

Goat and Sheep Genetic Resources of India

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Small ruminants (Goat and Sheep) form an integral part of Indian agriculture and widely distributed across all agro-ecological zones. There are 148.88 million goats and 74.26 million sheep in India and are reared mainly by small and marginal farmers. They contribute significantly to rural economy as they can sustain on paltry input resources and harsh environmental conditions. There are 44 and 34 registered breeds of sheep and goat respectively, beside large number of non-descript animals. Due to intermixing among breeds in the field, breed purity is being diluted. Hence there is need to develop suitable breeding policy for genetic improvement and conservation of goat and sheep by different states.

Introduction

Small ruminants are important livestock, which are largely associated with rural people in India and play an important role for keeper's economy. More than 70 percent of landless, marginal and small farmers of rural India rear them. The small ruminants rearing in comparison to other livestock species is highly beneficial for farmers as these species are generally reared on zero or low input system. They are much useful in arid and semi-arid areas where crop cultivation is a risk prone enterprise and play a big role in supporting the livelihood system and nutritional security. India is a rich repository of sheep and goat genetic resources, having 44 and 34 registered breeds of sheep and goat respectively (Fig. 1). These breeds have evolved through natural selection and selective breeding by rearers for adaptation to specific agro-ecological conditions. There is great variation in adaptability, productivity, feed utilization and disease resistance etc. of indigenous sheep and goat breeds of India. There are about 223.14 million goats and sheep (20th Livestock census, 2019) in country and in spite of high slaughter rate and inbuilt prejudice, both goat and sheep populations have been growing for the past few decades. Shrinkage in grazing areas, lack of veterinary health services, conflicts with the agriculturalists, lack of education etc. are the main problems faced by the pastoral communities.

Goat Genetic Resources

Livestock population of the country as per Livestock census, 2019 has been estimated as 536.76 million,

spread over different states and UTs of India (20th Livestock census-2019). Goats contribute 27.73% to the total livestock population and is next to the cattle (36.04%). The population of Indian goat is 148.88 million (Livestock Census, 2019) which is 10.14% higher than population as per Livestock Census, 2012. Among the different states, Rajasthan has highest goat population (20.84 million) followed by West Bengal and Uttar Pradesh, respectively. This increase in goat numbers in the country showed its popularity and usefulness due to their economic significance, low input resources, small generation interval, higher proliferation and adaptability to varied climatic conditions.

India is a good repository of goat genetic resources consisting of 34 recognized breeds (Table 1) and a good number of non-descript population. Out of 34 breeds of goat, 8 breeds viz. Beetal, Gohilwadi, Jakhrana, Jamunapari, Kahmi, Mehsana, Surti and Zalawadi are of dairy type, producing more than 150 kg of milk on an average per lactation. More than 75% of the breeds (26/34) in the country are primarily meat producers as indicated in Table 1. Dressing percentage of different breeds varies from 43 to 58.4%. There are only two breeds viz. Changthangi and Chegu which are pashmina producers. The pashmina produced by Changthangi goat is superior to that of Chegu in terms of fiber diameter and staple length, the important characteristics of Pashmina hair. More than half of the goat breeds in the country are early breeders, demonstrating early sexual maturity and first kidding at an age of less than 18 months.

