

# Gendered Livelihood Implications of Resource Access for Livestock Productivity Improvement in the Mixed Crop-livestock System of Central Highlands, Ethiopia

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## Abstract

Poor farmers require essential assets to increase benefits from their livelihood activities. This paper demonstrates gender implications of accessing different livelihood assets in order to improve productivity and thus reduce poverty. Gendered Sustainable Livelihoods Framework (GSLF) with Participatory Rural Appraisal (PRA) tools was used to look at various issues related to livestock productivity and its contribution to farmers' livelihood improvement. Three major target groups of farmer households were purposely sampled to take part in PRA exercises. Aiming at improvements in livestock productivity and gendered livelihoods, this comparative study was conducted in two case areas (Lenche Dima watershed and Kuhar Michael kebele), from June 2008 to February 2010, using qualitative approach. The study explored (1) the gender and livelihoods variations of access to assets and outputs/benefits, (2) implication of the above variations in improving water productivity especially for livestock keeping and then other livelihood activities, and (3) challenges, gaps, and entry points for targeting gender sensitive interventions. The result showed the existence of different levels of (1) gender and livelihoods variations between sites in accessing resources and benefits and (2) implications of the above variations on water productivity for livestock and other uses. Among the targeted farmer groups, women and young poor male farmers were identified as disadvantaged. This is mainly due to the limitations in accessing: 1) natural asset (land) for both farmer groups, 2) human asset (labor) for women farmers and 3) financial asset (money) for young farmers. They were also observed as more vulnerable groups for shocks like production failure and drought. Social assets such as kinship, joint arrangements, sharecropping and exchange arrangements, and Debo/Jigi-group works were important assets identified as temporary solutions helping these disadvantaged groups in addition to their own coping mechanism. The study suggests that a consideration of the limitations of the disadvantaged groups in water/livestock development intervention options is necessary to narrow gendered livelihoods variations and hence minimize poverty.

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**Key words:** *gendered-livelihood, livelihood-asset, livestock-productivity, mixed production system*

## **Introduction**

Rural populations in developing countries like Ethiopia depend largely on rain-fed agriculture, which is the backbone of the economy. People are vulnerable to environmental threats to their livelihood and wellbeing particularly in the drought prone areas. To achieve improvement of farmers' wellbeing, better understanding of the determinants of poverty and analyses of the social, economic, and institutional dimensions of rural community livelihoods and their linkages with the natural resource base are required. Such an understanding will help to identify better technological, institutional, and policy intervention options that avoid and overcome livelihood constraints.

Livestock are important livelihood assets in the Ethiopian highlands where rain-fed mixed crop-livestock production system dominate. Livestock is also considered as water user and aggravates scarcity partly due to mismanagement in livestock keeping (Pernille, 2003). Recent research indicates that low crop and water productivity constrains efforts to mitigate acute poverty and resource degradation (Stein and Bekele, 2002). Hailelassie et al. (2009) and Peden et al. (2007; 2009) suggested that improving livestock water productivity (LWP) will contribute much to improve agricultural water productivity and livelihoods in this mixed crop-livestock production system. Van Hove and van Koppen (2005) emphasize that improving LWP requires a gendered approach involving socio-economic interventions along with conventional natural resources management. This study applied the LWP and GSLF to identify gaps and options for improving farmers' wellbeing in the study areas: *Lenche Dima* watershed and *Kauhar Michael Kebele*<sup>2</sup> (administrative word) in the central highlands of Ethiopia.

The study aimed at identifying (1) the gender and livelihoods variations of access to assets and outputs (benefits from the resources accessed), (2) implication of these variations in improving livelihoods through improving water productivity especially for livestock keeping and then other livelihood activities, and (3) challenges and gaps for improvement of LWP and thus livelihoods, and entry points for targeting gender sensitive interventions. The research explored the following research questions. 1) What species of livestock do farmers keep and how are these managed, and what roles do livestock play in male and female farmers' livelihoods activities? 2) What natural resource and livelihood asset endowments are available and accessible to male and female farmers? 3) What

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<sup>2</sup> *Kebele* is the least administrative unit of governmental structure

type of water and livestock development interventions are introduced in the study areas? How do these interventions affect LWP and farmers' gendered livelihoods wellbeing? 4) What are the challenges faced by women and men in their efforts to improve LWP and hence their livelihoods?

## Methodology

### Description of the Study Sites

The study was conducted in *Kuhar Michael Kebele*, *Fogera Woreda*<sup>3</sup>, and *Lenche Dima* watershed in *Laste Gerado Kebele* of *Gubalafto Woreda*, Amhara Region, Ethiopia (Figure 1). The sites are located at 11°50'53'37" N and 37°38'10" to 37°42'17" E and at 11°49'13" to 11°51'57" N and 39°40'07" to 39°44'22" E, respectively (Descheemaeker, 2008; Gizaw et al, 1999).

