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Research Article

Livelihood Improvement of Broiler Farmers in Bhaluka of Mymensingh District, Bangladesh

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ABSTRACT

This study attempted to explore the impact of broiler farming on livelihood improvement of the selected broiler farmers of Bhaluka upazila (sub-district) under Mymensingh district by analyzing factors influencing key indicators of livelihood change like food availability, household conditions, physical assets, sanitation, and income. A total of 60 randomly selected broiler farmers was considered for the sample of this study, from whom data were collected using a structured questionnaire by a face-to-face interview from October to November 2022. The paired sample t-test and total livelihood score were considered for overall livelihood change. The findings underscore significant positive changes in livelihood dimensions following broiler farming adoption. It was found that the mean of the overall livelihood scores before (13.55) and after (18.02) situation reveals the improvement of livelihood status, which is further supported by the significant t-value (18.626). There was notable improvement in food availability, upgraded household conditions, increased physical assets, enhanced sanitation, and elevated income levels. Despite these positive outcomes, the study highlighted persistent challenges, particularly in disease outbreaks and high input costs. In addition to recognizing and resolving current issues, it highlighted how broiler farming may improve a variety of livelihoods in Bangladesh. Through shedding light on both successful outcomes and enduring challenges, the study helped shape strategies for promoting rural development and sustainable farming methods in the context of broiler farming.

Introduction

The economic structure of Bangladesh predominantly relies on agriculture and its associated activities (Rahman, 2017). As per the Livestock Economy report for the fiscal year 2022-23, the livestock sector contributes 1.85% to the Gross Domestic Product (GDP), with a share of 16.52% in the overall agricultural output (Rabbani, 2021). Noteworthy among these agricultural pursuits is the burgeoning small-scale broiler farming, which has demonstrated its viability and made substantial contributions to Bangladesh's economy. This sector assumes a pivotal role in enhancing livelihoods, ensuring food security, and alleviating poverty in rural and semi-urban areas of developing nations, including Bangladesh (Saleque, 2017). The contemporary landscape witnessed broiler production evolving into a specialized and expeditious enterprise, attributed to its short life cycle and relatively low capital requirements (Mozumdar et al., 2009).

The popularity of broilers among farmers can be linked to their short life cycle and comparatively low capital requirements (Etuah et al., 2020). Broiler farming has experienced significant growth in the last two decades due to increased income, population growth, and urbanization. Bangladesh, for instance, is experiencing a surge in demand for broiler meat, as poultry products are the primary animal protein source (Badol, 2019). Consequently, the proliferation of poultry farms, particularly in the broiler farming sector, has become a significant aspect of meat production and consumption in the country.

Broiler farming in Bangladesh manifests in two primary categories: independent farming and contract farming. While integrators dominate the broiler industry in countries like India, Thailand, and the Philippines, the growth of contract farming in Bangladesh has been less satisfactory and is currently under trial (Ali, 2016).

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Independent farming, therefore, remains dominant, contributing significantly to the development of the broiler sector as a lucrative venture. The majority of farmers in rural regions that raise small broilers employ family labor as opposed to hired labor (Rabbani and Ahmad, 2021). Small-scale farmers are those who employ family labor and make the most of their backyard or neighboring acreage in order to increase agricultural income. Small-scale farms located in rural areas in Bangladesh produce the majority of the country's broiler meat. In the rural economy, it is essential. (Kawsar et al., 2013). There are certain instances where the socioeconomic circumstances of the broiler raisers have significantly changed. According to a study report on the impact of the Smallholder Livestock Development Project (SLDP) on rural communities in various rural areas of Bangladesh, the program's intervention significantly improved the beneficiaries' overall socioeconomic condition, their ability to consume meat, their ability to participate in decision-making processes, and their access to employment opportunities (Mozumdar et al., 2009). According to a different study, broiler farming in Bangladesh's rural areas strengthened women's empowerment, enhanced socioeconomic conditions, and gave job chances for unemployed family members (Mehedi et al., 2020). Numerous studies have highlighted the nutritional importance of broiler meat as a source of high-quality protein and micronutrients, with implications for rural communities' health and nutrition (Luo et al., 2018).

