Review

Goat genetic diversity of India - An overview

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ABSTRACT

Indian goats include well defined and documented populations designated by breeds and those (lesser known) which are not studied adequately and least documented. The inadequately studied populations or 'lesser known', goats form a major chunk (65%) of the total goat population. As per the policy of Govt. of India, all the livestock breeds have to be registered and should find a place in the gazette of India. There are 28 registered goat breeds as on date. Each breed is known for its utility (Meat/Milk/fiber). Most of the goats are multipurpose yielding mainly meat in addition to their other specific performance e.g. milk. The complete characterization (phenotypic and genetic) of these populations may indicate the distinctness of some or all of these populations. After confirming the distinctness the population can be assigned the breed status and the useful characteristics of the breed can be utilized for upgrading other non-descript populations.

Key Words: Breed, goat, native tract, population
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Goats contribute (26.40%) to the total livestock population of the country and is next to the cattle (37.28%). The estimated population of goats as per the latest livestock census (LC) is 135.17 million consisting of 37.61 m males and 97.55 m females (19th LC, 2012). There has been a decrease by 3.82% in the goat population as compared to the previous population (140.53 million) (18th LC, 2007). Male animals contributed more to this reduction (-7.79%) as compared to the females (-2.19%). Since goat farming is associated more with the rural life, the reduction in goat population is less in rural areas. The changes in goat population in rural and urban areas have been reported as -3.18 and -15.66%, respectively. Among the different states, maximum decrease (-23.65%) in goat population was recorded in West Bengal. Increase in goat population was recorded in Assam (42.81%) followed by Bihar (19.54%), Chhattisgarh (16.52%), Gujarat (6.87%) and Uttar Pradesh (5.36%). National Bureau of Animal Genetic Resources (NBAGR), Karnal has been identified as a nodal agency to register the livestock breeds by Indian Council of Agricultural Research (ICAR). Applications are received from the stakeholders for registering their goat populations as breed. After scrutiny and verifying the authenticity of information provided by the claimant, the accession number is assigned to the breed on the recommendation of breed registration committee. The accession number is a notation

Jamnapari

Changthangi

Black Bengal

signifying the name of country, species, state (denoted by code/s), name of breed, species and breed (both denoted by codes) i.e. INDIA_SPECIES_ABCD_BREED_XYEFG where ABCD = two digit code each for two states, XY = two digit code for species (06 for goat) and EFG = three digit code for breed (serial number in the list of registered breeds). For example, the accession number assigned to barbari is INDIA_GOAT_ 2017_ BARBARI_06002. Here 20 and 17 are the state codes for Uttar Pradesh and Rajasthan respectively where the breeding tract lies, 06 is the code for goat species and 002 is the code for Barbari breed.

There are 28 registered goat breeds as on date. This consists of 1(Changthangi) from Jammu & Kashmir, 2 (Chegu and Gaddi) from Himachal Pradesh, 1 (Beetal) from Punjab,2 (Jamnapari and Barbari) from Uttar Pradesh, 1 (Pantja) from Uttarakahand, 3 (Jakhrana, Marwari and Sirohi) from Rajasthan, 5 (Surti, Gohilwadi, Kutchi, Mehsani and Zalawadi) from Gujarat, 4 (Sangamneri, Osmanabadi, Konkan Kanyal and Berari) from Maharashtra, 1(Ganjam) from Odisha, 1(Black Bengal) from West Bengal, 3 (Kanniadu, Kodiadu and Salem Black) from Tamilnadu, 2 (Malabari and Attapaddy Black) from Kerala, 1 (Teressa) from Andaman & Nicobar, 1(Sume-Ne) from Nagaland.

Each breed is known for its utility (Meat/Milk/fiber). Most of the goats are multipurpose yielding mainly meat in addition to their other specific performance e.g. milk by Jamnapari, Jakhrana, Surti, Beetal; fiber or pashmina by Changthangi, Gaddi, Chegu and multiple births by Black Bengal.

On the recommendation of ICAR-NBAGR, breed wise census was initiated by the State Animal Husbandry Departments of each state. The state wise total goat population of the registered goat breeds available as per the breed wise census, 2013 is given in table 1 and their geographical distribution is depicted in the map.

