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Present status of micro-livestock production in the *Anuradhapura* district, Sri Lanka

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ABSTRACT

Purpose: *Indigenous species and non-popular species are referred to as micro-livestock (ML). Micro-livestock farming provides numerous socio-economic benefits. However, attention for ML rearing is low. Hence the purpose of this study is to find the present status of ML farming in Anuradhapura district in order to provide suggestions to popularize ML as a livelihood and income-generation option among rural communities.*

Research Method: *A survey was conducted with 72 ML farmers selected from multi-stage random sampling in the Anuradhapura district. Descriptive statistics were used to analyze the socio-economic status of farmers and production details of ML farming. Logistic regression model was used to analyze the drives of ML farmers' decisions on market participation.*

Findings: *Village chicken was the most popular due to high demand for eggs. Feeding was the least cost component in ML farming. Potentials to expand ML rearing were low labour cost and cost of production and availability of market and infrastructure. Majority of the farmers sell their products to retailer shops. Marketing of ML products is influenced by gender, age, training and distance to market. Lack of technical support and markets, poor extension, diseases, predators and climatic change were identified as constraints for ML rearing.*

Research Limitations*: Micro-livestock farming is the least considered farming practice in the area. The farmers were scattered and they kept ML as a secondary activity.*

Originality/ Value: *There is a potential to expand ML farming in the area as a remedy for malnutrition and poor income in rural households especially the females.*

Keywords: *Indigenous species, Marketing of micro-livestock products, Micro-livestock, Rural community*

INTRODUCTION

Micro-livestock (ML) is referred to as the non-popular livestock species that are reared in small numbers with minimum attention (Anon, 1991). They are also referred to as 'mini-livestock' or 'unconventional livestock' and are less than half the size of the conventional livestock production (Hardouin *et al.*, 2003). Indigenous ruminant species such as goats, cattle, sheep; poultry species such as village chicken, ducks, turkey, geese, quails, and other livestock species that are reared in small numbers such as rabbits, guinea pigs, pigeons, and lesser-known animals such as deer, crocodiles are some examples for micro-livestock.

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Micro-livestock farming is a sector that has minimum attention in Sri Lanka. According to limited available records there had been 1.109 million of backyard chickens and 18,145 duck population in 2002 in Sri Lanka (Anon, 2020a). Indigenous goat farming is comparatively more popular among the rural community than other ML species (Abeykoon *et al.*, 2013). In addition to goats, non-popular poultry species such as village chicken, ducks, geese, turkeys, guinea fowls and quails are also reared in small scale. These ML species provide various nutritional and economic benefits (Udo *et al.*, 2011) to the local communities including meat, milk and eggs for consumption and market purposes. Moreover, they are also reared for draught purposes, pelts, manure and also as pets. Micro-livestock species are generally managed as a backyard system or as a family farming activity without much attention about the needs of the livestock. Therefore, the farmers do not need a large amount of capital and space for the establishment of these species (Anon, 1991). Thus, ML farming is a livelihood and a good secondary source of income for the rural farmers.

The North Central Province is the largest province in the dry zone of Sri Lanka. It is composed of *Anuradhapura* & *Polonnaruwa* districts. Out of the total population (1,266,663) in the province, 860,575 (67.9 %) belong to *Anuradhapura* district and 46.1% of the population contributes to the agriculture sector in the area (Anon, 2020b). According to the above report, the majority of the farmers are engaged as family workers (18.9%) while the unemployment rate is 4.6% highlighting the extent of untapped labour available in the area.

In the context of ML farming in *Anuradhapura* district, it has a larger population of cattle and buffalos but a lesser number of ML species (Anon, 2018). Main ML species in the district are indigenous chicken, rabbit, quail, guinea-fowl, turkey, duck and indigenous goat (Anon, 2019, Anon, 2020a). There had been approximately 18,254 livestock farmers in *Anuradhapura* District in 2018 (Anon, 2020a) out of which 34% and 4% were rearing indigenous chicken and goats respectively.

