



Sheep pastoralism in southern Karnataka

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Sheep rearing is one of the major animal husbandry activities supporting the livelihood of millions of rural Indians. As per 20th Livestock Census (2019), Karnataka state with 11.1 million sheep ranks third in sheep population in the country. Karnataka has five established breeds of sheep namely, Bellary, Deccani, Kenguri, Hassan and Mandya which together constitute about 48.6% of sheep population of the state. Majority (51.2%) of the sheep are not categorized to any specific breed and are grouped as non-descript. A small portion of the population (0.25%) is exotic crossbred sheep, seen in peri-urban areas maintained by some progressive farmers (Estimated livestock population -breed wise, based on Breed Survey (2013), GoI).

Migratory flocks are also referred to as transhuman herds where livestock is generally accompanied by hired men, owners and their relatives, but rarely by a whole family, on a long migration or transit between two seasonal ranges. Pastoralists are members of caste or ethnic groups with a strong traditional association with livestock rearing and breeding, where more than 50% of their family income is from livestock and over 90% of animals' feed consumption is from natural pasture or browsing (Sharma *et al.* 2003). According to Blench (2000), Indian pastoralism is poorly documented in the world; only some of the sheep pastoralists from Himalayas and Thar Desert of Rajasthan have been documented. There is not much literature available on sheep pastoralism in Karnataka. For successful implementation of government schemes for livestock improvement, shepherds of migratory flocks need to be targeted. In this regard the present study was taken up by Veterinary College, Hassan in order to obtain the information on home tract, migratory paths, socio-economic condition of shepherds, veterinary aid during migration, breeding methods adopted, fodder and water availability, animal marketing, etc.

The study was conducted in southern region of Karnataka

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state, India. Data collection was done through personal interview using structured questionnaire. Shepherd groups (25) on different migratory paths were followed throughout the entire transit period and interviewed time to time to collect data on different aspects of their migratory lifestyle. Data was collected on sheep breed, migratory sheep husbandry practices, migratory paths, different sheep identification methods, socio-economic factors such as financial management during migration and literacy level of shepherds.

Geographical distribution of sheep breeds depends on agro-climatic conditions such as terrain, rainfall, forest area and cropping pattern of the region. Karnataka can be divided into 10 agro climatic zones based on the rainfall pattern - quantum and distribution, soil types, texture, depth and physicochemical properties, elevation, topography, major crops and type of vegetation. Northern dry zone and central dry zone have maximum sheep population which together constitutes about 75.12% of total sheep population of the state. The sheep population in coastal and Malnad region is almost nil.

In Karnataka, Sheep rearing systems can be broadly classified into sedentary, semi migratory and migratory. Of the total sheep population of Karnataka, about 65% are migratory flock. Sheep of northern dry zone and central dry zone are mostly reared by this system. There are a large number of pastoralist groups in India, among them Kuruba, Dhangar, Golla and Kuruma communities are the ones reported from Karnataka (Sharma *et al.* 2003, Kuruba *et al.* 2020). The sheep migrate from dry zone to transient zone regions and cover a distance of more than hundred kilometers during the migratory period. Migratory or pastoralist way of sheep rearing is concentrated in two regions in Karnataka:

1. Northern Karnataka Pastoralists - Belagum district and adjoining taluks in region of northern dry zone.
2. Central and Southern Karnataka Pastoralists - Taluks bordering Chitradurga and Tumkur districts in Central dry zone.