After assigning the accession numbers, the characters of registered breeds have been published from time to time (NBAGR, 2008, 2009, 2012, 2015, 2016). The detailed information on the characters and performance of many of the registered breeds have also been published by ICAR-NBAGR in the form of breed monographs i.e. Jakhrana (Verma et al., 2005), Marwari (Dixit et al., 2005), Chegu (Aggarwal et al., 2005), Barbari (Sharma et al., 2005), Beetal (Sharma et al., 2005), Sirohi (Verma et al., 2006), Ganjam (Dash etal., 2006), Kutchi (Dixit et al., 2006)), Gohilwadi (Verma et al., 2006), Attapady(Aggarwal et al., 2007), Changthangi (Aggarwal et al., 2007), Malabari (Verma et al., 2008), Sangamneri (Verma et al., 2010), Konkan Kanyal (Verma et al., 2011), Berari (Verma et al., 2012), Sikkim Black (Verma etal., 2015), Sikkim goats (Verma et al., 2015), Nagaland goats (Verma et al., 2017). A brief description of breeding tract and phenotypic characters of each recognized breed has been given here.

Attapady Black (Accession: INDIA_GOAT_0900_ ATTAPADY BLACK_06001): Tract: District: Palakkad / Palghat districts of Kerala; Body Size: Medium; Colour : Black; Horn Size& Shape: Small to medium, Curved backward; Ear: Semi-pendulous; Utility: Meat

Barbari (Accession: INDIA_GOAT_2017 _BARBARI _06002): Tract: Aligarh, Agra, Mathura, Etawah districts of Uttar Pradesh; Body Size: Small to

Table 1. State-wise distribution of Goat breeds and their population

State	Total Goat population in the state	Breeds available in the state	District/s where breeding tract lies	Breed population		
				Pure	Graded	Total*
Andeman & Nicobar	65324	Teresa	-	NA	-	65324
Gujarat	4958972	Gohilwadi, ,	Amreli, Bhavnagar, Junagarh	168917	91964	263858
		Jhalawadi,	Surendernagar, Rajkot	390769	141638	532438
		Kutchi,	Ahmedabad, Kutchchh	380703	62652	443375
		Mehsana	Ahmedabad, Mehsana, ,Banaskantha, Gandhi Nagar, Sabarkantha, Patan	519844	89697	611804
		Surti	Vadodra, Surat	255593	129268	406487
Himachal Pradesh	1119491	Chegu,	Chamba, Kinnaur, Lahul, Spiti	29194	-	37682
		Gaddi	Chamba, Kangra, Kullu, Shimla	251097	150636	617162
Jammu & Kashmir	2017900	Changthangi	Leh, Ladakh	196179	-	196219
Kerala	1246077	Attapaddy,	Palakkad, Palghat	9592	5903	21639
		Malabari	Malappuram, Kannur, Cannanore, Calicut	548135	446117	1016199
Maharashtra	8435307	Berari,	Akola, Amrawati, Wardha, Nagpur	115450	66280	192575
		Konkan Kanyal,	Sindhudurg	26511	5784	33414
		Osmanabadi,	Ahmadnagar, Solar, Prabhani, Beed, Osmanabad, Latur	1974988	179865	3065837
		Sangamneri	Ahmadnagar, Pune	162834	22408	185242
Nagaland		Sumi-Ne	Junehboto, Tuensang	NA		
Odisha	6513087	Ganjam	Ganjam, Koraput	315427	95946	413922
Punjab	327272	Beetal	Amritsar, Gurdaspur	182785	35510	714982
Rajasthan	21665939	Jakhrana, ,	Alwar	976106	455696	1446655
		Marwari	Barmer, Bikaner, Jaisalmer, Jalore, Jodhpur, Pali, Nagaur	5344346	1834690	7182520
		Sirohi	Sirohi	1793464	1191808	3077354
Tamilnadu	8143341	Kanniadu,	Tirunelveli, Thoothukudi/Tuticorin	695390	360335	1056838
		Kodiadu Salem Black		-	-	-
Uttar Pradesh	15585615	Barbari,	Aligarh, Agra, Etawah	115450	66280	192575
		Jamnapari	Agra, Mathura, Etawah	836611	1435318	3913245
Uttrakhand	1367413	Pantja	Udham Singh and Nainital districts of Uttarakhand and adjacent Tarai area of Uttar Pradesh	100000	136000	23900 0
West Bengal	11505950	Black Bengal	Whole state	10670163	55028	20651324

*Total breed population in the native state or elsewhere in the country

medium; Colour : White with Tan / dark red spots; Horn Shape &Size :Medium, twisted, directed upward and backward; Ear: small, erect, tubular, directed upward and backward; Utility: Milk, Meat

