Equines farming and Agri-Entrepreneurship development

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Introduction

India has about 2% of the total World's equine population or 5% of Asian equine population (Chauhan, 2005). As per last livestock Census (2012), the total population of equids in India is 1.13 million, comprising of 0.19 million mules and 0.32 million donkeys (Table 1). Major population of equidae *viz.*, donkeys, mules and ponies provide livelihood to the rural societies living in arid, semi-arid and hilly regions, especially in the foot hills of Himalayas, through transport and draught where as remaining small population of equines is used in army, police, border security force, racing industry and sports.

Table 1: Population Trends of Equines from 1966 to 2012 in India.

(Population in Millions)

Species/Year	**Horses & Ponies**	**Mules**	**Donkeys**	**Total**
1956	1.50	0.04	1.10	**2.64**
1961	1.30	0.04	1.10	**2.44**
1966	1.10	0.08	1.10	**2.28**
1972	0.90	0.08	1.00	**1.98**
1977	0.90	0.09	1.00	**1.99**
1982	0.90	0.13	1.00	**2.03**
1987	0.80	0.17	1.00	**1.97**
1992	0.80	0.20	1.00	**2.00**
1997	0.70	0.29	0.78	**1.77**
2003	0.79	0.31	0.67	**1.77**
2007*	0.61	0.14	0.44	**1.19**
2012	0.62	0.19	0.32	**1.13**
% Change from 1956-2007	(-) 59.33	(+) 250.00	(-) 60.00	**(-) 54.92**
% Change from 1997-2007	(-) 12.85	(-) 51.72	(-) 43.59	**(-) 32.77**
% Change from 2007-2012	(+) 2.08	(+) 43.34	(-) 27.22	**(-) ?**

Source: **(*** Provisional)

1. *Basic Animal Husbandry Statistics, 1999; 2004, Deptt. Of Animal Husbandry & Dairying, Ministry of Agriculture, Govt. of India.*
2. *Agricultural Statistics at a Glance, 2002, Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India.*

It seems from population dynamics that population of horse and donkeys reduced by 1.17% per year from 1956 to 2007. Contribution of mule as pack animal has increased considerably registering an annual growth rate of 0.57% per year during the above said period. A negative annual growth rate of (-2.84%) animals for pack work over the year 1956 to 2007 (2.64 to 1.19 million) indicate farmer's preference for faster mode of mechanized transport. There has been a continuous decline in the equine population starting with 1966 up to the last census conducted in 2012. From this it is evident that equine population is continuously decreasing but we do not have any check on this decreasing trend than in coming future this animal species will become an extinct one. In view of decrease in world fuel reservoirs, we have to conserve and preserve this species for future as at present we do not know future requirement related to equines.

Equines in India

Presently, India has a rich biodiversity of equids in the form of seven distinct indigenous breeds of horses namely Marwari, Kathiawari, Kachachi-Sindhi, Bhutia, Spiti, Manipuri and Zanskari (Gupta *et al.*, 2012). FAO has recognized 3 more breeds, namely Chummarti, Deccani and Sikang besides indigenous donkeys and wild asses in the Rann of Kutch in Gujarat and Kiang in Laddakh. These equines are well adapted to different agro climatic regions and possess certain unique characteristics which are discussed here. The Arab, the first to be introduced is believed to have contributed substantially for the evolution of Kathiawari, Marwari, and Manipuri horses. Besides this, the exotic breeds of horses introduced in India include English Thoroughbred, Waler, Arab, Polish, Connemera and Halflinger.

Marwari

As the name indicates this breed of horse has its origin in Marwar and Mewar region of Rajasthan. The breeding tract of Marwari breed is Jodhpur, Udaipur, Jalore, Nagore, Pali, Sirohi, Barmer, Jaisalmer and Rajsamand districts of Rajasthan. These horses facially resembles Kathiawari breed probably due to mixing of Arabian blood. However both the breeds can be differentiated on the basis of a set of biometric indices (Gupta *et al*. 2012). The common colours of Marwari breed are bay, kumet (chestnut), surang (liver chestnut), bhanwar (black or dark brown), dane and cream. Their heights are 14-15 hands and weigh about 360 kg. The ears are located at 90° axis and can rotate at 180° angle. Tips of ears are pointed and curved inward like a sickle. The ears meet or overlap each other when the animal rotates them. In comparison to Kathiawari horses, Marwari horses have more height, length of ears, face, pastern and neck, and prominent nostrils and convex nasal bone. The number of true to breed Marwari horses is quite low probably due to indiscriminate cross-breeding in the native area.

