more appropriate to look at it through the concept of agency. Eggertson (1990:40-41) defines an agency relationship as: “when a principal delegates some rights – for example user rights over a resource – to an agent who is bound by a (formal or informal) contract to represent the principal’s interests in return for payment of some kind.” Krishna (2003) indicates that capable agency, as indicated in that study by active local leaders, can help to direct local action, and make it more effective. This is particularly true where specialized knowledge is required to undertake action, as in the case of irrigation systems where technical knowledge of the system is important, or in dealing with government offices, where knowledge of bureaucratic processes is needed.

*Social capital:* In recent years there has been considerable attention to the concept of social capital in a variety of development contexts (Dasgupta and Serageldin, 2000).<sup>7</sup> As with collective action, there are many interpretations of social capital, but one useful definition is: “the shared knowledge, understandings, norms, rules, and expectations about patterns of interactions that groups of individuals bring to a recurrent activity” (Ostrom 1999). This includes both horizontal ties among a group (sometimes referred to as “bonding social capital”) as well as vertical ties between different groups (referred to as “bridging social capital”), also recognized in Coleman’s definition (1988:598). Relations of trust, reciprocity and exchanges, common rules, norms and sanctions, and connectedness, networks and groups (Pretty 2001) are often indicated

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<sup>6</sup> We would consider that Marwell and Oliver’s (1993) example of a private benefactor donating a park to the community is better considered as philanthropy than collective action, although if the individual acts on behalf of the group, it may be considered as agency.

<sup>7</sup> The World Bank has even set up a website to discuss the applications of social capital to a wide range of development activities:

<http://www.worldbank.org/poverty/scapital/index.htm>

as important mechanisms to build social capital assets. While the study of such social ties itself is not new, the application of the term “social capital” has given it greater prominence in both academic research and development practice. Social ties are now viewed as important assets, a form of capital on a par with natural, physical, financial, and human capital. Similar to collective action, social capital has been defined differently following diverse approaches. Coleman (1988) and Robison et al. (2002) stress the individual asset component, but while the first definition is situational and instrumental, the second is based on the motive as the foundation of what social capital is. On the other hand, other political science approaches tend to regard social capital as a collective good (Putnam 1993, Ostrom 1994). Alternative approaches look at social capital in terms of social, psychological and cultural beliefs (Inglehart in Rose, 2000:151). Another distinction is made between structural and cognitive social capital (Uphoff 2002:218; Krishna 2003), where the first refers to social organization characteristics including rules, procedures and networks, while the second is linked to the mental process also reinforced by culture, ideology and beliefs.

Probably the biggest contribution of the literature on social capital is the recognition of the importance of social relations for people’s livelihoods, development programs and economic growth. The concept has also brought closer together diverse social science disciplines such as sociology, political science and economics in the study of development. The major weakness or controversial aspect has been the operationalization of the concept. This is linked to the fact that social capital cannot be measured directly, similar to collective action.

Although social capital and collective action are closely linked, the focus here is on the latter. If social capital constitutes a stock variable that refers to the structure of social relationships, collective action can be understood as one of the flows associated with it (Uphoff

2000:215). Studies show that social capital facilitates collective action (Krishna 2003; Ostrom 1994, 1999; Putnam 1993, Schmid 2000:3; Dasgupta and Serageldin, 2000; Narayan and Pritchett 1997), so that empirical research must usually incorporate both concepts when analyzing collective action.

## DIFFERENT TYPES OF COLLECTIVE ACTION

In the literature, collective action has been described as taking various forms including the development of institutions, resource mobilization, coordination activities and information sharing (Poteete and Ostrom 2003). The purpose of collective action affects the level at which we have to analyze the phenomenon: which institutional level (operational, collective choice or constitutional level if we use Oakeson's (1992) institutional framework) and which social unit (individual, group, community, intra-community etc.).

Similarly indicators of collective action might differ depending on the specific objective of collective action. If we investigate collective action for the maintenance of an irrigation system or collective action for the constitution of a federation of watershed groups, indicators of collective action will again differ, or in any case not overlap entirely. Poteete and Ostrom's paper (2003) discusses how indicators had to be redefined when moving from the study of irrigation systems to forestry, and the tension of maintaining a common core set of measures even among forestry sites around the world.