The district has a lot of potential to expand livestock rearing systems in terms of the availability of land, infrastructure and labour. Extensive management of livestock systems is the predominant livestock rearing system in the area. Further, limited information is available on the micro livestock species in the area and the potentials and constraints faced by the farmers who rear ML species. The availability of such data can be used to suggest possible solutions for the expansion and development of this sector in the *Anuradhapura* District. Therefore, this study aimed at investigating the present status of ML sector in the *Anuradhapura* district.

MATERIALS AND METHODS

Study Area

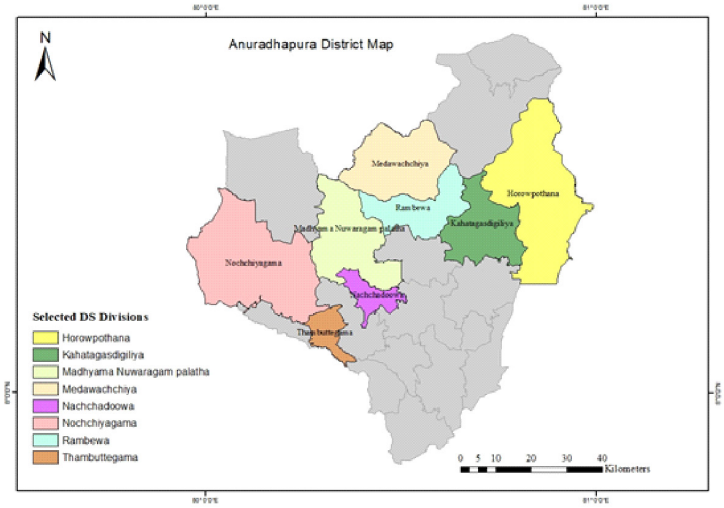
Anuradhapura district (8.3114° N, 80.4037° E), North Central Province, Sri Lanka was selected for the study considering its potentials for expanding ML farming among the rural farming community. Mean annual rainfall of the district is 1200-1900mm, temperature is 28-30 ^{0}C and the elevation is 89 m above mean sea level (Punniyawardhana, 2008). The study was undertaken from December 2019 to July 2020.

Data Collection

The number of farmers who were engaged in livestock farming in each DS division was obtained by referring to the annual statistical reports and databases available at the Provincial office of Department of Animal Production and Health (DAPH) and Divisional Veterinary offices of *Anuradhapura* district. Out of the total population in *Anuradhapura* district, only 2.6% were livestock farmers (Anon. 2018). Accordingly, a total of 72 farmers were selected from each DS division using multi-stage random

sampling and visited for data collection during the study period (Table 01).

The study was based on primary data collected from a pre-structured questionnaire survey. The questionnaire consisted of five main sections. The first section included questions about the demographic information of the respondents. Demographic information included questions on age, gender, level of education and income from ML farming. The second section of the questionnaire consisted of questions on the type of ML species reared, sources of purchasing ML species and purpose of rearing ML species. In the third section of the questionnaire the respondents were asked to provide production information related to ML such as average production per month and average market price for the products they sell. The fourth section of the questionnaire included questions about the feed management of the ML species. In this section information related to feed types used for different livestock species were obtained. The fifth section had questions to obtain information on extension services, potentials and constraints related to ML farming and, drives related to market access for selling the ML products.



(Source. Census of Population and Housing, 2012)

Figure 01: Map of the study area

Table 01: Number of ML farmers selected from each DS division.

DS divisions	GN divisions	Sample size[1]
Nachchadoowa	*Hidogama, Pawakkulama, Kudawawa, Pahalawawa*	10
Kahatagasdigiliya	*Mahapothana, Kahatagasdigiliya, Kakirawa handiya, Mugatiyana*	11
Thabuttegama	*Gammana 7, Gammana 5, Jayasirigama, Kudagama*	09
Rambewa	*Kirigollawa, Thalgahawewa*	08
Madawachchiya	*Madawachchiya, Dambuwawa, Dumriya nagaraya*	11
Nochchiyagama	*Pahalamunegama, Jayagama, Ihalagama, Waliala*	09
Horowpothana	*Rathmale, Horowpothana*	06
Madhyama Nuwaragampalatha	*Samagipura, Puliyankulama, Mahabulankulama*	08
Total		72

