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Analysis

Economic incentives and natural resource management among small-scale farmers: Addressing the missing link

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ABSTRACT

Small-scale farmers face numerous challenges to invest in natural resource management practices. The problems are interlinked, with such perverse economic problems as high transaction costs and risk rooted in the lack of comprehensive institutional and organizational services to farmers for risk reduction and incentive creation. Failure to address such a missing link undermines success in natural resource management. This paper ponders the importance of such a missing link and proposes analytic framework that explicitly integrates the economics of natural resource management into institutional and organizational analysis. The framework features the instrumentality of integrated institutional and organizational innovation to create opportunities and incentives to small-scale farmers to encourage investment in natural resource management practices.
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1. Introduction

Natural resource management (NRM) practices implemented at a farm or a landscape scale provide valuable options to sustainably manage land, water and ecosystem resources for livelihood development and climate change adaptation (Rockström et al., 2010; Oweis and Hachum, 2009; Pathak et al., 2009; World Bank, 2008). However, efforts promoting such practices in the developing countries are often constrained by limited adoption and unsustainable use of practices among small-scale farmers (Cary et al., 2001). A plethora of factors contribute to this, where lack of sufficient economic incentives from related investments is among the most important (Molden, 2007; Adhikari and Lovett, 2006; Fox et al., 2005; Antle and Diagana, 2003; Pagiola, 1998).

Farmers' production and resource management decisions are dependent on the economic incentives they generate (Beal, 1997). According to the theory of induced technical innovation in agriculture, changes in agricultural management systems are attributed to changes in economic incentives facing farmers (Templeton and Scherr, 1997; Binswanger and McIntire, 1987; Pingali et al., 1987; Hayami and Ruttan, 1985). There are also empirical evidences showing the important role of economic incentives in affecting NRM practice adoption and use among farmers (Niesten et al., 2013; Suich, 2013; Campbell et al., 2012; Desta et al., 2000; Pagiola, 1998; Barbier, 1990). However, the hitherto limited scope of NRM practice adoption and use among farmers (Amare et al., 2014; Tefera and Sterk, 2010; de Graaff et al., 2008; Aklilu et al., 2007; Woldeamlak, 2007) makes it necessary to have a broader view on the issue perhaps through an improved understanding of the role of the peculiar economic attributes of NRM practices vis-a-vis the institutional and organizational environment that influence transaction characteristics and, consequently, the profitability and attractiveness of investments in such practices (ESIF, 2008; Haileslassie et al., 2008; World Bank, 2006a). Such line of departure for analysis would be useful in view of the necessity to reduce risk and improve economic returns from NRM related investments through institutional and organizational innovation, especially in the context of small-scale farmers who generally are risk-averse (Rosenzweig and Binswanger, 1993) while striving to maximize utility and profit (de Janvry et al., 1991; Singh et al., 1986) under cash, technology and institutional constraints and under limited resources to commit to NRM practices.

Institutional and organizational issues can reasonably be considered as crucial factors underlying the problem of poor economic incentives from NRM related investments by small-scale farmers in the developing countries (Giuliani et al., 2008; Adhikari and Lovett, 2006; Desta et al., 2000). The argument can be valid in consideration of the various problems of institutional and organizational nature prevailing in such countries (Herath, 2005) together with the problem of absent or underdeveloped markets for NRM and related service provision. Nevertheless, such dimension of the problem used to receive limited attention in the

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NRM policies and intervention programs of the developing countries (Darghouth et al., 2008; Desta et al., 2000). While the peculiar nature of natural resource related transactions deserves an institutional and organizational analysis of its own (Hagedorn, 2008), there is also a lack of profound coverage of the issue in the development literature (Haileslassie et al., 2008; Clemens, 2006; Barrett et al., 2005). This paper ponders such dimension of the problem in an attempt to propose a framework for institutional, organizational and economic analysis to improve farmers' economic incentives from NRM related investments. The next section provides a theoretical background on the link between institutions, organizations and economic incentives, followed by framework discussions for institutional, organizational and economic analysis and innovation. Finally, the paper provides an overview of empirical evidence to lend support to the issues and propositions raised in the framework. The paper concludes by discussing the advantages of using the proposed framework in promoting NRM programs.

2. The Link Between Institutions, Organizations and Economic Incentives

Institutions are the rules of the game or the humanly devised constraints (formal and informal) that shape human interaction (North, 1990, 1993). Organizations are groups of individuals engaged in purposive activities as players of the game (North, 1993). As rules of the game, institutions shape organizations and govern people's behavior through the opportunities, incentives and sanctions created and imposed. The types, functions and services of organizations, including the specific rules they follow and the behavior of and interactions among their service users, are embedded in the institutional environment in which they function. Institutions and organizations and the nature and evolution of their interaction shape economic incentives of individuals and groups by creating or denying opportunities (Dorward et al., 2009).

