



Animal Husbandry in Cold Arid Region- The Kargil Perspective

Syed Mohmad Shah^{1*} and Mohmad Mehdi Akhone²

¹Scientist (Animal Sciences), Krishi Vigyan Kendra Kargil-I, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Jammu and Kashmir, INDIA

²Professor (Plant Sciences), Krishi Vigyan Kendra Kargil-I, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Jammu and Kashmir, INDIA

*Corresponding Author: smsahskuast@gmail.com

How to cite this paper: Shah, S., & Akhone, M. (2021). **Animal Husbandry in Cold Arid Region- The Kargil Perspective.** *International Journal of Livestock Research*, 11(10), 13-18. <https://dx.doi.org/10.5455/ijlr.20210621015601>

Received : Jun 22, 2021
Accepted : Jul 16, 2021
Published : Oct 30, 2021

Copyright © Shah *et al.*, 2021

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Just like its uniqueness in geographical location, climate and beauty, agriculture and animal husbandry too exhibit their own uniqueness in the cold arid Ladakh region. Its harsh climate and barren and slopy land provide a huge hindrance to agriculture in general and high yielding crops in particular. The topography, dissected with snow clad mountains and interrupted with lush green valleys in low altitudinal areas, offers an environment more conducive for livestock rearing than agriculture. Since, the livestock need fodder, the tribal farmer living in this part of the world has adapted himself to mixed agriculture-animal rearing, conquering all the difficulties posed by climate, mono-cropping system, non-availability of irrigation, barren and soil-less land, non-adaptability of high yielding crop and animal species. The importance and dependence on livestock sector can be assessed from the fact that the ratio of human to livestock is 1:3 in the region. The local tribal has benefitted from nutritional and livelihood security to social status and employment from the livestock. The current trend in urbanization has however cast a negative impact on animal husbandry in this region and might harm the interrelation between humans and livestock in a bad way, disturbing the fine ecological balance in this Himalayan range. The current fodder shortage, up to 40-60%, shall further compound the problem if long-term sustainable approach, taking peculiarities of mountain agriculture into consideration, is not planned and practiced in the coming days.

Keywords: Animal Husbandry, Cold Arid Agriculture, Fodder Scarcity, Kargil, Livestock Rearing, Mountain Agriculture

Introduction

Himalayan-mountain range is comprised of 7% of the total landmass in the country and has a significant bearing on the Indian climate. Its enormous height has led to creation of a vast rain-shadow zone in the north, commonly referred to as cold-arid region. This region is spread over to Ladakh Union territory (Leh and Kargil districts), Himachal Pradesh, Uttarakhand and Sikkim. Ladakh is a wildly beautiful desert in the western Himalayas, situated at an altitude of 10,000 to 14,000 feet. The region suffers from an extremely harsh climate during winter, recording the least minimum of up to -50°C in the Drass area. The region receives almost no rainfall, the only form of precipitation being snowfall in the winter months which obstructs the surface transportation for 4-5 months and cuts off the region from the adjoining Kashmir valley and rest of the country. The temperature ranges between -35°C in winter to $+35^{\circ}\text{C}$ in summer. Under isolated, harsh geographical and climatic conditions traditional agriculture, representing a unique way of human survival and progress, has come up as the only way-out for sustenance of the local population by harvesting water from the Himalayan glaciers. The adoption of agriculture as a solo sustenance practice is limited due to dissected topography with snow-clad high mountains and absolutely inhospitable environmental conditions. This has given rise to adoption of mixed farming by majority of the farmers, except for the nomadic Changpas who follow trans-humance style (Wani *et al.*, 2009). Thus, agriculture and animal husbandry has grown together and are interwoven and inseparable from one another and with the intricate cultural, religious and economical fabric of the society. Forming an integral part of life and living, agriculture and animal husbandry, taken together, are vital to the economy, culture, trade and tradition of this cold arid zone. Of primary importance is the value of livestock in local substance and market economy and stability, especially in the harsh winter months when the local agriculture is vanished and the import of agricultural products is almost impossible due to closure of the road transportation.