Amhara is one of nine regional states in Ethiopia that covers about 170 thousand km<sup>2</sup> area and contains 17.2 million people (23 % of the country's total), among which almost 90 percent of the people depend on Mixed Crop-Livestock Agricultural system (CSA 2008). The region hosts about 29 percent of the country's livestock, which accounts for 17 percent of the GDP. Livestock are mainly cattle (85 % of the TLU); other animals kept are sheep, goats, and equines. Among the many uses of domestic animals, cattle provide 90 percent of the draft animal power and are also used as a source of income, food, and wealth security (Girma et al. 2004).

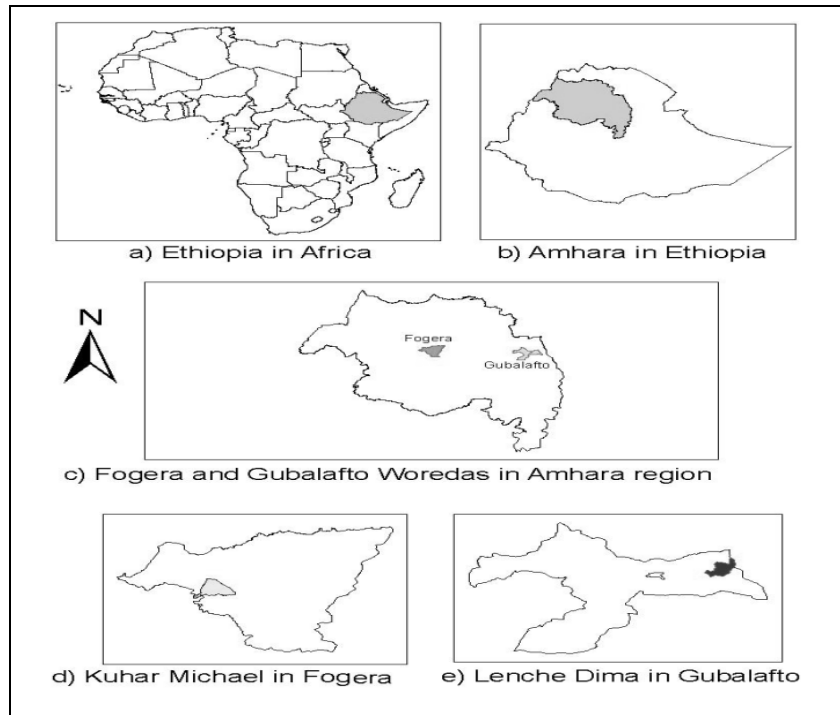
The study sites (Figure 1) were selected based on accessibility, the presence of interventions, institutional organizations, and agro-ecology. *Lenche Dima* and *Kuhar Michael* represent different comparable characteristics like production system, agro-ecology, and social structure especially religion. The former is sorghum based semi arid food insecure and Muslim community living area, while the latter is based on rice (*oryza sativa*) in the plain lands and Finger millet (*eleusine coracana*) and teff<sup>4</sup> (*eragrostis tef*) in the upland parts. It has also sub humid and food secured features with Orthodox Christianity follower community. In the two areas, livestock are very important asset in farmers' livelihood activities; however, they are less productive due to feed and water shortage,

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<sup>3</sup> Woreda is an administrative word, or local government, of Ethiopia, equivalent to a district composed of a number of smallest unit called Kebele or neighborhood associations

<sup>4</sup> Teff is the local name of fine grain/cereal crop, which is a grass family and used as staple food grain. Its scientific name is called *eragrostis tef*.

disease, poor veterinary and extension services, and also poor productive endogenous breeds.



**Figure 1: Location map of study sites (d and e) in Amhara Region, Ethiopia**

Source: recombined from Descheemaeker, 2008 and map library from internet (<http://www.mapmakerdata.co.uk.s3-website-eu-west-1.amazonaws.com/library/stacks/Africa/Ethiopia/Amhara/index.htm>)

### Data Collection and Analysis

The data was collected between June 2008 and February 2010. During the first visit, transect walk was conducted with randomly selected members of the communities and grazing areas and water sources were mapped using their expert and local knowledge. Wellbeing ranking of the whole household was also conducted with randomly selected farmers using lottery method. Then different

PRA exercises were employed with 10 purposely chosen target groups and 113 (60 & 53 from the two sites) randomly selected individual farmers. Some of the PRA tools implemented include: seasonal daily activity profiling, problem prioritization and preference ranking, matrix scoring, seasonal calendar, key informant interview, and focused group discussions. In the focus groups, five types of targets were involved in each site, and the participants included were 25 women and 35 men farmers in *Kuhar Michael* whereas in *Lenche Dima*, 16 women and 47 men participated. About two to three hours duration was used with each group during discussion, which is facilitated by the authors and the Development Agents of the *kebeles*. Using these tools, gendered access to resources and benefit share among household members, seasonal calendar for animal feed, water, and labor availability, disease and other related problems, and several other livestock and water related issues were explored. Throughout the course of data collection and analysis, the Gendered Sustainable Livelihood Framework (Figure 2) and Livestock Water Productivity Framework components and strategies were used as guiding tools to collect data and depict results from outputs of the PRA exercises.

