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Livelihood Diversification among the Pastoral and Agropastoral Groups in the Upper Awash Valley, Ethiopia

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ABSTRACT This study explores variations in livelihood diversification among three pastoral or agropastoral groups in the Awash Valley, Ethiopia. The data were derived from a survey of 596 households randomly selected in 31 *kebeles* (subdistricts) and from participatory rural appraisal exercises in nine *kebeles.* The indigenous peoples of the study area have traditionally depended on livestock for their livelihoods. In the last few decades, however, pastoralists' engagement in non-pastoral activities has become increasingly common as modern development schemes convert the rangelands into non-pastoral productions. Yet, the patterns of diversifications differ among the three groups. The Afar, who still enjoy a relatively large number of livestock per household have the least diverse portfolio, but when diversified, activities tend to be lucrative such as irrigated agriculture or well-paying or high-status jobs. By contrast, the Kerreyu and Ittu, with fewer livestock holdings per household, are engaged in more diversified income generating activities. Some of these activities, however, tend to be low-return, often with potentially negative environmental and socio-economic consequences. This study demonstrates that the pattern of livelihood diversification among the study groups is related to the household level livestock holding, which, in turn, may be related to the amount of rangeland and economic options available to pastoralists. Policy and development interventions need to consider these variations.

INTRODUCTION

Encroachment of commercial farming, protected areas and other non-pastoral land use, as well as recurrent drought and population increase have put increasing pressure on traditional pastoralism (Abdulahi 1998; Hogg 1988; Fratkin and Roth 1990; Little 1992; Coppock 1994) that requires large areas to effectively exploit the spatially and temporally variable resources such as pasture and water (Niamir-Fuller and Turner 1999). Unable to subsist on livestock alone, pastoralists are increasingly engaged in other economic activities. While there are some debates as to which classes of pastoralists are diversifying and whether or not these changes are permanent (see McCabe 2010). It is widely recognized that pastoralists across Africa, or even the rest of the world, are rapidly diversifying their livelihoods (Hogg 1988; Fratkin and Roth 1990; Little 1992; Coppock 1994; Fernandez-Gimenez 2002; Desta and Coppock 2004; Ellis and Freeman 2004; McCabe 2010). Because the social and ecological environments of pastoralists are heterogeneous, livelihood diversification in pastoral communities is complex and multifaceted (Little et al. 2001; McCabe et al. 2010). Thus, while some livelihood diversification strategies can increase pastoralists' resilience (Ellis 2000; Barett et al. 2001; McCabe 2003), others can increase their vulnerability to these pressures (Hogg 1988; Pedersen and Benjaminsen 2008).

This study explores variations in patterns of livelihood diversification among three pastoral and agro-pastoral groups: the Afar in Awash-Fentale District (locally known as *woreda*); and, the Kereyu and the Ittu in Fentale District in the Upper Awash Valley, Ethiopia. This exploration expands the dialogue on the growing field of scholarship on pastoral diversification. The author gathered information for this paper from two sources: 1) a survey of 596 households from 31 *kebeles*[1] (sub-districts); and, 2) several participatory rural appraisal (PRA) exercises conducted in nine *kebeles* of the two districts (Gillingham 2001; Gudina 2002; Mojo 2002; Beyene and Gudina 2009).The indigenous pastoralists of the Awash Valley had developed flexible herding systems well adapted to the vagaries of semiarid environments, but their traditional livelihoods have been in decline over the last five decades due to several reasons (Lane 1993; Abdulahi 1998; Laws 2000; Gebre 2001; Edjeta 2002). Since the 1960s, the establishment of the Awash National Park and other protected areas

and the establishment and expansion of commercial farms along the flood plains of the Awash River and its tributaries have removed much of the traditional rangeland from pastoral production, especially critical dry season grazing areas, and most of the livestock watering points (Lane 1993; Abdulahi 1998). The gradual loss of access to vital pastures and watering points has undermined the traditional resource management systems, especially seasonal livestock movement, a crucial adaptation that enabled pastoralists' opportunistic use of their variable environments (Lane 1993; Niamir-Fuller and Turner 1999; Assegid 2001; Edjeta 2002).

Furthermore, increase in human populations, due to both intrinsic growth of the local pastoral community and particularly immigration[2] into the Awash Valley, and recurrent drought have also exacerbated the problem (Beyene and Gudina 2009). The combined effects of all of these factors led to diminished seasonal mobility of livestock, forcing most of the pastoralists to use seasonal grazing areas year-round (Edjeta 2002; Beyene and Gudina 2009) bringing deterioration of the rangeland (Abule et al. 2005, 2007a). The lack of good pasture outside the Awash National Park, especially during the dry season, has forced pastoralists to encroach into the park leading to perpetual conflict between park and communities. Conflict among communities themselves has also increased due to competition for pasture and misplaced watering points in areas of ethnic boundaries[3] (Alemayehu 1997; Beyene 2006). In fact, many of the wet season grazing areas, which are now being used continuously throughout the year are now denuded, or covered by bush or unpalatable grass species (Abule et al. 2007b). As a result, livestock productivity (milk and meat production) as well as average livestock holding per household have declined, especially among Kereyu, leading to increased food insecurity (Abdulahi 1998). Due to this decline in average herd size per household and productivity of livestock, the majority of pastoral households in Fentale District cannot meet their food[4] and other requirements from livestock herding alone (Abdulahi 1998). Consequently, pastoralists must adopt strategies such as cultivation, wage employment, sale of charcoal and fuel-wood and other income generating activities (Abdulahi 1989; Laws 2000; Ejeta 2001; Gebre 2001). However, the pattern of livelihood diversification varies among the study groups. The aim of this paper is to quantitatively analyze and explain this variation among the study groups.

