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Applying Ostrom's institutional analysis and development framework to soil and water conservation activities in north-western Ethiopia

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ABSTRACT

Sustainable land management is of utmost importance in Ethiopia and relies on Soil and Water Conservation (SWC) measures collectively implemented by smallholders through participatory processes. This paper contributes systematic evidence on how SWC strategies are implemented and how participation is operationalized. Drawing upon inductive, qualitative research, we explore the design, implementation and evaluation of SWC activities, as they relate to Ostrom's Institutional Analysis and Development (IAD) framework, in order to determine how the activities can be made more appropriate, effective and sustainable. Findings show that on all levels of Ostrom's framework, there are shortcomings in the SWC institutions, which have to be addressed with more participatory approaches, a change from top-down to bottom-up measures, and economic incentives for farmers to invest in SWC measures instead of e.g. compulsory labor, and the integration of so far neglected groups like youth, women and the landless.

1. Introduction

Sustainable land management is of utmost importance in Ethiopia. The agricultural sector generates a significant portion of the country's gross domestic product, about 41%, according to World Bank (2017). It is also essential because the large majority of the population, above 80%, is reliant upon agriculture for their livelihoods, primarily as smallholder farmers (CSA, 2008; World Bank, 2017). However, little has been done to preserve land resources compared to the magnitude of the land degradation problem (Bewket and Sterk, 2002; Hurni et al., 2010). Despite decades of recognition, and some degree of activity to enhance soil conservation and rehabilitate lands, significant challenges remain. In order to understand why existing soil and water conservation (SWC) activities are not working effectively, we draw upon Ostrom's (2007) Institutional Analysis and Development (IAD) framework in the Upper Blue Nile Basin (UBNB) of Ethiopia.

There is currently a limited amount of research available on SWC activities in Ethiopia. The objective of the paper is to contribute an important systems perspective to the available evidence and thus provide new insight into SWC activities in Ethiopia. Drawing upon inductive, qualitative research, we explore the design, implementation and evaluation of SWC activities, as they relate to Ostrom's framework, in order to determine how the activities can be made more appropriate, effective and sustainable. The IAD framework was selected because the activities of SWC largely concern collective action for the provision of collective services (i.e. the commons). The structure of this paper follows the flow of Ostrom's framework, namely: context, action arenas, patterns of interaction, evaluative criteria and recommendations that can inform policy reform. Before delving into these details, we present an overview of the analytical framework and the methods used for this research.

2. Institutional analysis and development (IAD) framework

Ostrom's IAD framework has been widely employed in research aimed at studying local management of common resources (Benson et al., 2013; Clement and Amezaga, 2013; Rudd, 2004). The IAD framework provides guidance for highlighting key insights on institutional, technical, and participatory aspects of collective SWC interventions, or the commons problem, and their resulting effects. At the

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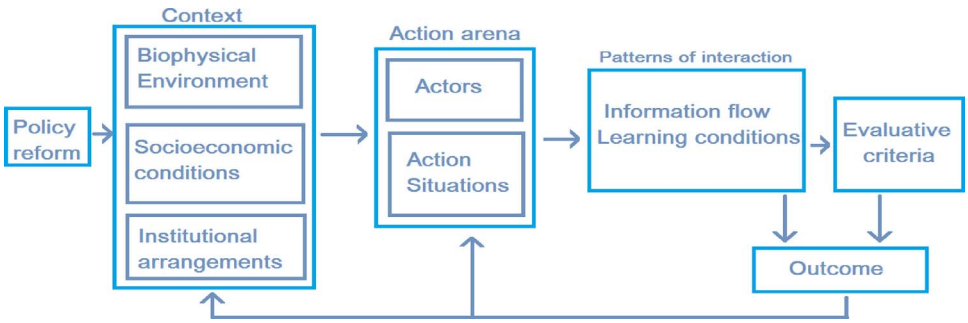

Fig. 1. The IAD framework.
Source: Ostrom et al. (1994).

framework's core is the 'action arena'. The action arena is composed of an action situation and actors. The action situation refers to a social space where the actors interact, solve the commons problem, and exchange goods and services; the actors are those who participate in the situation (Ostrom, 2007; Ostrom et al., 1994). In the Ethiopian SWC case, the action arena was assumed to shape the efforts towards sustainable watershed management.

By following the steps in the IAD framework (Fig. 1) and using the action arena as the unit of analysis, the analysis systematically follows the path of decision making from pre-planning to planning, on to execution and also ensuring the sustainability of a project. When the action arena and its associated rules are evaluated against the background of watershed development projects in terms of their structure, management, and outcomes or performance in community engagement, the results can provide useful guidelines for practitioners regarding how and where to act to improve the broad societal value of ongoing SWC projects.

