

Characteristic Features of Registered Indigenous Sheep Breeds of India: A Review

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ABSTRACT

Indian subcontinent is a rich source of diverse ovine germplasm, and only very few countries have such a large number of breeds with wide genetic diversity. Most of the breeds of sheep in India have evolved through natural adaptation to agro-ecological conditions, followed by some limited artificial selection for particular requirements. Most of the breeds have generally been named after their place of origin and on the basis of prominent characters. This vast ovine biodiversity in India is being eroded rapidly and more than 50% of sheep breeds are currently under threat. Sheep biodiversity in India is characterized by high degree of endemism and variations in agro climatic conditions of the different regions has led to the development of various breeds/strains that are well adapted to specific set of environmental conditions. These breeds have generally been named after their place of origin and some based on their prominent characteristics. Indigenous sheep contribute greatly to the agrarian economy, especially in areas where crop and dairy farming are not economical, and play an important role in the livelihood of a large proportion of small and marginal farmers and landless laborers. Conservation of genetic resources in developing countries is far more complex, because, in a vast majority of the cases, information about available genetic resources, their usefulness and need for and methods of conservation are not clear.

Key words: Indigenous Sheep, India, Biodiversity, Characteristics features, Conservation

INTRODUCTION

Animals with distinct characters localized to a place and different from those of other places are termed as breeds and give some local name. There have been little efforts to

conserve and improve the native breeds except for some Govt farms. Some important breeds of sheep are maintained for pure-breeding and producing stud rams for distribution to the farmers.

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Most of the breeds have generally been named after their place of origin and on the basis of prominent characters. The country has about 42 registered breeds of sheep. They vary from the non-woolly breeds of sheep in the Southern Peninsular region mainly kept for mutton and manure to the reasonably fair apparel wool breeds of the Northern temperate region. Sheep with its multi facet utility (for meat, wool, skin, manure and to some extent milk and transport) play an important role in the Indian agrarian economy. They have an excellent ability to survive over a prolonged period of drought and semi starvation and are less prone to extreme weather conditions, ectoparasites as well as other diseases. They are unique for their fibre which allows ventilation and also protects the skin from the

hot sun, rain and abrasions. Because of their hardiness and adaptability to dry conditions, the north-western and the Southern peninsular regions of the country have a large concentration of sheep. The sheep are mostly reared for wool and meat. Sheep skins and manure constitute important sources of earning, the latter particularly in southern India. Based on various agro-climatic conditions and type of sheep found in them, the following four distribution of type breeds in different agroclimatic region.

(I) Northern Temperate Region

This region comprises of Jammu & Kashmir, Himachal Pradesh and hilly parts of Uttat Pradesh. The important breeds of this region are Bhakarwal, Changthangi, Gaddi, Garole, Gurez, Karnah, Poonchi and Rampur Bushair.

1. Bhakarwal



The name of the Bakharwal breed is derived from the nomadic tribe which rears these sheep. The breed has no distinct home tract, and the sheep are entirely migratory. Bakharwal sheep flocks, winter in the Pir Panjal ranges of the Jammu division, and in the summer migrate to the Kashmir Valley, crossing the high mountain passes. They are medium-sized animals, with a typical Roman nose. The fleece which is coarse and open is generally white, although coloured fleeces are occasionally observed. They are a coarse carpet wool breed of sheep. All animals are

spotted fawn or grey. The rams are horned and the ewes are polled. The ears are long and drooping, and the tail is small and thin. Adult ewes weigh between 29 and 36 kg; rams can weigh as much as 55 kg. Most of this breed has now been crossed with Merino for improving greasy-wool production and quality for apparel wool and only a small proportion of flocks still contain pure Bakharwal animals. The sheep are shorn three times a year. The total annual wool produced per animal ranges from 1 to 1.5 kg.

2. Changthangi



Predominantly white and the rest are brown, grey and black. Undercoat white/grey; yields warm delicate fibre - pashmina (cashmere, pashm). Body and legs are small, have strong body and powerful legs. Ears are small, pricked and pointed outwards. Horns are large

turning outward, upward and inward forming a semicircular ring. Average live weight of buck is 20 and doe is 20 kg; average birth weight is 2.1 kg. Kidding is once a year, normally single; Average age at first kidding is 20 months.