METHODS

The Study Area

Fentale and Awash-Fentale districts are found in East Central Ethiopia within the Great Rift Valley. They include diverse topographical features ranging in altitude from 2007 m above sea level (ASL) at the tip of Mount Fentale to below 1000 m above sea level across most of the plains (Fig. 1) (Jacobs and Schloeder 1993). The region is characterized by extensive geological activity resulting in diverse terrain, several hot springs, and the saline Lake Basaka, which covers more than 35 km^2 (Jacobs and Schloeder 1993). The Awash River passes through both districts. Its tributaries, the Kesem and Kebena rivers, pass through only the Awash-Fentale District although the Kesem forms part of the northern boundary of Fentale District. For most pastoralists of the study area these rivers, along with the hot spring north of Mt. Fentale, are the only sources of water during the dry season both for humans and livestock. In recent times, however, NGOs and local government have constructed shallow wells and boreholes in some areas. The area is characterized by semiarid climate with dry, hot weather throughout most of the year. Annual rainfall averages only about 500 mm. The bimodal rainfall pattern forms two distinct rainy seasons - the long rainy season between June and September and the short between February and April (Fig. 2). The amount and distribution of rainfall, especially during the minor rainy season, is highly variable from one year to another making the area prone to recurrent drought (Abdulahi 1998).

Due to the varied topographical and hydrological features, the study area exhibits a variety of vegetation. Four major vegetation types include riverine forest, thornbush, wooded savanna, and grassland, with the latter two being dominant (Jacobs and Schloeder 1993). A fifth vegetation type, palm forest, is found almost exclusively within the western boundary of the Awash-Fentale District. Pastoralists in the study area keep a diverse assemblage of livestock, including cattle, goats, sheep and camels, to exploit the diverse forage, to minimize animal losses