Kathiawari

Kathiawari breed of horses is considered to be the oldest equine breed in India (Gupta et al., 2014).The breeding tract of Kathiawari horses is Rajkot, Bhavnagar, Surendranagar, Junagarh and Amreli districts of Gujarat and in parts of Rajasthan adjoining Gujarat. This breed is believed to have evolved from the wild horses of Kathiawar of Gujarat State and Arabian horses which happened to land on sea shore after the crash of a ship in Arabian sea. The prevalent colours of this breed are mainly chestnut, bay, brown, grey, piebald, skewbald and cream. These animals measure about 14-15 hands in height and weigh about 380 kg. The ears are of medium length located on 90° axis and can rotate at 180°. As compared to Marwari breed the

ears of Kathiawari are smaller in length, less in width, broad forehead and mandible, large expressive eyes, small muzzle, big nostrils, shorter face and shorter back with concave profile.

Kachchhi- Sindhi

This indigenous horse breed is native to Kachchh district of Gujarat and Jaisalmer and Barmer districts of Rajasthan. Total population is about four thousand. Unique features include roman nose appearance of face, ears curved at tips but not touching each other, 56 to 60 inch height, short back, short pastern bone length, broader hoof for better grip and docile temperament. Coat colour is mainly bay. Famous for its 'Rewal chal' as it performs with great speed and stamina covering long distance. The horse possess excellent drought and heat tolerance capacity in arid & semi arid region.

Bhutia

These animals were supposed to be bred from Punjab to Bhutan in the foot hills of Himalayas. Kaura et al. (1961) had linked Bhutia ponies with Punjab area which is very close to home tract of Marwari horses. Recent finding have indicated that there is some link between Bhutia ponies and Marwari horses (Gupta et al., 2014). .It is quite possible that some Marwar animals might have migrated long back from plane to hilly area with Indian army.

The prevailing colours are usually grey, iron grey, occasionally chestnut and roan. The height of Bhutia ponies is 13 to 13.2 hands and weighs about 270 kg. These ponies have a short neck, with low withers, a straight back, sloping quarters, deep chest, straight shoulders, and a well-set tail. Their mane is long. They are similar to the Spiti pony and the Tibetan pony, as these breeds have been interbred for years. The Bhutia Pony can live on much smaller food rations than other ponies of its size. Population of Bhutia breed has decreased drastically from 5436 in 1997 to 546 in 2007. Thus, immediate attention and efforts are required to conserve this precious breed of ponies in India.

Spiti

The breeding tract of Spiti horses is Kaja subdivision of the Lahul and Spiti district and the Yanthang area of the Kinnaur district of Himachal Pradesh in India. They are reared as pack animals at high altitude. The mane is long and has hairs of 25 to 40cm in length. The body colours are grey, brown, black and piebald. On an average, Spiti ponies stand 129cm height, 100cm body length, 148cm heart girth and weigh about 320 kg. Generally, they are hardy, surefooted and used mainly for riding and also as pack animals in cold hilly regions. These horses are capable of tolerating extreme cold conditions very easily as their legs are covered with coarse and long hairs. It has also been ascertained from various sources that their number is declining rapidly. Therefore, an urgent need is felt to conserve this breed taking important and quick steps.

Manipuri

Manipuri ponies are well known as Polo ponies. These are bred and found in State of Manipur and are considered as descendant of both the Mongolian wild horse and the Arab. On genetic analysis these were clubbed with Spiti and Zanskari ponies (Gupta et al., 2014). The prevailing colours are not specific, but brown or reddish brown is common. These horses have

small sized body with a fairly long face and well known for elegance, endurance and speed. The height of Manipuri horses is about 11 to 13 hands and they weigh about 300 kg. The legs of these animals are of fine quality, knees and hocks are strong and pasterns possess a gradual and proportionate slope. Ears are alert and almond shaped. Head is light and well proportionate with straight profile. Withers are moderately built, neck well formed with a full mane, chest deep, back straight and shoulders nicely sloping. Since the population of this breed has drastic decreased, its conservation is quite important along with other pony breeds (Gupta, 2012)

Zanskari

These are bred in Leh Laddakh region of Jammu and Kashmir. Common body colours are grey, bay and black. These horses are known for their hardiness and ability to work at high altitude. Their tail is long which touches the ground. Body hairs are fine, glossy and long. The height of the animal of this breed is between 13.2-14.7 hands. Hair coat of Zanskari ponies is thick and quite similar to that of Spiti ponies. Special mention is made of equines of this region for their exceptional ability to survive and perform under vary harsh climatic conditions of their high altitude habitat (between 3000 to 5000 meters). As per information received from local people, only a few hundred horses at present exist in Zanskar and other valleys of Laddakh. For breed improvement and conservation through selective breeding, Govt of Jammu & Kashmir has specially established a Zansakri Equine Breeding farm at Chuchot, Leh, Ladhakh (Gupta *et al*. 2010).