[1] *number of farmers visited to collect data*

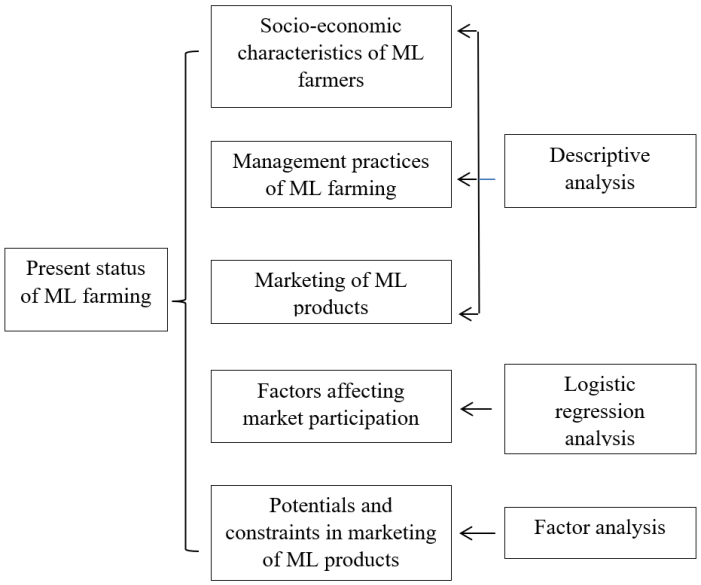


Figure 02: Analytical framework of the study

Data Analysis

Data were analyzed both qualitatively and quantitatively in order to provide a better picture of the present status of micro-livestock production in *Anuradhapura* district. Descriptive statistics (mean, mode, frequency and percentage) were used to analyze the socio-economic status of ML farmers, ML population and production data, feeding and other management practices, disease conditions, marketing of ML products and strength of the supportive services. Logistic regression model was used to analyze the drives of ML farmers' decision on market participation. Variables used in logistic regression are given in Table 02 and Figure 02. The regression equation used in the analysis is given below.

$$\text{Logit } Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots. + \beta_n X_n + \text{error}$$

Where; Logit Y =Market participation (if yes = 1, no = 0)

β_0 = Intercept

β_1 to β_n = Regression coefficients

X_1 to X_n = Explanatory variables (age, gender, income, market price, training participation, distance to market)

Table 02: Variables used in logistic regression analysis.

Variable	Measurements
Income	Monthly income
Sex	1-Male 2- Female
Age	Years
Educational level	1- None 2- Primary 3- Secondary 4- University 5-Above
Occupation	1-None 2-Schooling 3- Farming 4- Government sector 5- Private sector 6- Non-agricultural labor 7-Other
Market type used to obtain animals	1-Pet shop 2- NLDB farm 3- Private farm 4- From villagers 5-Other
Training participation	1-Yes 2- No
Access to market	1-Yes 2- No
Distance to market	Kilometers
Family labour	1-Yes 2- No (hired labour)

Moreover, factor analysis was used to analyze the potentials and constraints in marketing of ML products in the study area. Principal component analysis (PCA) emphasized that multiple observed variables have similar patterns of responses because of their association with an underlying latent variable. Hence, PCA was used to factorize the potentials and constraints. The factors with an Eigenvalue ≥ 1 were considered as the main factors which explain more variance than a single observed variable. Details about the PCA conducted in this study are presented in the results and discussion section.

RESULTS AND DISCUSSION

Demographic Profile of the ML Farmers

The survey yielded 72 responses in total, largely (72%) represented by male farmers whereas only 28% were female farmers highlighting the dominant role played by males in livestock production. The average age of a farmer engaged in ML production was 46 years. Eighty-two percent (82%) of the respondents had received primary education only while 11% had education up to secondary level. About 6% of the respondents had received no formal education at all, whereas, only 1% of the respondents had university education. These findings are highly relevant to what Abeykoon *et al*., (2013) and Okeoghene and Odemero, (2016) reported on the education of ML farmers.