Livelihood asset (Five capitals)	Access/Control					Livestock as an asset	Benefits (outputs and outcomes)	Access/Control					Vulnerability/Risks contexts (seasonality shocks, trends)	Institutional contexts			
	Most to access assets	M	W	H	C			G	Keeping livestock as a strategy/an activity	M	W	H		C	G	Local or community	Government or private
Natural						<ul style="list-style-type: none"> <li>- Water? Feed? Land?</li> <li>- Where?</li> <li>- How much?</li> <li>- In what cost (time, labor, price)?</li> <li>- What mechanism help to access assets and</li> </ul>	<ul style="list-style-type: none"> <li>- Soil fertility</li> <li>- Biodiversity</li> <li>- Optimum water use</li> </ul>										
<ul style="list-style-type: none"> <li>- Water</li> <li>- Land</li> <li>- Feed</li> </ul>							<ul style="list-style-type: none"> <li>- Nutrition</li> </ul>										
Human																	
<ul style="list-style-type: none"> <li>- Labor</li> <li>- Knowledge</li> <li>- Skills</li> <li>- Ability to work</li> </ul>																	

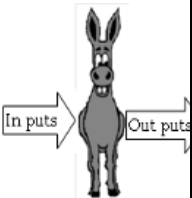
Physical Water- infrastructures Services						benefits? - Who support? - Who benefits?	Traction Transport Energy								
Financial Cash to purchase or pay for goods and services, e.g., medication, feed purchase...							Income Insurance Coping								
Social Resource-sharing groups Gifts, bride price Cultural festivities							Livestock or other productive activities - What type of animal? - Who? and - Where?	Status Social							

Figure 2: Gendered sustainable livelihoods framework (GSLF) (van Hove & van Koppen 2006)

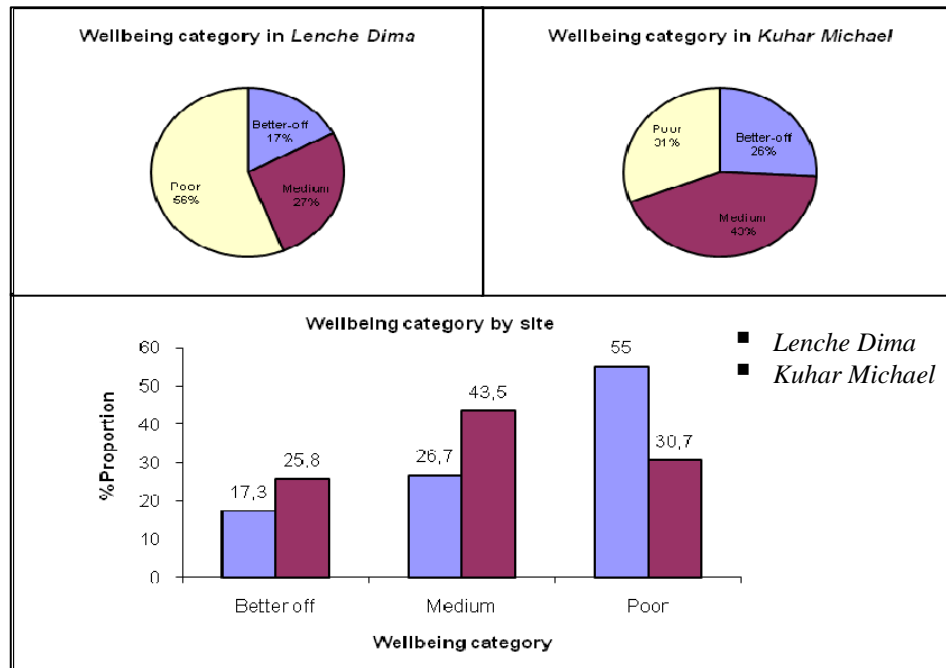
**Note:** M=Men; W=Women; H=Household (men, women, children); C=Community and G=Government

(Access and control on the left side of the donkey picture is for the costs to access resources listed under the five livelihood assts. The five columns (M, W, H.C, G) are indicating whether the costs are paid by either of the five responsible bodies. Whereas the right side is for the benefits obtained from keeping livestock, which is accessed and used/controlled by any of the five responsible bodies. These spaces are used to collect such information. They are left empty because putting all collected information inside the table will take a lot of space).

## Results

### Livelihood Status Variations of Farmer Communities in the Study Sites

Farmers' livelihood wellbeing in *Lenche Dima* and *Kuhar Michael* differs (Figure 3). More than half of the farmer community in *Lenche Dima* is poor. While in *Kuhar Michael*, about 30 percent of households are poor and almost 70 percent fall within the medium and better-off wellbeing classes.



**Figure 3: Proportion of farmers' wellbeing category in the study sites**

Source: computed from wellbeing ranking exercises

As depicted in Table 1, women headed households make up about 23 percent and 16 percent of the total in *Lenche Dima* and *Kuhar Michael* respectively. In both communities, about 35 percent of the poor are women. Though the proportion of poor women is similar in both sites, women headed households are relatively more in *Lenche Dima*. This is due to the increasing trend of women headed households in the *kebele* as a result of migration (especially young men farmers),

divorce and death. Young male farmers migrate to local, regional, and places abroad for seasonal casual employment to generate income, and to the Middle East such as Saudi Arabia and Djibouti for other job options.