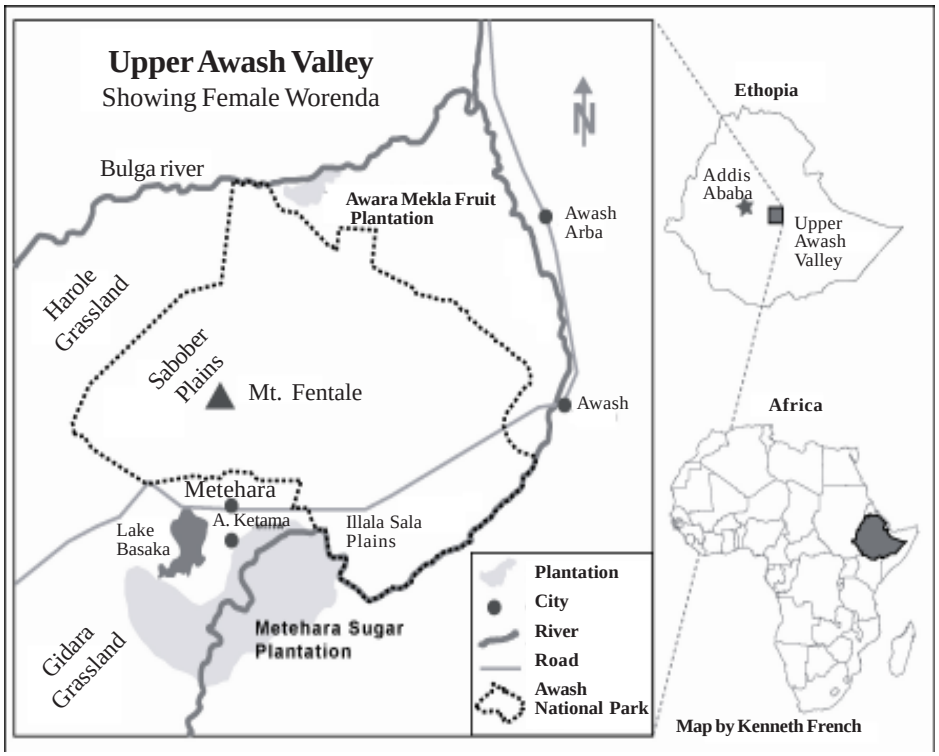

Fig. 1. Map of the study area

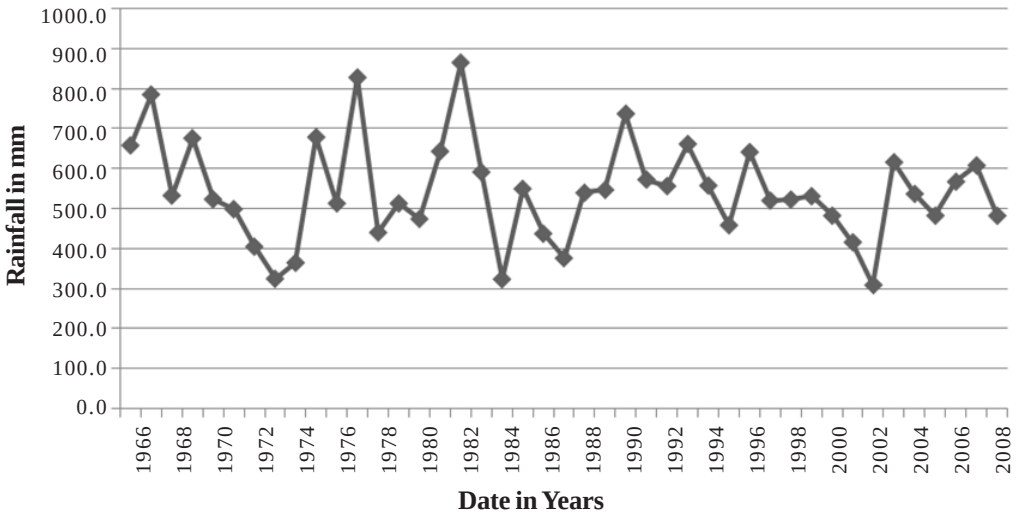

Fig. 2. Annual rainfall pattern from 1966 to 2008 (data from Metehara Sugar Estate Research Station)

during drought, and to meet various socioeconomic needs. Cattle remain the most prized of all livestock, although due to the increasing encroachment of bushland, pastoralists have increased the proportion of browsing species such as goats and camels (Abdulahi 1998).

Grassland is the dominant vegetation type (Jacobs and Schloeder, 1993), but a considerable amount of grassland is being converted into bushland or bare ground (Abule et al. 2007a). A primary concern of the pastoral community is decline in quality of the grassland (Abdulahi 1998; Laws 2000; Edjeta 2002; Beyene and Gudina 2009), which largely explains the decline in livestock productivity (Abdulahi 1998).

The Study Subjects

Two pastoral groups, the Afar as well as the Kereyu and an agropastoral group, the Ittu, inhabit the study area. The Afar, who are amongst the largest pastoral groups in Ethiopia, inhabit the Awash-Fentale District and areas further north, extending to Djibouti and Eritrea. The Kereyu, in contrast, live almost exclusively within Fentale District, an area of about 134,000 hectares. The Ittu, who also reside in Fentale, are more recent immigrants from West Harerge (a midland area where mixed agriculture is practiced) in the last 50 years (Abdulahi 1998; Gebre 2001). Although both the Kereyu and Ittu belong to the same language group, the Oromo, some aspects of their cultures differ. For example, almost all Ittus are agropastoralists, possessing farming skills prior to migrating to the Awash Valley. The Kereyu, on the other hand, are primarily herders (Abdulahi 1998). Although in recent times the Kereyu are increasingly engaged in cultivation, they see themselves as primarily herders. Their attitude towards, and skills in, farming differ from that of the Ittus. Thus, the Kereyu and Ittu are treated as distinct groups during sampling as well as in data analysis.

Data Collection and Analysis

The quantitative data for this report were derived from a survey of 596 households in 31 rural kebeles between April and May 2001 (Gillingham 2001). Among the sampled households, 188 belong to the Afar, 134 to the Kereyu, 246 to the Ittus and the remaining to the other ethnic groups, primarily Somali. About 16 percent households were headed by females. The average household size was 6.45 ranging from 1 to 42. Because the data were collected to provide baseline information for monitoring and evaluation purposes of the Awash Conservation and Development Project (ACDP), the household survey and PRAs cover a wide variety of issues. Data collection included community access to resources and social services, trends in availability and distribution of resources such as pasture and water, problems identified by communities, institutions to address these problems, and community-park relations. For this paper, only data related to the socioeconomic information are analyzed.

Kebeles were selected through stratified random sampling procedures designed to ensure equal representation of the three groups and distance from Awash National Park[5]. Within the *kebeles* themselves, households were chosen for interview using systematic random sampling techniques. The first household in a sample *kebele* was selected randomly and from then onwards every 2nd, 4th, 5th, 6th or 7th household, following the settlement pattern, were interviewed (Gillingham 2001). The number of households selected for interview in each kebele was proportionate to the estimated total number of households of that *kebele* extrapolated from 1994 census data (Gillingham 2001). The extrapolated census data served as the sampling frame for this study. The sampling fraction for each category varies between 14.2 and 41.9%, which was adequate for drawing inferences about the parent population (Oppenheimer 1992). Survey instruments were pre-tested in two *kebeles* that were not included in data analysis and revised as deemed necessary. Quantitative data from the household survey were analyzed using Minitab Statistical Software Version 15 (Minitab Inc.). Chi-square tests (with cells in contingency table greater than 5) were used to test differences between groups. Because the variable charcoal making had a frequency less than five, charcoal making and fuel wood selling were combined for statistical analysis.

As a follow-up to the household survey and to provide qualitative information, participatory rural appraisal (PRA), including focus group discussions and key informant interviews, was conducted on nine representative *kebeles* stratified again by the three ethnic groups (Gudina 2002; Mojo 2002). The PRA included resource

mapping exercises, identification and prioritization of perceived needs and traditional and formal institutions to address those needs, and the nature of resource use conflicts among pastoralists. The PRA exercise involved separate groups of adult males and adult females in each village. More relevant to this study are local communities' perspectives on changes of resource (primarily pasture and water) availability and distribution over time and the impact of these changes on their livelihoods.