Donkeys

The Donkey is a domesticated version of the wild ass. The donkey was domesticated about 5,000 years ago in Egypt, Iraq and Iran and was important, along with horses and camels in the development of trade and mobility. They were an important pack animal for the Roman legions who introduced the donkey to Britain. Genetic fingerprints indicated that wild African asses were the ancestors of domestic donkeys, making donkeys the only important domestic animal known to come from Africa. Donkey DNA analysis showed that there were 2 distinct populations of domestic donkey (*Science* Vol 304, p 1781): one descended from the Nubian wild ass *Equus asinus africanus* and the other being similar to the Somalian wild ass *Equus asinus somaliensis (*http://www.arthurgrosset. com/mammals/donkey.html, retrieved August 21, 2010). The Indian donkeys are not much studied animals using molecular genetics tools. However, based on the phenotype, the Indian donkeys have been grouped under “Large White” or “Small Grey” categories.

There are two breeds of Indian donkey: Spiti donkeys (INDIA_DONKEY__0600_SPITI_05001) and Halari donkeys (INDIA_DONKEY_0400_HALARI_05002). The total Donkey population in the country has decreased by 27.22% over the previous census and the total donkeys in the country are 0.32 million numbers in 2012.

Poitou Donkeys

Breeding tract of Poitou donkeys is in Europe (France). These donkeys were imported from UK in 1990 for superior quality mule production and breed improvement of indigenous donkeys. Good quality donkey jacks and jennies of exotic breed obtained from France and other

European countries are maintained by NRCE, State Animal husbandry Deptt. of Haryana and Uttar Pradesh, and at Equine Breeding Farms of the Army.

Indian Donkeys

Indian donkeys range from white to grey or black in colour. They usually have a dark stripe from the mane to the tail and a crosswise stripe on the shoulders. The mane is short and upright and the tail has long hair only at the end. The very long ears are dark at the base and tip. The different breeds of donkey vary greatly in size and shape but the average donkey stands 40 inches (102 cm) at the shoulder, the Sicilian donkey stands 24 inches (61 cm), the large ass of Majorca stands at about 62 inches (158 cm), while the American ass may reach a height of about 66 inches (168 cm) (http.//student.britannica.com, retrieved May 13, 2009).

(a) Large white Donkey

These donkeys were earlier abundant in Punjab, Haryana and Gujarat state. But, now they are localized to parts of Gujarat state only (now registered as Halari donkeys). The larger size donkeys are light grey to almost white in colour. The average height at withers is 110cm and weighs about 150 kg. These donkeys are yet to be characterized. Population of these donkeys has decreased drastically due to preference of end users is small size donkeys.

(b) Small Grey Donkey

Donkeys of this type prevail in almost all parts of northern India. The smaller size ones are dark grey in colour. They usually have a dark stripe from the mane to the tail and a crosswise stripe on the shoulders. The average height at withers is 90cm and weighs about 120 kg. The donkeys of this breed are yet to be characterized.

(c) Spiti Donkey

Donkeys of this breed are found in Spiti valley of Himachal Pradesh. These donkeys are of dark brown to black in colour. These donkeys look like exotic donkeys (Poitou) in appearance and colour. The height at withers varies from 80-95cms of Spiti donkeys. Ears are long. The donkeys of this breed are yet to be characterized at phonotypic and genotypic levels.

Donkey Population Trend

The great majority of donkeys in the world (probably over 95%) are kept specifically for work. Their most common role is for transport, whether riding, pack transport or pulling carts. In most countries, donkeys can be owned and used by either men or women. Children are frequently given responsibility for working with donkeys. Some farmers keep donkeys for guarding sheep. Since donkeys are seldom owned and maintained unless they are worked, estimates of national and regional donkey populations provide useful indicators of donkey work worldwide. Overall population figures cannot provide information on the frequency of donkey use.