It is also critical to identify the level at which collective action takes place. Many studies focus on community-level collective action, but not all forms of collective action take place at this level. Many microfinance programs use groups of ten to twenty members. McCarthy et al.'s (2002) study demonstrates the importance of cooperation among groups within the community, e.g. for water point management. Sultana and Thompson (2003) study the process

of fostering collective action in multistakeholder processes, and national federations of forest and water user groups in Nepal provide examples of larger-scale collective action. The appropriate units of analysis will therefore vary, depending on the research or policy question (Place and Swallow 2002).

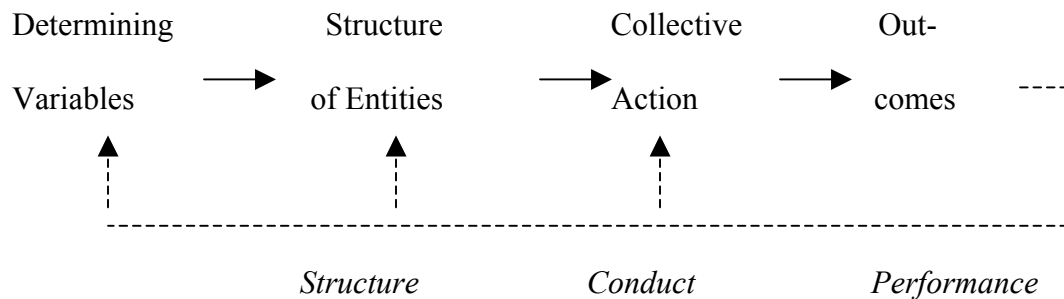
### **3. DEVELOPING AN ANALYTICAL FRAMEWORK**

Complexity of collective action relationships has been long recognized. There are three important contributors to this complexity: the high number of variables affecting collective action, the feedback relationships among many variables of interest (Agrawal 2002), and the adaptive nature of both collective action and its object, e.g. the state of, and management over, many natural resources (Wilson, 2002). Here we will focus only on a few of these aspects.

Clearly defining concepts, outcomes, decisions, actions, inputs, proxy variables, conditioning or explanatory variables, and the process of implementing collective action is the key to undertaking sound research on collective action. Definitions within each of these categories are not always clear, especially where social capital is taken to be a determining variable. Here the structure, conduct, and performance framework, first introduced by Bain (1959) in industrial organization theory, can be useful in distinguishing these different dimensions, and their interrelationships, as illustrated in Figure 1. One may consider that a number of factors influence the structure of groups, organizations or other entities, which in turn influence the conduct of the groups, especially with regard to collective action (a process). Yet neither the organizations nor the collective action itself are the ultimate objective: performance outcomes are important as well. Even this is not the end of the story, because feedback loops and co-movements of variables are likely to be important in a dynamic setting, indicating

endogenous relationships among many of the variables of interest, indicated by the dashed lines in Figure 1. Both qualitative and quantitative studies must take these interactions into account, and determine which variables can be safely taken as “given” in any one time period, and which variables are truly exogenous explanatory variables.

**Figure 1--Schematic of structure, conduct, and performance of collective action**



Because the structure, conduct, and performance of collective action all can change rapidly, as can many of their determinants, the potential for endogeneity and multiple feedbacks is important to consider when determining how to conceptualize the linkages, determine researchable questions, and collect the requisite data. This is the more so because of numerous proxy variables and the patterns between structure, conduct, and performance. However, failure to grapple with the complex nature of these relationships can lead to biased or misleading results.

#### **4. OPERATIONALIZING THE CONCEPT OF COLLECTIVE ACTION**

Two issues complicate operationalizing the concept of collective action. First, because collective action is a dynamic process that relates to social relationships, it is inherently difficult to measure directly. As a result, proxy indicators are generally used. However, because the manifestations of collective action can vary over time and also across cultures and communities, it is difficult to find comparable measures across sites and study periods. Formal collective

action that takes place through clear organizations may be easiest to recognize, and even to compare across sites, but focusing only on such easily measured forms may miss the most important instances of collective action, and may bias the study toward communities or societies which are more likely to use formal organizations.

A second complication arises from the distinct methodological approaches used by different social science disciplines, which affect how the concept of collective action is applied in practice in various studies. Each discipline and approach has something important to offer, and none (thus far) covers all aspects equally well. More traditional economic analyses tend to focus on the incentives of individuals to participate in collective action, generally taking as given the institutional framework. Institutional economics has broadened the scope to include endogenous choice over the institutional framework, though individual incentives and bargaining power of individuals largely remain the driving forces in those analyses.<sup>8</sup> Sociological approaches, on the other hand, tend to look at the behavior of groups as units of analysis and how motivation for action can be shaped at the group level through social networks, organizations, and even ideology.<sup>9</sup>

What is required is a means of bringing together the various disciplines so that they can first understand each other. Ultimately, it would be good for studies to combine methods, or at least choose the methods that are most appropriate for the questions being addressed, rather than because of the familiarity or disciplinary background of the researchers.

