



## Study on the Status of Village Chicken Management Systems in the Selected Areas of Batticaloa District, Sri Lanka

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**Abstract-** This study aims to assess the characteristics of the Village chicken Management systems in the five veterinarian ranges of Batticaloa District, Sri Lanka. In the Batticaloa area, data on 215 village chicken-rearing farms were gathered from five veterinary ranges (Batticaloa, Kaluwanchikudy, Kattankudy, Kokkadicholai, and Thumbamkerney). The methods utilized to collect the data on various techniques included field observations, organized interviews, and unstructured conversations with farmers. The mean flock size per farm was  $102.2 \pm 7.3$  birds per farmer yearly. During a clutch, the average number of eggs produced by a hen was  $13.10 \pm 2.0$ . Home cooking waste accounted for 40.93% of primary local feed sources. All day long 54.88% of people received tap water. The total yearly average output of eggs was  $153.74 \pm 5.33$ . The hatchability rate for Village chicken in this research was  $78.32 \pm 1.36$ . For their farms, half of those polled bought chicks from the market. The mobility percentage was  $12.25 \pm 1.67$  on average. Coryza disease, chicken cholera, and chicken fox were the three main causes of chicken mortality throughout the research. To enhance farm revenue, it is advisable to prioritise factors with positive coefficients ( $P < 0.05$ ) that contribute to income growth and optimise them. Simultaneously, efforts should be made to minimise the impact of factors with negative coefficients ( $P > 0.05$ ).

**Keywords:** Village chicken, local feed sources, clutch, Coryza, Mobility.

### I. INTRODUCTION

Poultry is the world's biggest species. Around the world, poultry production, which is crucial for food security and nutrition, is the fastest-emerging

agriculture sub-sector, particularly in developing nations (Tadesse et al., 2017). Factors such as population increase, income level development, and urbanization are expected to contribute to the sector's future success, according to a report by Cohen (2016). Poultry refers to domesticated birds that deliver meat and eggs for human utilization. Chicken is a key species in rural small-holder agriculture systems in Sri Lanka. In 2021, the nation produced 2934.55 million eggs and 236.79 MT of chicken meat. The estimated chicken population in Sri Lanka reached 24 million (Department of Census and Statistics, 2021).

According to the Department of Census and Statistics, 19 % percentage of backyard poultry farms are located

in the eastern province of Sri Lanka. Village chickens can significantly boost protein output and revenue for small-scale farmers (Wong et al., 2016). Chickens have short production intervals and are highly productive.

Disease tolerance, durability, trying to eat poor-quality feed, adaptability to rural locations, and adaptability to changes in feed supply are all important traits of village chickens (Mufteeth et al., 2018; Miriam et al., 2020). These attributes played a role in low-input producing strategies' long-term viability (Silva et al., 2016).

The body size, color, form, and other phenotypic traits of village chickens vary greatly. The most well-known Village chicken variations in Sri Lanka include the traditional Village chicken with diverse plumage tones such as red, black, brown, white, or multicolor, the naked neck, the long-legged, the crowned chicken, as well as the frizzle feathers (Silva et al., 2016). Also, a few unusual varieties, such as black meat chicken, rumples chicken, and even booted chicken, have been discovered (Liyanage et al., 2015). Various ways of

farming are utilized to grow village chickens, such as extended, backyard, semi-intensive, and intense. Backyard poultry farming is an essential system for rural areas. Although it's necessary to conserve these inherited resources via sustainable use, one of the main drawbacks of backyard poultry farming is the lack of a competitive financial edge. There are some people who lack sufficient information on country chicken rearing thus this study will prove to be essential in providing basic fundamental knowledge of rearing country chicken in the Batticaloa district.

## II. METHODOLOGY

### A. Description of study area

The study was conducted in Batticaloa, situated within the dry zone of Sri Lanka, experiencing a hot and humid tropical climate. Its average yearly temperature stands at 27.4°C, with temperatures ranging from 18°C – 38°C.



