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**Theme 3.** Sustainability of grasslands- social and policy issues

**Sub-theme 3.5.** Policy issues related to sustainable grassland production

## **The significance of nomadic pastoralism for sustaining soil fertility in Northern Karnataka, India**

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### **Introduction**

Pastoralist groups in India, including the Raika of Rajasthan, Pullikulam cattle breeders in Tamil Nadu, and groups such as the Dhangar, Kuruba and Kuruma of the Deccan Plateau realize a major proportion of their income from penning their herds and flocks on farmers' fields. Focusing on shepherds from Northern Karnataka, this paper makes a first attempt at calculating the impact of penning on livelihoods, soil fertility and the national economy.

### **Materials and Methods**

Semi-structured interviews and focus group discussions were conducted with shepherds and land owners in Bagalkot and Belgaon districts of Northern Karnataka to understand the contribution of flocks belonging to traditional (Kuruba) and non-traditional (Valmiki) shepherding communities in terms of livelihoods and fertilizing impact.

### **Results and Discussion**

According to local perceptions, the practice of penning improves soil condition in multiple ways. The body heat and pressure of the lying sheep pulverizes the soil and improves its water retention capacity. The turning over of the soil by the hooves of the sheep exposes insects and pests to the sunlight and kills them ("solarization"). It also attracts birds, triggering the "biocontrol" of pests.

Adult sheep produce about 1 kg of manure and 1.2 l of urine per day. The standard calculation is that 100 animals fertilize 2.5 acres in 6 nights. The concentration of nutrients is higher in urine than in manure, so the former is rated more highly by farmers. According to published data, the N, P and K content of sheep urine are 1.5%, 0.05% and 1.96% respectively, while sheep manure contains N= 0.7%, P=0.51% and K=0.29 % (Kolay, 2007). Based on a total population of 10 million sheep in Karnataka, we can calculate that they produce 10 million kg of manure and 12 million kg of urine per day, supplying a total amount of 250 t nitrogen, 57 t of Phosphorus and 264.2 ton potash daily. The market value of this amount of fertilizer would be Rs 2.3 million per day or Rs 850 million per year.

Shepherds deposit this directly on the field, without incurring any costs for transportation, and trampling it directly into the soil. Since the sheep do not remain in the cropped area for almost three months during the monsoons spending this period on grasslands forests and other common area. During day time during other parts of the year almost fifty percent of the day time is again spent in the these kind of landscapes. This translates into the fact that of the above Rs.850 million worth of fertilizer almost Rs. 638 million worth fertilizers is going into grasslands and other common areas annually from sheep alone in Karnataka.

In recognition of these agro-ecological services provided by shepherds, farmers remunerate them with 1-2 Rs/sheep/ night penned on their field which generates substantial extra revenue for the shepherds.

### **Conclusions**

Research to quantify the enormous contribution of migratory livestock keepers to sustaining soil fertility should be conducted at different locations in India, hopefully leading to policy measures that support the agro-ecological practices of pastoralists and prevent them from being squeezed out of crop cycles.

### **References**

Kolay, A. K. 2007. *Manures and Fertilizers*. Atlantic Publishers, New Delhi.