Definition

***Livelihood Diversification*:** Diversification here is defined as the pursuit of non-pastoral income generating activities such as farming, selling of products like firewood, charcoal, palm leaves, artifacts and engagement in waged employment. Sale of livestock and milk are not included here (modified from Little 2001; Little et al. 2001).

Wealth: Wealth was measured in terms of livestock holdings for the study groups. Pastoralists were reluctant to count or declare the number of livestock they owned. Hence, range categories, instead of actual livestock numbers, were used during data collection to construct a household livestock holding index (see Table 1 for details). While these categories may be adequate to classify households into different economic groups such as 'very poor', 'poor', 'middle' and 'well-off', this approach limits precise comparisons with other studies. Tropical livestock unit[6] (TLU) per household for each category was calculated using its upper limit, which may overestimate the actual value. Even with this overestimation, however, about 60% of pastoral households in the study area have less than 4.5 TLU per capita that is generally considered the minimum level to sustain traditional pastoral households in East Africa (for example, McPeak and Barrett 2001; Davies and Bennett 2007).

Table 1: Range of livestock holdings for each category

Livestock	*Categories*			
	1	*2*	*3*	*4*
Cattle	0-5	6-12	13-30	>30
Sheep/ Goats	0-15	16-30	31-50	>50
Camels	0-2	3-7	8 -15	>15

RESULTS

The survey results indicated that livestock herding is still the major[7] economic activity practiced by about 98% of the responding households (N=587). Approximately 72% (71.96%, n=592) households were also engaged in non-livestock based economic activities such as farming, wage employment and various forms of trading. Although farming was the most common (52.1%, N = 585) non-pastoral livelihood strategy, 42.1% (N = 585) of households were also engaged in activities other than livestock herding or farming. These economic activities included wage employment and selling of fuel wood, charcoal, palm leaves and milk. While all three groups universally practiced livestock herding, important differences were found in the number of households that were engaged in various economic activities.

Farming

More than two-thirds of the 31 *kebeles* sampled for this study included households that were engaged in farming. (70.97% N = 31). The remaining nine (29.03%, N=31) *kebeles*, where no household reported farming, were all found in Awash-Fentale District. In contrast, farming has spread to all sampled *kebeles* of Fentale District.

The proportion of households engaged in farming significantly varied among the study groups (Chi-square = 175.842, DF = 3, $P < 0.001$, N = 587) even though farming is practiced by at least 20% of households from all three groups. The vast majority of the Ittu (84.9%) were engaged in farming compared to the Afar (24.8%) and even to the Kereyu (35.2%) with whom the Ittu share the same district and almost identical ecological and social pressures (Fig. 3). In fact, among the three groups, only the Ittu included more farming households than those who were not (Fig. 3) perhaps reflecting their agro-pastoral background. During the PRA assessment, elders from one of the sampled *kebeles*, Kobo, claimed that farming started there with the arrival of the Ittus.

Figure 4 indicates a clear relationship between livestock holdings and farming, as the number of households engaged in farming is negatively correlated with livestock holding index (Chi-square = 34.451, DF = 3, $P < 0.001$, N =

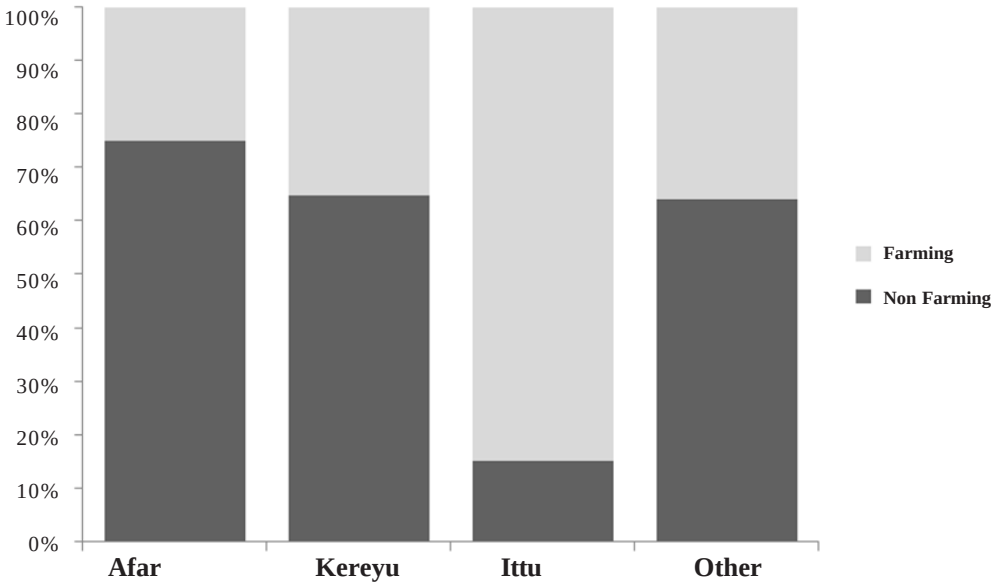

Fig. 3. Percentage frequency of farming and non farming households by ethnic group