Figure 1. Location of the study area

### B. Samples and data collection

The study commenced with a preliminary investigation to identify the crucial area of village chicken rearing in the Batticaloa district. Subsequently, through study was carried out from June to September 2022.

During this period, a total of 215 village chicken farms were visited across the five veterinary divisions of the Batticaloa region. To gather comprehensive data, three methodologies were employed such as structured interviews, unstructured interviews with farmers, and field observation.

Table 1. Farmers population and sample size in various veterinary division

Veterinary Divisions	Farmer's population	Sample size
Batticaloa	20	15
Chenkalady	09	-
Kauwanchikudy	33	30
Kiran	15	-
Eravur	07	-
Kokkadicholai	53	50
Vaharai	14	-
Valachchanai	06	-
Thumbamkerney	84	80
Vavunathivu	10	-
Araiampathy	09	-
Kattankudy	42	40
Rideethena	11	-
Oddamavadi	12	-
Kallady	04	-
Karadiyanadu	07	-

### C. Statistical analysis

Using proper statistical methodologies, qualitative and quantitative data sets were investigated. Excel Spreadsheet and the SPSS software package were used to examine the data (Version 25, IBM SPSS, Chicago, USA). The descriptive analysis investigation was a statistical method that looked at the village chicken production system as well as farmers' socioeconomic characteristics by using diagrams, mean percentages and frequencies. Correlation with various selected parameters to achieve the survey's objectives, and data were evaluated. The preceding methodologies were used in the scoping research.

## III. RESULT AND DISCUSSION

This area aims to provide comprehensive insights into the socio-economic characteristics of the farmers engaged in poultry rearing activities, their prevalent husbandry practices, various diseases affecting poultry production and the monograph pattern of village chicken. By examining these factors, we can better understand the dynamics of village chicken farming in the study area, identify potential challenges, and explore opportunities for improvement and sustainability within the poultry farms.

### A. Demographic Information of the poultry farmers

The comprehensive overview allows for a deeper understanding that showed table 2 delineates demographic factors such as gender and age distribution with a notable majority of participants being male 56% and most falling within the age range of 35 to 45 years, within educationally the majority possess primary level educators 64%, indicating a

potential area for educational interventions or support. Moreover the purpose of rearing village chicken primarily revolves around dual purpose its 94%, likely encompassing both meat and egg production. Furthermore, the table highlights the scale of rearing practices with significant management between 1-50 birds 40% of this distribution of farm income depicts a substantial portion of 10,000-30,000. Possibly to indicate a supplementary income source. To support rearing practice. Experience level varies with the majority having more than 4 years of hands-on experience 46% suggesting a considerable level of experience with the community.

Table 2. Household demographic information

Socio-Economic Attributes	Percentage
<b>Gender</b>	
Male	56
Female	44
<b>Age</b>	
Between 25-35 years	24
Between 36-45 years	44
Between 46-55 years	21
Above 56 years	12
<b>Education</b>	
Primary	64
Secondary	26
Tertiary	10
<b>Purpose of rearing</b>	
Meat	04
Egg	02
Dual	94
<b>Total numbers of birds</b>	
1-50	40
50-100	37
100-200	20
More than 200	3
<b>Off farm income</b>	
10000-30000	42
30000-50000	37
More than 50000	21
<b>Experiences</b>	
Less than 2 years	05
2 years	32
3 years	17
More than 4 years	46

According to Hailemichael & Gebremedhin (2020), the majority of the families' 82% of chicken sales were to pay for anticipated household costs. Compared to female-headed families, male-headed households were less likely to sell poultry and consumed an average of more birds. The likelihood of selling chickens decreased as family asset ownership increased and as the distance to a market town increased.

### B. Village Chicken Husbandry Practices

According to Mokanapriya et al., (2021), semi-intensive farming was practiced by 54% of farmers in the Ampara area, while intense farming was practiced by 32% of farmers and extended farming was practiced by 14% of farmers. 70.23% of Village chicken producers employed semi scavenging throughout the day. There wasn't an intentional practice of feeding chickens, and scavenging was the most common method of feeding.

