



Science

AVAILABILITY OF FEED RESOURCES FOR GOATS IN PASTORAL AND AGRO-PASTORAL DISTRICTS OF SOUTH OMO ZONE, ETHIOPIA

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Abstract

A survey was conducted in Hamer and Bena-Tsemay pastoral and agro-pastoral districts of South Omo zone, south western Ethiopia in between January to May 2011 with the objective to describe availability of feed resource for goats. Data were collected from the two districts by informal and formal survey methods using focused group discussion and semi-structured questionnaire administered to 250 households. Natural pastures from rangelands are major feed sources for goats. Higher feed availability is reported in March to April (during the main rainy season). However, availability of feed extends up to October in Bena-Tsemay district due to the higher rainfall in the district. In both districts, the hot dry season (November to February) is the period of feed scarcity and during which high mortality of goats have been reported. Crop residues and some food left over are also available for supplementing animals especially in the agro-pastoral areas. The efficiency of goat production in the studied districts could be increased by optimizing goats breeding season with the availability of feed resources.

Keywords: Feed Resources; Availability; Goats; South Omo Zone.

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1. Introduction

Feed resources are a major component of economic animal production in various animal enterprises. Feed availability and efficiency of use in specific agro-ecological zones and in smallholder production systems dictate to a very large extent the performance of both ruminants and non-ruminants. In Ethiopia, generally, green fodder (grazing) is the major feed source (about 39 percent) followed by crop residues (3 percent). Hay and by-products are also used as animal feeds which comprising about 12 and 3 percent of the total feeds, respectively. Moreover, very small amount of improved feed (like alfalfa, only about 1 percent) is being used as animal feed and other types of feed account about 12 percent in the country [1].

The major constraints of sheep and goat production related to nutrition and feeding in Ethiopia are inadequate feed supply, mainly due to small land-size and overstocking brought about by the shrinking amount of land reserved for grazing and the low feeding value of available feed resources resulting in low efficiency of utilization. This is aggravated by seasonal availability of forage and crop residues in the highlands and by recurrent and prolonged drought in the lowlands [2]. According to [3] the strategy for feed improvement would incorporate improvement of feed availability and quality. Moreover, matching sheep and goat production systems to available feed resources and more efficient use of agricultural and industrial by-products as sources of feed have been suggested as a strategy for ensuring appropriate nutrition of small ruminants in the country [2]. The objective of the current study is to describe feed resource availability for goats in pastoral and agro-pastoral areas of South Omo zone, south western Ethiopia.

2. Material and Methods

2.1. Descriptions of the Studied Area

The study was conducted in Hamer and Bena-Tsemay pastoral and agro-pastoral districts of South Omo zone. The districts are located between 04° 59.00" and 05° 58.40" N and 36° 12.45" and 37° 30.25" E in the Southern Nation, Nationalities and People's Region (SNNPR) of Ethiopia. The climate of the districts is hot to warm semiarid with altitudinal variation of 500 to 1800 meters above sea level. Rainfall in the districts is bimodal, the main rain occurring in March to May and a short rain occurs in September to October (Fig. 1 and 2).

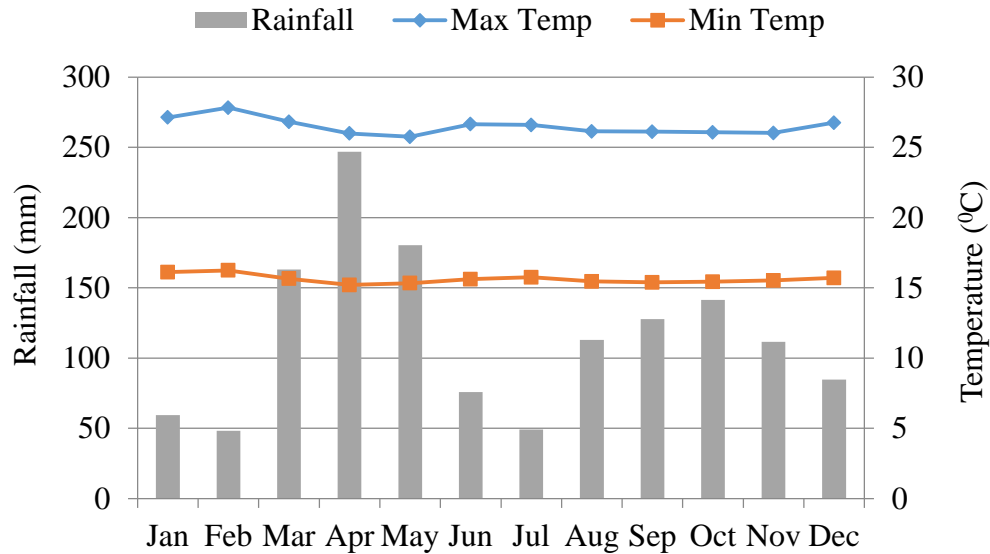


Figure 1: Monthly average rainfall and temperature (2000–2010) at Keyafer, Bena-Tsema district Source: [4]

