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Does the future hold for transhumance cattle production system in North Western Ethiopia?

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Introduction

Transhumance cattle production system consists of a seasonal displacement of livestock from one area mainly in search of better grazing area by herders who have permanent residences. In Africa, there is dry and rainy season transhumance (PAMO AND PIEPER, 2000). Dry season movement is the most important due to the lack of forage or water or both. Rainy season displacement is complex and the reasons for it are multiple. In Ethiopia, pastoralism is dominant in the arid and semi-arid areas in the eastern, northeastern and southeastern parts of the country, while agro-pastoralism represents an increasing practice in the semi-arid areas in the northwestern, southern and eastern parts of the country (TESFAYE MENGSITIE, 2008). The highlands (> 1500 masl), that occupy 39% of the land area, are important for cereal cultivation and mixed crop-livestock enterprise, while the arid to semi-arid lowlands (that occupy 61% of the land area), are dominated by livestock production. North Gondar Zone, in Amhara Regional State, is comprised of both highland and lowland districts. According to a report by the Metema Woreda Office of Agriculture and Rural Development (WOoARD, 2006), the highlanders in the Zone have been practicing transhumance cattle production system for a long time by migrating to the lowland districts during the rainy season. However, little is known about this cattle production system and the problems associated with it. This study was therefore undertaken to characterize the rainy season transhumance cattle production system, identify the major constraints and forward suggestions for future interventions.

Materials and Methods

The study involved three highland (Chilga, Dembia, Gondar Zuria) districts that practice transhumance and one lowland (Metema) district that receives the transhumance. Informal and formal surveys were employed to collect qualitative and quantitative data. From these districts, a total of 180 representative households from nine rural *Kebeles* (villages) were selected using systematic random sampling methods. Semi structured questionnaires and topical guidelines (checklists) were used to collect the necessary data. Accordingly, nine *Kebeles* in the highland districts and three *Kebeles* in the lowland and a total of 12 rural *Kebeles* were considered for the study. Representative sample of farmers were taken by using systematically random sampling method, and 20 representative farmers from each *Kebele* and a total of 240 households were selected for the study. Secondary data were collected from the concerned offices and formal survey with semi-structured questionnaires and informal surveys were conducted to collect

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primary data. Quantitative and qualitative data on socio-economic characteristics of the highlanders, livestock production and management system, time and causes of mobility, cattle management practices; feed availability, animal and product marketing, opportunities and major constraints were collected. Data were analyzed using Statistical Package for Social Sciences (SPSS, 2003).

Results and Discussion

Livestock production system in the highlands is characterized by mixed crop-livestock production and transhumance production system. Transhumance production system was practiced to a large extent by migrating to adjacent lowland areas. Although farmers practiced both dry and rainy season transhumance production system, the later is the dominant one. In the highlands, the mean family size per household was 7.4±0.17. About 42.2% of the household heads were illiterate, while 32.2% had adult education and 20.6% attended primary school. The average land and cattle holdings per household were 2.2±0.18 ha and 8.7±0.48 heads, respectively. The highland districts, i.e., Gondar Zuria, Dembia and Chilga districts have 217, 260 and 75 inhabitants per Km^2, respectively, while Metema has 21 inhabitants per Km^2. The average human population density in the three highland districts was 147 inhabitants per Km^2. The total cattle population in the three highlands districts was 525,000 with a density of 92 heads per Km^2, while in Metema the cattle population was 103,756, with a density of 26 heads per Km^2 (Table 1). The highland farmers transhume during the rainy season to take advantage of the lower human and livestock density in the lowlands.

Table 1. Human and livestock population in the study area

Districts	Human Population (‘000)			Land area (Km^2)	Human density (Head/Km^2)	Cattle Population	
	Male	Female	Total			No (‘000)	Density (Head/Km^2)
Gondar Zuria	141	138	279	1287	217	141	110
Dembia	160	156	316	1215	260	166	137
Chilga	121	118	239	3181	75	218	69
Total highland	422	412	834	5683	147	525	92
Metema	45	38	83	3995	21	104	26

Sources: CSA, 2008

The proportion of households that practice transhumance was 91.7% in Chilga, 77.6% in Dembia and 55.2% in Gondar Zuria districts. The major reasons for cattle mobility to the lowlands are presented in Table 2. Metema was the preferred destination for 84% of the respondents due to availability of good quality feed. Movement to the lowlands commences in May (69.5%) and June (29.6%), and depends on availability of feed and labor and cattle holdings. About 60% of the cattle are trekked to the lowlands during the rainy season. Herder groups are formed among relatives and neighbors at village level to optimize labor use and protection against theft. Herder groups carry drugs and veterinary supplies to treat sick animals in the lowlands. The average herd size per herder group was 58.8± 3.88. As shown in Table 2, the major reasons why cattle were trekked to the lowlands during the rainy season were due to availability of feed (99.2%), free land for stocking (92.4%), low disease risk (25.0%) and non-waterlogged areas (0.8%).

Preferred places for transhume during the rainy season were Metema (84.0%), Armachiho (9.6%), and Quara (4.0%) districts, while very few farmers considered Alefa and Chilga districts (0.8% each). Three major routes for transhumances were identified, and the selection of routes depended on distance, availability of forage and non-crop covered areas. The first destination is Agamwuha Kebele (Lemlem Terara) in Metema district, irrespective of the routes followed.