In the present study, chicken farmers used a variety of diets, including concentrate feed and commercial feed. To boost the development, meat, and egg productivity of the Village chickens, concentrated feed was made up of rice bran and paddy. Meanwhile, the differences in feed type's amount of farmer supplied are shown in Table 3. In kitchen waste, 40.93% of the farmers used it as feed, and just eight farmers utilized it. 3.72% of the Azolla feed was supplied. Similar effects have been recorded in rural regions where farmers were supplied a concentrated feed mixture of rice polish combined with water to improve the performance and growth of their animals. However, due to time constraints, scavenge feed and other concentrate feeds (vegetables, cereals, grain, etc.) were given. Additionally, 20% of farmers only used boiling rice and rice polish, even though 10.23% of farmers also offered extra wheat, paddy, or rice in addition to broken rice, boiled rice, and rice polish. At the same time, (Alam et al., 2014) showed that 63% of farmers utilized boiling rice and rice polish in addition to rice, rice polish, paddy, broken rice, and wheat bran as poultry feed components. Farmers contributed the aforementioned feed components as a result of the scavenging method.

The study found that the primary sources of water for village chickens in the survey area were tap water 54.88%, and well water 45.11%. According to Yosefe et al., (2018), the locally available subsurface water for 2.67% of the total in various configurations. Spring water makes up 41.32%, river water is 21.32%, rainwater is 15%, tap water is 9.32%, and pipe water is 2.66%. According to the findings of the present study, 93.95% of farmers utilized waterers, 0.93% used an automatic system, and 5.11% used a nipple system. Sri Lankan chickens require a steady supply of cold, clean water to suit their fundamental needs. Water is securely given to chickens via nibble drinkers, water fonts, and self-contained systems, but each has advantages and disadvantages. Open water systems like troughs, cups,

and buckets are ideal for poultry caretakers with the time to clean and monitor (Singh et al., 2020).

Table 3: Husbandry practices

Parameters	Frequency	Percentage (%)
<b>Management</b>		
Full confinement	03	1.40
Semi scavenging	151	70.23
Full scavenging	61	28.37
<b>Supplement Routine</b>		
Daily	106	49.30
Frequently	87	40.50
Occasionally	13	6.02
None	09	4.18
<b>Additional Feed Sources</b>		
Paddy	22	10.23
Rice polish	46	21.39
Kitchen waste	88	40.93
Roots and tubers	18	8.37
Animal proteins	20	9.30
Mixed feed	13	6.04
Azolla	08	3.72
<b>Feeding Methods</b>		
Floor feeding	76	35.34
Tray feeding	16	7.44
Feeder	123	57.20
<b>Water Sources</b>		
Tap water	118	54.88
Well water	97	45.11
<b>Watering method</b>		
Waters	202	93.95
Automatic	2	0.93
Nipple system	11	5.11
<b>Frequency of watering</b>		
Free access	142	66.04
Morning and evening	72	33.48
<b>Type of Housing</b>		
Built with locally available material	69	32.40
Built with durable housing material	46	21.42
House with elevated floor	29	13.50
Located under the shade	34	15.81
Low cost permeant house	37	17.20

A watering trough was present in 92.62% of the cases. 45.3% broken clay material, known locally as "sheila," 35% timber trough, and 11.3% plastic-made trough were the most widely used types of watering method (Yosefe et al., 2018).

The current study found that 56.74% of rural chicken producers utilized broody hens, 31.16% used brooders, 8.83% used basket brooding, and 3.25% used cage

made material. In chick care, providing appropriate nutrition, water, temperature, and protection from predators and illnesses becomes vital. Managing a chick's body temperature is tough since they do not have the skill until they are 3-4 weeks old. Some responses have additionally separated the chicks to avoid huddling and, as a result, mortality (Sharma et al., 2018). Excellent practices are connected with significant increases in providing a warm area, supplemental feed, using Aloe for chicken illness remediation, and lowering chick mortality.