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<sup>8</sup> Some economics literature, including experimental economics (Cardenas and Ostrom (forthcoming)) explicitly recognizes that individuals give value to not only their own benefits, but also to the benefits that others receive, following evolutionary theories (Becker 1976) and game-theoretic models of altruistic behavior (Axelrod 1981).

<sup>9</sup> For example, White and Runge (1995) found that, in determining who participated in watershed management activities, membership in Protestant religious groups played a bigger role than owning land in the watershed.



In the remainder of this section we first introduce concerns regarding scale issues and then briefly review different approaches to studying collective action.

## SCALE OF ANALYSIS

The scale of analysis that is appropriate to a specific study depends on the phenomenon investigated and on the research question to be addressed. For the purpose of this paper we distinguish temporal and spatial scales.

Spatial scale: Some forms of collective action occur between a few people or households; others may operate at the landscape, national, or even global level. Many natural resource management practices such as irrigation, forestry, rangeland, or watershed management require cooperation among individuals (Knox and Meinzen-Dick 2001). Studying such collective action needs to take into account both social unit as well as resource units, which often differ. Studies of collective action in irrigation (e.g. Meinzen-Dick, Raju and Gulati 2002; Bardhan 2000) have tended to define the units of analysis in terms of the hydraulic infrastructure, but Swallow et al. (2002) argue that social units may be the more appropriate. McCarthy et al.'s study (2002) uses multiple units of analysis, including the community, groups and institutions within the community. This study also included household-level data on participation in collective activities as well as outcomes from collective action. In some cases it may even be relevant to collect intra-household data, e.g. on determining who within a household participates, or how the distribution of costs and benefits of collective action differ among individuals in the same household.

When understanding of collective action in terms of its effectiveness requires multiple units of observation and analysis, including individuals, groups, farms and landscapes, perceptions of different dimensions of effectiveness may well differ among respondents. Sorting

out how to integrate and interpret disparate responses presents a challenge. Particular care is needed to distinguish between the responses of group leaders and other members, as they are likely to have different knowledge, viewpoints and biases.

In statistical analysis the appropriate sample size is affected by the level at which data will be collected. For analyzing who participates in a particular type of collective action, a sample of 200 households in, say, four villages may be sufficient ( $n=200$ ). However, for analyzing the factors affecting whether a particular type of collective action occurs in a village, that same sample would be insufficient ( $n=4$ , because the dependent variable is a village-level variable). One constraint to past analyses of collective action has been that they were limited to one or a few communities, and hence sample size was limited. The studies by Place et al.(2002), Krishna (2003), Berhanu et al. (2002), and McCarthy et al. (2002) represent important advances in collecting comparable data from a larger number of sites, to allow quantitative as well as qualitative analysis.

Temporal scale: If we want to investigate changes in collective action over time, we need long-term analysis based on historical or time series data, which presents a number of difficulties: collecting time series data requires consistency over time and often involves expensive long-term studies. Statistical analysis becomes complicated, particularly where many variables are endogenous. For instance, at any one point in time, researchers may safely take the existing bundle of property rights as given in order to understand the impact of land tenure on collective action; but over time, we expect these two variables to have two-ways effects, e.g. when collective action and property rights affect each other recursively. Looking at a “snapshot” simplifies the statistical analysis, but explains only current conditions, and may miss out on collective action that occurs only episodically. Furthermore, collective action may be created to

serve a temporary need and therefore the dissolution of groups, or lack of activity, may not be a bad thing. Also, effective collective action may warrant rapid adaptation and change, meaning that timing of data collection may be of particular importance. Descriptive methods, including historical accounts, are often preferred when investigating long-term changes in institutions. These provide a broad lens to understand the mechanisms of change operating in a specific context. The main problems with this approach, as with case studies more generally, is that the accounts tend to be quite context specific.