**Table 1: Proportion of women from total and poor categories in *Lenche Dima* and *Kuhar Michael***

Wellbeing class	<i>Lenche Dima</i>	<i>Kuhar Michael</i>
Total number of households by site	868	1034
Proportion of women from total household (Female headed households)	22.7 %	15.9 %
Proportion of women from poor category	35.6 %	34.4 %

### **Livestock Ownership Variations between Women and Men Headed Households**

Farmers in the study sites keep cattle, sheep and goat, donkey, camel (*Lenche Dima*), and small animals like chicken and honeybee. However, ownership for livestock varies between study sites, among wellbeing classes and between women headed and men headed households (Table 2 and 3).

**Table 2: Animal ownership proportion per households in the study sites on average basis**

Animal type (Average animal number per household)	Study sites		Proportion (K.Michael/L.Dima)
	<i>Kuhar Michael</i>	<i>Lenche Dima</i>	
Cattle	3.11	3.61	86/100
Sheep	0.04	0.18	22/100
Goat	0.53	2.33	23/100
Equines	0.27	1.13	24/100
Camel	-	0.12	0/100

Source: Computed from number of livestock population and households in year 2008)



Findings from ownership analysis, which emphasizes the parameter of draft power acquisition (Table 2), shows that in both study sites only half of the farmer households managed to own complete draft power (pair of oxen, according to farmers' standard). More than a quarter of the households (about 30% and 28% of farmer households in *Lenche Dima* and *Kuhar Michael*, respectively) do not possess oxen at all and nearly another quarter own incomplete draft power (single ox).

Researchers argue that livestock are the most important assets of the farming households to reduce poverty (Peden et al., 2007, 2009). The findings of this study demonstrated that the poor often do not have enough resources to acquire enough animals necessary for draft power. Farmers who do not have access to adequate draft power usually plough late and will have poor harvest (Cousins 1987). During the Focus Group Discussions in both *Lenche Dima* and *Kuhar Michael* ownership of livestock was used as a measure of wealth.

**Table 3: Livestock ownership (draft oxen as example) by gender in the study sites**

	<i>Lenche Dima</i>				<i>Kuhar Michael</i>				Total			
	Men		Women		Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Sample HHs	37	69.8	16	30.2	40	66.7	20	33.3	77	68.1	36	31.9
No oxen	3	5.7	13	24.5	5	8.3	12	20.0	8	7.1	25	22.1
One ox	9	17	2	3.8	10	16.7	5	8.3	19	16.7	7	6.3
Pair of oxen	24	45.2	1	1.9	18	30	3	5	42	37.2	4	3.5

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> Two oxer	1	1.9	0	0	7	11.7	0	0	8	7.1	0	0
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Ownership of other livestock groups												
Cows	18		0		31		9		49		9	
Other cattle groups	18		0		31		10		49		10	
Goat	9		0		4		0		13		0	
Sheep	1		0		2		0		3		0	
Donkey	18		0		16		2		34		2	
Chicken	22		4		31		8		53		12	
Beehive	1		0		6		2		7		2	
Camel	1		0		0		0		1		0	

Source: Computed from 113 sample households of target groups selected

Male headed households are the main beneficiaries in both study sites, especially from draft power due to relatively better cattle ownership. In both sites, only a few female headed households own cattle and thus have access to draft power in addition to chicken and donkey. Out of a sample of women farmer respondents (n=36), none of them was found to own either goat or sheep since they were from poor categories (Table 3). This indicates that the poor women are not in a position to own even small animals, which were supposed to be owned by them.

### **Variations in Accessing to Resource for Livelihood Activities Including Animal Keeping**

Major resources required for livestock keeping and productivity improvement from livelihood perspective include: land and water (natural assets), labor, time and knowledge (human asset), money and other stocks (financial asset), and services and structures. But their availability, accessibility, and relative costs (in terms of labor, time and money) to access vary by gender groups and sites.

#### **Access to Farmland**

Variation in access to farmland (mainly in size and quality) is observed among farmers' households, gender, and age groups. Young farmers and women headed households are the disadvantaged groups in land size distribution. Young farmers would access land largely through getting a portion from their parents. Women headed households, despite joint titling of land in Ethiopia, still had access to smaller pieces of land compared to male headed households due to shortage of land nowadays and rural population pressure who badly demand land for their livelihoods. Most of them have smaller sized farmland (0.25 to 1 hectare) while the better-off and medium farmers own between 1.5 to 3 hectares. In addition, they possess up to 2 hectares of extra rent-in land. Irrigation land users in both sites and those who have rice fields in *Kuhar Michael* are the advantaged groups with regards to quality. They can produce crop two to three times a year using irrigation and residual moisture, thus they are relatively better to secure both food and feed requirements than non-users. Regarding gender variation, few women farmers have also access to irrigated land in both sites but the participants are higher in *Lenche Dima*. Hence, it is possible to say the advantaged groups have relatively better opportunity to invest in livestock productivity improvement and increase their benefits.

