



Land use change and determinants of land management: Experience of pastoral and agro-pastoral herders in eastern Ethiopia



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ARTICLE INFO

Article history:

Received 18 February 2015

Received in revised form

24 September 2015

Accepted 2 October 2015

Available online 17 October 2015

Keywords:

Land use

Institutions

Pastoralists

Agro-pastoralists

Land management

ABSTRACT

This paper aims at identifying driving forces behind land use change and the determinants of investment in land management in pastoral and agro-pastoral communities. Data were collected from 182 households through a household survey and focus group discussions. Starting with narratives, an econometric approach was used to identify the determinants. The result shows that frequent droughts repeatedly undermining herd rebuilding capacity, the transformation of rights to land, emphasis placed in crop-farming by the training and extension interventions, communal land loss, and expansion of communal enclosure have affected change in land use. Benefits from the use of crop stalk as feed source, grazing on communal land, keeping relative's herd and access to training services significantly affect preference for dual form of property rights. Moreover, the econometric model predicts that having large number of plots encourages investment in land management, dependency ratio, sharing of land with neighbours, extensive land use behaviour, and participation in rotating labour undermine such an investment. This suggests the need to restore the role of customary authorities and social networks in land management. Moreover, the effect of state interventions in providing training, improved seeds and land management technologies will be unsustainable without considering the role of customary authorities.

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1. Introduction

Pastoralists and agro-pastoralists in the semi-arid regions can ensure livelihood security through retaining communal holding that would allow spreading risk, prevent sporadic conflicts and serve as a mutually beneficial insurance mechanism. For instance, practicing enclosures and protecting community woodlots help realize long-term economic benefits and foster environmental rehabilitation in highly degraded areas (Reij and Smaling, 2007; Bassett, 2009; Rohde et al., 2006; Magole, 2009). A threat for this could be an inherent institutional failure in coordinating collective action to govern uses and users of communal resources to prevent overuse and resource degradation (Grepperud, 1996; Bennett et al., 2009). Where institutions are effective, land allocation and land use between collective and private forms might experience the persistence of dualism with flexible decisions of households in allocating land either for private or collective use depending on the degree to which cooperative behaviour prevails. In this scenario, communities allocate more land for collective use when

coordination is easier. Again, members can mobilize labour effectively to manage the resources (irrigation, grazing, etc) and to bring more lands under private use when this is inefficient while still competing for uses on the existing commons (McCarthy et al., 1998). Such flexible land allocation and land use practices in the semi-arid regions increases uncertainty and discourage agents from undertaking asset-specific investments (Bromley, 2008). This is the case where the state of nature affects the possibility to secure reliable benefits from private investment. Moreover, in the absence of reliable credit and crop insurance markets, the incentive to undertake investment in land (such as terracing, agroforestry, stone bunds, etc. to improve soil fertility) is rather low. Others argue that since coexistence of dual land use does not undermine efficiency, site-specific productivity losses could be prevented (McConnell, 1983).

In the east African context, emerging land use practices could have a significant effect on the management of the rangeland and sustainable use of natural resources in dry land areas. Much of the relevant empirical work indicates that change in land use in pastoral and agro-pastoral areas has a strong link with the nature of land tenure in place and interact with other policy related factors (Unruh, 1995; Lane, 1998; Muhereza, 2001; Mwangi, 2005;

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Abdulahi, 2007; Kamara et al., 2004). However, empirical evidence on the influence of the Ethiopian land use policies is minimal (Gebreselassie, 2006). This increases the need to examine factors that contribute to land use change and preferences for different types of property rights. Area closure in Ethiopia underlines the inherent challenges associated with high level of uncertainty on equitable sharing of results from participation in those activities given a huge amount of investment in protection activities (Shylendra, 2002). Some argue that the practice has dramatically improved the rangeland natural resource base and had a positive effect in meeting the diverse resource needs (Mengistu et al., 2005).

In eastern Ethiopia, communal enclosure, conversion of communal grazing into private grazing land and growing fruit trees on privately enclosed land were emerging land use practices (Beyene, 2009c; Hagmann, 2006; CHF International, 2006:17). Overuse of natural resources to meet short-term economic benefits and the unrestricted nature of communal land use rights (i.e. an internally open access with the exclusion of non-clan members) characterize dry lands in eastern Ethiopia (Beyene, 2008). Short-term benefits can drive changes in land use practices, which in some cases take priority over the sustainable land use to ensure food security. The existing land tenure system, use rights and protective laws can create opportunities for people to use a given land and its resources in a sustainable way. However, previous studies failed to scrutinize drivers of land use change and to analyse the dynamics of land use as crop-livestock integration extends into semi-arid areas (Beyene, 2008; Devereux, 2006). Hence, knowledge gaps exist in explaining factors that determine certain types of land use and investment in land management. Examining drivers of land use change help undertake prompt action in introducing appropriate land use policy. Hence, the objective of this paper is to identify the driving forces behind land use change and to determine the factors that affect the preference for specific property rights and investment in land management in pastoral and agro-pastoral communities.