3. Gaddi



The Gaddi breed, also known as Bhadarwah, is native to the Kishtwar and Bhadarwah Tehsils in the Jammu region of Jammu and Kashmir and the breed is distributed in Kishtwar and Bhadarwah Tehsils in Jammu province of Jammu & Kashmir state, Hamirpur, Ramnagar, Udampur and Kulu and Kangra valleys of Himachal Pradesh and Dehradun, Nainital, Tehri Garhwal and Chamoli districts of Uttar Pradesh. These are medium sized animals, usually white, although tan, brown

and black and mixtures of these are also seen. Males are entirely horned but females to the extent of only 10 to 15% are horned. Fleece is generally white with brown coloured hair on the face. Wool is fine and lustrous; average annual yield is 1.13 kg per sheep, clipped thrice a year. A part of this clip is sent to Dhariwal mills and Amritsar markets. Undercoat is used for the manufacture of high quality Kulu shawls and blankets.

4. Garole



The Garole breed is native to the hot, humid and swampy Ganges delta of West Bengal. It is a small-sized animal, reared for meat, and plays a vital role in the economic subsistence of marginal farmers and landless households in the Sunderbans region of the South 24 Parganas district in West Bengal. It has a compact and square body with a small head, medium ears and a short thin tail. Grey and white are the predominant colours. Males are

usually horned and females are polled. The fleece is open and very coarse and, though not dense, covers almost the whole body and a major part of the legs. The animals are usually not shorn, though some farmers shear the animal and use the wool for bedding material. Garole ewes breed around the year with two lambing peaks between December to February and August to September. Multiple births are common.

5. Gurej



The Gurej breed is found in the Gurez block of Bandipore district in North Kashmir. They are the largest of the sheep breeds in the state. The skin colour pink. Both sexes are polled. Ears are large and leafy; tail is short to medium in

length and thin. Fleece is white coarse, dense and long stapled. Forehead, belly and legs are covered with wool. The March and September clips are yellow but the September clip is golden yellow in colour.

6. Karnah



The Karnah breed is primarily found in Karnah, a mountainous tehsil of Kupwara district in North Kashmir. These are generally large animals. The rams have large curved horns and a prominent nose line. Wool is generally white in colour. The sheep are shorn

twice a year, in spring and autumn which produce between 1 to 1.5 kg of wool per animal per year. Staple length ranges from 12 to 15 cm and the average fibre diameter between 29 and 32 μ .

7. Poonchi



The Poonchi breed, as its name suggests, is native to the Poonch and Rajouri districts of the Jammu region of Jammu and Kashmir. The animals are similar in appearance to Gaddi except being lighter in weight. Animals are predominantly white in colour, including the face but spotted sheep varying from brown to light black are also seen. Ears are medium long. Tail is short and thin. Legs are also short,

giving a low-set conformation. The weight of the adult ram ranges from 35 to 40 kg and that of a ewe from 25 to 30 kg. Wool is of medium to fine quality, mostly white in colour. Sheep are shorn three times a year which produce between 0.9 to 1.3 g greasy wool sheep per year. Fibre length ranges between 15 to 18 cm and the fibre diameter between 22 and 30 μ .

8. Rampur Bushair



The Rampur Bushair breed is distributed in Simla, Kinnaur, Nahan, Bilaspur, Solan and Lahul and Spiti districts of Himachal Pradesh and Dehradun, Rishikaesh, Chakrota and Nainital districts of Uttar Pradesh. These are medium sized animals. The fleece colour is predominantly white, but brown, black and tan colour are also seen on the fleece in varying proportions. The ears are long and drooping. The face line is convex, giving a typical Roman nose. The males are horned but most of the females are polled. The fleece is of

medium quality and dense. Legs, belly and face are devoid of wool.

(II) North Western region

This region comprises the states of Punjab, Haryana, Rajasthan and Gujarat and the planes of Uttar Pradesh and Madhya Pradesh. Important breeds of sheep found in this region are Chokla, Jaisalmeri, Jalauni, Magra, Malpura, Marwari, Muzaffarnagri, Nali, Patanwadi, Pugal and Sonadi. This region is the most important in the country for carpet wool production.