Population Information of ML Species Reared in the Study Area

Table 03 presents the different types of ML species reared by the farmers. According to the results, one respondent may rear one or several micro-livestock species. Majority of the respondents (85%) were involved in village chicken farming followed by duck (22%), turkey (11%), guinea fowl (7%), quails (8%), rabbits (6%) and goats (4%). Chicken is the most dominant avian species that contributes to the largest portion of daily meat demand in most Sri Lankan diets (Alahakoon *et al.,* 2015). Therefore, it is not surprising that most of the farmers were involved in rearing village chicken. Both common village chicken and *Naked Neck* village chicken species were reported in the study area. While only the muscovy breed of the ducks were reported, both white and pearl guinea pig species were reported in the district. With respect to turkey, *Beltsville Small White* breed was observed. Under quail birds, brown colour Japanese quail species was observed.

The number of rabbits and goats reared by the farmers were comparatively very low. Generally goat farming is popular in the Northern province of the country compared to North Central Province (Anon, 2020a) due to the availability of lands for free grazing and the existence of large nomadic herds (Premaratne and Premalal, 2006). Quails followed by village chicken and goats were the highest average number of animals that were reared in this study area (Table 04). Even though the number of goats reared was low in the study area, the number of goats reared by one farmer was higher compared to other ML species. Ducks, guinea fowls, turkeys and rabbits, were the lowest average number of animals reared by the respondents. Priti and Satish, (2014) stated that quail farming is a cheap enterprise compared to chicken farming due to the higher demand for quail meat and eggs and easy management practices involved. Accordingly, quail farming has a potential to expand in the study area too.

Purpose of Rearing ML Species

When the respondents were asked about their purpose of rearing ML, it was noted that all the poultry species were reared mainly for egg purpose and majority of the eggs were consumed at household level (Table 05). Only 1% of village chicken and guinea fowls were reared for meat production. Most of the time duck eggs and chicken eggs were exchanged among neighbours as a 'payment in kind'. In support of the present

finding, Silva *et al*., (2016) reported that farmers who keep village chicken consume more eggs and meat than the average community. Goats were totally reared for meat purpose as mutton has a high demand. Rabbits were reared as a pet to overcome the farm family stress conditions even though rabbits are mainly reared for meat purposes in many other countries (Zotte, 2014).

Table 03: Species of micro-livestock reared in the survey area.

Micro-livestock Type	Percentage of respondents (%)
Village chicken	85
Ducks	22
Turkeys	11
Guinea fowls	7
Quails	8
Rabbits	6
Goats	4

Table 04: Average number of different micro-livestock species reared by the respondents.

Animal type	Number of animals	SD
	Average number of species reared by one respondent	
Village chicken	30.09	76.57
Ducks	6.68	7.76
Turkeys	3.12	3.27
Guinea fowls	6.20	8.10
Quails	73.00	115.02
Rabbits	1.00	2.70
Goats	24.00	21.00

Note:

$$Average\ number\ of\ animals\ reared = \frac{number\ of\ animals\ reared\ from\ a\ given\ species}{number\ of\ farmers\ who\ reared\ the\ given\ species}$$

Table 05: Purpose of rearing ML and marketing of micro-livestock products.

Micro livestock species	Purpose of rearing	Home consumption per month (Number of eggs)	"Payments in kind" per month (Number of eggs)[a]	Amount of eggs/ meat sold per month	Selling price per egg (Rs)[b]
Chicken	Egg	81±8	21±5	254±47	20
Duck	Egg	32±11	27±25	36±14	30
Turkey	Egg	20±7	0	12±	40
Guinea fowl	Egg	115±	20±	40±	50
Quails	Egg	178±50	0	320±156	9
Rabbits	Pet	-	-	-	-
Goats [c]	Meat	-	-	40kg	Rs 625.00 per kg

means±SD; [a] micro-livestock farmers use or transact eggs in-exchange to obtain other required goods.; [b] Sri Lanka Rupees (LKR 199.00=1 US$; July 2021); [c] only two farmers from the survey sample

Sources of Obtaining ML Species

Micro-livestock farmers used various types of sources to obtain their animals. The majority of the respondents obtained species such as village chicken from the fellow villagers and some of the respondents had purchased them from the Central Poultry Research Station (CPRS), *Kundasale*. Species like rabbits, ducks and, quails were obtained from pet shops and private farms. Some farmers obtained farm animals such as turkey and, guinea fowl from NLDB (National Livestock Development Board) farms.

