REVIEW ARTICLE Bhartiya Krishi Anusandhan Patrika, Volume 40 Issue 2: 152-157 (June 2025)

Livestock Resources (Sans Goat and Sheep) of Jammu and Kashmir: A Comprehensive Overview

Olympica Sarma[1], Mubashir Ali Rather[2], R.S. Barwal[1], Shivangi Maurya[3]

10.18805/BKAP773

ABSTRACT

This review article provides a comprehensive examination of the diverse genetic resources of livestock and poultry except goat and sheepin the Jammu and Kashmir (J and K) region of India. It highlights the unique characteristics and historical significance of indigenous cattle, buffaloes, horses, donkeys, pigs, yaks, camels and various poultry breeds. The indigenous cattle, influenced by historical influxes and local adaptations, display distinct traits such as a hump, small stature and polled head. Buffaloes, particularly the valued Nilli Ravi breed, are predominantly found in the Jammu region. Horses, especially the Zanskari breed, are noted for their hardiness in high-altitude regions. The yak, vital to the Himalayan ecosystem, exhibits remarkable adaptation to harsh climates, providing sustenance and livelihood to local communities. The critically endangered Bactrian camel, introduced via the silk road, requires conservation efforts. Poultry breeds like the Kashmir Faverolla and Kashmir Anz geese are well-adapted to the region's climatic conditions. The review describes the importance of characterizing and conserving these genetic resources to sustain their ecological, cultural and economic contributions to the region.

Key words: Genetic resources, Indigenous, Livestock.

Farm animal genetic resources (FAnGR) encompass all animals of economic, scientific and cultural significance to humans, particularly in food and agriculture production (Rege and Okeyo, 2006). These resources are vital components of biodiversity, ensuring food security and genetic diversity. In JandK, livestock significantly contributes to the agrarian economy, providing meat, milk, eggs, skins, hides, fiber, wool, draught power, manure and genetic material for research and development (Ganai *et al.,* 2016). Livestock rearing offers nutritional security and insurance to farmers during crop failures (Sharif *et al.,* 2011). AnGR represents a repository of unique allelic arrangements, which can be associated with typical products, helping farmers manage and protect the environment. Despite favorable agro-climatic and geo-physical conditions, rich alpine pastures and natural endowments, the FAnGR of JandK has presented decreasing trend over the past years. (Anonymous, 2021a; Rather *et al.,* 2020) JandK boasts a diverse range of farm animals, including cattle, buffalo, goat, sheep, horses, poultry, yak and Bactrian camel (Ganai *et al.,* 2016). This diversity is reflected in the number of breeds and variations within and among them (Ganai *et al.,* 2016). An effort was made to congregate status of FAnGR of Jammu and Kashmir including Ladakh (J and K).

Cattle and buffalo genetic resources

Jammu and Kashmir is home to diverse cattle genetic resources, including native breeds adapted to harsh environments. The region has a rich history of cattle introduction, with various breeds brought in by different cultures, such as the Aryans, Pathans and Sikhs (Anonymous, 2021). Local breeds, like the Gurezi cattle, remain uncharacterized but possess distinct features, such as a prominent hump and small stature (Lawrence, 2002). The region's livestock production systems vary, with extensive systems in Jammu, intensive systems in Kashmir and intensive systems for large ruminants in Ladakh (Taneja, 2010; Wani *et al*., 2011). In the Kashmir Valley, the predominant cattle breeds are crossbred varieties, including Jersey, Holstein and Jersey × Nondescript (Fig 1), as well as Holstein × Nondescript and nondescript breeds found in the hilly areas. The Ladakhi cattle, registered among India's 43 breeds, are well adapted to the cold-arid Ladakh region and are useful for milk, draught and manure purposes. The cattle have evolved to thrive in the harsh, cold climate of Ladakh, developing unique adaptations to survive in low-oxygen conditions. Their compact, sturdy build

[1]Department of Animal Genetics and Breeding, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar-263 145, Uttarakhand, India.
[2]Diseases Investigation Laboratory, Nowshara, Srinagar-190 001, Jammu and Kashmir, India.
[3]Department of Veterinary Public Health and Epidemiology, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar-263 145, Uttarakhand, India.