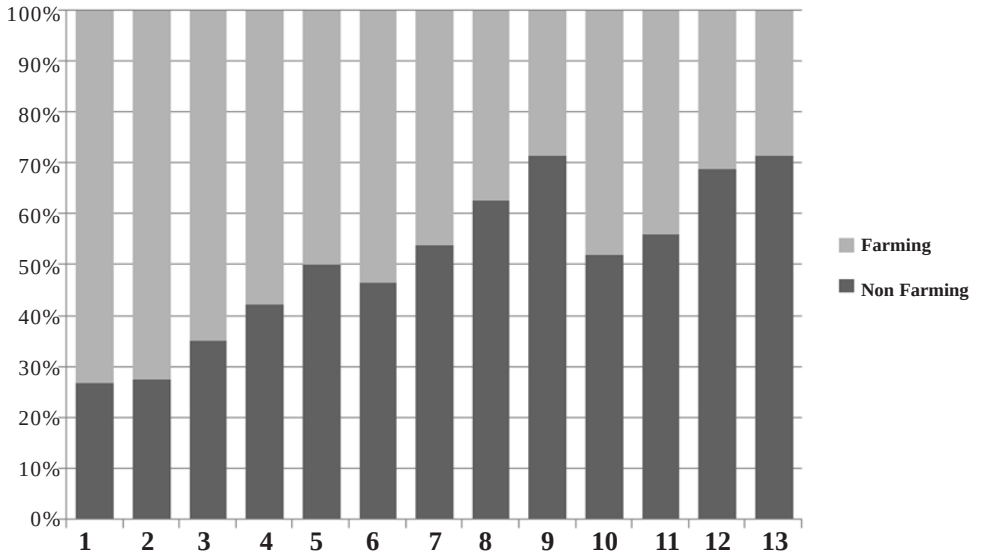

Fig. 4. Proportion of farming and non farming households by livestock holding index

587). This means that the highest proportions of farming households were poor households. For example, about 80% (79.1%, N = 306) of poor and very poor households were engaged in farming compared to middle and well-off households, who make up the remaining 20.9% (Fig. 5). Although anyone can get access to farm plots, especially for dry land farming, through their clan membership, some of the households in the very poor category may have some constraints that limit their participation in farming.

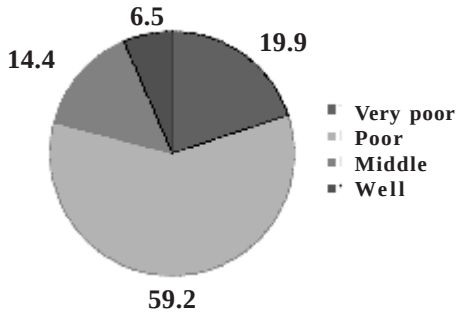

Fig. 5. Percentage of farming households by economic category

A closer look at Figure 4 reveals that categories with total livestock index scores of 9 and 10 have higher proportions of farming households than the general pattern indicates. Of the 24 households within these categories that reported farming, 15 (or 62.5%) were Afar, who used the more valuable irrigated farming. Although difficult to accurately discern from this data, better off households from Kereyu and Ittu might also use irrigation for farming. If this is the case, farming for these better off households may be a strategy of accumulation as described for other pastoralists.

Pastoralists in Awash use both rainfall and irrigation water for cultivation. Although the data on sources of water for farming are incomplete, among 84 households for whom we have the data, only about 27% had access to irrigation. The rest rely solely on rainfall for farming. All responding households from Afar used irrigation for farming, while Kereyu and Ittu households use either rain-fed and/or irrigated farming. The insufficient and erratic rainfall pattern in the Awash Valley (see Fig. 2) means that those who rely on rainfall alone experience frequent crop failure. For example, during the PRA interview, some households maintained that the years of crop failure are more common than years of good harvest. Those households that have to rely solely on rain-fed farming cultivate corn, almost invariably, corn for household consumption. Corn is the staple and preferred[8] food in the study area. Also, in the event of crop failure or after a good harvest, corn stalks are collected to serve as livestock fodder.

Unlike the rainfall-based farmers, those who have access to irrigation primarily produced cash crops such as tomatoes, onions and peppers. Corn becomes a secondary option only when farmers have two or three cropping seasons per year. Even then, corn is planted often in higher risk irrigated plots that are likely to get flooded during the main rainy season.

Employment

Only about 14% of the total households surveyed reported having one member of their family as being employed. Wage employment, which entails primarily working as plantation guards for commercial farms, did not show significant differences among the groups or across different wealth categories (Chi-Square = 4.279, DF = 3, P = 0.233, N = 303). The Kereyu (28.8%) and Afar (22.9%), however, are more likely to get involved in employment than the Ittus (17.3%). This finding perhaps reflects labor demand of the farming Ittus. Among the employed, 81.6% come from poor or very poor households while only 3.9% come from the well-off households. Members from well-off households that reported employment, not surprisingly, work for some form of administrative structure at the *kebele* or district level, rather than the low-paying, low status farm guard.

Pastoralists, traditionally, had been reluctant to take up wage employment because of extreme reaction from the community. As one Ittu elder, nearing his retirement as a farm guard, explained: "My retirement amount would have been much higher if my clan had not forced me out of the job, through a whipping[9] ceremony, long time ago when I first started to work as farm guard". Despite this negative traditional attitude towards wage employment, increasing stress has led masses of young pastoralists to look for any kind of work in commercial farms, including weeding and other laborious jobs, that would have been unthinkable only a decade or so ago (personal observation).

