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Indigenous Jaffna Local sheep production system as a mean of changing driver

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Abstract

Jaffna Local sheep (JLS) is an endangered indigenous sheep population in Sri Lanka. They have been identified as a breed that has a negative population trend. A study was undertaken to identify the sustainability dimensions of JLS production system. Socio-economic data were collected using a pre tested questionnaire from three leading sheep farms in the Jaffna peninsula, Sri Lanka. The results show that the farmers were having more than 40 years of experience in sheep farming. The sheep were reared with minimum inputs in a nomadic pastoral system. They were reared mainly for manure purpose. On request of the crop farmers, sheep are night paddocked in farm lands such as fallow paddy fields, coconut and palmyra lands. In addition, when the stocking rates are high the excess sheep are sold for meat purpose. Only extensive management is undertaken with a low input system. The sheep are hardy and well adapted to the hot and humid climate in the Jaffna peninsula, Sri Lanka and they convert the low-quality fibrous feed (weeds and crop residues available in the feeding grounds) into nutrient-rich meat with low contamination of medications (antibiotics). The dung and urine enrich the soils with nutrients enabling the crop farmers to cut down on the use of inorganic fertilisers. The household income is stabilized via the earnings from sheep system. Overall, the system showed that the resources are shared among the farming community with less negative impact on the environment. Main drawbacks in the system were the reluctance of the younger generation to be engaged in the JLS farming and the scarcity of feed during the drought period and main paddy cultivation season.

Introduction

Most of the developing countries rear indigenous sheep on small- or large-scale, either under extensive or nomadic pastoralism systems. Indigenous species are mainly reared under low-input low-output production systems with a minimum investment. Most of these indigenous sheep breeds are reared in African, Asian and European countries. Indigenous sheep breeds have the ability to survive in harsh environments where water and grasses are scarce and also where there are arid or semi-arid environments with low-quality forages. These indigenous breeds are reserves of valuable genetical materials that have the ability to adapt to such harsh environmental conditions and be resistant to the available nutrient fluctuations at different seasons, pest and disease outbreaks (Kosgey & Okeyo 2007).

Among all sheep breeds available in Sri Lanka (Bikenary, Bannur, Red Madras, Dorset), there is a traditional indigenous sheep breed called as *Jaffna local* sheep (JLS) restricted to the Jaffna Peninsula in the Northern part of Sri Lanka. *Jaffna Local* sheep is an endangered indigenous sheep population in Sri Lanka (ICAR- NBAGR 2016;

Kurukulasuriya et al. 2022). They have been identified as a breed that has a negative population trend (Vijitha & Silva 2013). They are well adapted to the hot and humid climate in the Jaffna peninsula. Even though the origin of Jaffna local sheep is not well documented, according to Goonewerdene et al. (1984) they may have been introduced to Sri Lanka many years ago by the traders from South India. The geographical nature of the peninsula restricts the movement of JLS and may have led to an uncontrolled inbreeding within the herd resulting in the existing ecotype of JLS with its unique morphological and genotypic characteristics (Goonewerdene et al. 1984; Silva et al. 2009). Main feed available for JLS are the low-quality roughages such as grasses and shrubs in the roadsides, unused lands and other governmental lands and the dried stubbles in the fallow paddy lands (Silva et al. 2009). Thus, the present study was designed to identify the sustainability dimensions (aspects related to environment, economy and society) of JLS production system in Sri Lanka.

Methods

Study area

The study was undertaken in three *Jaffna Local* Sheep (JLS) farms each situated at Kaithady (9.6884 ^{0}N, 80.1010 ^{0} E) and Tellippalai (9.7911 ^{0}N, 80.0339 ^{0}E) at Chawakachcheri (9.6665° N, 80.1321° E) Divisional Secretariat in the Jaffna district which is located in the Northern province of Sri Lanka. The three farms were belonged to Agroecological zone of low country dry zone (LD3) and had red-yellow latosol soil type (Punniyawardhena 2008). Mean annual rainfall was 1,105mm and mean annual air temperature was 31^{0}C. The study was undertaken from July to October 2022.

Farmer Survey

Data related to *Jaffna Local* sheep (JLS) rearing farmers were collected from the Divisional Veterinary Office, Jaffna District. Many farmers were restricted to the Divisional Secretariat, Chavakachcheri. Thus, two farms at Kaithady and one farm at Tellippalai village were selected for the survey on socio-economic status related to JLS farmers.