The importance of livestock in Ladakh region is manifested by the fact that the total livestock population in the region is almost thrice the human population. The majority of Ladakh's landscapes are more suitable for livestock husbandry rather than crop cultivation, making livestock production as the major production system of the region. This has paved the way for animal rearing at a proportionally higher rate than performing agriculture in the harsh ecosystem. The decreasing agriculture due to harsh weather, less availability of land and irrigation, rapid urbanization, mono-cropping system and comparatively poorer returns and alternative/more profitable job opportunities of the local youth not only affected the availability of local and traditional human food but had a tremendous negative impact on animal husbandry, primarily affecting livestock local fodder availability. Fodder deficiency to the tune of 40-70% is estimated in the region, which is not only hampering the production of livestock but is posing a great threat to their production and reproduction capability also (Tiwari *et al.*, 2016).

Humans and Livestock in Kargil Region

Kargil is a district, somewhere midway between Srinagar and Leh districts of the erstwhile state of Jammu and Kashmir. The region spans the entire length of Ladakh in the north-south direction, Jammu and Kashmir to the west, Leh to east and Pakistan-administered Gilgit-Baltistan to the north. The district lies to the northwest of the Great Himalayan range and encompass majority of the Zaskar range. Its population of about 1.40 lacs inhabits the river valleys of Drass, Suru, Kartse, Wakha and Zaskar regions. About 90% of its population is rural, scattered at a population density of about 10 persons per sq.km. Livestock rearing is an important occupation of the rural population in general and migratory population in particular who mainly depend on livestock for their livelihood. The district has a total livestock population of about 3.0 lacs (19th livestock census) which consists of cattle, zo/zomo and yaks, sheep, goats, horses, ponies, donkeys and mules, in addition to poultry.

Table 1: Livestock and poultry population (2018-19; Statistical Handbook 2018-19, Kargil)

S. No.	Species	Population	Total Livestock Population Excluding Poultry (%)
1	Cattle	39,129	10
2	Zo/Zomo/and Yak	16,608	4.4
3	Sheep	1,93,454	50.6
4	Goat	1,26,104	33
5	Horses, ponies, donkeys, mules	6959	1.8
	Total	3,82,154	100
6	Poultry	65,414	17.7 (of total livestock population)

From by the data, an inference worthy to be mentioned is the ratio of Livestock to human population (~3:1), which reflects the inter-dependence and inter-relatedness between the two. The detailed livestock population is depicted in Table 1.

Land-use Pattern in Kargil Region

The presence of rocky and barren mountains dissects the topography making it unsuitable for large scale agriculture. This is further compounded by absence of irrigation system since most of the glaciers have disappeared from the scene. Inhospitable environmental conditions further compound the problem and render most of the land unfit for cultivation. All these factors together create difficulties for agriculture in the region while, at the same time provide better conditions for livestock rearing. A list of the land use pattern in Kargil region is given in Table 2.

Table 2: Land use pattern in Kargil region (2018-19; Statistical Handbook 2018-19, Kargil)

S. No.	Land-Use	Area (ha)	Reporting Area (%)
1	Reporting area	19,431	100
2	Forest	103	0.53
3	Land under non-agricultural use	522	2.6
4	Barren and un-cultivable land	4148	21.35
5	Land under miscellaneous tree crops and grooves (not included in net sown area)	218	1.12
6	Cultivable waste land	2055	10.5
5	Fallow lands including current fallows	2660	13.6
6	Total cropped area	9725	50

Contribution of Livestock in Kargil Region

Livestock offers the best possible means to convert the local vegetative biomass into useful products and work in this region. The livestock sector provide milk, meat, eggs, wool, skin, hides, draught power, manure as well as companionship and reliable and sustainable economic security to the local population. The local landscape, being more suitable for livestock husbandry rather than crop production, imparts more value to livestock in local subsistence and market economy as well as in culture and survival. The most significant contribution of livestock in the region include:

1. Economic and Livelihood Sustenance

Ladakh region in general and Kargil in particular has three sources of household income *viz.*, income from salaried employees (40-50%), income from out-migrants/ skilled labourers' and other non-agricultural labour (20-25%), income from agricultural and allied activities (40-50%). Livestock based earnings account for about 46-62% of the total earnings among the tribal populations. Agriculture is the second largest contributor towards family income in Kargil. Ladakh Vision (2005); Jordan (2014). Region-specific wool and fiber products generate an additional income to the households.