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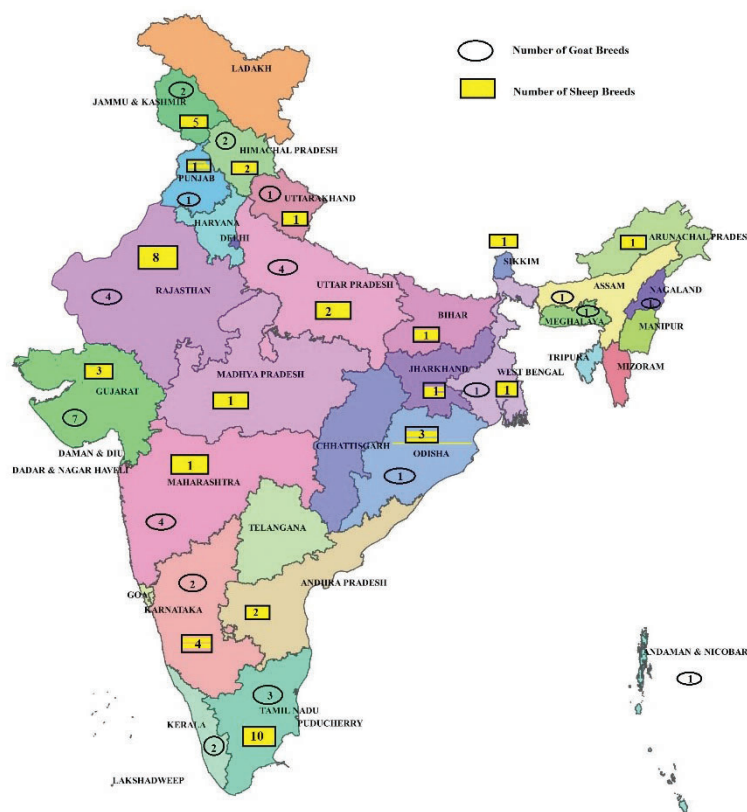


Fig. 1. Geographical Distribution of Goat and Sheep Breeds in India

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Sheep Genetic Resources

Sheep is an important livestock species in India and there are about 74.26 million sheep, which contribute greatly to the agrarian economy by providing gainful employment and income to large number of rural poor especially socially backward, marginal and landless labourers. Sheep sector ensure self-employment and family labour under extensive system and act as cushion at the time of drought and famine for keepers. The population of sheep in 2019 increased by 14.1 % over 2012 census which showed the importance of sheep in present scenario of livestock husbandry. India is gifted with vast biodiversity of indigenous sheep that has multi-facet utility for wool, meat, milk, skin, manure and forms a valuable constituent of the rural economy especially in the arid, semi-arid and mountainous areas of the country. Having 44 registered indigenous breeds, sheep contributes around 7-8 % in meat and 100% in wool production. Out of total raw wool produced in the country about 70% is carpet grade, 20% coarse grade and 10% apparel grade. Sheep population is generally

found in the arid and semi-arid areas of western India, deccan plateau and western himalayas. About 60% of sheep in the country are concentrated in six states, namely Andhra Pradesh, Rajasthan, Karnataka, Tamil Nadu, Jammu & Kashmir and Maharashtra.

All 44 distinguished registered sheep breeds are well adapted to specific environment in different agro-climatic region of the country. The classification of sheep has also been based on major products i.e. a) apparel wool, b) carpet wool, c) meat and carpet wool and d) meat types. Sheep breeds based on their geographical presence are also divided into four agro ecological regions.

- (a) **Southern Peninsular Region:** This region is semi-arid in the central peninsula and hot and humid along the coast and comprising highest number of sheep. It comprises the states of Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Kerala and other territories in the central area. This region having coarser wool breed mainly reared for meat production.

- (b) **North Western arid and semi-arid region:** This region has second largest population of sheep and comprises the state of Punjab, Haryana, Rajasthan, Gujarat, plains of Uttar Pradesh and Madhya Pradesh having carpet wool type sheep breeds.
- (c) **North Temperate Region:** This region comprises Jammu and Kashmir, Himachal Pradesh and hilly regions of Uttaranchal. This region consist mainly wool/ apparel type sheep breeds.
- (d) **Eastern Region:** This region is mostly hot and humid, except for some parts of eastern states, which are sub-temperate and comprises the states of Bihar, Jharkhand, West Bengal, Orissa, Assam, Meghalaya, Arunachal Pradesh, Mizoram, Manipur,

Table 1. Detail of different breeds, distribution, population, utility and accession number of registered breeds of goat