The breed considered in the present study is called as Sira sheep or Tumkur sheep, which is morphologically similar to Bellary sheep. Bellary breed of sheep is described as breed similar to Deccani and seen in lower basin of

Tungabhadra river (Acharya 1982). Jain *et al.* (2005) categorized it as a migratory flock from the region of Bellary and Chitradurga. Hiriyurataluk of southern Chitradurga district and Sirataluk in northern part of Tumkur district have maximum population of sheep, known for migration. This region also owns the largest sheep population in the state. The Sira sheep is completely migratory as compared to sedentary or semi migratory type in Bellary district. Sira / Tumkur sheep can be considered as a variety of Bellary sheep. Sira sheep of Karnataka are medium sized animals, with varied coat colour. The area of distribution of Sira sheep is different from the area demarcated as area of distribution for Bellary sheep by Jain *et al.* (2005). Sira sheep constitutes 28% of sheep population in Karnataka, highest compared to any other established breeds of Karnataka. Average flock size is 235 comprising of 8 adult males, 173 adult females and 54 young ones. The average adult male to female ratio is 1:22. During migration, four to five flocks move together.

Sira flocks are maintained under extensive system of rearing without any supplementation of extra concentrates. During the period from July to early December, sheep are reared in nearby forest areas, own agricultural lands or social forests. There are few forest areas near the adjoining regions of Sira taluk, where there is a moderate availability of quality fodder. Landless or small farmers usually take their sheep to nearby forest for a short period of few days. The migration distance is about 10 km. Medium and large farmers allow the animals to graze in their own agricultural lands, public grazing lands and social forest areas during the morning hours. The shepherds get their lamb crop during the months from September to November, which is the main lambing season. During the period starting from December, due to acute shortage of fodder resources in their area and leisure time due to completion of major agricultural activities, shepherds move to other areas for better grazing lands.

Migration and migratory paths: In general, as noted by Bhasin (2013), pastoralists schedule their migration on an annual basis according to the needs and availability of water and fodder. It is essential for them to have a fair idea about the pasture and water availability, rainfall, snowfall, diseases, political insecurity, national borders and accessibility to markets. Shepherds of Karnataka from dry climatic zone move towards transient zone and semi-Malnad regions which have more average rainfall than dry zones and less average rainfall and humidity than Malnad and coastal regions of the state. Sira sheep mostly migrate towards south; few flocks migrate towards north west i.e. parts of Shivamogga and Davangere region. The paths of migration towards south include Tumkur–Hassan–Chikkamagalur, Tumkur–Mandya–Mysore–Chamarajanagar, and Tumkur–Kolar–Bengaluru. Decanni, Yalaga and other local varieties from northern dry zone regions including part of Belagavi, Bijapur, Bagalkot, Raichur, Koppal and Gadag migrate towards Shivamogga and Davanagere semi-Malnad regions and Tungabhadra river basin where paddy cultivation is



Fig. 1. Migratory paths of pastoralists in Karnataka.

practiced and also to the some areas of neighboring states. Fig. 1. depicts the different migratory paths followed by pastoralists in Karnataka.

Husbandry practices of Sira sheep flock during migration: Sheep are reared in a pastoral way and are on move for 6–8 months covering an average of 200 km, during the period shepherds use their own methods to carry their luggage and protect the animals. Four to eight shepherd families with 200 to 300 sheep from each family, pool up their sheep while on migration. 95% of shepherds on migration belong to Golla tribal community. The migratory flock usually contains 1,000 to 1,500 sheep, 50 to 100 goats, 10 to 25 donkeys and 2–4 dogs. Shepherd to sheep ratio is 1:120. Donkeys are used for carrying luggage in specially designed bamboo baskets or netted bags (Fig. 2). Their luggage includes few utensils, clothing, Kambla (blanket) and ration enough for a week. In 92% cases women accompany the family during migration. Women are involved in cooking and lamb care. Men take sheep for grazing. When the sheep are penned, different shepherd families set up their tent in different directions surrounding the flock. Luggage is kept at 1.5 to 2 feet above the ground level using bamboo sticks and iron rails/ stones so as to avoid any rodents or other animals from entering into luggage (Fig. 3.).

From January to July (7 months) the sheep move, covering a distance of 250 km on an average. The sheep are reared separately during morning hours and are penned together at night. Shepherds never count sheep in their flock,



Figs 2–4. 2. Donkeys carrying luggage of pastoralists. 3. Luggage carrier box, placed above the ground to prevent water, rodents and other creatures from entering the luggage. 4. Penning of sheep.

and they consider counting sheep as inauspicious. In spite of no modern animal identification system used, they are able to identify individually each and every sheep of their flock. Animal identification is based on coat colour, social gathering of sheep and morphological deformities.