Corresponding Author: Olympica Sarma, Department of Animal Genetics and Breeding, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar-263 145, Uttarakhand, India. Email: olylucky15@gmail.com

How to cite this article: Sarma, O., Rather, M.A., Barwal, R.S. and Maurya, S. (2025). Livestock Resources (Sans Goat and Sheep) of Jammu and Kashmir: A Comprehensive Overview. Bhartiya Krishi Anusandhan Patrika. 40(2): 152-157. doi: 10.18805/BKAP773.

Submitted: 14-08-2024 **Accepted:** 27-02-2025 **Online:** 26-04-2025

and short legs enable them to navigate the rugged terrain with ease, making them ideal for milk production low-input farming systems. Despite their importance, many indigenous livestock breeds in the region remain unidentified and uncharacterized, warranting further attention and recognition. Therefore, efforts are needed to conserve and characterize these unique genetic resources, including the unexplored Gurezi cattle native to Gurez valley. The Dard-Shina tribe, responsible for rearing the Gurezi cattle, highlights the importance of preserving indigenous knowledge and practices in the conservation of these genetic resources.

R.S. Pura, Jammu is said to be the natural breeding tract for Nilli Ravi, a valued dairy breed of buffaloes (Anonymous, 2016c). Most of the buffalo population is migratory (Fig 2), with majority in Jammu region. In Jammu and Kashmir, there are 2533 thousand cattle heads. The decrease in local cattle population may be associated with urbanization, expansion of crossbreeding programmes for increasing milk yield per cow per day and change in life style. However, field surveys suggest the existence of hill type cattle in Kashmir valley (places not yet covered by the crossbreeding programmes), *e.g*. Gurez (Ganai *et al.,* 2011) and Ladakh. These hill type cattle are well adapted to the local conditions, resistant to diseases and are able to thrive on low quality and quantity of feed. Hill type cattle are cylindrical and highly adapted to cold climate. Their average daily milk yield ranges from 1.0 to 4.5 kg per day.



Fig 1: Jersey × Nondescript crossbred cattle.

Horse genetic resources

Horses are domestic farm species of specific importance to certain areas, especially the trans-Himalayan region of Ladakh (Leh and Kargil). They are valued for their abilities to survive extreme climate, for thriving on coarse feed and fodder and for working as beasts of burden in difficult topographies.

Zanskari

The Zanskari horse is a robust and agile breed, utilized for draught, transport, riding and sporting purposes, including polo. Renowned for their hardiness and adaptability to high-altitude, hypoxic conditions, they thrive in cold arid regions. Characterized by their grey, black and copper coats, they possess a distinctive appearance, with a medium build, wide face and long, heavy tail. The Zanskari horse population has been declining, with only 9,702 individuals reported in 2013. This decrease is attributed to cross-breeding with non-descript horses and road construction. To conserve this breed, the Department of Animal Husbandry has established a breeding farm in Leh and allocated a corpus fund of Rs. 200 lakhs. The Zanskari Equine Breeding Farm, established in 2001-02, has introduced four mares and one stallion. To avoid inbreeding, the capacity of these breeding farms needs to be enhanced and managed under the open nucleus breeding scheme (ONBS). As one of the six discrete and hardy breeds of horses in India, the Zanskari horse plays a significant role in the country's equine heritage. Their ability to work, run and carry loads in challenging conditions makes them an invaluable asset to the country (Ganai *et al.,* 2016).

Donkey and pig genetic resources

The indigenous donkey and pig population has not been characterized yet. The population of indigenous donkeys and pig as per the 20th livestock census stands at 1.2 million and 9.06 million, respectively (20th Livestock Census, 2019).

