

# Livestock Movement in Gaurisankhar Valley, Dolakha, Nepal

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## Abstract

*Animals are an integral part of subsistence farming system. They are considered as assets and are the source of food and manure. In mountains of Nepal, transhumance ruminant production system is practiced this practice of herding of cattle like Yak(Nak,Chauri)/sheep has been practiced for generation in the mountains of Nepal. This study is based on household questionnaire survey, FGD and interview in Gaurishankar gaupalika shows the movement of sheep ranged from 1,200m to 4,500m elevation and the movement of Yak ranged from 2,000m to 3,500masl. The agricultural fields around the settlements are cultivated when the herds remained in high mountain pasture. After returning to the village, they are tied to the field and their waste is used for manuring the agricultural lands. The types and size of livestock has also undergone a significant change. The number of sheep and buffalo have decreased due to lack of market while the Yak farming has been gaining popularity because of increase in national and international demand for Yak products.*

**Keywords:** Livestock movement, grazing system, transhumance, ruminant production system

## Introduction

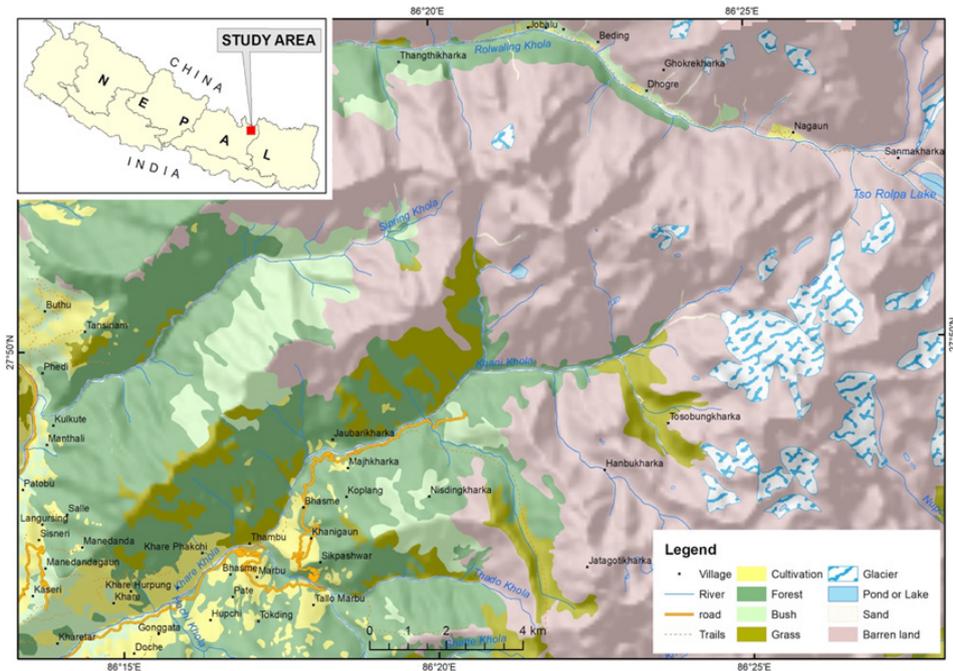
Nepal, located in the southern slope of the Central Himalayas, is an agro-based country where about 60% of the total population is engaged in agriculture (CBS, 2014). The topographic variation is high and the terrain of Nepal is diverse. The topography of Mountain region is generally characterized by irregular and steep relief of land/surface, fragile ecology, poorly developed soil with limited choice of crops. People of mountains have utilized the rugged topography of mountains with very restricted production capacity through pastoralism for generation. Pastoralism is one of the major

livelihoods of people in high mountains of Nepal (Tiwari et al., 2020). In mountains of Nepal, Transhumance ruminant production system is practiced where cattle, sheep and mountain goats migrate from one place to another throughout the year (FAO, 2005). Forage resources which are available from pastures during the monsoon season and from crop stubble during the winter season are utilized by this system (FAO, 2005). This practice of herding of cattle like Yak (Nak, Chauri) sheep has been practices for generation in the mountains of Nepal.

