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The role of institutions and social learning in soil conservation innovations: Implications for policy and practice

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ABSTRACT

Numerous economic, technical, and social challenges hinder farmers from adapting and adopting soil conservation measures in Ethiopia. Yet, some successful soil conservation measures are emerging in projects dedicated to sustainable natural resource management. This paper explores the role of institutions and social learning in changing the conventional top down technology transfer challenges to conditions that are conducive for soil conservation. The study was conducted by considering a successful soil conservation case in Ethiopia. Semi-structured interviews and workshops were used to collect data. In addition, the review of pertinent documents and literature was considered to complement this analysis. Innovation history analysis has been used as an approach to analyze the important events in the innovation process.

The findings show that social learning has created opportunity for more understanding on soil conservation and the emergence of less hierarchy amongst actors. It has also created space for the application of both indigenous and scientific knowledge in the innovation process. Farmers' organizations and their institutions are viewed as the core to the innovation process in leading and facilitating social learning, and in the formulation of bylaws. Hence, based on our case study we suggest that social learning and local level institutions may encourage soil conservation whenever lack of common understanding on soil conservation problems and solutions exists among the actors.

1. Introduction

The understanding of soil conservation innovations requires analyzing the complex relationships that occur among various actors and institutions. The behaviors of actors are governed by institutions (North, 1990). Actors consider the costs and benefits of certain behaviors and act according to their underlying values and preferences specifically, based on the information they have about the state of the world, the intention of other actors and the threat of social sanctions (Rudd, 2004). In soil conservation, actors must agree on a number of common rules and procedures that govern their behaviors and facilitate the collective action needed for soil conservation (Spielman et al., 2009). In order to reach an agreement, some form of interaction is needed to allow actors an opportunity to define their interests, to exchange knowledge and to mobilize resources. As Rist et al. (2006) suggested

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social learning is one option to exchange knowledge among actors. Social learning encourages the innovation processes through the generation and dissemination of knowledge (Röling, 2009; Spielman et al., 2009). Spaces such as social networks, platforms and social movements play a significant role in the generation and dissemination of knowledge (Steins and Edwards, 1999).

Based on the literature, in sub-Saharan Africa, different efforts were made to reverse soil degradation through the introduction of learning platforms, institutions and various actors in the agricultural extension system. Although these efforts have produced some success, only a few conservation technologies have been adopted on a wider scale (Shiferaw et al., 2009; Ekop and Osuji, 2003).

In Ethiopia, the Ministry of Agriculture has made considerable efforts to reverse the long-term soil erosion problems through the promotion of soil conservation innovations such as terraces and checkdams (Hurni, 1993; Bekele, 1997; Bekele and Holden, 1999; Bekele, 2003). The efforts include provision of hand tools, training of farmers and providing incentives such as food-for-work in food insecure districts (Tefera and Sterk, 2010). However, most studies show that the efforts made so far have not succeeded in triggering voluntary adoption of conservation innovations (e.g. Bekele, 1997; Tefera and Sterk, 2010). For instance, most of the soil and water conservation structures were destroyed during the regime change in 1991 (Bewket, 2007). Reasons for failure were related to the top-down approach in planning and implementation during the Derge regime (Beshah, 2003). In other words, the conservation measures neither address the farmers' needs nor their prevalent farming system (Bewket, 2007).

In the 1990s, some measures were taken to involve farmers through a participatory watershed management approach; yet, experts from agriculture still dominate the design and introduction of technologies. This has been confirmed by recent studies of Gebremedhin et al. (2006) and Spielman et al. (2011), in which three major challenges were identified. The first challenge is related to the design and implementation of soil conservation policies, which places emphasis on formal organizations for the innovation process. A continuous focus exists on linear modes of technology transfer, from experts to the farmers. Secondly, facilitation of innovation among farmers with experts, researchers, and NGOs was not an easy exercise. The ability to bring those possessing indigenous knowledge closer to those possessing scientific knowledge determines the facilitation of the innovation process. This was a difficult task due to the top down and supply driven nature of the agriculture extension system. Thirdly, a challenge also exists on how actors interact among themselves and with institutions. This challenge was associated with difficulties related to, for example, agreeing on rules and procedures, creating trust, and the monitoring of opportunistic behavior.

The Ethiopian government recognizes the important role of innovation systems in transforming agriculture and this thinking has been reflected in its strategies. For instance, the Agricultural Development-Led Industrialization (ADLI) strategy of Ethiopia outlines the important roles of government organizations (research, extension and education service) as pillars of the country's formal innovation system (MOI, 2002). It also promotes the adoption of new agricultural technologies to increase agricultural productivity, with the primary objective of transforming the agriculture based economy to an industry based economy overtime. The current Growth and Transformation Plan of Ethiopia (GTP) further underscores the important role of agriculture in the economy. GTP covers wide sectors such as agriculture, mining, trade and industry, rail network, road, telecommunications, energy, health, and education. In the agriculture sector it focuses on agricultural productivity, research and natural resource management (MOFED, 2010). It also emphasizes the need to strengthen research–extension–farmer linkages through research–extension–farmer councils. The agricultural research strategy programs mainly cover crop sciences, animal sciences, soil and water conservation, and agroforestry. Until 1994, the agriculture research was taking place under the national Institute of Agricultural Research. After 1994, most of the research centers were transferred to regional governments following the decentralization policy of the country (FDRW, 1999). However, the research has limited scope to address the real problems of farmers and most importantly the linkage between researches–extension–farmers has not been strong due to the limited interaction between farmers, experts, and researchers thus, the dissemination of successful innovations is limited (Belay and Degnet, 2004).

Some successful soil conservation innovations, however, have been realized in Ethiopia. The gully rehabilitation innovation in the Amba Zuria watershed is one example. Here, success stories in land management are defined by the area of land in which soil and water conservation measures were adopted (FAO, 2002). Before the implementation of the Sustainable Utilization of Natural Resources project in Amba Zuria watershed, soil erosion was a big challenge in the area. Literature (e.g. Desta et al., 2000) shows that the North Gondar zone including the case study area has been severely affected by soil erosion and estimates show that between 51 and 200 tones/hectare of soil is lost every year. Moreover, in the case study area the main pedestrian paths were blocked due to the damage caused by gully erosion. Hence, farmers had difficulty traveling to the nearby market or attending any public event (GZADO, 2010). The soil degradation problem in this area was the prime reason for the introduction of the Sustainable Utilization of Natural Resources project in Amba Zuria. The core issues of the project were organizational development of land user communities, conservation of soil and water resources and promotion of innovation activities to increase agricultural production (SUNRPO, 2010). Activities such as adoption of stone terraces and checkdams, spring and irrigation development, afforestation, and building access roads were practiced. Especially in gully rehabilitation program, many gullies were rehabilitated and changes were realized promptly. For instance, after two years of rehabilitation work, the gullies are now grounded at level and no gorges have been seen on the site, farmers are now harvesting grass and foraging leaves for cattle feed from these rehabilitated gullies (GZADO, 2010).

Moreover, due to the intervention of the project stone terraces were adopted in 360 ha of farmland, 8.5 km of gullies were rehabilitated, and in order to stabilize the check dams 461,210 tree seedlings, and 300,998 grasses were planted in the years between 2007 and 2010 (GZADO, 2010). Watershed