Farm guarding is a convenient job for both pastoralists and estate farms. For pastoralists, it does not require strenuous activity and for estate farms, pastoralists are more effective in keeping livestock out of farm surroundings than non-pastoralist guards. However, farm guarding is a low paying job and despite being the most common job available to pastoralists, it is not surprising to find that less than 10% of the better-off households are employed as plantation guards.

Charcoal and Fuel Wood

Fuel wood and charcoal selling were the most common non-pastoral, non-farming activities reported (31.75%, n = 378). These findings may indicate the limited options available for pastoralists to diversify their economy, especially in Fentale District. There are important differences among the study groups in their involvement in fuel wood and charcoal selling. Kereyu and Ittu were more likely to engage in these economic activities, while the Afar rarely did so (Fig. 6).

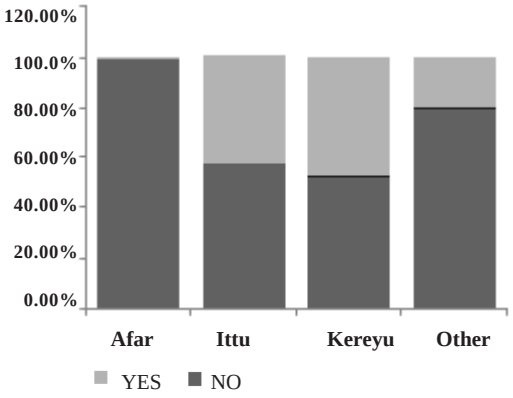

Fig. 6. Proportions of households engaged in fuel wood and charcoal selling

Fuel wood selling is almost always practiced by women. Women collect and transport fuel wood, by carrying the wood on their backs and/or on donkeys, to nearby towns or roadside sites along the highway. When men are involved in fuel wood selling, it is primarily in these roadside sites where the revenue is relatively high. Even here, women may do the bulk of the work in wood collection and transportation. Charcoal-making and selling, on the other hand, is almost an exclusively male activity.

Both fuel wood collection and charcoal making and selling require hard and arduous labor, but produce very limited revenue. Also in most parts of the study area, both fuel wood and especially charcoal making are illegal although enforcement of the activity is limited. Charcoal making, in particular is culturally abhorred as the following translation of a verse from a traditional Kereyu song reveals:

"You the charcoal maker
You took away the camel's dinner
I do not see your riches, where is your wealth?
Yet, you are making our children starve to death."

It is clear from the household survey and PRA data that fuel wood and charcoal making are commonly practiced by economically depressed households. It not surprising, therefore, to find that nearly 90% of the 120 households reporting fuel wood and/or charcoal selling belong to very poor and poor categories (Fig. 7).

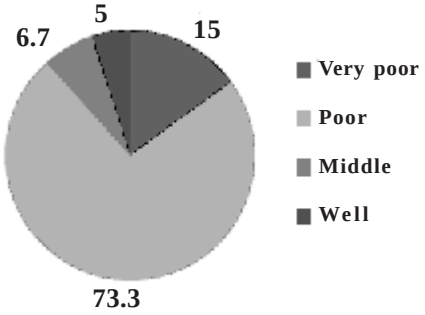

Fig. 7. Percentage of households engage in wood and charcoal selling

Palm Leaf Selling

That the palm forest is located within Awash-Fentale District accounts for palm leaf selling exclusively by the Afar. The percentage of households engaged in this activity is less than 3% for any of the other groups. Obviously, pastoralists that live in villages close by the palm forest, much of which is found within the northern part of the Awash National Park, are involved in palm leaf selling. For example, 92.9% of the households that reported this activity are Afar coming from four adjacent *kebeles* in areas abutting the Awash National Park. People in these *kebeles* have been selling palm leaves for at least two generations and, accordingly, have developed traditional institutions for its management. Community members highlighted the significance of the palm forest during the PRA exercise. They rely on the revenue generated through palm leaf selling, especially in times of crisis. For example, during the 2002 drought, utilization of the palm forest was crucial not only for generating badly needed income, but also for its edible fruits that people increasingly rely upon during the dry season.

DISCUSSION

As demonstrated above, the pastoralists of the Awash Valley have been diversifying their

livelihood increasingly over the last few decades. The researcher will discuss below the major livelihood diversification strategies and their implication for the well-being of pastoral and agropastoral households.

Farming: Farming is often the first livelihood strategy that traditional pastoralists diversify into in the dry lands of East Africa (Coppock 1994; Ellis 1998; Little et al. 2001; McCabe 2003; McPeak and Barrett 2001). This strategy has been utilized widely despite the inadequate environmental variables for rain-fed cultivation in these arid areas. The same general model seems to hold true for pastoralists of the Awash Valley. Crop cultivation in Fentale District is dependent largely on rainfall farming. Abdulahi (1998) reported that two-thirds of farming pastoral households in Fentale use rain-fed agriculture. Although quantitative data on sources of water for farming are incomplete, it is clear that dry land farming has continued to expand in Fentale since Abdulahi's study. During the current study, all sampled *kebeles* in Fentale District had households that were engaged in farming. In fact, rain-fed farming along the plains near Mt. Fentale (see Fig. 1) has expanded so widely that dust bowls have become a serious problem for the residents of Metehara and Addis Ketema towns[10] during the dry season.