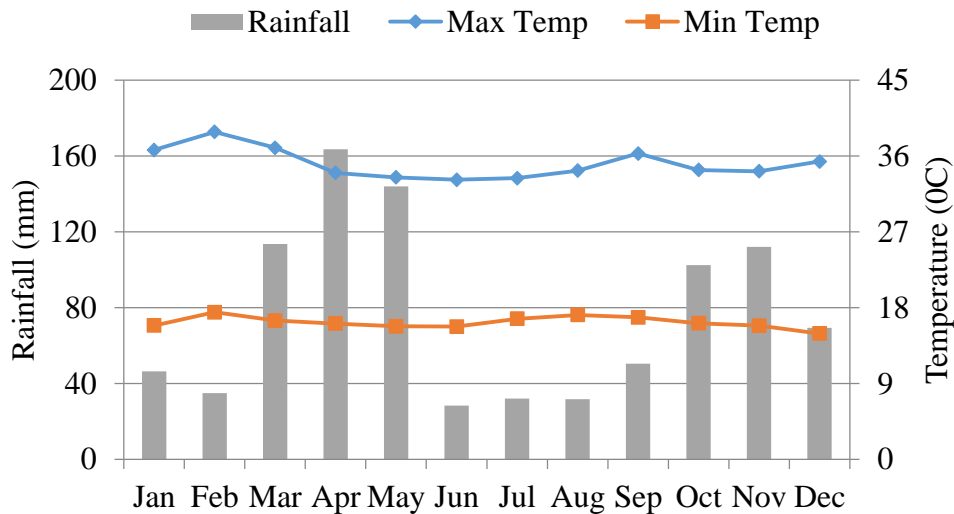


Figure 2: Monthly average rainfall and temperature (2000–2010) at Dimeka, Hamer district Source: [4]

2.2.Data Collection and Analysis

After selection of the two districts namely; Hamer (representing the pastoral area) and Bena-Tsema (representing the agro-pastoral area) a two stage sampling technique was used [5]. In the first stage, Kebele's (lowest administrative sub-units) and villages were selected from each district based primarily on distribution of ethnic groups and population of goats. In the second stage, respondent households were selected randomly using systematic sampling procedures from the selected villages (three to five respondents per village). The distribution of households in each district was presented on Table 1. Information on households livelihood sources, major

feed source for goats in dry and wet seasons, months of feed shortage or surplus for grazing goats were collected from January to May 2011 through group discussions using structured questionnaire administered to knowledgeable goat producers, community leaders and key informants. Moreover, a secondary data pertinent for the study was collected from relevant district offices. The collected data were analyzed using descriptive statistics [6].

Table 1: Distribution of the households in different sampling units (in numbers)

District	Sampling unit ¹		Households selected	Ethnic groups interviewed
	Kebele ²	Village		
Hamer	38 (9)	217(27)	122	Hamer, Arbore
Bena-Tsemay	31 (9)	220(45)	128	Bena, Tsemay, Birale, Ari
Total	69(18)	437(72)	250	

¹ Numbers in parentheses represent selected sampling units (households)

² Lowest administrative sub-units

3. Results

The households in study districts raised cattle and goats followed by sheep. The average goats holding per household was 66.7 ± 54.2 and 41.8 ± 31.2 , in Hamer and Bena-Tsemay districts, respectively. In both districts, sale of livestock is the main source of income. Sale of livestock products such as milk, butter and honey in Hamer and sale of crops such as sorghum, maize, millet, barley, wheat and tef in Bena-Tsemay are the second greatest source of income for the respondents. In both districts, goats are the greatest income source from livestock types followed by cattle. However, the proportion of households ranking goats as the first income source was significantly higher in Hamer district than Bena-Tsemay.

In Hamer and Bena-Tsemay districts, 83 and 80% of households, respectively, stated that natural pastures from rangelands (pasture grasses, legumes, fodder tree and shrubs) are major feed sources for livestock (Table 2). Some agro-pastoral households in the studied districts also use crop residues mainly from maize and sorghum harvests and graze their livestock on stubbles after crop harvests. Grazing lands are mainly communal and the households have different grazing sites with varying distances. Riverside grazing and enclosures that are owned either communal or private are used for grazing especially during the dry season.