In my study area, many types of dwelling systems were observed which means 30% of poultry farmers kept their birds in cages, which is made using locally available resources. Among the farmers, 19% used both situated under natural shade and constructed with durable housing material, 17% of farmers used a home with a raised floor, and 15% of farmers used a low-cost permanent house. However, a better housing structure can provide the environment required for straightforward chicken management and efficient supervision, which helps to boost output. Of the poultry farmers in the research, 89.57% housed the birds in Kacha houses made from locally accessible materials (Sharma et al., 2018). However, 77.8% of village chicken farmers in Ethiopia managed to maintain birds in a variety of nighttime protecting locations, including nests within the home 45.6%, floor wrapped by bamboo manufactured materials 27.1%, ceilings of the house 3.5%, and under site circumstances sitting spot 1.3% (Moges, et al., 2010). 40.4% of individuals have distinct shelter-made dwellings.

### C. Diseases and poultry production parameters in the study area

Village chicken plays vital role in providing both nutrition and income to households however their production and wellbeing often face challenges due to various diseases and management issues understanding prevent diseases and optimizing production parameters an essential step towards enhancing the productivity and sustainability of village chicken farming.

The most essential management element was disease. The prevalence of diseases in the study area is represented. farmers assessed chicken wellness on a routine basis by evaluating the birds primarily on their external looks, which were certified by veterinary officials from relevant places. Despite the fact that country poultry suffers from lesser epidemics than commercial poultry, disease outbreaks can provide a

significant barrier to Village chicken management. Illness occurrence was identified as a serious worry for free-range village hens, leading to decreased output and significant financial consequences. Throughout the research period, the majority of village chicken mortality were reported. *Coryza* illness infected 62.8% of the farmers. And 47% of Fowl Cholera illness affected birds. Farmers were shown signs of the sickness such as gasping, coughing, and sneezing, diarrhea with wet gray, yellow, or green droppings, lameness and swelling of legs or wings joints, and a change in the color of the comb to red or purple. Newcastle disease was found in 21% of the cases. Nevertheless, various treatment techniques were utilized to treat ill hens, and the sort of conventional treatment methods used by families revealed a substantial difference. Also, many farmers were ignorant of a variety of unusual ailments. Illness, on the other side, are usually the as a result of a mix of variables including husbandry, dietary, environmental, and flock organization.

Table 4. Diseases and poultry production parameters in study area

	Frequency	Percentage (%)
<b>Diseases</b>		
Fowl cholera	101	47
Coryza	135	62.8
Mycotoxycosis	02	0.93
Newcastle Disease	45	21
Lice	01	0.45
Fowl pox	65	30.23
Pullorum	02	0.93
Fowl Typhoid	07	3.26
Coccidiosis	05	2.32
Eye disease	08	3.72
Marek's Disease	12	5.59
Gumboro	24	11.17
<b>Poultry production parameters</b>		
<b>Average/year <math>\pm</math> S.E.M</b>		
No. of birds in the house	102.2 $\pm$ 7.3	
Eggs per hen per clutch	13.10 $\pm$ 2.0	

Egg Production	153.74 $\pm$ 5.33
Hatchability (%)	78.32 $\pm$ 1.36
Mortality (%)	12.25 $\pm$ 1.67

The average amount of birds in the house per producer year was 102.2  $\pm$  7.3 birds, the mean egg per hen per clutch was 13.10  $\pm$  2.0 eggs, the as a whole annualized egg production was 153.74  $\pm$  5.33 eggs, the Village chicken hatchability rate was 78.32  $\pm$  1.36 eggs, and the scope of the study had a mortality rate of 12.25%.

According to (Kingori et al., 2020), Over 76% of Kenya's chickens are Village, and they generate approximately 55% and 47% of the country's total egg and meat production, accordingly. Low productivity due to variety of variables, including husbandry, sickness, insufficient diet, and heredity. It became discovered that supplemental feeding, shelter, and illness management increased growth rate and egg supply.