Beetal (Accession: INDIA_GOAT_ 1600_ BEETAL_06003): Tract: Amritsar, Batala, Gurdaspur districts of Punjab; Body Size: Medium to large; Colour :Mainly Black, Brown with white patches; Horn Shape & Size :Medium, slightly twisted, directed backward and upward; Ear: long, leafy, pendulous, Other characteristics :Tall , roman nose and long ears; Utility: Milk, Meat

Berari (Accession: INDIA_GOAT_1100_BERARI _06023): Tract: Akola, Amrawati, Wardha, Nagpur districts of Maharashtra; Body Size: Medium to large; Colour : Light to dark tan; Horn Shape & Size : Flat, small, oriented upward and backward; Ear: medium to long, pendulous, Other Characteristics:stripes on face extending from muzzle to base of horns, black coloured ring around neck in adult male, black hair line along the vertebral column extending up to tail in both sexes; Utility: Meat

Black Bengal (Accession: INDIA_GOAT_2100_ BLACK BENGAL_06004): Tract: widely distributed in West Bengal, Odisha, Assam, Manipur, Meghalaya, Tripura, Arunachal Pradesh states; Body Size: Small; Colour :Predominantly black, brown; Horn Shape &Size :Small to medium in size, directed upward and backward; Ear: Small, horizontally placed; Other Characteristics :Small-legged goat, Hair coat short and lustrous, nose line slightly depressed; Utility: Meat, fecundity.

Changthangi (Accession: INDIA_GOAT_0700_ CHANTHANGI_06005): Tract: Leh district of Jammu & Kashmir; Body Size: Small; Colour : Mainly white, white with grey or brown hair mixing also available; Horn Shape &Size :Large, curved outward, upward/downward and inward, bigger and thicker in males; Ear: Small, horizontally placed; Other Characteristics :White, lustrous hairy coat (Pashmina,), short legs, beard, pink muzzle; Utility: Meat, Pashmina.

Chegu (Accession: INDIA_GOAT_0600_ CHEGU_06006): Tract: Chamba, Kinnaur, Lahul, Spiti districts of Himachal Pradesh, and Leh of Jammu & Kashmir; Body Size: Small; Colour : White, black, grey, brown and mixture of these colours; Horn Shape &Size : long, flat, cork shaped, directed upward, backward and inward/outward; Ear: Small, erected; Visible Characteristics: Reddish/tan/black spots mostly around head, neck and abdominal areas. Face and muzzle tapering, possess long hair with a second coat of pashmina wool; Utility: Meat, fiber.

Gaddi (Accession:INDIA_GOAT _0600_GADDI_06007): Tract:, Jammu & Kashmir, District: Chamba, Kangra, Kullu, Shimla districts of Himachal Pradesh; Body Size: Medium; Colour : Mainly White; Horn Shape &Size: Directed upward and backward and occasionally twisted, medium in size; Ears: Medium, drooping; Other Characteristics : Skin covered with coarse long hair; Utility: Meat, fiber

Ganjam (Accession: INDIA_GOAT_1500_ GANJAM_06008): Tract: Ganjam, Koraput districts of Odisha; Body Size: Medium; Colour: Black or Brown black,White, brown with or without patches; Horn Shape &Size : Long, twisted and curved backward and upward, Ear: Medium, drooping; Utility: Meat

Gohilwadi (Accession: INDIA_GOAT_0400_ GOHILWADI_06009): Tract: Amreli, Bhavnagar, Junagarh districts of Gujarat; Body Size: Medium; Colour : Black; Horn Shape &Size : Twisted and turned backward, Ear: Medium, tubular /drooping; Other Characteristics: Nose line is slightly convex. Body covered with coarse long hair; Utility: Milk, Meat.

Jakhrana (Accession: INDIA_GOAT_1700_ JAKHRANA_06010): Tract: Alwar district of Rajasthan; Body Size: Large; Colour: Predominantly black with white spots on ears and muzzle; Horn Shape & Size: Broad and flat, curving backward; Ear: Medium, drooping, having white spots; Other Characteristics : Straight face line. Forehead narrow and slightly bulging. White spot around muzzle, Udder size large with conical teats; Utility: Milk, Meat.