Feeds and Feeding

Feeding patterns and feeding methods used for different ML species varied according to the rearing system. Majority of the ML farmers (83%) practiced a semi-intensive system to rear goats, chicken, ducks, turkeys and guinea fowls. Under the semi-intensive system, the poultry birds and goats were allowed for scavenging during a specified period of daytime and at night they were confined into their sheds to avoid predator attacks. Quails and rabbits were reared under intensive systems only. About one percent of the farmers used an extensive system for rearing chicken and goats. Under this system livestock were totally dependent on scavenging and shelter was not provided at night. As observed, highest production was recorded from intensive and semi- intensive management systems compared to extensive systems.

The respondents in the study area offered various types of feeds, paying minimum attention to the requirements of the ML species. Major types of poultry feed that have been used were commercial poultry feeds, kitchen waste, cereals and other plant materials such as roots, tubers, oil seeds and aquatic plants. Feed ingredients such as rice bran and broken rice and *Sorghum bicolour*, *Zea mays* and green vegetables such as *Ipomoea aquatica (Kankung)* and *Alternanthera sessilis (Mukunuwenna)* have also been used as sources of feed. Respondents considered feeding as one of the least cost components in ML poultry farming. Silva *et al*., (2016) reported that village chicken were capable of finding their own feed by scavenging. Also Saina, (2005) stated that guinea fowl has a unique ability to free range and is tolerant to most common diseases of chicken. Moreover Assan, (2014) stated that rabbits could survive on a variety of feeds including kitchen waste. Hence, all these ML species can be managed in a low input sustainable farming system.

Most of the farmers in this area practiced crop-livestock integration. Therefore, majority of the respondents used agro-well (81%) as a source of water to feed the animals. Farmers also used ponds and village tanks (2%) as a source of water for ML. Further 17% of the farmers used tube-wells to get water for their ML. The quality of the water was not evaluated in this study.

Supportive Services Related to ML Production

The main supportive services related to ML production are described under three main categories namely artificial insemination (AI), extension services and veterinary services. The respondents were asked to rank their perceived satisfaction about these services on a scale of five (5=excellent, 1=weak). About 32% and 29% of the farmers identified extension and veterinary facilities as excellent services respectively, while 47% and 49% of the farmers ranked extension and veterinary services respectively as good. About 12% of farmers mentioned both veterinary and extension services under low and weak categories. During the discussions some farmers complained about the unavailability of government veterinary and extension officers for ML species when the farmers need their assistance or service. Thus, some farmers were not happy with the above two services. Similar experiences were observed by Chipasha *et al*., (2017) in a study undertaken with smallholder goat farmers in *Choma* district, Zambia. In the present study, some of the farmers have received training on ML farming. About 67% of the

respondents appreciated the training services available for them in the area. However, only 33% of farmers participated in these training programmes. The regional Veterinary Offices and institutes such as Faculty of Agriculture, Rajarata University of Sri Lanka and Animal Husbandry School, *Seeppukulama, Anuradhapura* were the key institutes that have provided these training facilities. Thus, veterinary and extension offices in the area have a key role in providing the required training on management of ML species including feeding, housing and marketing aspects, which would significantly enhance the ML production in the area. Artificial insemination (AI) facility was mainly requested by the goat farmers. But AI service for goats was very rare in the survey area as mainly it was offered to cattle farmers.

Disease Management of ML Species

Prevalence of diseases was high among ML species in the study area. Some of the common diseases problems reported were diarrhea condition, Gumboro, fever, worm infestations and parasites (tick). Further, paralysis, swollen esophagus and chicken pox were also prevalent. As a treatment for these disease conditions, farmers used Vitamin B, and antibiotics. Farmers also used indigenous medicinal plants such as *Acalypa indica* (*Kuppameniya*) to treat the micro-livestock. Among goats and rabbits, disease conditions were less prevalent when compared with poultry species. Ticks, worm infestations and fever were the common disease problems that were observed in rabbits and goats in the study area.