### **Access to Grazing Land**

Open communal grazing land is accessible to all farmers from their entitlements. But few farmers have private grazing area (28.3 % of 60 respondent farmers in *Kuhar Michael* for example). In *Lenche Dima*, grazing land is very scarce. The only accessible communal grazing land is even far from the residential areas (5 to 6 hours walk round trip) and is reached by small portion of farmers. However, other sources of grazing and browsing like portion of non-arable open and enclosed hills, farm boundaries and crop aftermath (stubble and weeds), gullies, natural waterways, small grazing areas near homesteads, and live fences are also used. In *Lenche Dima*, about a quarter of the users from the enclosed hill area are women farmers. But except a few, they are using the area for other income generating activities instead of using the grass for animal feed.

### **Access to Water Resources for Livestock and other Domestic and Productive Uses**

The availability and accessibility of water for livestock varies between study sites, between villages and by season. In *Lenche Dima*, deep well piped water is the major source, especially for domestic use in dry and wet seasons. Other sources like natural and manually excavated ponds, rivers and wetland as well as runoff water harvesting structures (tried by twenty farmers) also serve as dry season water sources. Though some of these structures fail to sustainably provide water, farmers are using them to grow backyard fruit trees and vegetables (income source), and to secure water need for livestock and domestic use during dry period. However, dry season livestock-water shortage is still one major problem in this area, especially from November (in bad years) and becomes critical in May and June; as the area is grouped in semi arid lowland agro ecology with bimodal rainfall. A few farmers who could afford to get the line also own home connected pipe water, which is unique in this study area. In *Kuhar Michael*, farmers use different water sources for multiple purposes. Mostly rivers are used for livestock drinking and irrigation farming. Some have access to clean water especially for drinking and domestic use. Few farmers have their own hand dug shallow wells used for multiple purposes (domestic use, for livestock and gardening). Other sources like open shallow communal well, ponds, springs, river and rain water during rainy season are also used by almost all of the farmers. However, flood is the big problem in this area especially in the plain land during the rainy season.

Regarding responsibility to collect water, women and children (girls) are more responsible for water collection for both domestic use and livestock

watering, while watering livestock from rivers is the responsibility for men and boys in both sites. Donkeys are used to transport water in *Lenche Dima* unlike in *Kuhar Michael* where human labor is used to do this job. In *Kuhar Michael*, donkeys are mostly used for carrying grain to markets and mill houses and sometimes fuel wood to homestead or markets.

### **Access to Labor for Livestock Keeping**

Labor is an important livelihood asset that determines the capability and interest to keep livestock and improve productivity. It is also a major input for crop production especially men's labor to benefit from land. Herding cattle is the duty of children (boys and girls from 7-12 years old). Children, especially, boys usually do herding at grazing area and watering from rivers. While girls, in addition to their supportive role in feeding and watering livestock around homestead and cleaning the shed, they usually do help mothers in water collection for home uses and other domestic activities. However, availability and accessibility of labor varies seasonally and among households. In *Kuhar Michael* for instance, mid November to end of December is peak season when children's labor is highly in need. During this time, most of them stop going to school temporarily which affects their educational activity.

Women headed households are disadvantaged group in labor accessibility than others in both sites as they lack mainly men's labor to do farming unless they have own son or other relatives. Religious differences between the two communities also contribute to labor use differences. For example, in *Kuhar Michael* Christian community, farmers have spare labor on religious holidays (about 10 days every month) as they do not work major farm activities (like plowing, weeding, and harvesting). Though this condition may affect the crop production activities, it can be considered as an opportunity to livestock in getting especial attention by men for well feeding, watering and health care. Children can also get free time to study and do their own activity. Women will also have opportunity to get support from their free children labor at home. Both men and women can do social activities during these holidays. However, in the Muslim community of *Lenche Dima*, since every day is a working day, this situation is different.

### **Access to Services: Veterinary, Credit, Extension, and Market**

**Veterinary service:** Farmers in both sites do not have easy access to veterinary services at the respective *Kebeles* unless they go to the nearby towns (Woreta and

Hara) to use government veterinary clinics or private livestock drugstores. Men are more responsible for this activity. However, women also do it when required in the absence of men, though it is challenging for them. They have to walk long distances with their animals alone, unless they make some arrangements for someone to accompany them.

**Credit Service:** Financial problem is another major limiting factor, especially for women and young male farmers in both study areas to acquire livestock first. Institutions like Farmers' Cooperatives and Amhara Credit and Saving Institution (ACSI) in Fogera *woreda* (district); safety net and revolving fund services under food security program, and Micro Enterprise Office in *Lenche Dima*, work in credit service to solve financial problems. However, ACSI, the only accessible institute in *Kuhar Mickael*, credit system does not invite the very poor farmers to use its services. The institution's credit system requires collateral (livestock or enough land) from farmers, which they do not have at hand. Though credit service is better in *Lenche Dima*, farmers are not effectively utilizing the access and have a problem in the credit flow (problem in targeting households especially safety net program). Thus in both sites, improved and targeted credit facilitation is required to give chance for poor farmers, especially those who have other assets (land and labor).