Jamnapari (Accession: INDIA_GOAT_2000_ JAMNAPARI_06011): Tract: Agra, Mathura, Etawah districts of Uttar Pradesh and Bhind, Morena of Madhya Pradesh; Body Size: large; Colour : Mainly White, sometimes with patches of tan or black mostly

on head and neck; Horn Shape & Size : Short, sword shaped; Ear: Long pendulous slightly folded; Other Characteristics : tuft of hair on face, roman nose, Hair on thigh, curve along dorsal line; Utility: Milk, meat

Kanni Adu (Accession: INDIA_GOAT_1800_KANNIADU_06012): Tract: Tirunelveli, Thoothukudi/Tuticorin districts of Tamil Nadu; Body Size: Medium; Colour : Predominantly Black; Horn Shape & Size : Broad, small, curving backward; Ear: Medium, drooping, white margin; Other Characteristics : White stripes on either side of the face extending from the base of the horn to corner of the muzzle, Utility: Milk, Meat.

Kutchi (Accession:INDIA_GOAT_0400_KUTCHI_06013): Tract: Gujarat, Rajasthan; District: Ahmedabad, Kuchh of Gujarat and Barmer, Bikaner, Jaisalmer, Jalore, Jodhpur, Pali, Nagaur districts of Rajasthan: Body Size: Medium, Colour : Predominantly black white, brown, and spotted; Horn Shape & Size : Short to long, thick and cork screw type, curved upward; Ear: Medium , pendulous, Other Characteristics : Long and coarse hair, slightly roman nose, white spot in the neck region, curly tuft hair on forehead; Utility: Milk, Meat.

Malabari (Accession:INDIA_GOAT_0900_MALABARI_06014): Tract: Malappuram, Kannur, Calicut districts of Kerala; Body Size: Medium; Colour : Mainly White; Horn Shape &Size :Short, Slightly twisted directed outward and upward; Ear: Medium, drooping, Ear tip is slightly curved; Other Characteristics : polled, Beard, mostly stall fed, prolific; Utility: Milk, Meat.

Marwari (Accession: INDIA_GOAT_1700_MARWARI_06015): Tract: Barmer, Bikaner, Jaisalmer, Jalore, Jodhpur, Pali, Nagaur districts of Rajasthan; Body Size: Medium; Colour : Predominantly black; Horn Shape & Size :Short, pointed, directed upward and backward; Ear: Flat, long, drooping; Other Characteristics :Long shaggy hair coat; Utility: Milk, Meat.

Mehsana (Accession: INDIA_GOAT_0400_MEHSANA_06016): Tract: Gujarat, District: Ahmedabad, Banaskantha, Gandhi Nagar, Mehsana, Sabarkantha, Patan; Body Size: Medium; Colour : Black; Horn Shape &Size :Screw type, curved upward and backward, pointed; Ear: medium, with white spots ranging from a few to complete white; Other Characteristics : White spots are present on the upper part of muzzle. Hair coat long and shaggy; Utility: Milk, Meat.

Osmanabadi (Accession: INDIA_GOAT_1100_OSMANABADI _06017): Tract:, Ahmadnagar, Solar, Prabhani, Beed, Osmanabad, Latur districts of Maharashtra; Body Size: Medium; Colour Predominantly black; Horn Shape & Size : Slightly twisted, curved upward and backward; Ear: Medium size, drooping; Other Characteristics : Hairy coat, wattles, straight nose live Utility: Milk, Meat.

Sangamneri (Accession: INDIA_GOAT_1100_SANGAMNERI _06018): Tract: Ahmadnagar, Pune districts of Maharashtra; Body Size: Medium; Colour : Mainly White, black or brown. Spotted animals are also available; Horn Shape &Size :Thin, directed upward and backward, medium; Ears: Medium, Horizontally placed or slightly drooping; Other Visible Characteristics: Coarse hairy coat, Face is triangular and convex type, Wattles, Beard; Utility: Milk, Meat.

Sirohi (Accession: INDIA_GOAT_1704_SIROHI _06019): Tract: Sirohi district of Gujarat and Rajsmand of Rajasthan; Body Size: Large; Colour : Predominantly brown with light or dark brown spots; Horn Shape &Size : Small to medium, curved upward and backward; Ears: Flat and leaf like pendulous ears; Other Characteristics : body medium to large, nose slightly roman, legs long, curve along dorsal line; Utility: Milk, Meat

Surti (Accession: INDIA_GOAT_0400_SURTI_06020): Tract: Vadodra, Surat districts of Gujarat; Body Size: Small to medium; Colour : Mostly White; Horn Shape & Size :. Small to medium, directed upward and backward; Ears: Medium sized, drooping; Other Characteristics :. Well-developed udder with large conical teats; Utility: Milk, Meat

Zalawadi (Accession:INDIA_GOAT_0400_ZALAWADI _06021): Tract: Rajkot and, Surendranagar districts of Gujarat; Body Size: Medium to large; Colour :Body is covered with black, lustrous, shining hairs; Horn Shape & Size : Horns are cork-screw type moving straight upwards, backwards and slightly outward

with pointing tips; Ears: long, leaf like, pendulous, with white spots.; Other Characteristics : Well-developed udder with large conical teats, long legs; Utility: Milk, Meat.