Yak

The yak is a vital component of the ecosystem in the hostile climate of the Himalayas, providing sustenance, transportation



Fig 2: Buffalo of poonch.

and livelihood for the people living in this region. Domesticated from the wild yak (*Poephagus mutus*), it has adapted to the harsh environment, utilizing small blades of grass on altitude pastures and traversing long distances on snow-bound passes. The yak is a robust animal with a distinctive appearance, featuring a pure black, pure white or piebald coat with shades of brown, black and white also present. Its heavy head and wide convex forehead are notable features. Yaks spend most of their time in grazing areas, with only lactating and pregnant cows and young calves provided with enclosures. To adapt to the harsh winter conditions, they consume ice to quench thirst during winters and salt is provided regularly, with the frequency increasing in extreme weather conditions. Yak hairs are used for making ropes and tents, while their dung serves as the primary fuel source for herders. As a semi-domestic animal, the yak is renowned for its hardiness and resistance to extreme cold and hypoxic conditions, earning it the nickname “ship of the plateau” or “ship of snow”. Found in Kargil, Leh and Gurez, yaks thrive in high-altitude environments but struggle at lower elevations, suffering from heat exhaustion above 15°C. Hybridization with cattle produces dzo and dzomo, which exhibit significant heterosis. Yaks have gained immense popularity due to their exceptional survival in hypoxic conditions, making them ideal for high-altitude environments. Dzo, the hybrid of yak and cattle, are preferred for ploughing due to their superior strength, while female yaks (Dzomo) produce nutrient-rich milk with 7-12% fat and 5-6% protein (Ganai *et al.,* 2016). Yaks also offer a good dressing percentage of 40-45% and produce a fine undercoat. They thrive at altitudes of 2,500 to 6,000 meters, providing a source of livelihood for highlanders through their milk, hide, meat, fuel and manure (Gupta *et al.,* 1996). As a cultural icon and financial asset, yaks serve as excellent pack and transport animals, warranting documentation and improvement through technologies used for cattle and buffalo enhancement.

Camel genetic resources

Double humped camel

It is believed that these camels belong to a stock originally native to Gobi desert of Asia and were introduced by Yak traders through the silk route. These camels are suitable for cold desert areas. They produce superior quality hairs which are used in cottage industries. The camels were widely used as important source of transport when the silk route was in operation before 1950. The Bactrian camel (*Camelus bactrianus*) is a large, even-toed ungulate native to the steppes of Central Asia. They are mostly found in cold deserts of China, Mongolia, Iran, Afghanistan, Pakistan and Kazakhstan. A small population of *Camelus bactrianus* also exists in the Nubra valley of Ladakh region. It was introduced as a draught animal in Ladakh by travellers in the 19th century. However, after closure of the silk route in 1950, only a few Bactrian camels were left behind with the local traders in the Nubra valley. Presently the Bactrian camel has critical population of 211 animals. Bactrian camels move at about 5 km/hr, produce 5 kg of hair/year, 600 litres of milk /year and 250 kg of dung / year (Shergojry *et al.,* 2017). These Bactrian camels hold historic importance of Central Asian trade capable of carrying 1 quintal, working 6-8 hours daily (Angchok *et al.,* 2012). The animal displays tolerance to high levels of salt and sugar in the body, making it an appreciable animal model for blood pressure and diabetes (Ganai *et al.,* 2016). The Bactrian camel is adapted to harsh cold climatic conditions and can remain without food and water for days together. The IUCN has declared the camel critically endangered since 1998, yet no serious measures have been adopted to conserve this species (Makhdoomi *et al.,* 2013). Complete registration of the Bactrian camel, protection of community grazing areas, promotion of camel-based tourism and small cottage industry for camel products will ensure conservation of this treasured genetic resource.