#### D. Monograph pattern of village chicken

Village chicken populations in Sri Lanka are closely related to Red Jungle Fowl (*Gallus gallus*) and Grey Jungle Fowl (*Gallus gallus*) (*Gallus sonneratii*). According to (Silva et al., 2008). Village chicken in Sri Lanka is a hybrid of many genotypes. The monograph pattern of village chicken refers to a specific breeding strategy aimed at enhancing the genetic diversity and productivity of village chicken breeds within rural areas (Sanjeeva et al., 2011). Through the detailed monographs which are comprehensive studies or reports the farmers gain valuable insights into the characteristics and potential of the local chicken breeds. By understanding unique attributes breeders can implement target breeding programs to the traits of disease tolerance egg production and meat production, ultimately monograph pattern plays a vital role in conserving the genetic resources of village chicken, and contributing to sustainable farming and livelihood in rural areas (Dessie et al., 2011).

In my study area, most of the farmers reared, brown plumage, black plumage, and naked which is 84.17%, 81.86%, and 78.60%. Some of the farmers have fancy birds such as rumpless chicken, booted

bantam, frizzle feathers chicken, and crested crown chicken which is respectively 12.55%,10.69%,12.9%, and 5.58%.

Table 5. Monograph pattern of Village chicken

Monograph pattern	Frequency	Percentage (%)
Black plumage	176	81.86
Brown plumage	181	84.17
Naked neck	169	78.60
Brown and black plumage	94	43.72
Brown and white plumage	87	40.46
White plumage	81	37.67
Golden mix plumage	97	45.11
Long Legged Chicken	98	45.58
Rumpless chicken	27	12.55
Gray/Ash plumage	73	33.95
Multi coloured plumage	62	28.83
Frizzle Feathered	26	12.09
Black chicken	33	15.34
Crested chicken	12	5.58
Booted Bantam	23	10.69
Black and white plumage	29	13.48

#### E. Monthly farm income versus selected parameters

The relationship between monthly farm income and several influential factors among these factors positive correlation is observed with certain key parameters that showed Table 5. firstly the purpose the rearing village chickens emerges as a significant contribution to monthly farm income with a correlation coefficient of 0.745 this suggests that having a clear objective in chicken rearing positively impacts the income similarly the number of chickens shows a strong positive correlation of 0.742 indicating that higher chicken population lead to increased income moreover gender age and chicken management during brooding also show positive correlation with coefficient of 0.732,0.629 and 0.624 respectively these findings emphasize important of effective management practices in optimizing farm income ( $P<0.05$ ).

Additionally, the role of experience and occupation in chicken rearing is highlighted experience shows a notable positive correlation with farm income with a coefficient of 0.594 this suggests that accumulated knowledge and occupation exhibit a positive correlation of 0.592 indicating that certain occupations may be better suited for maximizing farm income these insights Underscore the significant of both experience and their occupation engage the farm income. Effective management practices also emerge as a crucial determinant of farm income the correlation coefficient for the management practices stands at 0.511 indicating a positive relationship between strategic management to enhance the productivity profitability in village chicken farming ( $P<0.05$ ).

Conversely, certain factors show a negative correlation with monthly farm income notable involvement with the veterinary division, water sources, feeding method, and watering method exhibit a negative correlation specifically the veterinary division may not significant impact on farm income. Similarly, the source of water feeding method and watering method show negative correlations of 0.293,0.342, and 0.421 respectively, indicating that certain approaches may hinder income generation. Surprisingly the education level of the farmers does not show a significant correlation with the farm income as indicated by the coefficient of 0.431 these findings suggest that income generation and chicken farming are influenced by formal education level and more by experience and effective management practice ( $P>0.05$ ).