S.No.	Breed	Distribution	Population*	Utility	Accession Number
1.	Attapady	Kerala	31182	Meat	INDIA_GOAT_0900_ATTAPADYBLACK_06001
2.	Barbari	Uttar Pradesh and Rajasthan	4759305	Milk, Meat	INDIA_GOAT_2017_BARBARI_06002
3.	Beetal	Punjab	1234760	Milk, Meat	INDIA_GOAT_1600_BEETAL_06003
4.	Black Bengal	West Bengal	27661976	Meat, Skin	INDIA_GOAT_2100_BLACKBENGAL_06004
5.	Changthangi	Jammu and Kashmir	205940	Hair (Pashmina), Meat	INDIA_GOAT_0700_CHANGTHANGI_06005
6.	Chegu	Himachal Pradesh	2356	Hair (Pashmina), Meat, Pack	INDIA_GOAT_0600_CHEGU_06006
7.	Gaddi	Himachal Pradesh	738425	Hair (Pashmina), Meat	INDIA_GOAT_0600_GADDI_06007
8.	Ganjam	Orissa	211478	Meat, Milk	INDIA_GOAT_1500_GANJAM_06008
9.	Gohilwadi	Gujarat	288453	Meat, Milk	INDIA_GOAT_0400_GOHILWADI_06009
10.	Jakhrana	Rajasthan	655582	Meat, Milk	INDIA_GOAT_1700_JAKHRANA_06010
11.	Jamunapari	Uttar Pradesh	2555965	Meat, Milk	INDIA_GOAT_2000_JAMUNAPARI_06011
12.	KanniAdu	Tamilnadu	1445588	Meat	INDIA_GOAT_1800_KANNIADU_06012
13.	Kutchi	Gujarat	584538	Meat, Milk	INDIA_GOAT_0400_KUTCHI_06013
14.	Malabari	Kerala	1104305	Meat, Milk	INDIA_GOAT_0900_MALABARI_06014
15.	Marwari	Rajasthan	5041776	Meat, Milk	INDIA_GOAT_1700_MARWARI_06015
16.	Mehsana	Gujarat	422509	Meat, Milk	INDIA_GOAT_0400_MEHSANA_06016
17.	Osmanabadi	Maharashtra	3597071	Meat	INDIA_GOAT_1100_OSMANABADI_06017
18.	Sangamneri	Maharashtra	163091	Meat, Milk	INDIA_GOAT_1100_SANGAMNERI_06018
19.	Sirohi	Rajasthan and Gujarat	1952116	Meat, Milk	INDIA_GOAT_1704_SIROHI_06019
20.	Surti	Gujarat	231194	Meat, Milk	INDIA_GOAT_0400_SURTI_06020
21.	Zalawadi	Gujarat	408450	Meat, Milk	INDIA_GOAT_0400_ZALAWADI_06021
22.	Konkan Kanyal	Maharashtra	16892	Meat	INDIA_GOAT_1100_KONKANKANYAL_06022
23.	Berari	Maharashtra	84823	Meat	INDIA_GOAT_1100_BERARI_06023
24.	Pantja	Uttarakhand and Uttar Pradesh	28728	Meat, Milk	INDIA_GOAT_2420_PANTJA_06024
25.	Teressa	Andaman & Nicobar	3362	Meat	INDIA_GOAT_3300_TERESSA_06025
26.	Kodi Adu	Tamil Nadu	399924	Meat, Milk	INDIA_GOAT_1800_KODIADU_06026
27.	Salem Black	Tamil Nadu	491992	Meat, Skin, Manure	INDIA_GOAT_1800_SALEMBLACK_06027
28.	Sumi-Ne	Nagaland	1509	Fibre	INDIA_GOAT_1400_SUMINE_06028
29.	Kahmi	Gujarat	NA	Meat, Milk	INDIA_GOAT_0400_KAHMI_06029
30.	Rohilkhandi	Uttar Pradesh	NA	Meat, Milk	INDIA_GOAT_2000_ROHILKHANDI_06030
31.	Assam Hill	Assam and Meghalaya	NA	Meat	INDIA_GOAT_0213_ASSAMHILL_06031
32.	Bidri	Karnataka	NA	Meat	INDIA_GOAT_0800_BIDRI_06032
33.	Nandidurga	Karnataka	NA	Meat	INDIA_GOAT_0800_NANDIDURGA_06033
34.	Bhakarwali	Jammu and Kashmir	NA	Meat, Milk, Hair	INDIA_GOAT_0700_BHAKARWALI_06034
Indigenous Goats			54323290		
Non descript Goats			94561496		
Total Goats			148884786		