Konkan Kanyal (Accession:INDIA_GOAT_1100_KONKAN KANYAL_06022): Tract: Sindudurg district of Maharashtra; Body Size: Medium, Colour :Mostly black, brown; Horn Shape & Size : Medium, cylindrical, pointing backward; Ears: Medium, white margin, flat, long ,drooping; Other Characteristics : White marking on face and neck region, Ventral surface of the body is white. Legs long, medially white, belly white; Utility: Milk, Meat

Pantja (Accession:INDIA_GOAT_2420_PANTJA_06024): Tract: Udam Singh Nagar of Uttarakhand; Body Size: Medium; Colour : Brown/tan; Horn Shape & Size : Small to medium, straight, curving upward, outward; Ears: Medium, flat, drooping; Other Visible Characteristics : stripes on face extending from muzzle to base of horns, hair on thighs; Utility: Milk, Meat

Teressa (Accession:INDIA_GOAT_ 3300_TERESSA_06025): Tract: Andeman & nicobar island, Body Size: Medium; Colour : Brown or tan ; Horn Shape & Size : Large horn with flat base; Ears: Medium, erected, horizontally placed; Other Characteristics : Tall, black hairs on dorsal midline up to the tail. Black colored muzzle, eyelids and hoofs. White stripes starting from eye brows and extending up to nostrils or mouth; Utility: Milk, Meat.

Kodi Adu (Accession:INDIA_GOAT_1800_KODIADU_06026): Tract:, District: Thoothukudi & Ramanathapuram districts of Tamil Nadu; Body Size: Medium to large; Colour : Chem-Porai goats are white in colour with varying degree of reddish brown colour, whereas, Karum-Porai goats are white in colour with varying extent of splashes of black colour; Horn Shape & Size : small, thin orienting upward and backward; Ears: Medium, slightly drooping; Utility: Meat

Salem Black (Accession:INDIA_GOAT_1800_SALEM BLACK_06027): Tract: Salem and Erode districts of Tamil Nadu; Body Size: Medium to large; Colour : Predominantly black colour coat; Horn Shape & Size : Medium, grey in colour, curved upwards and backwards, thicker and longer in males; Ears; medium size, black, slightly drooping; Other Characteristics : Animals tall, long, lean and leggy with compact body, muzzle, hooves black; Utility: Meat.

Sumi-Ne (Accession:INDIA_GOAT_1400_SUMINE_06028): Tract: Zunehboto, Tuensang districts of Nagaland; Body Size: Small to Medium; Colour : White with black patch in the neck region; Horn Shape & Size : Pointed, directed upward and then slightly backward, Longer and thicker in males, orienting upward and backward; Ears: Medium size, erect and are placed horizontally; Other Characteristics : Nose line straight, Long hair in the adult males. In females, the long hair present generally on thigh region; Utility: Meat

Lesser known goats

Many populations of goat existing in different pockets of the country are either nondescript or graded or inadequately studied and hence are called lesser known populations. Due to lack of detailed study on them they are not properly documented. During the breed census conducted in 2013 these goats have been enumerated under graded category. Some populations which earlier belonged to this non descript category have been studied by taking visits to their respective breeding tracts. A good amount of information was generated and documented which strengthened the claim for their registration as new breed of goat. Still, there are populations left which require detailed study before assigning them the breed status if they are unique. The Information available on many lesser known goat populations have been compiled by Verma et al. (2010), Mishra et al. (2015) and Bhatia et al. (2016).