Family size and literacy level: Family size was grouped into three categories, and it was found that 7% families were small (4 members), 59% families were medium (5–8 members) and 34% were large (> 8 members). Family size and land holding are the factors influencing the sheep flock size. An average flock size owned by the small family is around 60 as only one or two members of the family will be spared for grazing sheep during migration. Small family size is one of the major constraints in managing pastoral sheep flocks in current times.

In our study, 36.2% pastoral shepherds were found to be illiterate with no formal education, 37.4% had primary education, those who had secondary education were 19.2% and 7.2% of shepherds had college education. Although the literacy rate is less, shepherds have the knowledge about the benefits of vaccination, different diseases and their prevention and treatment. They vaccinate their animals regularly and they follow their own traditional system of treating diseases.

Financial management practiced by shepherds of migratory Sira sheep flock: Pastoralists earn their profits through milk, wool production and meat production. Pastoral system diversifies the resources and products and rarely focusses on only one product in order to survive in the unpredictable and harsh environments (Horowitz and Jowkar 1992, Salzman 1971, Bhasin 2013). Herd diversification also helps in taking full advantage of different vegetation in the same pasture. During the period of migration the financial management decides their profitability from sheep. Pastoralists earn their income through penning (Fig. 4.), sale of milk, wool and lamb crop (Bhasin 1988, 1989, 1996, Kuruba *et al.* 2020). The expenses are for labour, animal health care and daily personal expenses. Penning price depends on the region and type of agricultural land, the price is more for penning in areca or coconut plantation than on the dry land. During the study, on an average, penning prices ranged from ₹500 to 1,200 per night for 1,000 sheep. In addition to cash, shepherds also receive grains, usually 4 to 5 kg of ragi

(finger millet) from the cultivators. Some shepherds hire labourers for migratory period by giving two adult sheep or ₹18,000/season in addition to daily food. Shepherds sell only the sick animals on migration. At the end of migration the entire lamb crop (4–6 months lambs) is sold at once. Shepherds always carry only that amount of cash which is enough for their regular expenses and if they require large amount of money or get a large amount from sheep/ lamb sales, one of the senior member visits home with money to deposit in bank or to keep at home. Although 70% shepherds claimed to have bank accounts, only 5% of them used automated teller machine (ATM) and carried out bank transactions during migration. Most of them are unaware of the facility. Except for emergency, they rarely visit their native place during migration. At least one shepherd of the flock has mobile phone through which they contact the family back home, know the weather conditions from fellow shepherds in other places and market the lambs and sheep through traders.

SUMMARY

Present study was conducted to understand and document the migratory system followed, socio-economic status, management and healthcare practices adopted by pastoralists of southern Karnataka. In-person interview method with a structured questionnaire was used for collecting data from 25 shepherd groups on migration. Migration starts during December and continues for 6–8 months covering around 200 km. The breed is locally called Tumkur or Sira sheep which is not yet recognized as a separate breed. Migratory flock usually contains 1,000 to 1,200 sheep, 50 goats, 10 donkeys and 2–4 dogs. The average adult male to female ratio is 1 : 22. Sale of lambs and penning rental are the main sources of income. Sheep pastoralism is an established and effective way of utilizing the excess green cover in transient regions by the sheep from pasture deficient dry zones. Maintaining the social and community pasture and forest lands at their home place will be a benefit during the lean and non-migratory periods. Assessing the migratory paths, fodder and water resource and penning demand by the farmers on migratory tract will help policy makers to provide suitable interventions to curtail the problems of pastoralists. The traditional knowledge of shepherds should be documented

and validated for larger use. The pastoralists need to be educated and trained about the use of digital finance management, herd diversification, health management and government schemes to increase their profitability and standard of living.

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