1. Chokla



Chokla also known as Chhappar and Shekhawati, is native to the districts of Churu, Jhunjhunu, Sikar, and the border areas of Bikaner, Jaipur and Nagaur districts of Rajasthan. It can be categorise as medium fine wool. Chokla are light to medium-sized animals. Their face is generally devoid of wool

and is reddish brown or dark brown in colour which may extend up to the middle of the neck. The skin is pink. The ears are small to medium in length and tubular. Both the sexes are polled. The coat is dense and relatively ine, covering the entire body including the belly and the greater part of the legs.

2. Jaisalmeri



The name of the Jaisalmeri breed is derived from its home tract, Jaisalmer. They are distributed across the Jaisalmer, Barmer and Jodhpur districts of Rajasthan. The animals are tall and well built with black or dark brown face, the colour extending up to the neck, typical Roman nose, long drooping ears,

generally with a cartilagenous appendage. Both sexes are polled. The tail is medium to long. The fleece colour is white, of medium carpet quality and not very dense. This is the largest breed in body size of Rajasthan which produce good quality carpet-wool. There is need for conserving this breed.

3. Jalauni



The Jalauni breed is distributed across the Jalaun, Jhansi and Lalitpur districts of Uttar Pradesh. The animals are medium sized with straight nose line. Both sexes are polled. Ears are large, flat and drooping. Tail is thin and medium in length. Fleece is coarse, short-stapled and open, generally white. Belly and

legs are devoid of wool. The Uttar Pradesh Government is presently engaged in upgrading Jalauni with Nali to improve its wool yield and quality. Nali crosses show improvement in fleece production as reflected by fleece weight, staple length and quality.

4. Magra



The Magra breed (formerly known as Bikaneri; and also known as Bikaneri Chokhla and Chakri) is distributed in the Bikaner, Nagaur, Jaisalmer and Churu districts of Rajasthan. Animals true to the breed type are found only in the eastern and southern parts of Bikaner districts. The animals are medium to large in size. White face with light brown patches around the eyes are the characteristics of this breed. Skin colour is pink. Ears are small to medium and tubular. Both sexes are polled. Tail is medium in length and thin.

Fleece is of medium carpet quality, extremely white and lustrous and not very dense. The most important strain of Magra (Bikaneri Chokla) has flocks with extremely white and lustrous fleeces and found only in a flocks with extremely white and lustrous fleeces and found only in a few villages around Bikaner. Their fleece is of good carpet quality. The breeding programme involves improving this breed through selection; however, there is much crossing with other breeds in the vicinity.

5. Malpura



The Malpura breed is native to the Tonk, Sawai Madhopur, Jaipur and Dausa districts and adjacent areas of Ajmer, Bhilwara, Chitaurgarh, Kota and Bundi districts in Rajasthan. They derive their name from the Malpura Taluk in Tonk district in Rajasthan. The animals are fairly well built with long legs with face light brown. Ears are short and tubular, with a small cartilagenous appendage on the upper side. Both sexes are polled. Tail

is medium to long and thin. Fleece is white, extremely coarse and hairy. Belly and legs are devoid of wool. The milk production averaged 64.50 kg in a lactation period of 90 days. Topping and lambing percentages in the spring and autumn seasons, are 61.54, 96.23% and 88.7, 32.7% respectively. The dressing percentage on the live weight basis at 6 months ranged from 40.90 to 49.49.

6. Marwari



The Marwari name originates from the home tract of the breed – the Marwar region of Western Rajasthan which encompasses Jodhpur, Jalore, Nagaur, Pali, Sirohi and Barmer districts. The animals migrate to distant places in Uttar Pradesh, remote districts of Madhya Pradesh and sometimes to the northern parts of Maharashtra. Sheep are

hardy, yielding coarser carpet variety white wool of a mixed hairy composition. This sheep is characterized by long legs, black face and a prominent nose. Fleshy appendages under throat, known as wattles, are often present. Tail is short and pointed. They possess high resistance to disease and worms. The yield of wool per year is 0.90-1.81 kg per animal.

7. Muzaffarnagri



The Muzaffarnagri, also known as Bulandshahri is native to the Muzaffarnagar, Bulandshaher, Saharanpur, Meerut and the Bijnor districts of Western Uttar Pradesh and parts of Delhi and Haryana. The animals are medium to large in size, face lines slightly convex. Face and body are white with occasional patches of brown or black, ears and face occasionally black. Both sexes are polled.

Males sometimes contain rudimentary horns. Ears are long and drooping. Tail is extremely long and reaches fetlock. Fleece is white, coarse and open. Belly and legs are devoid of wool. As the breed is one of the heaviest, largest and very well adapted to irrigated areas, its gradual decline in number necessitates conservation.