Animals are an integral part of subsistence farming system. Animals are also worshipped in different cultures of Nepal. They are also considered as assets and are the source of food and manure. Livestock sector contributed about 11.5% of total GDP (MoALD, 2019). However, livestock farming has been decreasing in Nepal especially in mountains of Nepal (Tiwari et al., 2020). The Agriculture Perspective Plan 1995-2015 (APP) had targeted to increase AGDP from 31% to 45%, driven by livestock k growth rates of 2.9% to 6.1% during the period of 1995-2015. Sadly, the target for livestock was not achieved (Pradhanang et al., 2015). Some of the reason attributed to the decline are the introduction of community forest and decrease in pasture land (Bhusal, Banjade & Paudel, 2018), globalization and changing lifestyle, and less interest of younger generation (Chapagain & Bhusal, 2013); Shrestha, Joshi & Joshi, 2006; Pandey & Chhetri, 2005; Banjade & Paudel, 2008), and changing vegetation growth (Parajuli, Paudel & Gyawali, 2013). Thus, this study aims to assess the changing size, composition and movement of livestock in mountain pasture land in Gaurishankar valley, Nepal.

## **Methods and Materials**

The study area is located in Dolakha district of in Central Nepal (Figure 1). Geographically, the study area extends from 86° 16' 50" to 86° 17' 30" East longitudes and 27° 45' 40" to 27° 47' 15" North latitudes. The elevation of the study area ranges from 1250m to 5800 masl. The location of settlements and farming activities are limited up to the elevation of 3500m. According to LRMP (1986), the village lies under the High Mountain region. the major settlements of the study area are Marbu, Tokding, Hupchi, Sikipashwar, Bhasme, Kopleng, Gongate, Majhkharka in Gaurishankar/Rolwaling valley.



**Figure 1.** Gaurisankhar valley

The study area mainly faces toward North-East direction and the average slope ranges from moderate to steep slope. The general land use pattern of the area is agricultural land with a level terraced surrounded by hardwood and conifer forest in the low land below 2,000masl but height land has pasture land and rugged and snow cover area. The dominating soil types and soil texture in this region is Anthropic and Typic Eutrochrepts Dystrochrepts Haplumbrepts Hapludalfs with loamy skeletal, boulder, clay loam (LRMP, 1986). Khani Khola is the major river of the study area which is located in the northern boundary. The major tributaries of Khani Khola are Thado Khola, Ghatte Khola and Hupche Khola. The climatic zone of the village is temperate (Karki, Talchabhadel, Aalto, & Baidya, 2016). The average annual rainfall in the village is about 2444mm (1989-2018, Jiri Station) and it occurs from June to September (monsoon season) which ranges from 180 to 650 mm. The average temperature of the village ranges from -0.4 °C to 24 °C (1989-2018, Jiri Station).

The total population of Marbu village is 1,409 where about half of the population is female (50.5%) (CBS, 2017). According to CBS (2017), the total household in the study area is 331. However, at the time of our field study the total household number was 526

(Information from Gaurisankhar Gaupalika). The increase in household number was for getting the earthquake relief money distributed by government. Many joint families separated from the joint family to nuclear family, which increased the household number in the village.

The data were collected during the month of October 2019. Household survey, Key informant interviews (KII) and focus group discussion (FGD) were done for primary data collection during field study. The study area was stratified based on altitudinal variation. In each zone, 20 farmers were randomly selected for household questionnaire survey from each elevation zone. Thus, a total of 60 respondents were selected from the three zones which covered about 12% of total households of the area. The total numbers and list of the households was acquired from the ward records provided by the Office of 7 Number Ward of Gaurishankar Gaupalika. Total six key-informants, two from each elevation zone, were selected for conducting KII. A standard semi-structured questionnaire was developed to collect detailed information about livestock type, livestock size and livestock distribution and changes over the time. The household questionnaire was designed and structured in KoBo toolbox. The KoBo Toolbox is an open-source field data collection tool developed by the Harvard Humanitarian Initiative (<https://www.kobotoolbox.org>). It is available online and can be accessed through electronic devices. Likewise, for KII Informants were selected based on their involvement, knowledge, and experience. In-depth discussion about the change in livestock grazing pattern, movement of livestock by seasons and the changes in livestock composition pattern was discussed. Similarly, one FGD was done where movement of different livestock and challenges related to livestock farming were discussed.

## **Results and Discussion**

### **Livestock number**

The livestock type and size vary with elevation. The major livestock at higher elevation are yak, chauri, cattle, sheep, and mules (CBS, 2014). Table 1 shows the number of livestock according to caste and ethnicity. Sherpa has the highest number of livestock due to the commercial farming of yak for dairy products. Very few farmers practice commercial farming of goats and mountain goats. Similarly, poultry farming is only practiced by Kami, Gurung, and Newar for household consumption. It is found that about 53% of livestock is cattle followed by goats and mountain goats at 39% and poultry at 8%. The average livestock per household is 11.9 for blacksmiths followed by Magar (9.2), 9 for Gurung (9) and Sherpa community (8.4). The average livestock per household for Tamang, Newar and Chhetri community is given in Table 1.