These observations, including the frequent crop failure reported by Kereyu and Ittu households, suggest that the environmental sustainability and economic viability of rain-fed cultivation may be in question. It is fairly clear, at least for the Kereyu, that dry land farming is driven by failure to meet household needs exclusively through livestock herding (Abdulahi 1998; Laws 2000; Gebre 2001). Cultural abhorrence to farming and Abdulahi's (1998) finding that only 5% of Kereyu households practiced farming before the mid-1980's, imply that poverty is the main 'push factor' (Ellis 1998; Barrett et al. 2001) for the adoption of dry land farming. From the ensuing land degradation, dust bowls, and frequent crop failure, dry land farming in Awash appears to be unsustainable, especially using current practices and systems.

By contrast, irrigation farming is a completely different story. The high-return irrigation farming has become attractive not only to pastoralists from all wealth categories, including the well-off households but also for local 'investors' that rent farm plots from or get involved in sharecropping with the pastoralist land owners (Gebre 2001). Cash crops such as tomatoes, onions and peppers require so much investment for land preparation and farm input, and their prices are so volatile, that most pastoralists are unable to afford either the initial cost and/or the risks of market failure. As a result, complex arrangements of land deals, some of which may be outright illegal from the nation's land policy perspective, have developed with local 'investors' (Gebre 2001). Some pastoralists may need technical (Abdulahi 1998) and financial assistance (for example, microcredits) as well to realize the full potential of irrigation farming. In the last few years, the Regional Government of Oromia is installing an extensive irrigation system throughout most of Fentale District, where pastoralists are rapidly converting the rangeland into corn farms. This intervention has the potential to alleviate food insecurity in the district. However, the long-term environmental as well as social and nutritional impact of this intervention has yet to be investigated.

Employment: In the Awash valley, employment opportunity for pastoralists is limited and comes almost exclusively from commercial farms. For example, Abdulahi (1998) found that among employed Kereyu and Ittu about 90% were employed by the Matahara Sugar Plantation as farm guards. Unlike salaried employment of skilled and educated pastoralists in other East African countries (Little et al. 2008), employment for pastoralists in Awash, though full time, does not provide sufficient income, making it an occupation of the poor. For pastoralists of the study area, access to education is extremely limited. This limitation prevents them from gainful employment although they are now sending more and more children to school than ever before. Still, some form of intervention is needed. Support for basic necessities such as food and boarding is essential to enable the majority of children from pastoral communities, especially girls, to attend and stay in schools. Academic retention is necessary so that students have a better chance of worthwhile employment upon graduation. Most pastoral households, however, especially in Fentale District, cannot afford to support their children if they have to go away to receive an education. Any education intervention should address these issues to make education accessible to pastoralists of the Awash Valley.

Fuel Wood and Charcoal: It is widely recognized that fuel wood and charcoal selling is an occupation of the poor pastoralists across East Africa (Berhanu et al. 2007; Little et al. 2008) that arises out of desperation. Not only do pastoralists generally discourage charcoal making, many of our PRA discussions were filled with vehement accusation of charcoal makers for cutting down trees. It can also lead to conflict within communities between those who make charcoal and those in charge of natural resource management (Beyene and Gudina 2009). The negative environmental impact of charcoal making is clear to pastoralists themselves as well as government officials. But, the magnitude of poverty pushes some households to an extreme which requires a more comprehensive approach to address this problem. On the other hand, little involvement on this activity by sampled households in Afar may indicate their better fortune compared to their counterparts in Fentale District. Although *kebeles'* distance from towns or highways was not considered during sampling, many of the Afar *kebeles* sampled near the towns of Awash and Sabure did not report this activity[11], indicating the differences among groups is not related to their locations in relation to markets.

Palm Leave Selling: Palm leaf selling appears to be a sustainable arrangement between pastoral households and highland merchants. These merchants purchase dry palm leaves from pastoralists and sell them to small cottage industries in the highland cities. This transaction has been going on for generations and sophisticated community-based management systems have developed for the harvesting of palm leaves. Interestingly, economic status was not statistically associated with palm harvesting. The observation that almost all households living adjacent to the palm forest are engaged in this activity may suggest that pastoralists are willing to diversify when appropriate opportunities arise as the "pull factor" (Ellis 1998). More detailed study of this community controlled palm leaf harvesting may provide instructive lessons for community-based natural resource management models in the Awash Valley.

Although there are many reasons why pastoralists diversify (Barrett et al. 2001; Little et al. 2001; Ellis and Freeman 2004; McCabe et al. 2010), decrease in livestock holdings and the concomitant decline in livestock productivity appear to be the primary driving forces for livelihood diversification among the pastoralists in the Awash Valley, especially in Fentale District. Similar patterns have been observed in various studies of pastoralists in East (Little et al. 2001; Desta and Coppock 2004), as well as other parts of Africa (Barrett et al. 2001) or in Asia (Fratkin and Mearns 2003).