2. Nutritional Security

The overall health scenario of the people in the Kargil region is a malnourished state. Availability of the nutrients in the diet varies greatly due to harsh agro-climatic conditions, socio-economic status and poverty (Dar and Rather, 2014). Of the total daily protein requirement, at least one-third is met through milk. The average milk consumption in Kargil and Leh district was reported to be 152g and 170g, respectively per 10 days per person (Dar and Rather, 2014). The meat of Zo/Zomo/Yak and cattle is the main source of food during winter months, while sheep and goat are an important meat source during summer months.

3. Security and Status Symbol

Livestock, especially cattle, yak, sheep and goat are used during uncertainties of time and emergency whether due to harsh weather/climate, road blockade, war-time, family financial crunches, etc. In one of the studies, it was reported that about 12% of the families' used livestock for meeting uncertainties to avoid the bank loan (Biradar *et al.*, 2013). In the past, the livestock wealth of a family or clan was seen as a status symbol but in the current times, the scenario has changed. It is presumed that the Covid-19 crisis which left a major chunk of population jobless, has reverted the changing thought process and land-holding and livestock are once again seen as a status and security symbol.

4. Employment Generation

Employment generation or workforce absorption by livestock sector depends on the operational holding and social status of the livestock rearer. It has been reported that an average of 300 man-days in a year are generated in livestock husbandry activities. Livestock-generated annual employment of 140.79 man-days for adult women and 95.35 man-days for adult men (totaling to 236.14 days) (Biradar *et al.*, 2013). The difference in work force generation reflects a decreasing trend on agricultural and animal husbandry dependence in the last decade mainly due to reasons of low-profitability, social-stigma associated with farming and animal rearing, decreased land-holding and expenditure pattern.

5. Livestock Products

In addition to meat, milk and eggs livestock provide products like wool, pashmina, dung, manure as well as services like draught power, means of transportation and ploughing as well as commodities for religious gratification by being the sacrificial commodities. The farmers' of Kargil have been reported to produce 1.41 quintal/year/family of farm yard manure (Biradar *et al.*, 2013). The farmers have their unique traditional way of collecting the manure from the animal sheds. After cleaning the shed in month of November, the farmers sprinkle sufficient quantity of dry soil on the floor of the shed wherein they deliberately leave cow dung. Then in April/May the floor of the shed is cleaned completely and all the sediment is applied to agricultural land. Various agriculture research stations and KVKs of ICAR have been actively demonstrating to the farmers the techniques of vermicomposting for production of the quality vermicompost which is much needed for agricultural activities in this barren and poor soil health region of the country. Animal husbandry thus ensures maintenance of soil fertility through addition of farm yard manure and by providing draft power for ploughing and transportation. It is for this reason that majority of the farmers in the region follow mixed farming system.

Livestock Fodder/Feed Resources in Kargil

The main agricultural crops grown in the area are wheat, gram, other millets, pulses, fruits and vegetables. These crops are cultivated under a total area of about 7305 ha of land. Fodder for livestock feeding is grown under an additional area of 3613 ha. The fodder as well as barley and wheat straw are used for livestock feeding. In addition, cattle, yak, sheep and goat are also reared in free range alongside the river valleys, pastures, and orchards. The three major sources of fodder supply are crop residues, cultivated fodder and fodder from common property resources like forests, permanent pastures and grazing lands. As the land is devoid of soil throughout the region, most of the land is barren and vegetation, if any, is scarce and of poor quality for animal fodder. Cereals, thus, have a major role in animal feed. The main cereals include wheat, barley and other millets. Some parts of the district, especially lower altitudinal parts of the valleys, harbour perennial, annual grasses and palatable shrubs as natural vegetation which form an excellent animal fodder. Most of these shrubs have medicinal properties and other nutraceutical and pharmacological benefits which are presumed to play a vital role in maintaining the health and productivity of the local livestock, despite of the harsh and unbearable climatic conditions. The crops are sown at a higher seed rate (more than double) as compared to normal/recommended rate for the purpose of obtaining more crop residues for fodder during winter season. Manual weeding is practiced throughout the region from the crop fields as the collected weeds are also realized as the animal fodder. After complete stall feeding during the six long winter months, the animals are mostly let loose for grazing the fields and bask in the sun. This practice, though seen to boost the average milk yield and health condition of the animals, has been a major disadvantage to perennial fodder production, like alfa-alfa, as the cattle eat the fodder at its early growth stage. Vegetable parts of pulses and millets, though available in very small amounts, also form minor source of fodder for livestock.