8. Nali



The Nali breed is well adapted to the arid and semi-arid regions of Rajasthan and Haryana. It is also found in large numbers in Uttar Pradesh. Nali sheep is of a large size. It has compact head, large and leafy ears, short legs with amber hooves. The forehead is covered with wool and the face is full of light brown

hair. Body colour is yellow white. Both sexes are polled. The animals are clipped twice a year, in the month of March and September and weighs between 2.5 to 3.5 kg per year. Mature ram weighs between 35-40 kg while ewes are between 25-30 kg.

9. Patanwadi



The Patanwadi (also called Desi, Kutchi, Kathiawari, Vadhiyari and Charotari) is found in the coastal plains of the Saurashtra and Kutch regions of Gujarat, and the sandy loamy areas of Patan, Panch Mahals and Mehsana districts of Gujarat. The breed includes three distinct strains: (i) non-migratory, red faced animals with small bodies, yielding relatively finer fleeces. These are typical Patanwadis and are located in north eastern Saurashtra; (ii) the migratory type, with larger body and long legs,

typical Roman nose and long tubular ears. This variety, producing coarser fleeces, is found in western and northern Gujarat; (iii) the meat type, with big body, low stature and coarser fleeces, found in south eastern areas around Palitana. It is distributed in coastal plain region of Saurashtra and Kutch districts and sandy loamy areas of Patan, Kadi Kalol, Sidhapur and Chanssama taluks of Mehsana district of Gujarat.

10. Pugal



The name of the Pugal breed originates from the Pugal tehsil of Bikaner district, which is the home tract of this breed. It is also distributed over Bikaner and Jaisalmer districts of Rajasthan, but pure specimens are available only in the north western border area of the two districts. Fairly well built, animals have black face, with small light brown strips on either side above the eyes, lower jaws, of typically light brown colour. The black colour

may extend to neck. Ears are short and tubular. Both sexes are polled. Tail is short to medium and thin. The fleece is of medium carpet quality but not very dense. Considering these small numbers, there is need for conservation of this breed. The breeding policy involves improving this carpet wool breed through selection for greasy fleece weight and carpet quality.

11. Sonadi



The Sonadi breed is found in the Mewar region of Rajasthan comprising Udaipur, Dungarpur, Chittaurgarh and Banswara districts, also extends to northern Gujarat. They are also locally known as Laapdi (long flat drooping ears) and Bhagli (of good fortune). The animals are fairly well built somewhat smaller to Malpura with long legs, light brown face with the colour extending to the middle of the neck, ears large, flat and drooping and generally have a cartilagenous appendage. Tail is long and thin. Both sexes are polled. Udder is fairly well developed.

Fleece is white, extremely coarse and hairy. Belly and legs are devoid of wool.

(III) Southern peninsular region

This region (semi-arid in central peninsular and hot humid region along the coast) comprises of Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala. The important breeds of this region are Bellary, Coimbatore, Deccani, Hassan, Katchaikatty-Black, Kenguri, Kilakarsal, Madras-Red, Mandya, Macheri, Nellore, Nilgiri, Ramanadhapuram-white, Trichi black and Vembur.

1. Bellary



The Bellary breed is native to the districts of Bellary and Davanagere and the adjoining areas of Haveri and Chitradurga districts of Karnataka. This breed is not very different from Deccani. Animals found to the north of the Tungabhadra River are called Deccani and those to the south of it Bellary. Mostly found in Bellary district of Karnataka. The animals

are medium sized with body colour ranging from white through various combinations of white and black to black. One third of the males are horned, females are generally polled. Ears are medium long, flat and drooping. Fleece is extremely coarse, hairy and open. Belly and legs are devoid of wool.

2. Coimbatore



It is distributed in Coimbatore district of Tamilnadu. It is wool purpose breed. The Coimbatore breed, also called Kurumbai. It is widely available in Coimbatore and Madurai districts of Tamil Nadu and bordering areas of Kerala and Karnataka. The animals are of medium size and white colour with black or

brown spots. Ears are medium in size and directed outward and backward, Tail is small and thin. 38% of the males are horned but the females are polled. Fleece is white, coarse hairy and open. Adult male average body weight 25kg. Adult female average body weight 20kg.