The camels were widely used as important source of transport when the silk route was in operation before 1950. The Bactrian camel (*Camelus bactrianus*) is a large, even-toed ungulate native to the steppes of Central Asia. They are mostly found in cold deserts of China, Mongolia, Iran, Afghanistan, Pakistan and Kazakhstan. A small population of *Camelus bactrianus* also exists in the Nubra valley of Ladakh region. It was introduced as a draught animal in Ladakh by travelers in the 19th century. However, after closure of the silk route in 1950, only a few Bactrian camels were left behind with the local traders in the Nubra valley. Presently the Bactrian camel has critical population of 211 animals. Bactrian camels move at about 5 km/hr, produce 5 kg of hair/year, 600 litres of milk /year and 250 kg of dung / year (Shergojry *et al.,* 2017). These Bactrian camels hold historic importance of Central Asian trade capable of carrying 1 quintal, working 6-8 hours daily (Angchok *et al.,* 2012). The animal displays tolerance to high levels of salt and sugar in the body, making it an appreciable animal model for blood pressure and diabetes (Ganai *et al.,* 2016). The Bactrian camel is adapted to harsh cold climatic conditions and can remain without food and water for days together. The IUCN has declared the camel critically endangered since 1998, yet no serious measures have been adopted to conserve this species (Makhdoomi *et al.,* 2013). Complete registration of the Bactrian camel, protection of community grazing areas, promotion of camel-based tourism and small cottage industry for camel products will ensure conservation of this treasured genetic resource.

Poultry genetic resources

Poultry species reared locally in the state including chicken, ducks and geese which are described below: Among the poultry breeds of J and K, only Kashmir Faverolla and Kashmir Anz have been registered. The Kashmir Faverolla is a unique breed of chicken, primarily reared for eggs and meat (Fig 3, 4). It is an inter-breeding group of many distinct genotypes, with three main types: Normal feathered, naked neck and Gul Hapuch (bottle jawed). These birds are

incredibly resilient and well adapted to hostile climatic conditions, including freezing temperatures and minimal supplemental feeding. They are also quite disease resistant, making them a valuable asset for backyard farming. Their plumage is a striking feature, with mixed shades of black, green, red and gold and various patterns such as solid, striped, patchy, spotted, or barred. They have a single comb type, white skin and yellow shanks. The eggshell color is light brown. Other notable physical traits include feathered shanks, tuft of feathers over earlobes, silky frizzle, multiple spurs and a distinctive feathered cap on their head (Iqbal and Pampori, 2008). Kashmir Faverolla are mainly found in backyard management systems, where they scavenge for food with some supplemental feeding. They are housed only during the night, allowing them to roam freely during the day. Their breeding tract includes the districts of Budgam, Srinagar, Baramulla, Anantnag, Kupwara and Pulwama in the Kashmir Valley. This



Fig 3: Male Kashmir faverolla.



Fig 4: Female Kashmir faverolla.

indigenous chicken breed is highly variable and adaptable to the cold climate of the mountainous terrains of Kashmir. However, with the progress of the poultry industry, the local bird has become less prominent (Ganai *et al.,* 2016). To conserve this breed, it is essential to make it economically viable for egg and meat production under low-input backyard production systems. The average adult weight of male and female birds is 1.72±0.04 kg and 1.5±0.02 kg, respectively. The average egg weight is 46.06±0.48 g (Iqbal and Pampori, 2008).

Local duck of Kashmir

The average adult body weight of adults is 1.70 kg (Bihaqi *et al.,* 2013). Four types of bill colors are seen in local ducks (Fig 5), *viz*. pinkish black, black (mosaic), greenish, yellow and greenish yellow mosaic. Grey or brown eye colors are present whereas shanks are mostly orange colored. Shell colours are green and white.

Kashmir geese

Adult body weight of Kashmir Geese is 3.9 kg. Gooslings on an average weigh 89.2 g. Age at sexual maturity, average clutch size and hatchability of eggs is 13.7 months, 9.445 eggs and 83.37% (Gupta *et al.,* 2011). The incubation period of goose eggs is about 30 to 32 days. The breeding tract of Kashmir geese includes the areas in and around the water bodies of the Kashmir Valley. Kashmir Anz is the registered breed of geese of India. These are cinnamon or white in color, reared for meat, eggs, feathers, or as a hobby in areas located around the water bodies. Kashmir Anz geese are hardy, disease resistant and excellent foragers, requiring minimum inputs for rearing and management (Hamadani, 2013).