Non- descript goat breeds of temperate Himalayan region are Shingari and non-pashmina goat of Ladakh (Roy *et al .,* 2007). Goats of North East region's are Singharey (Verma *et al.,* 2015), Sikkim Black(Verma *et al*., 2016). North West arid and semi-arid region's non-descript goats are Udaipuri (Barwal *et al.,* 2010), Jaunpuri (Singh *et al*., 2010), Bundelkhandi, Rohilkhandi/ Bareilly (Das, 2008; Bhatia *et al.,*2016)), Chaugarkha (Barwal *et al.,* 2007)and Tarai goat (Singh *et al.,* 2010). Goats of Southern region are Andaman goat, Teressa, Barren

Singharey (Sikkim)

Sojat (Rajasthan)

Bundelkhandi (UP&MP)

(Anthra, 2006), Bidri goat (Tantia,2017 ; Naveen Kumar et al., 2008), Nandidurga (Tantia. 2017) Mahabubnagar (Ekambaram *et al.,* 2011) whereas that of Eastern Region are Black Bengal type (Rao *et al.,* 2006), Jharkhand Black (Singh and Singh, 2006), Kalahandi, Raigarhi (Verma *et al.,* 2015), Ghumusari (Rao *et al.*, 2002; Verma *et al.,* 2015), Malkangiri (Verma *et al.,* 2015), Narayanpatnam (Verma *et al.,*2015) and Assam Hill goats. Some of these populations have been studied but not found fit for breed status whereas some (six) are likely to be declared as new breeds.

General management

It is generally believed that goat can eat anything and everything. They have very sensitive lips and are in the habit of smelling the food which is clean and tasty. Goats avoid eating soiled food unless they are pushed to starvation. Goats are kept on local vegetation. The feeding practices may be stall feeding, semi-stall feeding, grazing alone, and grazing with supplement feed. The large flocks are sent for pasture feeding. The natural grasses, shrubs, trees and crop residues form the part of pasture grazing. Fodder resources consists of *Pala (Zizyphyus jujube), Khejri (Prosopis cineraria), Ber(Zizyphus rotundifoJia), Neem (Azadirachta indica), Babool (Acacia arabica),Kikkar (Acacia nilotica).* Stall-fed animals are supplemented with the concentrate consisting of *Loom, Guar, Moth, Moong, Bajra, Jowar, Maize* etc. The pregnant animals and good milch goats are given extra ration. The newborn kids are kept on milk feeding and are allowed to suckle their mothers ad-lib.

Goats are generally kept open but at night they are shifted to temporary katcha houses constructed using material like mud, bricks, stones, concrete, bamboo sticks, wooden logs and iron girdle etc. Very few houses are made puccka in a planned way. There is no proper arrangement of electric and water supply in the goat houses. They are made either on the ground level or on the pillars raised from the ground at 3-4 ft level. The floor in such elevated houses is made of wooden planks. A ramp is made for the entry and exit of the animals.

Small gates with temporary lock system are also made. The goat house with raised flooring help in keeping the house neat and clean as all the droppings and urine come down on the ground below the floor of house and do not accumulate on the floor. The raised flooring also provide good ventilation and keeps the animals free from infections. In some houses the feeding mangers are also made on the outer wall of the house. When the animals are small in number they share the owner's residence. For kids, basket /cage housing is used. In the field animals are kept open in a area fenced temporarily using sticks or ropes.

Health of goats is of prime importance for a good profitable goat farming. Good quality green fodder and balanced feed increase the productivity. Controlled and monitored breeding using good and selective bucks on healthy goats help in improving the breed. Buck can be kept in 1:9 ratio in a farm and buck should be replaced after every 12-18 months to avoid inbreeding in the flock. Males which are not selected for breeding purpose should be castrated at the age of 2-4 weeks. While selecting breeding bucks, males with fully developed, well extended and of equal sized testis should be

preferred. Similarly, in doe the udder and teats should be well developed and symmetrical with sufficient milk to nourish the kids. For first time breeding, age of sexual maturity 12-15 months or 25 kg body weight should be considered for both sexes. Generally singlet is given during first kidding. The litter size increases in the subsequent kiddings and reach 3to 4 with improved feeding.

CONCLUSION

The present diversity in caprine species is the result of a combination of various processes, including domestication, migration, genetic isolation, environmental adaptation, selective breeding, introgression and admixture of subpopulations. Molecular characterization can help unravel the genetic history of a species, which is most relevant for managing the present and future genetic diversity. In this era of intellectual property rights (IPR), the proper documentation on such populations is essentially required.Thus the emphasis should be to describe, characterize and document lesser known populations of the country so that the proportion of non-descript population is considerably transformed in to defined breeds. This will be an important step towards planning the organized breeding program for their genetic improvement, conservation strategies and sustainable utilization.

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