Table 2. Major reasons for cattle mobility to the lowlands

Major reasons – in search of	Chilga (N=54)		Dembia (N=47)		Gondar Zuria (N=31)		Overall (N= 132)	
	HHC	%	HHC	%	HHC	%	HHC	%
feed	54	100.0	46	97.9	31	100.0	131	99.2
free area	50	92.6	46	97.9	26	83.9	122	92.4
disease free area	6	11.1	16	34.0	11	35.5	33	25.0
non-waterlogged area	1	1.9	0	0.0	0	0.0	1	0.8

HHC = Household count

The number of cattle owners and the size of cattle population involved in one group were 4.3±0.18 farmers and 58.8± 3.89 heads, respectively. Productive and reproductive performance of indigenous cows in the lowlands is presented in Table 3. The average daily milk off take, lactation yield and lactation length of indigenous cows in the three studied areas was about 2.0±0.07 liters, 540±21.05 liters, and 8.9±0.16 months, respectively. The mean age at first calving (AFC) and calving interval (CI) was 5.2±0.30 years and 19.0±0.38 months, respectively, while mean calf crop was 7.4±0.47 heads. The average weaning age of calves was 11.6±0.26 months. The major cattle diseases were tick infestation and babesiosis (80% respondents), lumpy skin disease (73%), Foot and Mouth Disease (55%), Blackleg (44%), Anthrax (43%) and internal parasites (43%).

Table 3. Mean (±SE) values for productive and reproductive performance of indigenous cows

Variables	Chilga (N = 58)	Dembia (N = 57)	Gondar Zuria (N = 56)	Overall (N = 171)
	Mean(±SE)	Mean(±SE)	Mean(±SE)	Mean(±SE)
Daily milk yield (L)	2.4 (0.11)[a]	1.7 (0.11)[b]	2.0 (0.13)[ab]	2.0 (0.07)
Lactation yield (L)	698.5 (34.15)[a]	405.5 (27.65)[b]	512.8 (36.31)[b]	540.0 (21.05)
Lactation length (mo)	10.1 (0.29)[a]	7.9 (0.17)[b]	8.6 (0.29)[b]	8.9 (0.16)
Weaning age (mo)	12.3 (0.45)[a]	11.5 (0.43)[a]	10.9 (0.44)[a]	11.6 (0.26)
Age at first calving(year)	5.0 (0.18)[a]	5.0 (0.09)[a]	5.7 (0.89)[a]	5.2 (0.30)
Calving interval (mo)	19.6 (0.62)[a]	18.6 (0.68)[a]	18.9 (0.68)[a]	19.0 (0.38)
Calf crop (No)	6.6 (0.19)[a]	8.4 (1.37)[a]	7.2 (0.21)[a]	7.4 (0.47)

Values with the same superscript within a row do not differ significantly at 5 % level

In the lowlands, fresh milk is fermented into sour milk prior to churning. Milking, butter making and selling of dairy products in the lowlands are performed by only male herders. In the highlands, butter (95.6%) is the most important salable dairy products followed by raw milk (18.4%), fermented milk (*ergo*) and buttermilk (6.1%). However, during the transhume period, butter (95.3%) is the major marketable commodity followed by raw milk (61.3%), buttermilk (18.9%) and fermented milk (14.2%). Regarding live animals sales, dry cows, oxen, heifers and young bullocks are marketed locally.

The transhumance return back home to the highlands in October (45.8%) and September (35.9%), and the major triggering factors (Table 4) are high ambient temperature (43.0%), availability of crop aftermath in the highlands (25.1%) and high infestation of flies in the lowlands (10.6%). Most of the respondents (86.3%) estimated that the trend of transhumance has been increasing due to feed shortage (50.4%), expansion of crop cultivation (27.4%) and increasing human and cattle population (21.2%) in the highlands. The major constraints identified

and prioritized by the transhumance highlanders were conflict with the lowlanders, theft of animals, human and livestock diseases and lack of markets.

Table 4. Major reasons for mobility back to the highlands

Major reasons	Chilga (N=53)		Dembia (N=54)		Gondar Zuria (N=29)		Overall (N= 136)	
	HHC	%	HHC	%	HHC	%	HHC	%
High temperature	26	29.5	33	61.1	18	48.6	77	43.0
Availability of crop aftermath	27	30.7	10	18.5	8	21.6	45	25.1
High fly infestation	14	15.9	4	7.4	1	2.7	19	10.6
Waterlogged areas dry up	13	14.8	3	5.6	1	2.7	17	9.5
Others*	8	15.1	4	9.1	9	31.0	21	16.7

HHC = Household count; *Others include labor need, fear of theft, shortage of grass and water.

Conclusion and Outlook

Highlanders face various constraints in cattle production both in the highlands and the lowlands. The major constraints in the highlands are shortage of land, cattle theft, human and livestock diseases, tick and fly infestation and bloating. In the lowlands, the major challenges are cattle theft, human and livestock diseases tick and fly infestation and lack of market. Proper animal health care, good management of grazing land, community based conflict management, provision of improved technology and ideas through awareness and appropriate training to the community are critical to this production system. Human and livestock populations have been increasing both in the highlands and lowlands and the current accelerated infrastructure development in the lowlands (tarmac road, electricity, phone, etc) will further encourage more migration to the lowlands. Unless alterative development strategies are devised, the conflict over resources will intensify, probably leading to the demise of this production system.

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