Livelihood diversification in Awash is considered primarily a survival and coping mechanism in the uncertain environment threatened by so many factors: land dispossession, population pressure as well as frequent drought (Abdulahi 1998; Gebre 2001; Edjeta 2002; Davies and Bennett 2007). This is particularly the case for households that are engaged in low return activities such as charcoal selling as well as dry land farming. It is also recognized that some, especially wealthy, pastoralists may diversify to capitalize on opportunities for increasing wealth (Little et al. 2001). While this may be the case for the some of the Afar, very few, if any among the Kereyu and Ittu can be considered wealthy (but see Gebre 2001). It is, therefore, not surprising to find most households in our study area diversify into low return and often environmentally destructive activities that may actually exacerbate, rather than alleviate, the ever-increasing poverty in the Upper Awash Valley.

It is suggested that diversification can increase resilience and reduce vulnerability to risks and shocks in the arid environments (Barrett et al. 2001; McPeak and Barrett 2001; McCabe 2003; McCabe et al. 2010). It is also true, however, that poor pastoralists diversify in activities that may actually increase vulnerability to these risks (Hogg 1988; Berhanu et al. 2007; Lesorogol 2005; Little et al. 2007). It is not surprising, therefore, to find those pastoralists most affected by dispossession of land and the concomitant loss of their productive rangeland in the Awash Valley resort to activity which in the long-term may undermine the very base of their livelihoods. This situation can create a "poverty trap", a more enduring and vicious condition (McPeak and Barrett 2001).

Despite this widespread attempt to engage in various income generating activities, especially among poor pastoralists, the key economic activity for almost all study households still remains livestock herding. Not only do households attempt to build their herds by various means[12] but also some households, located near

the sugar plantation, are experimenting with new kinds of intensive livestock raising. Through provision of by products from the sugar factory such as cane tops and molasses, some pastoralists are experimenting with small-scale fattening. However, more studies are needed to understand whether these activities are temporary attempts to keep lactating livestock around homestead or a deeper transformation in an attempt to increase the value of livestock in the beef market. Depending on the findings of such studies, appropriate intervention can be designed to assist pastoralists enhance their livelihoods.

CONCLUSION

Two preliminary conclusions can be made from this study. First, results of this study are in broad agreement with the general patterns of livelihood diversification among pastoralists across East Africa in that the more affluent households (primarily the Afar) tend to diversify into more lucrative, higher value economic activities such as irrigated agriculture and higher paying, high-status administration related jobs. The primary motives for these households may be risk aversion and/or accumulation. For the poorer households, however, survival may be the major force driving diversification, notwithstanding the fluctuations of household fortunes and the limited options in this precarious environment.

The second finding is that decline in livestock holdings appear to be the primary factor that forces pastoral households into low return economic activities, such as fuel wood and charcoal selling. It is also apparent both from the household survey and PRA exercises that Afar households have significantly higher livestock holdings to the extent that what are considered "better off" households by Kereyu/Ittu standards may actually be considered poor by Afar standards. This skewed distribution of livestock holdings between the Afar on one hand and Kereyu/Ittu on the other may be the result of the amount of rangeland they have. While the Afar can move their cattle to areas of more than 100 km from their more permanent villages during the dry season, the Kereyu and Ittu would be out of their 'territory' (shared with hostile neighbors for the most part) if they move 30 or 40 kms from their permanent villages. Needless to say, the impact of land alienation is more severe for the Kereyu and Ittu compared to the Afar. Hence, development and/or policy interventions in the Awash Valley need to address these differences among the different ethnic groups as well within them.

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NOTES

1. *Kebele* is commonly a name for a defined geographical area with a variable number of villages. Formal designation of a *kebele* refers to the smallest administrative unit with its own elected or government appointed council.
2. People from all over the country immigrate to the Awash Valley looking for economic opportunities within the commercial farms and small towns that are expanding along the main highway and railway. However, the predominant rural immigrants are the Ittu, who may outnumber the indigenous Kereyu in Fentale District (Gillingham 2001).
3. Due to degradation of traditional grazing areas, pastoralists are moving into ethnic boundaries which had been mutually avoided in the past, escalating conflict between Afar on one hand and Kereyu/Ituu on the other.
4. Pastoralists rarely subsist on livestock products alone but acquire whatever grain or any other item they may need through income generated by sale of livestock products.
5. Because one of the objectives of the household survey was to assess communities' attitude to-

wards the park, distance from the park was one of the criteria for sampling.

6. Total Livestock Units (TLUs) were calculated as 1 TLU = 1 head of cattle = 0.7 camels = 10 sheep or goats. TLU is an animal weighing 250 kg (Jahnke 1982)
7. Respondents had not only to list the kinds of economic activities members of their household were engaged in but also rank the importance of each activity. The 'importance' included relative contribution of the activity in question to the household income and other services, such as milk provision.
8. When provided with wheat during emergency food aid, pastoralists often sell the wheat to purchase corn
9. 'Whipping ceremony' is the last resort to stop a clan member from engaging in any activity deemed improper by Kereyu and Ittu society.
10. The dust bowl around these two towns has become so severe that drivers are often forced to pull their vehicles to the side of the road until the dust bowl passes
11. Fuel wood and charcoal are primarily sold in towns or along the highway. Although *kebeles'* distance from these areas was not considered in sampling, Afar *kebeles* within 5 km of towns and highway did not report these activities.
12. For example, a farm guard who got a sack of sugar as a bonus reportedly to have sold it for 600 birr to buy a heifer for 300 and used the rest for domestic consumption.

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