Donkey’s population has declined dramatically in the most industrialized countries of Europe and North America. Although donkey populations are low in the developed countries, but it is the relatively stable in many rapidly industrializing countries such as Brazil, China, Dominican Republic, Ecuador, Egypt, Mexico, Morocco and Pakistan. These countries may be rapidly urbanizing, but they also have large rural populations with low incomes. These rural people continue to benefit from donkeys for local transport. The countries that have shown major

declines in donkey numbers in recent years, have often have been those where the rural populations have had access to private motor vehicles (e.g., Italy, Ireland). The implication is that urbanization and industrialization only starts to have a significant effect on donkey populations when rural people are wealthy enough to replace donkey power with motor power. This is still a long way off in many parts of Africa, Asia and Latin America.
Certainly, declines have been recorded from Turkey, Israel and South Africa. In these countries (as in others) the use of donkeys is perceived as 'backward' and there are sometimes psychological pressures to remove the donkeys and become modernize. In Indian context also somehow more industrialization/mechanization may be responsible for decreased trend for donkey population.

In industrializing countries, expectations of declining donkey populations could become self-fulfilling prophesies, if accompanied by social pressures or legislation that marginalize donkey owners.

Scope of Equine based livelihood System in India

The present scenario with respect to equines in the economic and social milieu varies in different parts of the world and so is in India. In contrast to the affluent Western societies which prefer horses for sports and recreation, in India it is for the livelihood of the landless, small and marginal farmers the equine serve. However equines are playing a silent but an important role in human life.

Approximately, 98% equine in India contributes to the employment and income of the poor farmers and landless labourers under unorganized sector who primarily depend on livestock. The remaining about 2% of the equine population as organized sector is owned by elite sections of society and is used for sports such as racing, polo and for national security purpose by military and paramilitary forces. Indigenous horses like Marwari, Kathiawari and Manipuri have been utilized for equestrian events, polo and ceremonial events. Equine being an important animal for draught and transport plays a significant role in rural economy and constitute main source of income for sizeable underprivileged section of society in many parts of the country. Though horses and ponies are scattered all over India, the donkeys are mainly concentrated in North-Western India (Rajasthan, Gujarat, Haryana, Uttar Pradesh, Uttaranchal and Delhi). The use of equines for draught purpose has special economic significance in difficult hilly terrains, arid and semi-arid zones where motorable roads are inadequate. The improvement of equine production has great potential and significance for uplifting the economic status of the poorest of the poor in rural and semi-urban areas. Inspite of mechanized transport and all unfavorable circumstances, the use of mules for draught and of Thoroughbred and other horses for sports, tracking and racing has increased considerably. This clearly indicates the distinct role played by the mule as a draught animal for transporting the agricultural commodities and household goods in the states where agricultural and horticultural produce is affluent requiring transport from the point of production to the point of sale and consumption.

Role of Equines at Pilgrimage places and in tourism: As saddle-horses, ponies of the Kashmir valley are providing entertainment to numerous tourists since many decades in world famous places like Gulmarg, Pahalgam, Sonamarg and Yousmarg etc. They also carry the tourists and their belongings up and down the Himalayan Mountains while tracking over the beautiful slopes of the valley. The Amar Nath (Kashmir) and Vaishno Devi Yatra (Katra pilgrimage, Jammu) by millions of Hindus every year would not have been possible without this quadruped. Besides

these places, equines are also used in places of tourist attractions in other parts of the country in earning livelihood for their owners.

Role of horses in Safari: In many parts of Rajasthan, horse safaris and trekking has also been initiated during the last 10-15 years by some of the organized Marwari equine breeders for earning a handsome amount from the tourists. Mostly such safaris are preferred by tourists coming from American and European countries. This has also highlighted the importance and quality of Marwari horses in foreign countries which may pave way for export of this breed.

Equestrian events: There are many ways to show off your horse, competitions being one of them. Some of the competitions are Endurance riding**,** Show Jumping**,** Tent pegging**,** Polo and Horse racing etc. A lot of people take interest in such equestrian events at different levels in earning their livelihood. Some people are engaged in feeding & watering, exercising, grooming, foot care and farriery, as Jockey and general management of horses. Livelihood of these people is based on existence of horse and their use in equestrian events.

Patrolling: In most of the states**,** horses are being used by police/ BSF/ Para-military forces to patrolling purposes in their routine activities. Beside this good quality horses including Marwari horses are also being maintained by important Govt houses including Rashtrapati Bhawan also. Presence of equines at such places results in employment of a fleet of trained personnel in earning their livelihood.