To collect the socio-economic data, a pre tested questionnaire included with both open and close ended questions was used. The questionnaire consisted with five main sections; the first section included demographic information (age, gender, level of education, income). The second section included information related to the JLS farm (objective of rearing JLS, herd size, rearing system, feeding, vaccination, mortality rate). The third section was related to the farmers' socio-economic status (income from the JLS farm, expenditure). The fourth section was related to the potentials and drawbacks for rearing JLS and the fifth section about suggestions for popularizing the farming of JLS.

Statistical analysis

Descriptive statistics (mean, mode, frequency and percentage) were used to analyze the following data related to JLS farmers; demographic information (age, gender, level of education, income), information related to the JLS farm (objective of rearing JLS, herd size, rearing system, feeding, vaccination, mortality rate), farmers' socio-economic status (income from the JLS farm, expenditure) and the potentials and drawbacks of rearing JLS and the suggestions for popularizing the farming of JLS.

Results

The farmers belonged to Tamil community and their religion was Hinduism. They were having more than 40 years of experience in sheep farming. The sheep were reared with minimum inputs in a nomadic pastoral system. They were reared mainly for manure purpose. However, when the stocking rates are high the excess sheep are sold for meat purpose to the buyers coming from the southern part of the country as there is no demand for *Jaffna Local* sheep meat from the local population.

Only extensive rearing system is undertaken and the flock of sheep is night paddocked on farmlands such as fallow paddy fields, coconut and palmyra lands on request by the owners of the agricultural fields. The owners pay a

premium price (LKR 45,000 per unit of paddy field) for night paddocking the sheep. This method provides the much-needed organic matter to the agricultural soils through dung and urine enriching them with macro and micro nutrients. This practice reduces the requirement of inorganic fertilizer input during the paddy cultivation. Overall, the resources are shared among the sheep and crop farming communities with less negative impact on the environment.

Most of the instances farmer and the flock stay at one land/field for a maximum of three days and shift to another location on request. The flock of sheep is restrained to a paddock using temporary fences made up of either thatches or metal polls. The farmer may hire one or two other helpers to take care of the flock during day and night depending on the size of the flock.

Main sources of feed were the roughages available in the fallow paddy fields, other agricultural fields, road sides and play grounds. Main sources of water were the dug wells and seasonal ponds available in the grazing pathways. Farmers used some cultural methods to treat the sheep and they were annually vaccinated against foot and mouth disease. However, restraining individual sheep for disease treatment was the most cumbersome activity as the sheep were not used to human touch and handling.

Main potentials available are the JL sheep who are well adapt to Jaffna peninsula, availability of feed and water in majority of the months and the availability of feeding land areas while the drawbacks include; unwillingness of labourers to stay with the flock and move them to feeding grounds and lack of sources of feed and water during the dry months.

Figure 1: Jaffna local sheep resting on a fallow paddy field

Conclusions

The objective of this study was to identify the sustainability dimensions (aspects related to environment, economy and society) of the *Jaffna Local* sheep production system in the Northern part of Sri Lanka. This sheep is reared in a nomadic pastoral system with minimum inputs. The main purpose of rearing *Jaffna Local* sheep is for manure and meat. The sheep is fed with feeds available in fallow paddy fields, other agricultural fields, road sides and play grounds and water which is freely available in the dug wells and seasonal ponds in the feeding grounds. The flock of sheep is night-paddocked on farmlands on request by the owners of the agricultural fields. The sheep is confined to an agricultural field with temporary fences to restrict the animal movement during the night time. This method provides the much-needed organic matter to the agricultural field through dung and urine enriching them with macro and micro nutrients. This practice reduces the requirement of inorganic fertilizer input during the crop cultivation. Overall, the resources are shared among the sheep and crop farming communities with less negative impact on the environment.

In addition, the disease incidences are also less in this production system as *Jaffna Local* sheep are well adapted to the harsh environmental conditions prevailing in the area as they were reared for generations and generations in the peninsula.

Compared to the indigenous goat breeds in Sri Lanka, *Jaffna Local* sheep breed is less exploited and popular due to their inherently lower production capacity. In contrast, to mutton from goats, there is no demand for *Jaffna Local* sheep meat from the local population and thus sold the extra animals for meat purpose to the buyers coming from the southern part of the country. Thus, only a limited number of farmers daringly invest in the management of *Jaffna Local* sheep but those farmers earn a considerable profit from this farming system.

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