*Indigenous pure plus graded; Source: ICAR-NBAGR and 20th livestock census

Table 2. Detail of different breeds, distribution, population, utility and accession number of registered breeds of sheep

S. No.	Breed	Distribution	Population*	Utility	Accession Number
1	Balangir	Orissa	80435	Meat, Carpet Wool	INDIA_SHEEP_1500_BALANGIR_14033
2.	Bellary	Karnataka	4275218	Wool, Meat	INDIA_SHEEP_0800_BELLARY_14019
3.	Bhakarwal	Jammu and Kashmir	187967	Coarse carpet wool	INDIA_SHEEP_0700_BHAKARWAL_14001
4.	Bonpala	Sikkim	68831	Meat, Wool	INDIA_SHEEP_2200_BONPALA_14034
5.	Changthangi	Jammu and Kashmir	71901	Meat, Wool	INDIA_SHEEP_0700_CHANGTHANGI_14002
6.	Chevaadu	Tamilnadu	67873	Meat, skin, manure, religious, cultural	INDIA_SHEEP_1800_CHEVAADU_14041
7.	Chokla	Rajasthan	382197	Fine carpet quality fleece	INDIA_SHEEP_1700_CHOKLA_14008
8.	Chottnagpuri	Jharkhand	315069	Meat, wool	INDIA_SHEEP_2500_CHOTTANAGPURI_14035
9.	Coimbatore	Tamilnadu	100317	Meat, wool	INDIA_SHEEP_1800_COIMBATORE_14020
10.	Deccani	Andhra Pradesh, Maharashtra	2383932	Meat	INDIA_SHEEP_0111_DECCANI_14021
11.	Gaddi	Himachal Pradesh	666915	Meat, wool	INDIA_SHEEP_0600_GADDI_14003
12.	Ganjam	Orissa	61479	Meat, wool	INDIA_SHEEP_1500_GANJAM_14036
13.	Garole	West Bengal	73582	Meat	INDIA_SHEEP_2100_GAROLE_14039
14.	Gurez	Jammu and Kashmir	25714	Milk	INDIA_SHEEP_0700_GUREZ_14004
15.	Hassan	Karnataka	737401	Meat, wool	INDIA_SHEEP_0800_HASSAN_14022
16.	Jaisalmeri	Rajasthan	680173	Meat, wool	INDIA_SHEEP_1700_JAISALMERI_14009
17.	Jalauni	UP and MP	42931	Meat, wool	INDIA_SHEEP_2010_JALAUNI_14010
18.	Karnah	Jammu and Kashmir	3121	Meat, wool	INDIA_SHEEP_0700_KARNAH_14005
19.	Katchaikatty Black	Tamilnadu	1900	Ram fighting during festivals, hair, meat	INDIA_SHEEP_1800_KATCHAIKATTYBLACK_14040
20.	Kenguri	Karnataka	1286284	Meat	INDIA_SHEEP_0800_KENGURI_14023
21.	Kendrapada	Odisha	10974	Meat, prolificacy	INDIA_SHEEP_1500_KENDRAPADA_14042
22.	Kilakarsal	Tamilnadu	46229	Meat	INDIA_SHEEP_1800_KILAKARSAL_14024
23.	Madras Red	Tamilnadu	297506	Meat	INDIA_SHEEP_1800_MADRASRED_14025
24.	Magra	Rajasthan	131689	Meat, wool	INDIA_SHEEP_1700_MAGRA_14011
25.	Malpura	Rajasthan	209534	Meat, wool	INDIA_SHEEP_1700_MALPURA_14012
26.	Mandya	Karnataka	250038	Meat (Excellent quality)	INDIA_SHEEP_0800_MANDYA_14026
27.	Marwari	Rajasthan and Gujarat	2870057	Meat, wool	INDIA_SHEEP_1704_MARWARI_14013
28.	Mecheri	Tamilnadu	1242742	Skin (finest quality), meat	INDIA_SHEEP_1800_MECHERI_14027