3. Deccani



The Deccani breed is spread over the greater part of the central peninsular region, comprising the semi-arid areas of Maharashtra, Andhra Pradesh and Karnataka. Deccani breed is an admixture of the woolly types of Rajasthan and the hairy types of Andra Pradesh and Tamil Nadu. The sheep is small and hardy, and well adapted to poor pastoral

conditions. It possesses a coloured fleece, black and gray colours being more dominant. The average annual yield of wool being 4.54 kg per sheep. The wool is of a low grade and is a mixture of hair and fine fibres, mostly consumed for the manufacture of rough blankets (Kambals). The flocks are maintained chiefly for mutton.

4. Hassan

The Hassan breed of sheep as the name suggests is traditional to the Hassan district of Karnataka. These are small sized animals with white body and light brown or black spots. Ears are medium-long and drooping. 39% of

the males are horned, females are usually polled. Fleece is white, extremely coarse and open, legs and belly are generally devoid of wool.

5. Katchaikatty Black

Katchaikatty Black sheep are maintained in small flocks in Vedipatti taluka of Madurai district of Tamil Nadu. Animals are medium in size with compact body and are black in

colour. Coat type is hairy. The breed is reared for meat and manure. Rams are well known for fighting.

6. Kenguri

The Kenguri breed, also known as Tenguri is native to the hilly tracts of the Koppal and

Raichurs district (particularly Lingasagar, Sethanaur and Gangarti taluks) of Karnataka.

These are medium sized animals. Their body colour is mostly dark brown, but colours ranging from white to black with spots of different shades are also not uncommon.

Males are horned, while the females are generally polled. Although their exact number is not known but their population is too small.

7. Kilakarsal



The Kilakarsal, also known as Keezhakkaraisal, Karuvai, Keezha Karuvai, Ramnad Karuvi and Adikaraisal, is mainly found in the Madurai, Virudhunagar, Tirunelveli and Thoothukudi districts of Tamil

Nadu. Coat dark tan, with black spots on head, belly and legs. Ears medium sized. Tail small and thin. Males with thick twisted horns. Most animals have wattle.

8. Madras Red



The Madras Red breed of sheep is native to the Kanchipuram and Chingalpet and Madras districts of Tamil Nadu. The animals are medium sized. Their body colour is predominantly brown whose intensity varies from light tan to dark brown. Some animals



have white markings on the forehead, inside the thighs and on the lower abdomen. Ears are medium long and twisted horns and the ewes are polled. Their body is covered with short hairs which are not shorn.

9. Mandya



Mandya, also known as Bannur and Bandur, is distributed in the Mandya district and areas bordering the Mysore district of Karnataka. Relatively small animals are white in colour but in some cases their face is light brown which may extend to the neck. Possess a compact body with a typical reversed U-shape wedge from the rear. Ears are long, leaf-like and drooping. Tail is short and thin. A large

percentage of animals carry wattles. Slightly Roman nose. Both sexes are polled. Coat is extremely coarse and hairy. There is high incidence of cryptorchidism in Mandya, possibly due to selection of animals for meaty conformation. Adult male weighs 35 kg and female weighs 23 kg. Best mutton type conformation among the Indian breeds.

10. Mecheri



It is distributed in Salem, Erode, Karur, Namakkal, and fewer parts of Dharmapuri districts of Tamilnadu. Also known as Mainlambadi and Thuvaramchambali in Coimbatore district. Mostly found in Macheri, Kolathoor, Nangavalli, Omalur and Tarmangalam Panchayat Union areas of Salem district and Bhavani taluk of Coimbatore

district of Tamil Nadu. It is a meat purpose breed. It has medium sized body with pale purplish skin color. There are no horns for both the sexes. Ears are medium sized. Tail is short and thin. Body is covered with very short hair which are not shorn. Adult male average body weight 36kg. Adult female average body weight 22kg.