**Extension Services:** Extension services seem biased towards crop production and then natural resource conservation in both study sites. In livestock department, package participants are very few as compared to participants in crop production. In *Kumar Michael* for example, in year 2000 E.C. participants in milk production (improved heifer) were only three who are better-off households and *Kebele* administrative workers. About eight better-off household farmers participated in improved animal feed; and about 25 better-off and medium households participated in fattening and production packages of small ruminants. The trend in *Lenche Dima* is also the same except that participants in livestock sector especially in goat rearing are better (for example, 92 farmers participated in year 2000 EC) due to better credit access, safety net programs and food security program.

**Market:** Livestock market is seasonal in both places. The nearest market for *Lenche Dima* is Hara town and for *Kuhar Mickael* is Woreta town. Information flow is mostly through farmer to farmer contact. December, April and September are the main seasons when animals are more demanded by local consumers and can fetch higher prices. This is due to the increased demand of animals for festivity purposes by the community during holidays (Christmas, Easter, and New Year in these months). Sellers (farmers) get better prices when there is high demand for their livestock. Men are responsible for selling live animals. Livestock

market in *Lenche Dima* this year (2001/02 EC) is not good for farmers since every farmer was a seller of livestock due to the bad season effect on feed and water shortage. The distant markets in both sites are discouraging for women farmers to take animals and sell if they should travel alone.

### **Variations between Women and Men Headed Households in Benefits from Basic Resources (Livestock, Land and Water)**

Among the farming household groups, women headed and poor households are benefiting little from the livestock and natural resources (land and water). The reason is that most of them do not keep livestock and some have only oxen for draft power. Moreover, due to lack of draft power, they are sometimes forced to do sharecropping. The men headed medium, and better-off households are benefiting relatively more as they have relatively better resources to keep livestock and do farming on time. Few introduced interventions like domestic water supply development benefits both men and women jointly in accessing clean water to secure particularly health but relatively more for women in terms of saving labor and time. In *Lenche Dima*, it also benefits men to change the role of and time to use to collect water from a distant source. Irrigation provides benefits for both men and women jointly in a household except those who rent out their land by half share as they only get half of the production from their land right. In addition, even if they have interest to keep animals that they prefer, they cannot do it due to the shortage of labor.

### **Major Problems of Livestock Keeping for Improved Productivity and Benefit**

Problem prioritization varies between sites. In *Lenche Dima*, grazing land/feed/ especially after hillside enclosure is the first problem followed by water scarcity regardless of gender and wellbeing. But in *Kuhar Michael*, livestock diseases (trypanosomiasis and internal parasites) due to Tse-Tse fly and flooding over grazing areas, quality water, and then feed are the major problems in order of priority. Generally, the following problems have been identified as challenging factors for livestock productivity and livelihood improvement.

- Feed (quantity and quality) is a major problem for all types of farmers regardless of wellbeing status, age, and gender. Diseases and limited access to veterinary services are other problems mentioned by all participant farmers.

Population pressure (both human and livestock) is a driving force for land shortage, overstocking of grazing area and deterioration of the quantity and quality of the pasture, thus expose animals to diseases making them less productive. Farmland shortage for young poor farmers as a major livelihood challenge is also an outcome of population pressure. Moreover, successful livestock production is heavily dependent on access to water (Peden et al, 2007). However, water scarcity especially during the dry season in both sites and in the uplands of *Kuhar Michael* where there are no multiple water sources is another major problem. Risk of flood especially in the plain land, feed shortage, waterborne diseases, and malaria are also other limitations in the area.

- Financial problems with very poor credit services for women headed and poor young farmer households especially in *Kuhar Mickael* and shortage of labor for women headed households in both sites are among the major challenges. Limited awareness or experience and extension service in livestock department in the areas is also one factor to motivate farmers to participate in raising livestock. Other social factors like theft and predator to keep goat for instance (for women participants due to shortage of labor), and biting pest for sheep in the plain flooded area of *Kuhar Michael* are other problems that discourage farmers to keep livestock.
- In order to get temporary solutions for problems related to disadvantaged households like women and young poor *farmer groups*, social assets like kinship, joint work, sharecropping arrangements, Debo/Jigi-group works have important contributions. However, farmers also use own coping mechanisms like seasonal migration for temporary employment, selling locally made alcohol (women in *Kuhar Michael*), and selling firewood and charcoal. Selling draft oxen during off-farm season and other livestock is also a coping mechanism in worst situations, especially to *cope with dry* season feed problems.

### **Implications of the Identified Variations on Livelihoods' Improvement**

Variation in women household proportion by sites has implications on poverty level increment unless women do something that helps to improve their livelihoods. Wellbeing level variation will have contributions in land use efficiency and benefit for poor and women farmers. Variation in accessing crucial resources has big *implications in farmers'* livelihoods through affecting their income and productivity. This is because farmers, especially women and the poor,



have less opportunity to use the land owned as they have draft power (physical productive capital) or labor (human capital) problems. Rather they rent out by share arrangements, which reduces the crop yield and crop residue share. This in turn has implications on food security by reducing food supply and their income. Variation in access to labor has also impact on the agricultural activities and land and water use efficiency for improved productivity. In addition, variation in benefit sharing from the resources have implications on gendered livelihoods and the poor may remain as poor unless supported by some intervention options to build their capacity to use their own resource and build assets to secure their livelihoods.