Rainfall is the main factor which determines availability of grazing in the studied districts. Higher feed availability in the studied districts is during the main rainy season (March to April). The hot dry season (November to February) is the period of feed scarcity in both districts (Fig. 3). In Bena-Tsemay district, availability of feed is higher (extends up to October) since the rainfall in the district is relatively higher and longer compared to Hamer district. Feed shortage and high mortality of kids and adult goats in both districts have been reported during the hot dry season (November to February).

Table 2: Major Feed sources for goats according to the households studied in the districts

Feed Sources	Hamer (n=122)		Bena-Tsemay (n=128)		Overall (n=250)	
	Frequency	%	Frequency	%	Frequency	%
Rangeland	101	82.8	101	78.9	202	80.8
Crop residue	11	9.0	19	14.8	30	12
Others*	10	8.2	8	6.3	18	7.2

*enclosures and riverside grazing

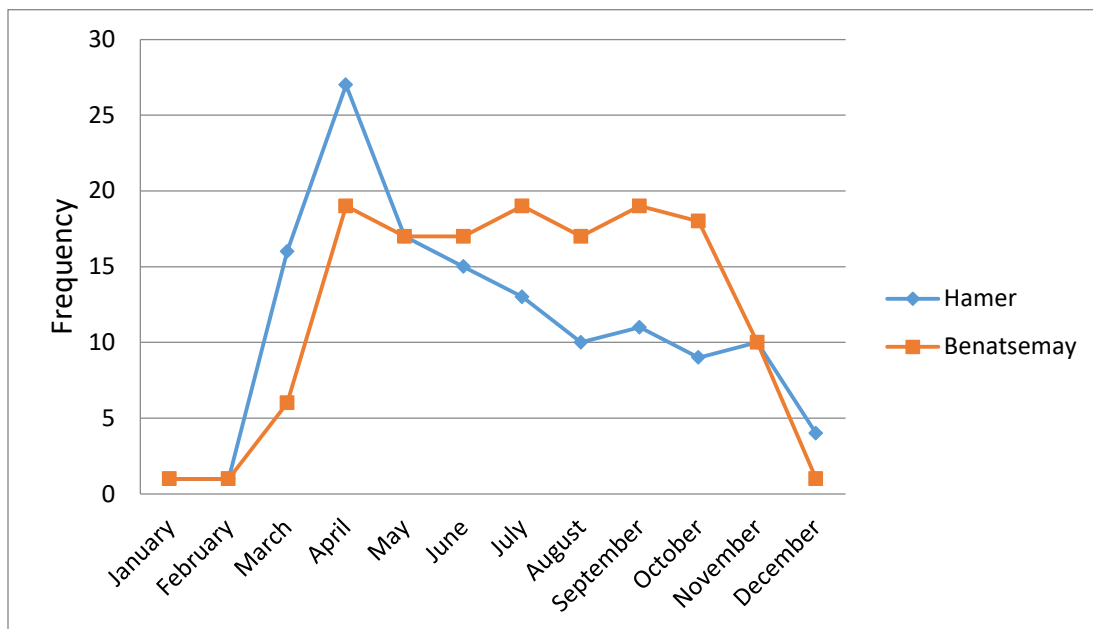


Figure 4: Seasonal pattern of feed availability in Hamer and Benatsemay districts of South Omo zone as reported by the respondents (Frequency indicates number of households who said available)

4. Discussions

The two districts possess 60% of the goat population of the pastoral and agro-pastoral districts of South Omo zone [7]. It has been reported that livestock production and cultivation are the basis for economic culture for the pastoral and agro-pastoral ethnic groups in both districts [8, 9]. However, the higher percentage of households ranking goats as the first income source in Hamer than Bena-Tsemay district may indicate a higher economic dependence of pastoral households in Hamer district on goats than the agro-pastorals in Bena-Tsemay district. In the pastoral/extensive systems, the greater role of goats in income generation compared with the crop dominated smallholder system has been reported [10].

The present study showed that rangeland is the major feed source for the households. It has been reported that the rangelands of south Omo zone are dominated by varying densities of Acacia, Grewia and Solanum woody and herbaceous species of grasses and legumes [11]. Available information also indicate that more than 48% of the total land area of the districts is used for grazing and/or browsing by cattle, sheep and goats [12]. Sorghum, maize, millet, barley, wheat, and tef are also the main crops grown in the districts [12]. Availability of feed resources is

dependent on the pattern of rainfall in the two districts. Similar feed sources and grazing pattern exists in Borana rangelands of south Ethiopia [13].

However, a decrease in rangeland and change in vegetation composition due to frequent droughts, overgrazing, and expansion of cultivation is posing a serious threat to livestock production in South Omo rangelands [14, 11]. Reports also indicate that availability and quality of grazing and browse resources in the pastoral areas of Ethiopia vary with altitude, rainfall, soil type and cropping intensity and the pastoral zones are characterized by dense thorn bush with a low carrying capacity [3]. Moreover, it has been reported that poor management of rangelands, inappropriate grazing management, rangeland fires and droughts limit the availability of fodder to ruminants in the country [15, 16, 17].