11. Nellore



It is distributed in Nellore, Prakasam and Ongole districts of Andhra Pradesh. They are tall animals with little hair except at brisket, withers and breech. Rams are homed ewes are polled. Long and drooping ears; Majority of animals carry wattles. Males have average body weight of 36 kg and female have 28 kg. Nellore is the tallest breed of sheep in India, resembling goats in appearance. It has a long face and long ears with the body densely covered with short hair. The majority of the flocks are of fawn or deep red fawn colour. Based on coat colour, three varieties of this breed are: Palla' completely white or white

with light brown spots on head, neck, back and legs. Jodipi' (also called Jodimpu) are white with black spots particularly around the lips, eyes and lower Jaw but also on belly and legs, and Dora are completely brown. The animals are relatively tall with little hair except at brisket, withers and breech. The rams are horned but the ewes are almost always polled. The ears are long and drooping. The tail is short and thin. 86% of the animals carry wattles. nellore district and neighbouring areas of Prakasam and Ongole districts of Andhra Pradesh predominantly contain this breed population.

12. Nilgiri



The Nilgiri breed is said to have evolved during the 19th century, originating from a cross-breed base and contains an unknown level of inheritance of Coimbatore, the local hairy breed, Tasmanian Merino, Cheviot and Southdown. These are distributed in Neelagiri district of Tamilnadu. It is wool purpose breed.

They are medium weighed animal. Majority are found in white colors. Certain goats are found with purple spots on their body and face. Ears are broad and drooped out. Females are without horns. Adult male average body weight 31kg. Adult female average body weight 31kg.

13. Ramanadhapuram white



This is distributed in Ramanadhapuram, Sivagangai, Virudhunagar districts and adjoining areas of Tirunelveli district of Tamil Nadu. It is meat purpose breed. It has medium sized body. Majority of them are white in color. Certain goats hold black colored stripes

all over their body. The ears are medium sized and directed outward and downward. Males have twisted horns but females are polled. Tail is short and thin. Legs are smaller and slender. Adult male average body weight 31kg. Adult female average body weight 23kg.

14. Trichy black



These are distributed in Trichy, Perambalur, Dharmapuri and Salem districts of Tamilnadu. Also known as Tiruchy Karungurmbai, the breed is largely found in Perambalur and Ariyalur taluks of Tiruchy districts, kallakurichy taluk of South Arcot district, Tirupathur and Tiruvannamalai taluks of North Arcot district and Dharampuri and a portion of Krishnagiri taluk of Dharampuri district of

Tamil Nadu. It is wool purpose breed. These are smaller breeds. Black coloured all over the body. Adult males are found with horns and females without horns. Ears are smaller, facing forward and downwards. Tail is short and thin. Adult male average body weight 26kg. Adult female average body weight 19kg. Their fleece is extremely coarse, hairy and open.

15. Vembur



The Vembur, also called Karandhai, It is distributed in Vembur, melakarandhai, keezha karandhai, nagalapuram regions, Tuticorin and Virudhunagar districts of Tamilnadu. These are taller breeds. Their colour is white with irregular red and fawn patches all over the body. It is meat purpose breed. Ears are

drooped out. Tail is smaller and slender. Adult males are found with horns and absence of horns in case of females. Adult males average body weight 35kgs. Adult females average body weight 28kgs. The body is covered with short hair which are not shorn.

16. Chevaadu:



Chevaadu sheep are found in Tirunelveli district of Tamil Nadu. The sheep is popularly known as Chevaadu and the background for the name of this breed owes to its “Brown” coat colour. Animals are small to medium in size. Two colour variant viz. light brown and dark brown or tan are present. Body is covered with brown hair. Head is erected and high in disposition. Horns are curved horizontally outward, backward with blunt conical apex having few thick ridges. Horn is light brown in colour. Adult body varies from 18 to 39kg. Estimated population is about 1,58,200. This sheep is primarily used for meat and manure purposes. This sheep also plays an important role in the socio-cultural life of the local inhabitants. This sheep is considered as a

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ceremonial animal for various social rituals. Chevaadu sheep is a lesser known hairy meat breed of sheep reared in Tamil Nadu.

(IV) Eastern Region

This region (hot and humid) includes Bihar, West Bengal, Orissa, Assam and other eastern states. This region has no distinguished breeds of its own except in the case of Bihar where Shahabadi and Chottanagpuri breeds are found. Other important breeds of this region are Balangir, Bonpala, Ganjam, Tibetan. The sheep in this region are primarily of meat type but for Arunachal Pradesh which has a small number of better wool sheep. The quality of wool produced by the sheep of this region in general is small and extremely coarse, coloured and of hairy quality.

1. Balangir



The Balangir breed of sheep is native to the north western districts of Balangir, Sambalpur, and Sundargarh in Odisha. These are medium sized animals of white or light brown or of mixed colours. A few animals are black also.