2. Material and methods

2.1. Background of the study area

This study was carried out in three pastoral and agro-pastoral districts in eastern Ethiopia including *Fantalle*, *Kebribeyah* and *Mieso*. The districts represent similar land use patterns though they differ in their socio-economic characteristics, the nature of landscape and ecosystems (biophysical factors), market orientations and in the level of state interventions. *Fantalle* and *Mieso* are governed under Oromia Regional State while *Kebribeyah* is a district in Somali Regional State. There is disparity in the level of land cultivated among the three districts. Greater proportions of land have been cultivated in *Mieso* than in other districts. Historical accounts show that rain-fed farming had started in the late 1950s in *Kebribeyah* District after which crop-farming (maize and sorghum) has been increasing while the importance of livestock rearing decreased in the households' livelihoods. The motivation for such land use shift is associated primarily with frequent droughts. Such a change in land use was, however, unsuccessful since pastoralists did not have the basic skills and knowledge needed to engage in farming. On the other hand, agro-pastoralists were encouraged to claim private grazing enclosure to secure feed sources. In association with this, they started cultivating the same plot depending on rainfall condition which is often labelled as "opportunistic farming" (Fig. 1).

In *Mieso*, where an agro-pastoral production system predominates, crop-farming (maize, sorghum, vegetables in their garden) was not common among pastoralists while agro-

pastoralists have started it in the 1960s. Elders' narrations show that in the early 1930s, the imperial government allocated land (about 500 ha) for two private investors to cultivate maize, sorghum and bean as well as to produce livestock by fencing large pastureland. These two activities competed with the communal grazing. Investors employed armed guards to prevent access by pastoralists to the enclosed land. Pastoralists retaliated by destroying investors' farm and raiding their animals in order to discourage them and block further encroachment of highlanders into their grazing area. However, the regime change in the mid-1970s has made land to be a state property. This gave an opportunity to the pastoralists who were evicted from their land. Many households took up farming as an economic activity (Beyene, 2009a). Supplemental irrigation using river diversion or capturing of intermittent floods to crop fields is a recent practice in the district.

In the third district (*Fantalle*), there is still a large communal grazing land compared to the two districts. Irrigated farming has become common following the diversion of Awash River by the Oromia Regional Government. The average landholding of irrigators is 0.42 ha per household which conforms to the recommended size in the regional land administration and use proclamation indicating that the maximum holding size should not exceed 0.5 ha.¹ In general, three forms of land use are possible: land for grazing alone where a pastoral household produces livestock, combines crop (shallots and maize) and livestock or is engaged in crop farming due to complete herd loss. The latter forms of land use became a source of land use conflict with those involved solely in livestock production. The modern (cemented canals) and traditional systems of irrigation co-exist in the district. Although pastoralists can produce three times in a year, unstable market prices and the absence of the contract farming² has reduced the benefits from irrigated farming. Recent interventions in natural resource management and provision of a series of trainings have encouraged investment in irrigated farming and increased land conversion. Accordingly, 4642 ha³ of land has been covered by irrigated farming since 2005 while the target is 18,000 ha.

The local level land use and classification practices manifest the national policy in promoting livelihood diversification and integrated crop-livestock based production system even in a pastoral setting. Implemented in the notion of voluntary settlement, this has affected investment in land management and land use change. In *Fantalle*, the establishment of *Matahara* Sugar Factory in 1977, the delineation of Awash National Park and land lost to the flood (due to expansion of lake *Basaka*) cover 17.35% of the district's land. This has intensified shortage of land and reinforced competition. The land under permanent and annual crop still accounts for 26% of the arable land. This suggests that the land use plan of the district signals further possible expansion of investment in privately held farmland.⁴ In all districts, irrespective of slight differences in crop types grown, the community members keep camels, cattle, sheep, goats and donkeys as livestock. Those pastoral and agro-pastoral households close to small towns take up petty-trading activities opening small shops in these towns. Those in *Kebribeyah* district rent out their camels for contraband trade while households in *Mieso* produce charcoal as a source of energy where they sell a sack of charcoal for up to 150 ETB.

¹ Oromia rural land use administration proclamation, No. 130/2007, p.11.

² This is referring to the agreement between the producers and the buyers in fixing prices of the products prior to production which is presumed to hedge them against the risks of price fluctuation.

³ Official archive of the *Fantalle* district.

⁴ Based on office archives of the districts on land use and classification.

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