Marketing of Products

Type of market places available for sale of micro-livestock products: Majority of the farmers (94%) sell their products to retailer shops. It is mainly because the retailer shops were within the village and it does not involve an extra cost to bring the product to the market. However, the retailer purchased the product to a price far below the expected price by which the farmer wants to sell. And about 3% of the farmers sell their products to the collectors. Collectors may be neighbours or other villagers. Another 3% of the farmers preferred to sell their products to wholesalers.

Mode of transportation of micro-livestock products: In the survey area, farmers used two major types of transportation services to transport their products to the market. Majority of the farmers used their own vehicle (94%) i.e. motor bike or bicycle while the rest of the farmers used a hired vehicle to transport the products. Abeykoon *et al*., (2013) stated that bicycle ownership was positively associated with the value of poultry sales.

Availability of by-products from micro-livestock production: Micro-livestock farmers used excreted materials of the ML for the production of organic manure. According to the survey, about 72% of the farmers were involved in the manure production. They applied this manure for their own cultivated crops. Only 6% of farmers sold the manure as an additional source of income. Remaining farmers did not care about the manure derived from the system.

Factors Affecting Market Participation

Market participation means the decision of the farmer to sell the product at a retail or wholesale market. The factors which affect the market participation were analyzed using logistic regression. From all factors used (income, gender, age, educational level, occupation, training participation and distance to market) only four factors significantly affected the market participation of the farmers. According to Table 06 and Table 07; age [Odds Ratio (OR) = 0.63)], gender of the head of household (OR = 321.5), participation for training (OR = 32.8) and distance to market (OR = 0.18) significantly decided the market participation decision of the ML farmer. Accordingly, older farmers are more likely to participate in the market because they produced a

marketable surplus with their enhanced farming experience. The results further prove that male farmers are more likely to be market-oriented farmers compared to females. Moreover, the odds of being market-oriented farmers are higher for higher levels of training participation in relevant fields. Non-market-oriented farmers are more likely to be market-oriented farmers when they have less distance to marketplaces. These findings are highly related to Abeykoon *et al*. (2013) who reported that the gender of the head of household decided the market participation of poultry farmers.

Further, the above author also stated that the number of family members below 15 years, access to market information, ownership of a bicycle, the breeds of ML and the distance to market from the farmhouse improve the sales of indigenous chicken farmers. Similarly, Mutsami, (2019) reported that market participation was positively affected by the size of household, rabbit breed, credit access, group membership and access to training, however, age negatively affected the decision of market participation.

Potentials to Market ML Products

According to the survey data, the main potentials identified to market ML products are presented in Table 08. The respondents were asked to rank the perceived potentials for ten factors. As stated by the respondents, the main potential for ML farming in *Anuradhapura* district is the availability of a wider range of feeds. Premarathne and Samarasinghe, (2016); and Premarathna and Somasiri, (2015) also reported that a wide range of feeds are available in this area for grazing livestock. About 99% of the respondents identified land availability as a potential for ML farming in the district. This could be true because *Anuradhapura* is the largest administrative district of the country and land size is 6664 km2 (Anon. 2018). The next potential as perceived by the respondents is the easy management of ML species. Abeykoon *et al*. 2013 also reported about the easiness of managing ML species. In summary all the ML farmers had access to a wide range of feeds to feed the livestock and land to establish the ML unit. Due to the availability of a wide range of animal feeds like grasses, fodders and other plants, the cost of feeding was reduced.

Table 06: Analysis of maximum likelihood estimates.

Variables	Measurements	Estimate	Pr > Chi Sq
Intercept		25.38	0.01
Age	Number of years	-0.46	0.01
Training Participation	Yes, or No	1.74	0.036
Distance to market	Number of kilometers to the nearest market	-1.67	0.02
Gender	Male, or Female	2.88	0.02

Table 07: Odds Ratio Estimates.

Variables	Point estimate	95% Confidence limits	
Age	0.63	0.43	0.91
Training participation	32.82	1.24	866.42
Distance to market	0.19	0.04	0.78
Gender	321.35	2.02	>999.99

Next potential component was the economical aspect. It was classified into 3 potentials as (i) low labour cost, (ii) market potentials to sell excess production and (iii) less cost of production. Above mentioned potentials scored 97%, 60% and 22% respectively. Low labour cost was due to the participation of family members in managing ML activities. Factors such as adaptation of new technology i.e. use of high producing breeds, feeding formulated diets, market promotion activities via social media, would facilitate in popularizing micro livestock production and marketing in the study area.