**Table 1.** Livestock distribution by caste/ethnicity

Caste/ Ethnicity	Number and types of livestock				Total	Average /HH
	Total HH	Yak/ Cattle	Mountain goat/goat	Poultry		
Sherpa	27	143	83	0	226	8.4
Gurung	10	25	38	27	90	9
Blacksmiths	7	33	37	13	83	11.9
Magar	6	47	8	0	55	9.2
Newar	6	5	20	4	29	4.8
Chhetri	2	6	2	0	8	4
Tamang	2	5	4	0	9	4.5

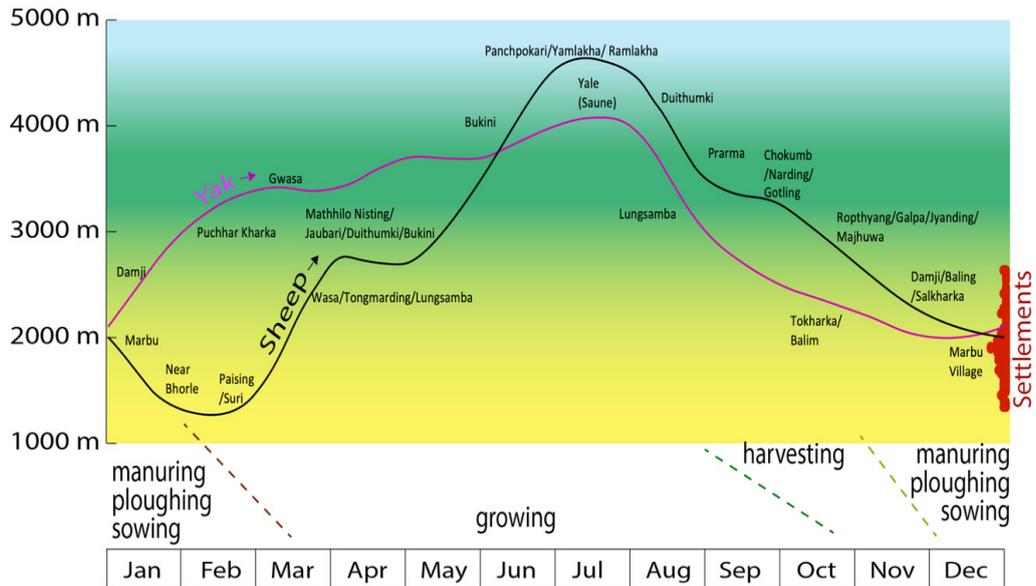
**Source:** Field Survey

The main types of livestock in the study area are yak, sheep, buffalo, cow and goats. There has been major change in livestock in the village in past 40 years. The number of sheep and buffalo have declined while the yak farming has increased in recent years. The decline in sheep and buffalo farming is due to lack of market while number of yaks has increased due to increase in demand of yak cheese and yak butter.

### **Livestock movement**

The movement of Sheep ranged from 1,200m to 4,500m elevation and the movement of Yak ranges from 2,000m to 3,500m. The graph below (Figure 2) shows the movement of yak and sheep in Marbu village. The movement of Yak starts from 2,000m to 4,000m while the movement of sheep ranges from 1,250m to 4,500. The movement of yak starts early January at Marbu village and moves to 2,100m. By mid-February to early March, Yak and the herders reach Damji (3,000m). By March/April Yaks are at 3,400m at Puchhar Kharka and in April/May they reach Gwasa which is also at about 3,400 m. The herders with yaks reach 3,700m during May to June and they pass Upper Nisting, Jaubari and Duithumki and Bukini pastures. From June to August, they are at about 4,000masl and cross the Yalepass. After that they move downwards and reach 3,000m by August/September in Lungsamba and 2,250m in October/November and pass Tokharka and Balim. Finally, during November to December, they reach to Marbu village. Likewise, the movement of sheep also starts at Marbu village but first moves downwards to near Bhorle (1,250m) and moves upward to Paising/Suri (1,400m) from December to March. Then the sheep is taken to 2,700masl by May and they pass Wasa, Tongmarding and Lungsamba pastures. Finally, by August the sheep reach 4,500m by passing through the highland pastures such as Panchpokhari, Yamlakha and Pamlakha. After that they move downwards and reach to Duithumki at 3,500masl and Prarma at 3,250 m by Sempember to October. By November, sheepsreach 2,700 m passing

Chokumb, Marding and Golting and by December they reach to Damji or Baling or Salkharka at 2,200m passing pasture such as Roptyang, Galpa, Jyanding and Majhuwa. Finally, by January they reach to Marbu village. Figure 2 has presented the spatial-temporal dimension of livestock movement in the valley.