Dog genetic resource

Bhakarwal dog

It is the indigenous dog of J and K, India, also found in smaller numbers in Afghanistan and Pakistan. Kashmir Sheepdog (Pahil Hoon), Bakarwal Mastiff, Kashmiri Bakharwal Dog (Bakarwal Hoon), Gujjar Watchdog, Gujjar Dog (Gujjir Hoon) and Kashmiri Mastiff are among synonyms of Bhakarwal dog. Bhakarwaldog is loyal, brave, protective (Anonymous, 2021d) livestock guardian and settlement protector dog (Anonymous, 2021c), mainly distributed across the Pir Panjal Range of Jammu



Fig 5: Local ducks of Kashmir.



Fig 6: Bhakarwal dog.



Fig 7: Bhakarwal dog with sheep flock.

and Kashmir. The dog is also found in smaller numbers in Afghanistan and Pakistan (Anonymous, 2021c). The dog has been bred from times immemorial by the Bakarwal and Gujjar nomadic tribes (Muslim nomadic tribes) as shepherding dog. The dog is loyal, brave and protective with majestic appearance. Bakarwal dog is a powerful, medium sized, agile, sturdy, typical mountain dog with a furry coat and plumy tail that gives it a majestic look (Anonymous, 2021c). The common colours of Bakarwal dog include black, brown tan, red, fawn, pied, sable, white and brindle. However, black is most common colour (Javaid, 2021). The average litter size is 3-4 pups once a year (Anonymous, 2021d). Bhakarwal dog shares phenotypic characteristics with and looks like a medium version of Tibetan Mastiff (Anonymous, 2021d). Bhakarwal dog (Fig 6 and 7) is noted for determination and courage to protect sheep and goat flocks from predators including leopards, jackals and Hamalian black bear (Anonymous, 2021d). The height of this dog is 24-30 inches (Anonymous, 2021e). Life expectancy of Bhakarwal dog is about 10 to 12 years (Anonymous, 2021e).

CONCLUSION

The livestock resources of JandK, excluding sheep and goats, play a crucial role in the region's agricultural economy and socio-cultural fabric. The diversity in species, including cattle, buffaloes, poultry and equines, reflects the adaptive strategies of local farmers to the unique agro-climatic conditions of the state. These animals not only contribute to the livelihood of the rural populace through milk, meat and other by-products but also support traditional practices and rituals, thus preserving cultural heritage. Future research and extension efforts should focus on integrated approaches that combine traditional knowledge with modern practices. Empowering farmers through education and training, along with encouraging public-private partnerships, can lead to a resilient and prosperous livestock sector in J and K. Therefore, by leveraging the untapped potential of these resources, the state can achieve greater food security, economic stability and overall development.

ACKNOWLEDGEMENT

We extend our sincere gratitude to the researchers and animal husbandry departments in Jammu and Kashmir for their invaluable contributions and support.

Disclaimers

The views and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions. The authors are responsible for the accuracy and completeness of the information provided, but do not accept any liability for any direct or indirect losses resulting from the use of this content.

Informed consent

Since this is a review article so, there is no use of animal procedures for experiments.

Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this article. No funding or sponsorship influenced the design of the study, data collection, analysis, decision to publish, or preparation of the manuscript.

REFERENCES

20th Livestock Census (2019). All India Report. Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Government of India, Krishi Bhawan, New Delhi, India.

Angchok, D. and Stobdan, T. (2012). Double-humped camels of Ladakh: stranded between the stakeholders. Current Science. 102: 12.

Anonymous, (2021c). Wikipedia. Accessed on 14/10/2021.

Anonymous, (2021d). https://wagwalking.com/breed/bakharwal. Accessed on 14/10/2021.

