

Factors Affecting Technical Efficiency of Dairy Production in the Dry Zone of Sri Lanka



HARTI

POLICY

BRIEF

2024 – 08

ISSN

3030-797X online
3030-7988 print

Background

Dairy development in the dry zone is significant due to its ability to increase food security, reduce rural poverty, reduce import bills, and prevent rural to urban migration. Milk production has been a traditional industry, which has survived thousands of years playing a key role in infant nutrition and alleviating nutritional poverty in all age groups (FAO, 2007). It has been a vital source of high-quality protein, minerals, and vitamins to the population, by way of milk and meat. For many rural smallholder farmers, dairy animals are a 'living bank' that serves as a financial reserve for periods of economic distress (Perera & Jayasuriya, 2008).

According to the Central Bank Annual Report 2022, the agriculture contribution to GDP was 7.5%, out of which only 0.7 came from the animal production subsector. The total cattle and buffalo population in Sri Lanka was 1.6 million cattle and 0.48 million buffaloes in 2022 and milk producing animals represent 20% of the total herd. Further, in 2021, the total domestic milk production was

litres of buffalo milk (Department of Animal Production and Health, 2021). However, the year 2022 the total milk production was 377 million litres which was 13% reduction of the milk production compared to 2021. The total importation of powdered milk in 2022 was accounted Rs. 63 billion (Department of Customs, 2020), incurring an astronomical cost on the government coffers.

According to the Statistical Bulletin, 2020 of the Department of Animal Production and Health, the total cattle and buffalo population in Sri Lanka was estimated as 2.1 million and the dry zone contains of 1.6 million animals. The dry zone is home to 79% of the total animal population in the country and this population only produced 50% of the total milk production of the country. As described by the Department of Animal Production and Health, 21% of the total herd confined to the wet zone produces around 50 % of the total milk production of the country. However, in most of dry zone areas, the dairy farming practices are relied on extensive farming and animals are grazing in natural grasslands. The use of grassland resources for livestock has a long tradition. In climatic and vegetation context, these grasslands are highly diverse. The ecosystems are impacted by various

factors associated with development activities including clearing for short-term cultivation, illegal burning, and extensive removal of herbage for fodder and overgrazing. Further, lack of these grassland maintaining programmes and mismanagement of these natural resources lead to wipe out natural farming systems, thus threaten the eco systems (Premarathne et al., 2003).

As Herath (2016) pointed out Sri Lanka's milk industry is threatened by poor distribution channels, high input cost, particularly the high feed cost, labour cost, veterinary services, poor storage. marketing and technical issues. Enhancement of milk production is essential with soaring milk prices. In actuality, for long-time local milk producers received a meagre price compared to the price of imported milk. The price increase of milk is an important factor to enhance the local production.

Problem Statement

Sri Lanka faces several constraints in the dairy sector as low yields from herd, limitations of grassland and high input prices (Weerahewa, 2009). Further, dairy farming systems such as the hill country, mid country and low country wet zone have intensified and, according to DAPH these farming systems produce around 6-8 litres per day, however, the dry and dry intermediate zones having more resources such as land, natural grasslands, number of animals per herd, continue to produce around two litres. Further, dairy management practices, input availability, technology and farmer related factors have a significant impact on the milk production efficiency. Hence, those challenges lead to stagnation of the dairy industry of the dry zone. Further, domestic production is only sufficient to fulfill 40% of the milk requirement of the country. It indicates that the maximum production

potentials with the existing systems were not harnessed. Increasing the technical efficiency in production assumes greater significance in attaining potential output at the farm level. Therefore, analysis of technical efficiency of dairy production in the dry zone is important to uplift the dairy production in the dry zone of Sri Lanka.

1. What are the factors affecting technical efficiency of dairy production in different

Research Questions

- farming systems in the dry zone of Sri Lanka?
2. To what extent dairy technologies reach the farmers?
3. What are the policy suggestions to enhance the dairy production in the dry zone of Sri Lanka?

Research Objectives

The overall objective of this study is to understand factors affecting technical efficiency of dairy production in the dry of Sri Lanka. The specific objectives are as follows.

1. To determine factors that contributed to the dairy production efficiency in the dry zone of Sri Lanka.
2. To study the level of technology adaption of dairy farmers.
3. To provide policy guidelines to enhance dairy production in the dry zone of Sri Lanka.