### QUALITATIVE APPROACHES

Qualitative data collection and analysis is a useful starting point for studying collective action, especially when all the manifestations of collective action and the key institutions are not understood. Qualitative methods are flexible, allowing researchers to adapt hypothesis and methods to fit the local situation. While many may see qualitative and quantitative methods as opposing, in reality they can be extremely complementary, particularly in the study of collective action. Qualitative methods can be used to design and implement quantitative methods and to interpret quantitative information when used in an iterative manner; on the other hand, information from quantitative studies can help researchers choose case-study sites for more in-depth analysis.<sup>10</sup>

Specific data collection techniques include participant observation, detailed case studies, unstructured or semi-structured interviews with key informants or focus groups, oral histories, a

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<sup>10</sup> For more on combinations of qualitative and quantitative methods, see Kanbur 2003.

range of participatory research and visualization techniques such as community mapping exercises, seasonality charts, matrix ranking exercises, and Venn diagrams.<sup>11</sup>

An advantage of many qualitative techniques is that they allow researchers to build rapport with respondents, who in turn can provide the insider's view and understanding of the situation. The process can identify relevant institutions that might otherwise be overlooked, as well as elicit information on rules, norms, and attitudes that have a strong bearing on collective action. Qualitative information can also be collected on the process by which people actually make and implement collective decisions, and the process of institutional change. Dispute or key event analysis, and historical or trend analysis all provide a time dimension, which can reveal the important dynamics of collective action. Carefully selected focus group or key informant interviews allow a cross check on information, either by members within the group or by subsequent interviews. Participatory techniques may even help communities to identify common interests and catalyze collective action.

Qualitative approaches also have their limitations and potential dangers. Because neither the questions nor the analytical techniques can be fully specified in advance, qualitative research requires skilled personnel to collect the data and facilitate processes (Sultana and Thompson 2003), much has to be analyzed on the spot, even to identify the appropriate follow-up question. Different interests or skill levels between interviewers can bias the results, as noted in McCarthy et al.'s article (2002), where one interviewer got consistently different results than the others. The focus of interviews may shift rapidly, making it difficult to compare responses from different interviews, though checklists of key information can help in this regard. Excess information can also be a problem, such that it is difficult to sort out what is most important.

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<sup>11</sup> Many participatory techniques can also be used to generate quantitative data (e.g. Galdwin, Peterson and Mwale 2002). The difference between participatory and conventional, or extractive, data collection lies in the extent to which community members, as opposed to researchers, are engaged in the analysis and even in charge of the agenda.

Here software such as HyperResearch can be useful for sorting out the responses on different topics.

Despite the perceptions that qualitative research is “quick and dirty,” in fact good qualitative data collection is both time-consuming and expensive (because of the need for skilled data collectors, and the fact that the number of interviews and time spent in different data collection activities is likely to be far greater than standard household surveys). As a result, qualitative data are almost always collected for a smaller sample size than most surveys. This raises important questions on how representative the data are. Particular care therefore needs to be given to the sample selection: even if a site and respondents are purposively selected, the criteria and rationale need to be clear. The same applies for the composition of focus groups: interviewing whoever shows up at a meeting may lead to respondent bias, and the presence of certain people (e.g. high-ranking men, or government agents) may repress the voices of others. It is important to be aware that there are different historical perspectives, even within a social group, but to also be careful that the research does not stir up further conflict. The reliability of data collected will also be subject to the limits of respondents’ memory and knowledge. Rather than assuming away any biases or trying to control for them statistically, qualitative researchers should be aware of the likely biases of respondents, and even make that part of the analysis.

## QUANTITATIVE APPROACHES

Quantitative approaches are particularly useful for generating results across a sample population, since the sample itself should be drawn with the express intent of ensuring representativeness. Multivariate analyses enable researchers to isolate the impact of one variable on collective action and/or the outcomes of collective action, holding constant the impact of all other variables thought to affect collective action or its outcomes.

One of the first difficulties with applying quantitative methodologies is to quantify the benefits to collective action outcomes. As discussed in Place et al. (2002), some benefits are tangible and (relatively) easily measured, such as the value of increased access to irrigation water; while others are tangible but are very difficult to measure, particularly if such benefits accrue over time, such as with soil erosion control measures and various agroforestry techniques. Other benefits are less tangible, and even more difficult to measure. For instance, belonging to self-help groups where neighbors provide cash or labor if the household suffers an adverse shock, may yield measurable benefits in terms of direct payments or value of labor, but the reduction in vulnerability to such shocks should yield still higher benefits for those that are risk-averse. This latter value is very difficult to measure, not the least because it is difficult to distinguish how risks are valued differently across households.