## Discussion

The difference in agro-ecological and topographical nature of the study areas resulted in variations in the production system. Crops grown, animals reared and their contributions, and the requirement for labor and peaks also vary. These variations in turn could influence food self sufficiency, income level, and wellbeing of the different household classes since resource accessibility, productivity and market value of these different crops and animals are different.

Wellbeing variation between men and women headed households among the study sites is a combined effect of different factors mainly environmental, institutional and socio-economic. A higher level of poverty (higher number of poor households) found in *Lenche Dima* is because of the environmental factors: drought and low erratic rainfall that affects agricultural productivity. Hindrances to the wellbeing of women households is more severe than the men households in both sites, and the reason for this is not just because they are women but the limitations in accessing basic resources or livelihood assets. Shortage of labor and draft power can be mentioned as specific examples. Since there are no diversified livelihood activities other than agriculture (crop production and keeping livestock) in the rural areas of study, it is not easy to manage the whole agricultural activities and cope with production risks especially for resource poor households. Thus women headed farmers, mostly in labor and draft power limitations, are influenced to use the land they owned for securing their food and other needs. Because, situations force most of them to share out their limited resources (land and its outputs) they have and get poorer.

Livestock ownership variation also has to do with resource limitations for different groups of farmer households to keep and invest for improvement. Livestock is pivotal for the agricultural system and livelihoods in general in both study sites since it is an integral part of agriculture, especially oxen for draft

power. Livestock also constitutes the most important role as asset base and serves as a safety net during periods of food crisis like it happened in *Lenche Dima* this year (Year 2001/02 E.C due crop failure). Moreover, livestock, in particular draft oxen, is thus often used as the indicator of social stratification (Pernille 2003). However, decision for investing on livestock is closely related to labor availability, land and livestock holding: referred to as access to key productive resources (Hailesillasié et al, 2009). In the study sites, livestock ownership is for the better-off and medium level households with diversified types and better herd sizes. From the gender point of view, men headed households own more livestock in herd size and animal types than women headed households. Because women farmers may not have either enough labor or land size to be motivated for livestock keeping, and most of them are under poor category especially with financial problems to acquire livestock, and then labor – key for livestock keeping.

If we take only oxen ownership for draft power need for example, almost half of the households surveyed have shortage of draft power (own only one or no oxen). According to respondents, standard draft power need for productive farming activity is a pair of oxen. Therefore, half of these households need to fill this gap in order to be productive. Thus facilitating some kind of credit for such purpose might be crucial to help the poor. Because, most of such types of households work in any share or rent out arrangements (commonly half share in both sites with some exceptions in *Lenche Dima*) that reduce their production from their land owned and income by half. The exception in *Lenche Dima* is that only the grain yield is shared equally (as women headed farmers explained) unlike in *Kuhar Michael*. The crop residue, farm boundary green feed sources, weeds and crop aftermath, all go to the farmer who rent in land in *Lenche Dima* while both grain and farm by-products are equally shared in *Kuhar Michael*. This makes poor farmers less beneficiary from the land ownership right. It also discourages investing in livestock keeping in order to benefit from increased productivity, and thus improve their livelihood wellbeing. On the other hand, this land renting system is giving an opportunity to benefit others like young farmer households who do not have enough land but labor. It also adds more benefit to better-off and medium farmers who rent in additional land from such poor farmers. If labor is the key limiting factor for women headed households, livestock keeping should not be necessarily the first priority to solve their problems. There have to be other alternatives that they can do by themselves as source of income to secure their livelihoods.

Provision of feed is a major livelihood challenge and high labor and farm input cost for farmers in sub-Saharan Africa (Peden et al, 2009) including the study sites. The major natural asset for farmers' livelihood activity is farmland,

which is also important for animals to provide major feed source from crop residue. Farmland is accessible to all farmers with various sizes, except a few newly married young ones, especially after 1996/97 land redistribution time. Rural land redistribution was made throughout the country for the last time by the government in order to reallocate land resources to all farmers who are in need of land. During this time, extra land and land with no owner was taken from those who had excess and who were using without entitlements. These lands were redistributed to the landless according to their family size (a quarter hectare for a farmer). Those with bigger land size, enough labor for different farm activity and draft oxen can farm the land and get better benefits when compared to others. They also contribute to the improvement of productivity through increasing production from the land owned and rented. Quality land (irrigable and rice field (*Kuhar Michael*)) owners will have also relatively better contribution for LWP than those who do not have. This is because they can have farm activities almost throughout the year, thus will have additional feed for animals which increases water productivity and enhance multiple use system of resources (water and land). This will also help to keep animals well, healthy and more productive. Some framers (who have bigger land size) also keep a parcel of land as a private grazing land where they can produce improved type of feed in addition to the natural grass for improved animal productivity. This is of course site specific, which is practiced only in *Kuhar Michael*. Therefore, farmland accessibility, size and quality as explained above is one important factor for enough feed provision to livestock keeping, improving productivity and benefiting from the resource for improved wellbeing.