**Figure 2.** Movement of Yak and Sheep

**Source:** Field Survey

From the graph we can observe that the when the livestock were migrating upwards, the field below were filled with crops which were at growing phase and when the livestock returned back to the village, the harvesting was already finished and majority of the agricultural land would be empty for the livestock. When the animals were tied to the field their waste were used for manuring the agricultural lands.

### Livestock manure

The village is free of chemical fertilizer. Farmers only use animal waste as manure. Cattle and buffalo are usually left at the village. They are tied in the farm land and are left there for few days and are moved to different place in the same farm land terrace. According to key informant, farmers has once introduced chemical fertilizer many years before but instead of increase productivity the soil quality deteriorated. Thus, after that no farmers have introduced chemical fertilizer in the village. Although, a few young farmers are not opposed to the idea of introducing fertilizer if proper training is given. However, majority of the local farmers want to produce organic products in the village.

## **Change in livestock type and size**

There has been major change in livestock size. There has been decline in sheep and buffalo farming while the Yak farming has increased in recent years. The decline in sheep and buffalo farming is due to lack of market while increase in demand of Yak dairy products like cheese and butter, Yak farming is gaining popularity. There are eleven households who have a large herd size of yak. Among them, yaksix are in Tokding, two each in Sikpasaur and Hupchi and one in Marbu. Similarly, there are six households who have a larger number of goat farming i.e., each have more than 50 goats. The commercial yak farming is mainly done by Sherpa while goat farming is done by Sherpa and Gurung.

Most of the farmers have opted to discontinue sheep farming while some have started poultry rearing for consumption purpose. The village was once hub for selling livestock like goat and buffalo but now no outsiders come to the village to buy them from nearby villages especially during festivals. Now, the buying and selling of livestock is limited within and the neighboring villages. Thus, livestock size has drastically decreased and it has further resulted decreases in manure in upland farms. It further causes the low productivity. Low productivity in upland have also resulted abandonment of upland agriculture land. Thus, due to lack of market and labor the villagers have decreased their livestock size and type.

Until 2,000, sheep was the main livestock for the Gurung community. At present, the farming of sheep has almost vanished. There has also been a decline in sheep in other parts of Nepal due to unavailability of pasture land (Bhatta, Helmuth, Stork, & Baral, 2015; Tulachan, 2000; ICIMOD, 2012). Sheep farming declined with decreased demand for wools for clothes, blankets, and carpets in the village area after the introduction of clothes and other garments from China. Yak farming is getting popular due to the high demand of yak dairy products. The yak farmers alone export of dairy products worth more than 50 lakh annually. It is due to unavailability of market, sheep and buffalo farming has been declining in the study area. Chapagain and Bhusal (2013) also found that traditional agro-pastoral production systems and livestock keeping system has been affected by globalization.

## **Conclusion**

The movement of livestock is aligned with seasonal variation of the area. The herders take the livestock upland when the land below is sowed and are full of crops and fall lowland when the agriculture land is fallow. The livestock are kept there and the on-field manure preparation are done. The main livestock herded are Sheep and Yak in the study area. The movement of Sheep ranged from 1,200m to 4,500m elevation and the

movement of Yak ranges from 2,000m to 3,500m. The livestock are in upland from the period of February to August when the land below is in growing stage. Similarly, after August, the herders move downwards during the harvesting period and finally when they reach below the land is empty where they are kept for in situ manuring. Finally, when the sowing period starts again, they are moved upwards. This, age old practice shows that the mountains of people have utilized the difficulties of the topography in the optimum way. The villagers are completely dependent upon livestock manure for agriculture. Thus, these livestock are integral part of their livelihood. However, the types and size of livestock has also undergone a significant change. The number of sheep and buffalo have decreased due to lack of market while the Yak farming has been gaining popularity because of increase in national and international demand for Yak dairy products. The decrease in livestock have also negatively impacted agriculture as the local farmers are fully dependent on livestock for manure.

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