Provision of many public goods is a function of quality as well as quantity; how well waterpoints are maintained, how well soil erosion control measures are constructed and maintained, etc. Sometimes, researchers use questions that ask respondents to rank the quality of different services, but this can yield potentially misleading results if respondents in different communities have different “reference” points for assessing quality. Place et al. (2002) consider some of these measurement issues in their paper; for instance, they note that it may be better to train enumerators in assessing quality, since the enumerators can then use a standard reference point enabling comparisons across communities. Poteete and Ostrom (2003) discuss how the research protocols of International Forestry Research Institute (IFRI) use biophysical scientists to collect measures of forest conditions that are as consistent as possible from site to site, even across continents. Recent quantitative research supports the notion that it is best to collect a wide range of indicators. Berhanu et al. (2002) are concerned with restricted access grazing

areas, and identify a number of collective measures each of which are measured and regressed separately. McCarthy et al. (2002) also consider a number of outcomes both in terms of natural resource management (e.g. use of common pastures, land allocation patterns) as well as in provision of public goods (soil erosion control, reforestation activities); statistically significant explanatory factors do indeed differ across regressions. On the other hand, Krishna (2003) develops an index of development performance; to do so, he performs a factor analysis on a number of outcomes associated with collective action to derive a unique indicator of performance that is comprised of this range of outcome variables.

Assuming that one can identify and measure collective action outcomes, one is then immediately confronted with the difficulty of measuring one of the key variables thought to affect successful collective action, “social capital”. The hypothesis is that, in communities with greater social cohesion in terms of shared norms and values, and trust amongst members, undertaking collective action will be easier (less costly). But, it is quite another thing to identify indicators of social cohesion that apply across communities; that is, that are comparable measures across all of the sample units. Krishna (2003) develops an indicator of the cooperative capacity within a village based on household-level information on participation in labor-sharing arrangements and measures of trust, solidarity and reciprocity. Similarly, McCarthy et al. (2002) use factor analysis to develop indicators of cooperative capacity, based on community-level information collected on network density and active participation. As shown in Krishna and McCarthy et al. (2002), indicators of cooperative capacity are often highly correlated; in these cases, one cannot include all variables as explanatory variables in a regression analysis because of multicollinearity—thus the advantage of using factor analysis in the first stage of analysis. However, researchers and policymakers may expressly wish to test which of the facets of social

cohesion and/or cooperative capacity appear to affect collective action outcomes more strongly. For instance, ethnic and/or economic heterogeneity are often posited to reduce cooperative capacity and social cohesion, but does either really lead to poorer collective action outcomes? Thus, the papers by Berhanu et al. (2002) and Place et al. (2003) directly use such indicators as regressors in equations of collective action outcomes, as do McCarthy et al. (2002) for a subset of regressions.

Quantitative analyses can be extremely useful for exploring the determinants of successful collective action; but, a lot of preparatory fieldwork must be done up front in order to identify collective action outcomes and indicators of cooperative capacity that are comparable across the population under consideration. Careful thought must also be given to issues of endogeneity and thus what information can be collected that would enable researchers to instrument for potentially endogenous variables.

## EXPERIMENTAL GAMES

Vernon Smith, who won a Nobel Prize for his work on experimental economics, states that “experimental economics applies laboratory methods of inquiry to the study of motivated human interactive decision behavior in social contexts governed by explicit or implicit rules”<sup>12</sup>. Under an experimental game framework, researchers typically design hypothetical situations (the laboratory setting) including the rules governing how participants may respond to questions within a hypothetical framework. For instance, a researcher can give participants a list of payoffs that each individual might expect if they contribute to a hypothetical public good. If the researcher wants to test the value of communication, participants may not be allowed to communicate before decisions are made in certain stages of the game, but allowed to

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<sup>12</sup> Taken from [www.ices-gmu.org/article.php/368.html](http://www.ices-gmu.org/article.php/368.html).



communicate in other stages. The benefit of this method is the capacity to fully account for the externality that groups confront, and thus to be able to precisely measure the benefits from behavior that maximizes group rewards vs. behavior that maximizes individual rewards. One can also isolate and evaluate precisely specified rules within which players interact, and thus assess the impact of institutional design on players' choices. Cardenas and Ostrom (forthcoming) analyze how farmers in Colombia respond to an experimental game situation, where they are asked to consider how much firewood they would collect from a common forest; participants are given a list of payoffs so they can calculate how their own and others' decisions affect overall payoffs. The paper presents evidence that institutional rules affect participant behavior; in particular, facilitating communication amongst players leads to better outcomes than imposing a fine for over-collecting fuelwood.