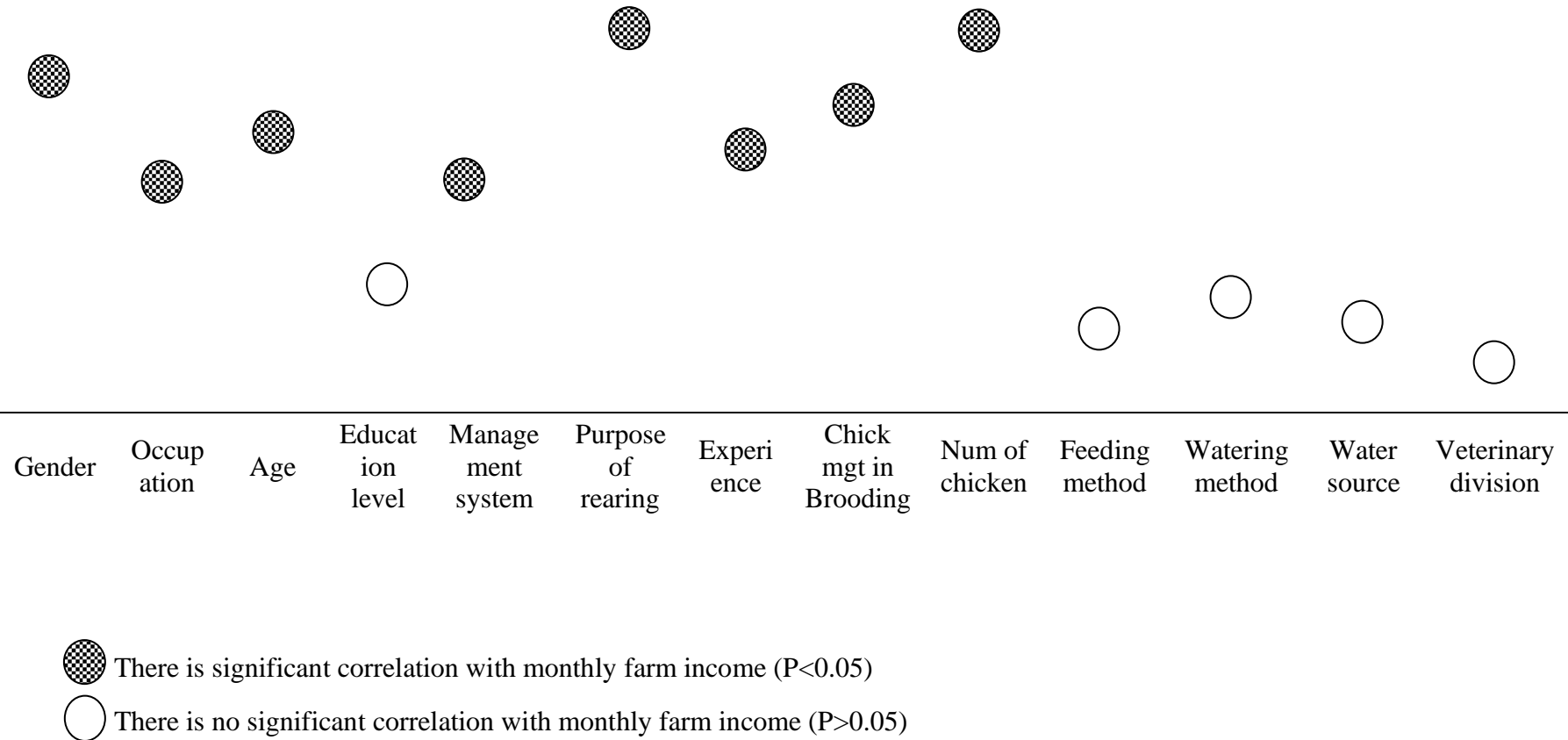


Figure 5. Farm income versus selected parameters

F. Regression model

This equation provides insights into the elements affecting monthly farm income and can aid in predicting and making decisions to enhance farm efficiency. It is represented as  $Y = MX + C$ .