Riding School: Horse riding is becoming an integral part of school education in different parts of our country. Students are being trained in horse riding and handling during their schooling in India. This has also lot of potential in equine based livelihood system in India if State Govts and education institutions make it compulsory for all young students during their school education itself. This will definitely help in developing a bond between horse and rider and ultimately interest in riding of such riders will help in horse development and conservation.

Transportation: In many parts of northern India especially in western UP, horses, mules and ponies are being used for transporting the children to schools, passengers from villages to main roads/high ways. These horse owners earn their livelihood through transporting the human beings from one place to other. As a transport animal, donkeys are used by owner for earning livelihood in different manners *viz.*, use of donkeys at brick-kilns, construction sites, construction of multi-storied buildings, sale of vegetables, milk transport etc. In different parts of the Country, one can find utility of equines in transporting various items.

Utility of equine products

i) Equine milk: It has been observed that equine milk has tremendous medicinal value, curative agent for metabolic and allergic diseases, use in cosmetics and anti-aging property. In some part of the country, donkey milk is sold for medicinal uses. This new possibility of increasing the income of the equine owners is very common among general public.

ii) Vermi-composting: Earlier disposal of equine dung was havoc. But, now the same is being used for production of vermi-composting at some research and private farms. The vermin-compost is quite beneficial in agricultural fields also. This can also be exploited as a source of livelihood.

Economic evaluation:

Some economic studies have been carried out previously related to earning obtained by the equine owners. Pal *et al*. (2013) reported that average income per donkey per day of donkey owners was Rs 75.0±1.89 and Rs 187.2 ±7.74 in SE and NE Rajasthan, respectively. Average income per donkey per day in NE Rajasthan was high may be due to use of donkey in carting to carry more goods in small duration of time. But, overall income from donkeys per household and their economic status was higher in SE Rajasthan than NE Rajasthan. In another study, donkey owner earned Rs 100 to 250 per day with cart including his own salary. Slightly low (Rs 100 to 200) earning was observed at brick kiln and construction sites (Singh *et al.* 2007). The study indicated that donkeys contribute to sustainable rural development in Rajasthan. At certain Pilgrimage, equine owners earn a handsome amount (Rs. 250-500) from their ponies and mule per day per animal.

References:

Chauhan, S.K., 2005. General Scenario of Equines in Equine Husbandry in the Mountains: A Socio Economic Analysis. Mittal Publications, New Delhi, pp: 26-30.

Gupta, A. K. (2012). Manipuri Ponies: Need and Strategies for conservation. In : 30th ISVM National Symposium on "Animal Health vis-à-vis Animal Welfare with Application of Biotechnology with Special Reference to North-Eastern Region: & Annual Convention of Indian Society for veterinary Medicine (ISVM), Feb., 1-3, 2012.

Gupta, A.K., Chauhan, M., Bhardwaj, A., Gupta, N., Gupta, S.C., Pal, Y., Tandon, S.N. and Vijh, R.K.(2014). Comparative Genetic Diversity Analysis among Six Indian Breeds and English Thoroughbred Horses. Livestock Science 163: 1–11.

Gupta, A. K., Pal, Yash and Tandon, S. N (2010) "Zanskari Pony" (eds. A. K. Gupta, Yash Pal and S. N. Tandon) Publisher : Director, NRCE, Hisar pp 1-16.

Gupta, A. K., Tandon, S. N., Pal, Y., Bhardwaj, A., Chauhan, M. (2012). Phenotypic characterization of Indian horse breeds – a comparative study. Anim.Genet.Resour.50, 49–58.

Kaura, R.L., (1961). Breeds of horses and donkeys. In: Kaura, R.L. (Ed.), Indian Breeds of Livestock (Including Pakistan Breeds), Prem Publisher, Golaganj, Lucknow, India, pp. 48–57.

Pal, Yash., Legha, RA., Lal, Niranjan., Bhardwaj, Anuradha., Chauhan, Mamta., Kumar, Sanjay., Sharma, RC and Gupta, AK (2013). Management and phenotypic characterization of donkeys of Rajasthan. *Indian Journal of Animal Sciences* 83 (8): 793–797

Singh M K, Gupta A K and Yadav M P. 2007. Performance evaluation of donkeys in arid zone of India. *Indian Journal of Animal Sciences* 77 (10): 1017–20.

Singhvi, N. M. (2001). Conservation and management of equines. Indian J. Animal Genet. Breeding 23: 292-295.

Varshney, J.P. and Gupta, A.K. 1994. The donkey and it potential - a review. Int. J. Anim. Sci. 9 : 157-167.