There are some drawbacks, as well. When designing experimental games for the field, the design will necessarily be constrained by the capacity of the players' to understand the rules of the game. This is not trivial; many people (even those with Ph.D.'s!) have difficulty in understanding rather basic choice scenarios when stochastic variables are introduced, for instance. With complicated scenarios, one may be confounding cognitive difficulties with true incentive behavior. Additionally, experimental games may suffer from the same types of bias that often arises in the "willingness to pay" literature, which is also based on eliciting information from hypothetical questions. The framing of situations and particular questions might affect responses in ways not intended or anticipated by the researcher; participants may not take their decisions "as seriously" as they might when confronted with actual circumstances that demand a response by them. Playing with real money (equivalent, in many cases, to one day's wages) may make the games more real. And, testing the level of cooperation predicted by

experimental games against empirical measures of how much the same community cooperates in various arenas would provide corroborating evidence that would increase confidence in the results of games, but to date, this remains a major gap in the literature.

## ACTION RESEARCH

In action research, the researchers are not detached observers, but are engaged in interventions designed to foster collective action. Hypotheses are tested through a real-time experiment, with research designed to test and assess the actions or interventions. This involves putting ideas into action, analyzing process and outcomes, and adapting the program as the research unfolds. The iterative nature of such research is illustrated in the study by Sultana and Thompson (2003). This study uses a method called Participatory Action Plan Development (PAPD) to build consensus, through adaptive and participatory approaches. This approach follows Edmunds and Wollenberg's (2001) work on multi-stakeholder negotiation in the forestry sector, which favors strategic behavior and selective alliance-building to assure participation of disadvantaged groups. PAPD involves an exploratory phase, an information sharing and mutual learning phase, and an action phase. The action phase is a distinctive feature of action research, which can be combined with development projects designed by the community itself.

Action research covers a continuum in terms of involvement of the local people in the process, from participatory to non-participatory. but particularly for collective action studies, participatory approaches often preferred Involving communities in the research allows for combining local knowledge and external expertise to diagnose constraints and solve problems that are of concern to communities as well as researchers.

As with other research approaches, there are many techniques used in action research, but process documentation is a fundamental element, with continuous reflection on what is

happening. Participatory rural appraisal (PRA) techniques such as community land use mapping may be used for identifying needs and problems and planning the approach of the program. Monitoring and evaluation should occur throughout the study, and involve community members as well as researchers. Additional experiments can be included on relevant issues, with quantitative data collection and analysis included where feasible.

Action research is by its very nature dynamic, adapting to real-life situations, both anticipated and unexpected. The learning may be deeper, and may lead directly to change, potentially reducing the gap between theory and practice. When done in a participatory manner, action research empowers local people and facilitates social learning. At the same time, because the agenda is negotiated between researchers, communities, and other stakeholders such as the state, NGOs, or development projects, the result is a compromise that may not meet everyone's goals. In particular, adapting to each local situation may result in non-standardized approaches and data that make it difficult to compare across sites and contexts. As a result, lessons learned tend to be very localized and site specific. It is particularly difficult to say how such a process would take place without the research intervention—could similar communities do this on their own? Complex or unclear research issues and hypotheses can make monitoring and evaluation even more difficult. In observing a process, important factors may be overlooked, unless one knows in advance what is relevant. And even where action research is conducted in a participatory manner, there are still power relations involved, including between researchers, other project stakeholders, and different members of participating communities.

## 5. CONCLUSIONS

Many policies and projects for rural development that are supported by numerous donors and development agencies today, for agriculture, natural resource management, marketing, microfinance, and service delivery are based on the premise that people will cooperate at the local level, or even across different policy levels. In order to avoid the failures of the earlier community-based development programs it is important to base these policies on sound theoretical foundations. While much has been learned in the last decades on the determinants of collective action, there is the need to refine findings and improve empirical research methods so that it will be possible to inform policy makers on the best way to scale-up success stories.

Qualitative and quantitative analysis used together can complement each other and help reduce some of the weaknesses of single methods. For example qualitative analysis can inform the quantitative structure of the study, and thus lead to a more parsimonious model specification, and quantitative and qualitative analysis used in an iterative way can be used to cross-validate results. Process methods, such as action research, usually use both qualitative and quantitative techniques.

The choice of methods or the combination of methods to be used in the analysis of collective action depends foremost from the research question(s) of a study. Sharing knowledge of strengths and weaknesses of individual methods among disciplines can help identify best practice approaches that can produce comparable analyses and more robust results that, in turn, can assist policymakers, development practitioners, and groups themselves, to strengthen collective action for natural resource management and other key forms of mutual assistance.

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