For winter feeding, dry straw of wheat and native barley and dried alfalfa and maize are stored generally on roof tops of houses or at other protected structures (Tiwari *et al.*, 2016). A number of farmers, after much efforts and training from agricultural research stations, also opt for silage making for feeding in lean months. The recent intervention has been the attempts of small-scale hydroponic fodder cultivation. In addition to these fodder sources, the farmers feed any eatable item, not fit for human consumption, to the cattle. This includes kitchen wastes like left-over rice, left-over cooked vegetables, tea leaves, etc. Apricot and apple pumice also add to the livestock feed. Since, the average yield is very low as compared to the national average and the region has mono-cropping system due to harsh climate, a huge gap exists between actual fodder requirement and local availability. The deficiency varies from block to block and is up to the tune of 40-70%. Importation of fodder from other parts of the country is done but not generally preferred due to huge transportation costs involved. This has cast a great burden on the local farmers and made animal rearing a challenging activity. The fodder scarcity is hugely felt and has tremendously affected the cattle population, production and reproduction. The area under cultivation of different crops in Kargil is given in Table 3.

Table 3: Area under different crops in Kargil (2018-19; Statistical Handbook, 2018-19, Kargil)

Crop	Area (ha)	Percentage of the reporting area	Percentage of total cropped area
Paddy	0	0	0
Maize	0	0	0
Wheat	1491	7.6	15.3
Grim	3924	20.2	40.3
Other millets	1273	6.6	13.08
Pulses	617	3.2	6.3
Total food grains	7305	37.6	75.1
Fruits and Vegetables	350	1.8	3.6
Other fodder crops	0	0	0
Oil seeds	0	0	0
Fodder	3613	18.6	37.1

Future Strategies

Understanding of the traditional land and livestock management and its amalgamation with current production and management interventions would prove very beneficial for this low-intensity production system. The future action plan should be built on the paradigm of mountain specificities and cold arid agriculture and allied activities if this delicate ecosystem is to be preserved and human driving forces of modernization and urbanization are scientifically rationalized. The already adaptable animal and plant/tree species should be conserved and propagated, albeit on scientific rationale. The production systems should be in the form of diversified farming systems in human-livestock-crop-fodder continuum and continence.

Acknowledgements

The authors acknowledge all kinds of support provided by Directorate of Extension, SKUAST-K.

Conflict of Interests

There is no conflict of interest.

Publisher Disclaimer

IJLR remains neutral concerning jurisdictional claims in published institutional affiliation.

References

1. Biradar, N., Desai, M., Manjunath, L. and Doddamani, M.T. (2013). Assessing Contribution of Livestock to the Livelihood of Farmers of Western Maharashtra. *Journal of Human Ecology*, 41(2), 107-112.
2. Dar, R.A., and Rather, G.M. (2014). Assessment of Magnitude of Malnutrition and Related Health Problems in Cold Desert Ladakh. *India European Academic Research*, II (4), 4895-4919.
3. Jordan, T., and Sen, S. (2014). Social issues of ageing in Ladakh: the sociological insight. *International Journal of Multidisciplinary Research in Social and Management Science* 2 (3), 89-91.
4. Ladakh Autonomous Hill development Council. (2005). Ladakh Vision document, 2025 <http://leh.nic.in/pages/VISIONDOCUMENT.pdf>.
5. Statistical Handbook of Kargil. (2018-19). Directorate of Economics and Statistics. UT of Kargil, Govt. of India.
6. Tiwari, J.C., Raghuvanshi, M.S., Kumar, O., and Roy, M. (2016). Fodder production system-A major challenge in cold arid region of Ladakh, India. *Moj Ecology and Environmental Sciences* 1(1), 0005.
7. Wani, S. A., Wani, M. H. and Yusuf, S. (2009). Economics of Pashmina based Trans-humane production system in cold arid region of Jammu and Kashmir. *Indian Journal of Agricultural Economic*, 64 (2), 229-245.