29.	Muzzafarnagri	UP and Uttarakhand	41760	Meat, wool	INDIA_SHEEP_2024_MUZZAFARNAGRI_14014
30.	Nali	Rajasthan	250343	Carpet Wool	INDIA_SHEEP_1700_NALI_14015
31.	Nellore	Andhra Pradesh	14043835	Meat	INDIA_SHEEP_0100_NELLORE_14028
32.	Nilgiri	Tamilnadu	3144	Apparel Wool	INDIA_SHEEP_1800_NILGIRI_14029
33.	Patanwadi	Gujarat	879620	Meat, wool	INDIA_SHEEP_0400_PATANWADI_14016
34.	Poonchi	Jammu and Kashmir	20232	Wool	INDIA_SHEEP_0700_POONCHI_14006
35.	Pugal	Rajasthan	170450	Meat, wool	INDIA_SHEEP_1700_PUGAL_14017
36.	Ramnad White	Tamilnadu	396856	Meat	INDIA_SHEEP_1800_RAMNADWHITE_14030
37.	Rampur Bushair	Himachal Pradesh	18239	Pelt, Meat, Wool	INDIA_SHEEP_0600_RAMPURBUSHAIR_14007
38.	Shahbadi	Bihar	60295	Meat, wool	INDIA_SHEEP_0300_SHAHBADI_14037
39.	Sonadi	Rajasthan	39373	Meat, wool	INDIA_SHEEP_1700_SONADI_14018
40.	Tibetan	Arunachal Pradesh	318	Meat, wool	INDIA_SHEEP_2300_TIBETAN_14038
41.	Tiruchi Black	Tamilnadu	21605	Meat	INDIA_SHEEP_1800_TIRUCHIBLACK_14031
42.	Vembur	Tamilnadu	102134	Meat	INDIA_SHEEP_1800_VEMBUR_14032
43.	Panchali	Gujarat	NA	Milk, meat, manure, wool	INDIA_SHEEP_0400_PANCHALI_14043
44.	Kajali	Punjab	NA	Wool, Meat	INDIA_SHEEP_1600_KAJALI_14044
Indigenous Sheep			32620213		
Non descript Sheep			37552269		
Total Sheep			70172482		

*Indigenous pure plus graded; Source: ICAR-NBAGR and 20th livestock census

Tripura, Nagaland and Sikkim. The breeds of this region are mainly of meat/ wool type.

Future Prospective and Action Points

Small ruminants rearing contributes significantly to the sustenance of small and marginal landholders, and landless rural people in India. They also play a significant role in ensuring food and nutritional security for the families of millions of resource poor rural households. In spite of having rich repository of sheep and goat breeds there is substantial non-descript population of these species, which necessitates undertaking characterization of these animals on fast track. Breeding policy for multiplication and conservation of small ruminants by different states should also be framed and conservation of indigenous breeds should be promoted. The issues

like decreasing grazing resources, lack of veterinary health services, conflicts with the agriculturalists, organized marketing system, availability of superior breeding bucks/rams etc. need to be suitably addressed involving stakeholders to popularize and improve goat and sheep in field.

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