Grazing land availability and accessibility has variations and its own limitations in both study sites. In the case of *Kuhar Michael*, open communal grazing land is accessible to all farmers belonging to the entitled land. Grazing land is also demarcated and entitled to the community during the land redistribution time. Every village got/has its own grazing land and is entitled for that village community in this site. However, since the grazing type is free and is overstocked, both the quality and quantity of the pasture deteriorates thus needing some management. A farmer explained that because of over grazing, an unwanted plant like “Amekala” weed is dominating the grazing area. Few farmers use own private grazing area as additional feed source. For example, from sixty respondent farmers, about seventeen (28.3 %) use private grazing land. This might give opportunity for intervention to improve animal productivity through improving feed both in quality and quantity. In *this site*, the road side (has risk of car accident) and hilly grazing bush grasslands are alternative grazing areas during the rainy season when the grazing land is over flooded.

While in *Lenche Dima*, grazing land is very scarce since the communal grazing land is accessible only to a small portion of farmers, which is in Alawuha (5 to 6 hours walk for round trip) and Hara wetland. Moreover, the grazing land is poor in vegetation cover and thus poor in both quality and quantity especially in the dry season. Resource map of the watershed in *Lenche Dima* drawn by farmers and direct observation depicted that some portion of the non-arable hills were the major grazing areas available as indicated in Gizaw et al, (1999). However, from 2002/2003, about 379.75 ha land is developed and about 209 ha land is distributed to individual farmers (*Kebele DA*<sup>5</sup>). This area is now enclosed and protected from the reach of animals and human beings (only cut and carry system of feeding exercised). Of course, farm boundaries and crop aftermath (stubble and weeds), gullies, natural waterways, small grazing areas near homesteads, and live fences are also used as a feed source in this area. Gully banks are considerable source of native/wild herbaceous legumes and bushy plants which are major sources of feed for the dry season together with shrubs and trees around homesteads, farm and grazing lands (Gizaw et al 1999). Here, the enclosed hill area is also accessible to women farmers. According to the *Kebele DA*, a quarter of individuals who got share from the hill are women farmers. But except few, they are not using the area as a source of feed for their own animals though they might not have livestock; instead they sell the grass and earn some cash income. Other farmers with feed gap will fill from these sources.

Regarding labor, it is a key factor in livestock development, particularly in Sub Saharan Africa, mainly because many of the technologies developed for improving livestock feeding are more labor intensive than those they replace (Owen 2005). It is also found as one of the important livelihood assets which can determine the capability and interest to keep livestock and invest for the improvement of productivity. In farmers' livelihood activity, men's labor is the major input for farming and efficient use of land resources in livelihoods improvement. For livestock keeping children's (boys and girls) labor is found to be in big demand in a household (herding at grazing area and watering from river or other sources especially boys). Girls contribute by helping women, usually mothers, in collecting water from different sources and other home activities (Figure 4). Participant farmers explained that from mid November to end of December, it is labor peak season in *Kuhar Michael*. During this period, children's labor is highly demanded and most of them do stop going to school which might have impact on children's education. Women headed households have the shortage of labor, especially men's labor for farming activity. This forces

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<sup>5</sup> DA refers to the development agents employed by the agricultural and rural development office and working agricultural extension works at *Kebele* level.

most of them to rent out their farmland mostly by half sharecropping arrangement and get only half of the benefit from their land. In addition, even if they have interest to keep some kind of animals they prefer, they cannot do it because of the shortage of labor.

### Conclusion and Suggestions

In summary, gender and wellbeing variations are major issues needed to be seen in a livestock development intervention since the contributions and challenges differ even between sites. Labor and finance, the major limiting factors for example need to be also seen and solved in order to help the poor and thus make them beneficiaries from the natural resources available and accessible.

Considering the following options is also helpful to invest in livestock/water productivity improvement for improved livelihood and wellbeing. Farmers believe in minimizing herd size and keep more productive animals - improved cow for example at the first instance. This will help to feed and water animals well and make them more productive. Secondly, they can choose the kind of enterprise/s in which they can involve in order to get better benefits from animals. For instance, farmers mostly prefer fattening of large animals and keeping small ruminants for production purposes based on their capability to do. Seasonal arrangements like keeping more animals in good time and minimizing their number in times of adversity are also other options for improved productivity. The reason is, when there is ample feed, labor, and space (grazing), it is possible to keep more animals and sell and minimize herd size during a difficult season. Improved and optional credit system to solve financial problem; water development to improve water supply system - considering groundwater use as strategic water supply option; and grazing management and development especially the private grazing areas improvement to increase biomass (feed) production from the smaller sized plot of about 1/4<sup>th</sup> ha are other options that need to be seen. Thus, helping the farmers in providing access to the limitations is important in consideration of the above options for better productivity.

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