5. Conclusion and Recommendations

Natural pastures from rangelands are major feed sources for goats. Higher feed availability is reported in March to April (during the main rainy season). However, availability of feed extends up to October in Bena-Tsema district due to the higher rainfall in the district. In both districts, the hot dry season (November to February) is the period of feed scarcity and during which high mortality of goats has been reported. Crop residues and some food left over are also available for supplementing goats especially in the agro-pastoral areas. To sustain goat production in the districts efficient utilization of grazing resources through proper rangeland measures is required. Moreover, the efficiency of goat production could be increased by optimizing the breeding season of goats with the availability of feed resources.

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References

- [1] CSA (Central Statistical Agency), Agricultural Sample Survey 2011/12 Volume II: Report on livestock and livestock characteristics (private peasant holdings), Statistical bulletin 532, CSA, 2012, Addis Ababa, Ethiopia.
- [2] Yami, A., Nutrition and Feeding of Sheep and Goats, In A. Yami and R.C. Merkel (eds), Sheep and Goat Production Handbook for Ethiopia, Ethiopia Sheep and Goat productivity Improvement Program (ESGPIP), 2008, Addis Ababa, Ethiopia.
- [3] Mengistu, A., Feed resources in Ethiopia, In J.A. Kategile, A.N. Said, and B.H. Dzowela (eds), Proceedings of the second Pastures Network for Eastern and Southern Africa (PANESA) workshop, held at the International Laboratory for Research on Animal Diseases, 11-15 November 1985, Kabete, Nairobi, Kenya.
- [4] NMA, Keyafer, Dimeka, Turmi and Jinka stations 2000 –2010 weather report, National Meteorological Agency, Hawassa Branch Office, 2011, Hawassa, Ethiopia.
- [5] Bethlehem, J., Applied Survey Methods: a statistical perspective. John Wiley and Sons, Inc. Publication, U.S.A., 2009.

- [6] SPSS (Statistical Package for Social Sciences), SPSS 15.0, Student Version for Windows, 2007, (Prentice Hall)
- [7] SOFEDB (South Omo zone Finance and Economy Development Bureau), Zonal Statistical Abstracts 2009, Jinka, South Omo Zone, Ethiopia.
- [8] Ayalew, G., The Arbore of Southern Ethiopia: A study of Inter-Ethnic relations, social organization and production practices, MA Dissertation, Department of Sociology, Anthropology and Social Administration, College of Social Sciences, Addis Ababa University, 1995
- [9] Turton, D., Pastoral Livelihoods in Danger-Cattle Disease, Drought, and Wildlife Conservation in Mursi land, South-Western Ethiopia, Oxfam (UK and Ireland), 1995, Oxfam.
- [10] Kosgey, I.S., G.J. Rowlands, J.A.M. van Arendonk and R.L. Baker, Small ruminant production in smallholder and pastoral/extensive farming systems in Kenya, Small Ruminant Research, 77, 2008, 11–24.
- [11] Admasu, T., E. Abule and Z. Tessema, Livestock-rangeland management practices and community perceptions towards rangeland degradation in South Omo zone of Southern Ethiopia, 2010, Available source: <http://www.lrrd.org/lrrd22/1/tere22005.htm>.
- [12] Terefe, A, A. Ebro and T. Zewedu, Rangeland dynamics in South Omo Zone of Southern Ethiopia: Assessment of rangeland condition in relation to altitude and Grazing types, 2010, Available source: <http://www.lrrd.org/lrrd22/10/tref22187.htm>.
- [13] Tolera, A. and A. Abebe, Livestock production in pastoral and agro-pastoral production systems of southern Ethiopia, 2007, Available source: <http://www.lrrd.org/lrrd19/12/tole19177.htm>.
- [14] Carr, C.J., Patterns of vegetation along the Omo River in southwest Ethiopia, Plant Ecology, 135, 1998, 135–163.
- [15] Angasa, A., The effect of clearing bushes and shrubs on range condition in Borana, Ethiopia, Tropical Grasslands, 36, 2002, 69–76.
- [16] Benin, S., S. Ehui and J. Pender, Policies affecting changes in ownership of livestock and use of feed resources in the highlands of northern Ethiopia, Journal of African Economies, 13(1), 2004, 166–194.
- [17] Gemedo, D., B.L. Maass and J. Isselstein, Enchroachment of woody plants and its impact on pastoral livestock production in the Borana lowlands, southern Oromia, Ethiopia. African Journal of Ecology, 44, 2006, 237–246.

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