$$Y = 6047.30 - 432.42(\text{gender}) + 361.73(\text{Occupation}) - 576.272(\text{Age}) - 362.94(\text{management system}) - 846.03(\text{Purpose of rearing}) + 54.56(\text{Experience}) - 85.27(\text{chick mgt in Brooding}) + 5503.15(\text{number of chicks})$$

Table 6. Coefficients and regression model along with Monthly farm income

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6047.305	1507.859		4.011	.000
	Gender	-432.416	472.336	-.041	-.915	.361
	Occupation	361.726	287.227	.059	1.259	.209
	Age	-576.272	233.108	-.102	-2.472	.014
	Management system	-362.940	554.737	-.024	-.654	.514
	Purpose of rearing	-846.030	663.567	-.049	-1.275	.204
	Experience	54.553	208.022	.010	.262	.793
	Chick_mgt_Brooding	-85.267	165.628	-.021	-.515	.607
	Number of chicken	5503.149	254.193	.875	21.650	.000

a. Dependent Variable: Monthly farm income

The constant term 6047.30 represents the monthly farm income and each coefficient represents the change in the monthly farm income for a one-unit change in the corresponding independent variable holding all the variables constant for example the coefficient of number of the chicks is 5503.15. In the context of village chicken farming, the multiple linear regression analysis's findings provided various new insights into the variables determining monthly farm income. The number of hens is shown to be a very significant predictor among the independent variables analyzed. A strong positive coefficient indicates that growth in the number of hens results in a significant increase in monthly farm income. Furthermore, age has a negative coefficient, indicating that older people often earn less each month from farming. It's important to remember, though, that this relationship might change depending on additional contextual elements. That for every additional chick influences the monthly farm income.

For example, if they want to increase the farm income they can focus on the factors with positive coefficients that increase the income and try to optimize them while minimizing the impact factor with a negative coefficient.

IV. RECOMMENDATION

Therefore, to achieve successful chicken farming, there must be the best bio-security that should be taken all along the entire production process of raising a country chicken. This includes proper cleaning of cages, control of parasites, and minimizing factors that cause diseases in and between cages. Proper washing, and disinfection significantly minimize the risks of contagious disease outbreaks. Health management is significant for continued general health and productivity, and for avoiding loss during brooding, proper pre-placement measures must be taken. These are matters such as checking feeding systems, the temperature of the floor, the general ventilation.

As for the process of poultry production, it is also crucial to have healthy living conditions. This involves handling of the trash issue in a way that no aspects of it are moist to develop health issues and other aspects of it being dusty and contributing to respiratory issues. Performer can also be enhanced through the control of drink lines, provision of ample quantities of good quality water, and availability of good quality feed. In addition, the regular inspections of the equipment used, as well as the control and regulation of the cage's



environment, that is its temperature, humidity, air exchange, and lighting are important procedures as well. The development of a specific health plan for the entire bird population with a veterinarian's recommendation ensures the health status and productivity of the birds.

## V. CONCLUSION

Village chicken farming in the Batticaloa a district to uplift the livelihoods of poor farmers in the area. It highlights the high egg production rate as a promising avenue for improving the financial situation of rural farmers. The study focuses on various aspects such as farmer management practices, animal efficiency, and financial factors affecting poultry market cooperation and Village chicken farmers. The research aims to provide fundamental knowledge on raising Village chickens in the Batticaloa district. The study explored the relationship between monthly farm income and various factors in village chicken farming positive correlations were found with factors such as clear objective in chicken rearing, the number of chickens, experience, and occupation .effective management practice were highlighted as crucial conversely involvement with the veterinary division certain water sources feeding method and watering method showing negative correlation. The study indicates that monthly farm income, influenced by factors such as gender, farmer experience and management system, and the purpose and age of the chickens, plays a crucial role in Village chicken proliferation. It suggests that improved management techniques and an effective reproduction system could reduce death rates and healthcare practices in rural chicken farming. Overall, the research aims to distinguish the attributes of Village chicken farm management and provide valuable insights for poultry farmers and researchers in the Batticaloa region.

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