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NUMBER 39, OCTOBER 2002

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## INNOVATION IN NATURAL RESOURCE MANAGEMENT: THE ROLE OF PROPERTY RIGHTS AND COLLECTIVE ACTION IN DEVELOPING COUNTRIES

EDITED BY RUTH MEINZEN-DICK, ANNA KNOX, FRANK PLACE,  
AND BRENT SWALLOW

**D**egradation of natural resources is a global problem that threatens the livelihoods of millions of poor people. Innovation by research centers, development organizations, and farmers themselves has produced many promising technologies and practices for making agriculture and natural resource management more sustainable. Most of these technologies, however, require investment by farmers, both individually on their own farms and collectively by groups or communities. The book, *Innovation in Natural Resource Management: The Role of Property Rights and Collective Action in Developing Countries*, edited by Ruth Meinzen-Dick, Anna Knox, Frank Place, and Brent Swallow, examines the factors that affect whether and how farmers apply sustainable agricultural technologies and natural resource management practices, giving special attention to the role of property rights and collective action.

The volume begins with a conceptual framework showing how property rights influence incentives to adopt innovations that have long time horizons, and how collective action is necessary for technologies or practices that operate on a socio-spatial scale above the individual farm. A chapter on methodology discusses how the concepts of tenure security and technology adoption can be put in practice in empirical studies that are relevant to policymakers and practitioners. Case studies from Africa, Asia, and Latin America then show the complex ways in which these institutions affect the adoption of a wide range of practices, from agroforestry techniques to rangeland management and from livestock feeding practices to integrated pest management.

### Property Rights and Long-term Investment

Although the effects of property rights on agricultural investment have long been debated, the evidence has been fragmented, owing in part to the poorly understood complexities of the rights of individuals and groups to land, water, and trees. Understanding the links between property rights and innovation requires looking beyond "ownership" as defined by government title. For private, common, or public property, there can be many different bundles of rights to use, manage, or transfer the resource to others. The household may not always be the relevant level to examine property rights: in Malawi, different rights held by men and women affect incentives for forestry and agroforestry, whereas in Syria, rights of tribal communities play a key role in rangeland management.

Tenure security—the extent of people's rights and how confident they are that their rights will be respected over time—affects people's long-term investments in technologies for managing their resources. The case studies in the book describe different tenure systems and examine their effects on investment and productivity. Evidence shows how tenure arrangements can be shaped by market forces (as in cattle feed access in coastal Kenya) and proximity to urban areas (as in land inheritance patterns in Malawi). Because tenure systems are dynamic they usually respond to population and commercialization forces to accommodate new technology that is beneficial to the community. Not all members of the community, however, will benefit equally. Where men of certain groups have primary rights, women and tenants who have weaker, derived rights may not benefit as much and may have different incentives. Tenure implications may also be embedded in the technology itself, as is the case where cashew nut trees are used as evidence for land tenure in Mozambique, and this situation may actually deter new investment. Finally, government

intervention in tenure policy may have positive or negative impacts on tenure security.

Property rights do not derive from state law alone; customary law and even local norms may be even more important sources. But if local institutions erode, customary property rights may also weaken. Indeed, cases from Haiti and Syria argue that state regulations formalizing tenure have reduced tenure security by weakening the social institutions that underpinned customary property rights systems, without replacing them with effective state institutions. In Ethiopia, state institutions were "effective" but only in enforcing policies that restricted individual and community rights.

### Collective Action for Landscape-level Innovation

Many natural resource management practices cannot be effective if adopted by a single farmer but require coordination across farms or even communities. The cases of ant control in Colombia and cattle treatment for tsetse fly control in Ethiopia demonstrate the need for collective action in pest management, as well as some of the practical difficulties in getting people to work together, even where there is a clear common good. The case of crop-livestock conflicts in Sri Lanka shows that achieving balanced resource management is even harder where different user groups are highly fragmented and have conflicting interests.

Like property rights, collective action is dynamic, changing in response to internal and external forces, including policies, projects, and the availability of innovations. In Syria, for example, some customary tribal institutions are effective in regulating rangelands, whereas others have eroded. In Kenya, the availability of new technologies for intensifying cattle feeding has led to farmer innovation in the institutions governing fodder access, as well as in the application of the technologies themselves. The results of participatory research on ant control in Colombia and tsetse control in Ethiopia were shaped by collective action, which in turn depended upon the pre-existing cohesiveness of the communities and the practical difficulties and transaction costs of cooperating. On the other hand, a study from Honduras found that although external government organizations stimulate individual farmers to adopt conservation practices, they appear to displace local collective action for natural resource management.

The importance of collective action goes beyond adoption of particular agricultural technologies. Policies devolving the management of irrigation systems, forests, fisheries, and watershed resources from the state to user groups are based on the assumption that local communities will act together to control resource use. If that cooperation does not materialize, then devolution will not

lead to sustainable management. The cases in this book are instructive because they analyze factors affecting the degree and type of collective action that emerges or takes place. Factors that can limit cooperation include ethnic heterogeneity, power differences, distance between farmers or to market, and rapid population growth or changes. Special attention may be required under these conditions.

### Conclusions

Simplistic policy prescriptions that call for giving title as a way to stimulate investment can be misleading, because there is more to tenure security than just statutory title and more factors influencing investment than just tenure security. Development practitioners also increasingly recognize the need for collective action for adoption of many technologies and natural resource management practices, but sustained local involvement requires more than just establishing organizations on paper. Promoting sustainable natural resource management requires an understanding of the interaction between local and external institutions and must build on local strengths. This volume provides both methodological tools and empirical findings to show how such an understanding can be developed and how it can serve as the basis for adoption of sustainable resource management technologies to improve productivity, equity, and the environment.

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