General aspect was categorized into 5 potentials. They were easy management practices in ML farming, multiple purposes obtained from ML, efficient use of farm space, extension services and availability of developed infrastructure (Table 08). All these aspects encouraged the ML farmers to survive and engage in the ML rearing system. Abeykoon *et al*., (2013) stated that competitive market and market information services have to be established and strengthened in order to improve the value of village chicken sales. Okeoghene and Odemero, (2016) showed that protein consumption and improved income were the most important potentials available for ML farmers in Nigeria.

Table 08: Classification of potentials to market ML products.

Potentials	Percentage (%)
Wide range of feed availability	100
Land availability	99
Low labour cost (family labour)	97
Market potentials to sell excess production	60
Less expensive to purchase ML	22
Easy management	96
Multi-purpose animals	93
Efficient use of space	76
Extension services	26
Wisely developed Infrastructure	6

Table 09: Component matrix of factor analysis.

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Severe diseases conditions (A)	.050	.535	.427	.598
Spreading of natural enemies and predators (B)	-.048	-.143	-.674	.900
Lack of technical support (C)	.936	.007	-.099	-.018
Poor extension (D)	.938	.078	.169	-.020
Religious beliefs (E)	-.092	-.099	.759	-.093
Lack of market (F)	.286	.598	-.268	-.233
High labour cost for commercial production (G)	-.063	.662	.419	-.003
Low production (H)	.002	.727	.034	.027
Climatic changes (I)	-.204	-.269	-.617	-.026
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				

a.Rotation converged in 7 iterations.

Table 10: Classification of constraints to market ML products.

Factor 01	Factor 02	Factor 03	Factor 04
Issues in supportive services	Production issues	Environmental issues	Social issues
Lack of technical support	Severe diseases conditions	Spreading of natural enemies and predators	Religious beliefs
Poor extension	Lack of market	Climatic changes	
	High labour cost for commercial production		
	Low production		

Constraints to Market ML Products

In order to identify the constraints that affect for ML farming in *Anuradhapura* district, factor analysis was employed. Constraints were identified by the feedback of the farmers. Farmers were asked to rank the severity of the constraint on a scale of five (5=highly affected, 4-affected, 3-moderately affected, 2-not affected or 1-not present at all for the ML farming in the district. According to the Eigenvalues of the extracted factors, four main constraints were identified as the variables affecting ML farming in the area. Table 09 shows how the variables were grouped into each factor.

Constraints were classified into four main issues namely; (i) issues in supportive services (ii) issues in production (iii) issues in environmental conditions and (iv) social issues (Table 10). Lack of technical support and poor extension were grouped under issues in supportive services. Severe disease conditions, lack of market, high labour cost for commercial production and low ML production were grouped under production issues. The spreading of natural enemies and predators, and climatic changes were classified under environmental issues. And religious beliefs were identified as social issues. Okeoghene and Odemero, (2016) and Assan, (2014) also stated that lack of technical support as the main constraint in ML farming. And Abeykoon *et al*., (2013) showed that the households' decision to participate in the poultry market was significantly ($p<0.05$) affected by religion which was also observed in the present study.

CONCLUSIONS

According to the results, village chicken farming was popular due to the high demand available for eggs and low feeding cost. Potentials available for micro-livestock farming in the area were low labour cost and the cost of production, availability of market and developed infrastructure. Factors such as adaptation of new technology i.e. use of high producing breeds, feeding formulated diets, market promotion activities via social media, would facilitate in popularizing micro-livestock production and marketing in the study area. In addition, micro-livestock farmers in the area also used the excreted materials for the production of organic manure as a source of fertilizer for their own crops.

However, marketing of micro-livestock products is influenced by gender, age, training participation and distance to market. Utilization of ML species is a feasible option to cater to the increasing demand for animal protein. Hence, micro-livestock farming has a high potential to grow in *Anuradhapura* district at village level. Thus, in order to maximize the benefits of ML farming, supportive services and infrastructure should be developed.

Conflicts of Interest

The authors have no conflicts of interest regarding this publication.

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