In the action arena, interests of the different stakeholders confront and planned initiatives are (re)shaped. Therefore our approach is first to analyze, what was planned by official interventions and which administrative set up has been installed, then to compare the planned changes and the real ones. The region chosen for the investigation is the UBNB where planned change with the "community participation" strategy has been implemented for more than five years. As set out in government documents (e.g., MoANR, 2017; MoFED, 2010; NPC, 2016), SWC development works have been and are going to be widely executed across degraded watersheds through community participation to achieve sustainable land management. The ongoing initiative was launched in 2010, following the release of the country's 5-year Growth and Transformation Plan (i.e., GTP-I (2010/11-2014/15), followed by the GTP-II (2015/16-2019/20)) (MoFED, 2010; NPC, 2016). Therefore we were able to examine the pre-planning and planning processes, implementation, participation of marginalized and disadvantaged groups, and monitoring and evaluation (M&E) systems.

3. Contextualizing land degradation

Land degradation, a process that involves a decline in the processes and productivity of ecosystem goods and services provided by land (e.g., soils, water, vegetation) (Vu et al., 2014), poses enormous challenges to both humanity and ecological systems. This challenge is experienced across all regions in the world (Vu et al., 2014), but particularly in sub-Saharan Africa, which has the highest rate of land degradation (Tully et al., 2015). In the United Nations Convention to Combat Desertification (UNCCD) conference, poor management of land resources was identified, among other factors, as an important driver of land degradation (Kust et al., 2016; UNCCD, 2009). As a result, sustainable land management practices offer synergistic solutions in protecting land from being degraded and in restoring degraded land (Akhtar-Schuster et al., 2011; Kust et al., 2016). Hence, parties in developing countries (e.g., Ethiopia) that have been affected by land degradation have been receiving support (e.g., technical guidance, finance, and knowledge transfer) to mainstream land degradation and sustainable land management issues into their national policies and frameworks (Akhtar-Schuster et al., 2011). We employ Ostrom's IAD framework as a means to evaluate SWC activities within this context of land degradation, analyzing the broader environment that is influencing the challenges related to land degradation and restoration as well as the development of more sustainable land management practices.

Soil degradation due to water erosion from heavy rains (Ayele et al., 2016), overgrazing (Alemayehu et al., 2013), conversion of marginal lands to croplands (Bewket and Sterk, 2002), and inappropriate farming practices (Astatke et al., 2003) remain major threats to sustaining agricultural yields and soil fertility. Hurni et al. (2010), for example, estimated that soil loss due to water erosion of cultivated fields in Ethiopia amounts to about 42 Mg ha^{-1} $year^{-1}$. Considering that substantial efforts to promote soil conservation and environmental rehabilitation have been on-going for four decades (Bayabil et al., 2010; Dessie et al., 2012), the continued loss of this amount of soil due to water erosion suggests these efforts have not sufficiently and/or appropriately addressed the causes. Recent national strategies and policy documents in Ethiopia have also considered combating land degradation as one of the most important development priorities (MoANR, 2017; NPC, 2016).

However, soil conservation and environmental rehabilitation interventions have had little success in bringing about the voluntary uptake of improved SWC technologies by smallholder farmers to tackle soil degradation problems in the drought-prone highlands of the UBNB (Dessie et al., 2012; Smit et al., 2017; Tesfaye et al., 2014). The lack of integration from the different disciplines and sectors (German et al., 2007), limited stakeholder participation (Bewket and Sterk, 2002; Smit et al., 2017), inappropriate incentives such as food-for-work programs (Amsalu and de Graaff, 2006), rigid technical packages, unmanageable planning units (Desta et al., 2005), and top-down extension systems (Amsalu and de Graaff, 2006; Dessie et al., 2012; Smit et al., 2017) have been reported as limiting factors to success.

Evidence suggests that without localized participatory initiatives, there will be limited widespread adoption of exogenous SWC technologies by smallholder farmers (Desta et al., 2005; German et al., 2007). These factors influenced the Ethiopian government, with the support of the FAO, to pilot community-based participatory watershed development approaches from 1988 to 1991 (Desta et al., 2005). Following this initiative, various international agencies (e.g., WFP (United Nations World Food Program), GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit)) have adopted similar, but scattered, watershed development approaches (Desta et al., 2005) to support the government's efforts to improve the land resource base. Community-based participatory watershed development guidelines were formulated in 2005, the intent of which was to provide adaptable planning and implementation tools (Desta et al., 2005).

Recently, a growing body of work (e.g., Amare et al., 2014; Amsalu and de Graaff, 2006; Haregeweyn et al., 2012) has shown some positive outcomes in sustainable land management in Ethiopia in general and the UBNB in particular. However, intervention programs still lack a concerted focus on sustainability issues from their early diagnostic phases and instead start considering sustainability during the phase-out