Institutions and organizations matter to improve the incentives of economic agents by addressing the problem of transaction costs, bounded rationality and imperfect information faced. Accordingly, institutional and organizational innovation can be considered as key option to improve farmers' economic incentives from NRM related investments (Merrey and Gebreselassie, 2011; Darghouth et al., 2008; Hagedorn, 2008; Cortner et al., 1998). Institutional mechanisms for collective action coordination and property right enforcement and availability of credit, insurance and information service providing organizations directly or indirectly affect the costs, benefits and uncertainty associated with investments in NRM practices and, consequently, the profitability and attractiveness of such practices to farmers. Institutional arrangements that coordinate resource use and management practices at a community level tend to influence farmers' management decisions and actions, both as individual actors on their farms and as group actors in using and managing common-pool resources. Organizations that promote access to credit services at terms that consider the unique characteristics of NRM practices, especially the long time required to realize the returns, tend to enhance NRM practice adoption among farmers.

However, institutions and organizations in the developing countries are considered generally weak to address the problem of transaction costs, bounded rationality and imperfect information faced by economic agents (Herath, 2005). This is expected to be a missing link in the process of NRM among small-scale farmers in the developing countries. As discussed in House et al. (2008), Pascual and Perrings (2007) and Davis and North (1971), the need and possibility to generate economic incentives that cannot be captured within the existing arrangements may necessitate institutional and organizational innovation to form new arrangements. The pivotal role of institutions and organizations in creating opportunities and incentives, therefore, makes it relevant to strive for such innovation to address the missing link in NRM. The process can be informed through institutional, organizational and economic analysis focused on understanding the economics of NRM practices and the institutional environment and the organizational setup (Fig. 1) that shape the cost, risk and incentive structure of investing in such practices.

3. A Framework for Institutional, Organizational and Economic Analysis

The new institutional economics (NIE) is credited for laying down the theoretical foundation to approach economic problems through institutional innovation. Based on the premise that institutions influence incentives in economic exchange (Herath, 2005; North, 1990) the NIE invoked the necessity for institutional innovation to improve economic efficiency in societies by addressing transaction cost and market imperfection related problems. Notwithstanding the evolving theoretical and analytical metamorphosis in the NIE (Williamson, 2000), the development policy literature suggests taking an institutional economics perspective in analyzing the development problems of developing countries, including the challenges in agricultural and rural development and NRM. This is mainly associated with the incomplete nature of conventional economic analysis which predominantly focuses on the role of market mechanisms and prices, by downplaying the importance of transaction costs and the role of institutions to inform decisions and policy making on the management and optimal use of natural resources (Kant, 2005; Hatzius, 1997). Similarly, Kirsten et al. (2009) assert the particular relevance of the NIE approach to address the challenges of agricultural development in poor rural economies since its analysis embraces the problem of imperfect information and associated institutional issues. Kydd et al. (2009) suggest approaching the management of natural, ecological and environmental resources from the NIE perspective to get insights useful to address the problem of poor economic incentives, market failure and poor social coordination. However, the relevant NIE literature on NRM is mainly focused on issues related to collective action coordination and property rights, with less emphasis given to the issue of economic incentives. The proposed framework in this paper extends institutional analysis in NRM to a frontier that allows explicitly addressing the issue of economic incentives as an integral component of innovations and intervention programs.

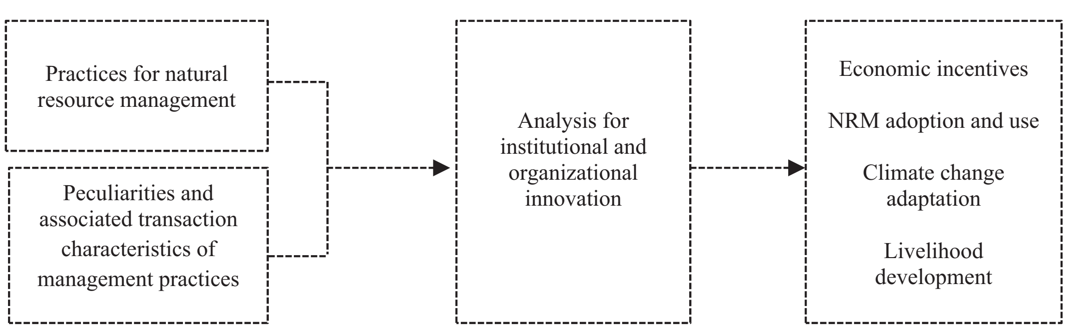

Fig. 1. Institutions, organizations and economic incentives for natural resource management.

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