The ears are small and stumpy. Males are horned and females polled. Tail is medium long and thin. Fleece is extremely coarse, hairy and open. Legs and belly are devoid of wool.

2. Bonpala



The Bonpala breed is native to southern Sikkim. The animals are tall, leggy and well-built. This is found in southern Sikkim. The animals are tall, leggy and well-built. Fleece colour ranges from complete white to

complete black with a number of intermediary tones. Ears are small and tubular. Both sexes are horned. Tail is thin and short. Fleece is coarse hairy and open. Belly and legs are devoid of wool.

3. Chhotanagpuri



The Chhotanagpuri breed is mainly found in Jharkhand, Chottanagpur, Ranchi, Palamau, Hazaribagh, Singhbhum, Dhanbad and Santhal Parganas of Bihar and Bankura district of West Bengal. These are small light weight

animals, light grey and brown in colour which possess small ears parallel to the head. Tail is thin and short. Both sexes are polled. Fleece is coarse, hairy and open which is generally not clipped.

4. Ganjam



The Ganjam breed of sheep is native to the Ganjam, Koraput, Phulbani and parts of the Puri districts of Odisha. These are medium sized animals with coat colour ranging from brown to dark tan, some have white spots on

the face and body. Ears are of medium size and drooping. Nose line is lightly convex. Tail is medium long and thin. Males are horned but females polled. Fleece is hairy and short which is not shorn.

5. Shahabadi



The Shahabadi, is native to the Shahabad (subsequently bifurcated into the Bhojpur, Rohtas and Buxar districts), Patna and Gaya districts of Bihar. This is also known as plain type sheep. These are medium sized leggy animals. The fleece colour is mostly grey,

sometimes with black spots. Ears are medium sized and drooping. Tail is extremely long and thin. Both sexes are polled. Fleece is extremely coarse, hairy and open; legs and belly are devoid of wool.

6. Tibetan



This Tibetan sheep breed is distributed in Northern Sikkim and Kameng districts of Arunachal Pradesh. These are medium-sized animals, mostly white with black or brown face and brown and white spots on the body. Both sexes are horned. The nose line is convex, giving a typical Roman nose. The ears are small, broad and drooping. The fleece is

relatively fine and dense. The belly, legs and face are devoid of wool. Tibetan sheep produce an excellent, lustrous carpet-quality wool, which was available in plenty to the Indian States bordering Tibet when the Indo-Tibetan border was open. However, after its closer in 1962, little Tibetan wool is available from Tibet.

7. Kendrapara



Kendrapara sheep is found only in coastal Jagatsinghpur and Kendrapara districts of Odisha. Locally it is called kuji mendha. It is the 42nd sheep breed to have been registered in India. Adult body varies from 24 to 30kg and are dwarf in built with the body covered with coarse hair. Estimated population is about 1,23,000. These are primarily used for production of mutton. These sheep are mostly brown in colour. Head, face, belly and legs are bare. Rest of the body is covered with non-lustrous hair. Animals have horizontal ears; short, straight and drooping tail. Button type horns in few males. They are well adapted to

high ambient temperature, high humidity and heavy rain. Kendrapara sheep carries Fec B mutation gene, which is responsible for prolificacy (multiple babies in same delivery) or multiple birth syndrome. This characteristic makes them distinctive from other species sheep species as they are not known for giving multiple births. Kendrapara sheep is second sheep breed in India (other one is Garole sheep found in West Bengal) and the sixth in the world that carries Fec B mutation gene. Multiple-birth characteristics make it a profitable livelihood source. They are primarily used for mutton production.

CONCLUSION

There is a rich biodiversity among the indigenous sheep breeds of India reflected by more than 42 listed breeds of sheep. For sustainable and improved sheep breeding programmes, it is important to measure, observe the production environments and involve farmers for exploiting the existing breeding practices and management systems. This publication would promote action particularly at national level to improve the information base on domestic Indian breeds of sheep. It is noteworthy that the characterization of Indian sheep breeds was last done in the first half of the century since then no recent estimates are available and surveys in majority of the regions/breeds are far from complete. A few breeds have been evolved from the base populations created by crossing native and fine wool exotic breeds. The future of sheep in India lies in the appropriate approaches to conservation combining a number of integrally related components and effective action programmes approached holistically for successful conservation of sheep genetic resources at national level.

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