

Community Watershed Management in Semi-Arid India:

The State of Collective Action and its Effects on Natural Resources and Rural Livelihoods

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INTRODUCTION

The Indian government accords high priority to integrated watershed management programs, especially in rain-fed and drought-prone areas. Investment in integrated watershed management requires cooperation among stakeholders at different levels. The ability of communities to initiate and sustain collective action often depends on internal socioeconomic characteristics and the biophysical and socioeconomic setting. There is a lack of knowledge of the factors that influence the level and effectiveness of collective action within the context of community watershed programs. This study uses socioeconomic data from 87 watershed villages in six districts of Andhra Pradesh, India, to develop indicators for the degree of collective action and examine its potential determinants. The study provides useful insights on how community institutions determine the level of collective action in watershed management and how such collective action is related to the overall performance and effectiveness of watershed interventions.

COLLECTIVE ACTION IN WATERSHED MANAGEMENT

Some of the investment activities of watershed management include construction of check-dams for infiltrating surface water, terraces for soil and water conservation, and tree planting. Watershed management potentially provides livelihood support for socially complex and diverse groups with differing entitlements and rights of access and use of resources. Sustainable management of such resources requires institutional mechanisms for fostering cooperation and coordination of the resource use and investment decisions among diverse stakeholders.

This study identifies two main components of collective action needed for the effectiveness of watershed management interventions. First are *enabling institutions* that enforce rules for operation and management of the various common assets and structures. These rules include mechanisms for conflict resolution, regulation of behavior, and agreed norms for sharing costs and benefits. Second is *organizational performance* - local mechanisms for coordination and implementation of watershed activities, including user groups, committees, and associations that

determine the objectives and basic structure of authority and decision-making. The level of collective action therefore defines the ability of the community to create operational frameworks to achieve the goals pursued by the community.

METHODOLOGY AND DATA

Standard data collection instruments were used at the community level to collect information from leaders, user groups, and key informants in each of the 87 watershed villages. Data included a range of issues that characterized the village and the watershed groups. This included multiple indicators for the level and success of collective action. The indicators span the types of group actions described above and are aggregated to develop indices of the level and effectiveness of collective action. Using these indices, the analysis investigates the determinants of the level of collective action and how this in turn influences its effectiveness in terms of changes in natural resource conditions and livelihoods of resource users. Along with other factors hypothesized to influence the success of collective action, the study analyzes how various facets of collective action determine outcomes such as improvement in soil and water conditions, and other natural resources on private and common lands.

This first-stage effect of collective action is captured by constructing an aggregate performance index for diverse outcomes defining changes in resource conditions and benefits derived from watershed management activities. In the second stage, collective action in watershed management is expected to improve the wellbeing of the community and participants. This is the key incentive for stimulating greater participation and private and community investments in watershed activities. To measure this effect, information solicited from communities on various indicators of poverty and welfare changes within the watershed is used. These changes are those that respondents consider to be primarily attributable or driven by the integrated watershed management interventions. The study then tests whether the level of collective action in fact is associated with these positive welfare changes within the community.



Without effective and adaptable local institutions, the long-term sustainability of watershed investments will remain questionable.

Level of collective action

Two sets of variables that capture the level of collective action in watershed management activities are considered. The index for enabling institutions includes rules adopted by the watershed community, percentage of watershed association members making cash and labor contributions, and attendance of meetings and fund-raising events. The organizational performance index includes proportion of smoothly running user groups, self-help groups, number of watershed association meetings per year, and percentage of members attending meetings.

Success of collective action

A mix of quantitative and qualitative indicators measures the effectiveness of collective action in watershed management in terms of achieving various community objectives, including number of improved or well-managed communal tube (drill) and open wells, check-dams, ponds, tanks, area of community forests, and share of communal and private land treated with collective conservation practices. In the second level of the analysis, seven indicators capture the changes in the level of asset endowments or poverty profiles in the surveyed communities, including increases in the number of households owning livestock and land, self-sufficiency in food staples, income growth, and reduction in seasonal and permanent outmigration.

RESULTS

This study shows that collective action in watershed management can be captured through a set of variables that indicate the capacity of communities to design and enforce certain common institutional arrangements, and their ability to mobilize local financial and labor resources for watershed investments. The index for enabling institutions is positively associated with rainfall, number of castes, number of phones, and female employment in watershed works in the community, and decreases with larger groups and degraded land in the community, market access, and urbanization.

The organizational performance index decreased with rainfall, size of the group, number of seasonal migrants, and distance from the seat of the local administration, but increased with area of the village, flow of information within the village, share of land under village commons, equitable distribution of benefits and preference given for employment of the rural poor and female workers. In most watershed communities the level of collective action is very limited: only 10%–15% of watershed communities were able to significantly harness the potential of collective action to achieve desired economic and environmental objectives. There is a strong

correlation between higher levels of collective action and higher performance of communities in facilitating resource-improving investments, especially water-harvesting structures and good management of these resources. The effectiveness of watershed groups in terms of their performance on this index depended on other variables such as rainfall, access to education and other social services, governance structures, resource degradation or scarcity problems, and the quality of the road linking the village. On the other hand, the correlation between higher collective action and changes in the index of poverty parameters was not statistically significant.

Changes in watershed natural resource stocks did not have a significant effect on changes in household welfare, indicating that the indirect effects of collective action on the poorest segments of the community are still limited. This offers evidence that the links between collective action and poverty are not always straightforward as distribution of rights and other factors will condition how effectively the poor may benefit from improved natural resource conditions within the watershed.

Overall, the results indicate that collective action has made a significant contribution in terms of improving the investment and management of critical jointly held natural resource assets, but evidence is still lacking on its effects on improving the asset endowments of the resource poor and reducing poverty levels within the semi-arid watershed villages included in this study. To improve active participation of the resource users and the poverty impacts of watershed programs, there is a need to promote pro-poor interventions and institutional arrangements that enhance equitable sharing of both costs and benefits. Future research needs to investigate how effective local institutions for watershed collective action emerge and how such institutions adapt during the post-project phase and influence the propensity for sustainable community management of local investments. Without effective and adaptable local institutions, the long-term sustainability of watershed investments will remain questionable.

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