Anonymous. (2016c). Hand Book of Right to Information. Sheep Husbandry Department Government. Jammu and Kashmir.

Anonymous. (2021a). Directorate of Sheep Husbandry Kashmir division, Government of Jammu and Kashmir. http:/ /jk sheep husban dry kashmir.net/sheep.html. Accessed on 10/07/2021.

Anonymous. (2021). Animal Genetic Resources of India. ICAR- National Bureau of Animal Genetic Resources. Karnal.

Anonymous.(2021e).https://www.dogbreedinfo.com/b/bakharwaldog.htm. https://wagwalking.com/breed/bakharwal. Accessed on 14/10/2021.

Bihaqi, S.F.A., Bhat, G.A., Ganai T.A.S., Bihaqi, S.J. and Hamadani, H. (2013). Morphological and certain economic traits under rural conditions of local ducks of Kashmir. Indian Journal of Animal Sciences. 84(4): 431-435.

Ganai, N.A., Bhat. Z.A. and Shiekh. F.A. (2016). Policy planning for conservation and sustainable use of farm animal genetic resources in J and K. National Symposium on Policy Planning for Livelihood Security through Domestic Animal Biodiversity and XIII Annual Convention of Society for Conservation of Domestic Animal Biodiversity. Compendium. 2. 84-94.

Ganai, T.A.S., Misra, S.S. and Sheikh, F.D. (2011). Description of Changthangi sheep of Ladakh. Indian Journal of Small Ruminants. 17(1): 32-40.

Gupta, S.C., Tundup, T., Gupta, N. and Kumar, P. (1996). Livestock Wealth of the Ladakh: A Cold Arid Region in India. Animal Genetic Resources. 19: 27-36.

Hamadani, H. (2013). Morphometry, Production Characteristics and Rearing Practices of Domestic Geese of Kashmir. M.V.Sc. Thesis. Submitted to SKUAST-Kashmir, India.

Iqbal, S. and Pampori, Z.A. (2008). Production potential and qualitative traits of indigenous chicken of Kashmir. Livestock Research for Rural Development. 20(11): 14.

Javaid, R. (2017). A Rare Breed. Greater Kashmir. Cited from Wikipedia. Retrieved on 14/10/2021.

Lawrence, W.R. (2002). The Valley of Kashmir. Gulshan Publishers, Srinagar. pp. 358.

Makhdoomi, D., Gazi, M., Nabi, S. and Ahmed, S. (2013). Morphometric studies on adult double humped camel of Ladakh, India. Emirates Journal of Food and Agriculture. 25(7): 544-548.

Rather, M.M., Bashir, I., Shah, M.M., Ahanger, S.A., Ashraf, B. (2020). Wool quality and body weight traits of newly imported Merino sheep during 2020. Animal Science Quarterly. 1(2): 6-9.

Rege, J.E.O. and Okeyo, M. A. (2006). Improving our knowledge of tropical indigenous animal genetic resources. AGTR Version 2 Training Module.

Sharif, M.K., Tariq, M.M., Waheed, A., Bajwa, M.A. and. Awan, M.A. (2011). Evaluation of economic traits of Balochi and Bibrik (Beverigh) sheep breeds of Balochistan,. Pakistan Journal of institute of Science and Technology. 1(2): 133-139.

Shergojry, S.A., Akhoon, Z.A., Mubarak, T. and Namgyal, D. (2017). Socio-economic Impact of Livestock in Tribal Areas of Leh. Journal of Krishi Vigyan. 6(1): 187-190.

Taneja, V.K. (2010). Expert Committee Report Constituted by Planning Commission, Government of India on Animal Husbandry Dairy Development and Sheep and Goat Husbandry Programmes in Jammu and Kashmir. 17.

Wani, S.A., Wani, M.H. and Saraf, S. (2011). Prospectus of Livestock Enterprise in Jammu and Kashmir, UGC Project, Terminal Report, SKUAST, Srinagar.