Methodology

To achieve the above objectives primary data was collected through a structured questionnaire the total number of dairy farmers selected to represent each farming systems. To represent the Coconut Triangle dairy farming system, 65 farmers from the Kurunegala district, 45 farmers from Jaffna district representing the Jaffna Peninsula farming system and for the low country dry farming system two districts were selected. These



Gender (Male, Female), Education Level- (Primary, secondary, GCE O/L, GCE A/L, Degree), Training received (Yes, no), Experience (Years), Member of farmer manage society (Yes, no), Skills (Yes, no)

Key Findings

- 1 According to the study sample, dry zone dairy farming indicates 0.5% large scale farmers, 46.3% medium scale farms and 53.2 % small scale farms and comprises of 8.3% of intensive farmers, 68.1% of semi-intensive farmers and 23.6% of the extensive farmers.
- 2 The farm factors that contributed significantly for the milk production in the dry zone include the number of milking cows in the herd, amount of concentrate feed given, amount of pasture feed /day, water supply frequency/day and the availability of cattle shed. The farmer factors that have a significant influence on the milk production are training received and the experience of dairy farming
- 3 The number of milking cows and the quantity of a feed intake play a significant role in milk production. For every additional 1% increase of milk will represent 0.8% and for each additional kilogram of feed there is an increase of 0.72 liters to the total milk output. This implies that providing an adequate amount of feed has a positive impact on getting a higher milk yield up to recommended level.
- 4 Technical efficiency of dairy farming in the dry zone according to the sample is 0.602 (60%) which implies that within the available resources the milk production can be increased by 40% with effective use of available inputs. In the dry zone study areas such as Kurunegala, Anuradhapura, Jaffna and Hambantota indicate technical efficiency of 77%, 77%, 55% and 32%

include 60 farmers from the Anuradhapura district and 45 farmers from the Hambanthota district. To gather information required for technical efficiency calculation a structured questionnaire survey was conducted with 215 of total dairy farmers.

According to Bettese and Coelli (1995) and Malcolm (2015), the theoretical frame work is derived. The Cobb-Douglass production Frontier Model has been commonly used as linear form as logarithms of input and output quantities.

Dependent variable - milk production

Independent Variables - Feed cost Concentrate (Rupees), Pasture feed (Amount- kg- price), milking cows per herd(Number), Herd size (Number), Milking at present(Number), Breed Type(Improved, local), Animal Breeding (AI, Bulls), Pasture land availability (Yes, no), Veterinary Cost (Rupees), Labour cost (Rupees), Type of Management (Extensive, intensive, semi-intensive), Cattle shed availability (Yes, no), Farm Infrastructure provision (Standard, lower standard), Extension provision , Type of extension received, Role of Private sector in extension provision and production improvement support
 Producer specific Variables - Farmer's age (Years),

respectively. Hambanthota district shows the lowest technical efficiency as most of the farmers practise extensive type of dairy farming.

- 5 It is noted that most of the essential dairy technologies have been adopted by farmers, however; half of the dairy farmers do not observe the right amount of feeding and 24-hour water provision to the milking animals. According to the Stochastic Frontier Analysis 24-hour water provision to the milking animals will increase the milk production by 0.254 for the liter enhancement of milk.
- 6 Average cost of production of milk without family labour was rupees 103.2 in the study area without considering the management type. The district wise cost of production of milk was calculated as Kurunegala district Rs, 100.73, Anuradhapura district 101.75, Hambanthota district 105.85 and in Jaffna district cost of production was 104.78. The total feed cost was accounted 70 % of the total cost of production. However, the average cost per animal per day was around Rs. 225.
- 7 The most producing dairy breeds in study area include jersey, Friesian, jersey Frisian cross breeds and jersey sahiwal cross breeds. Their maximum production was recorded as 12 to 20 liters per day.

Recommendations

To enhance the milk production with available resources, it is important to educate dairy farmers on correct amount of concentrate feeding; milking animals per herd, availability of 24-hour water provision to the farm and presence of cattle shed in the dry zone. Therefore, it is important to empower the knowledge base and infrastructure to facilitate to develop the dairy sector in dry zone of Sri Lanka.

To increase the dairy production in dry zone, it is important to enhance the facilities for dairy feed production such as silage and concentrate feed. In addition, provide land and other technological facilities are important with the help of village level dairy farmer managed societies.

Required citation: Hitihamu, S., Jayasinghe, U. and Aiome, N. (2024). *Factors Affecting Technical Efficiency of Dairy Production in the Dry Zone of Sri Lanka*, HARTI Policy Brief, No. 08, Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI), Colombo, Sri Lanka.

Findings of this policy brief have been adapted from the HARTI research study *Factors Affecting Technical Efficiency of Dairy Production in the Dry Zone of Sri Lanka*.

Hector Kobbekaduwa Agrarian Research and Training Institute
No. 114, Wijerama Mawatha
Colombo 07
Sri Lanka.

+94-112696981, +94-112698539-41

editor@harti.gov.lk

<https://www.harti.gov.lk/index.php/en/publication/policy-briefs>