Because of this, broiler farming has been essential in producing meat to combat malnutrition and acting as a means of creating jobs and reducing poverty (Kabir et al., 2015). Despite these positive aspects, challenges persist within the broiler farming sector, such as disease prevalence, irregular provision of credit, and inadequacies in various inputs and services. Notwithstanding these challenges, the private sector, particularly small farmers relying on self-financing, exclusively oversees broiler farming in Bangladesh, offering a substantial scope for industry development (Hennessey et al., 2021).

Against this backdrop, the present study aims to comprehensively assess the impact of broiler farming on livelihood improvement, while concurrently identifying and analyzing the problems that broiler farm holders face.

Methodology

Study location

Four villages in the Bhaluka upazila (sub-district) of the Mymensingh district-—Kharuali, Ashka, Miraka, and Kathali—were the study's locations (Figure 1).

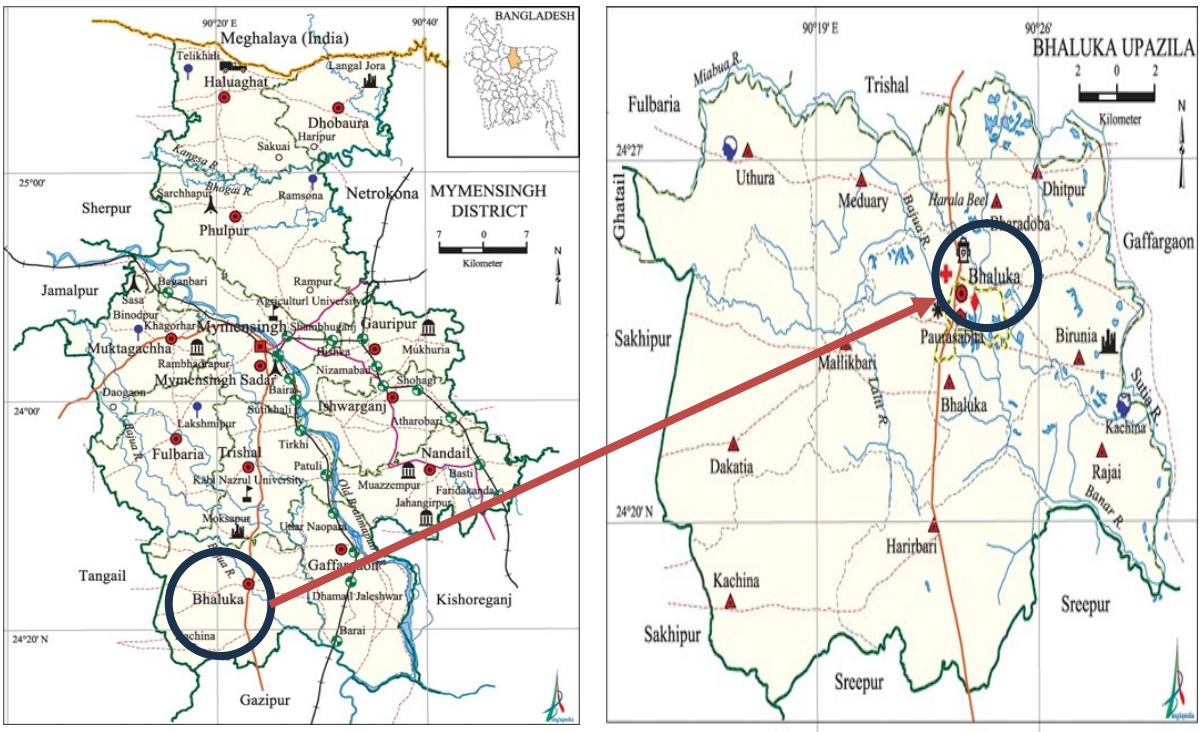

Figure 1. Map of Mymensingh district and Bhaluka upazila (sub-district) showing the study areas

These four villages were purposively selected because broiler farming is much more frequent in these areas than other areas of Bhaluka upazila (sub-district). The Upazila Livestock Officer (ULO) and other pertinent Bhaluka upazila (sub-district) officials provided ideas that were used to make the decision. The primary criterion for selecting the study area was suitable coverage for broiler farming activities. At first, primary information was collected from Bhaluka upazila livestock officer regarding the farming activities and concentration of broiler activities in the study area.

Population and sampling

An updated list of all the broiler farmers of the selected four villages (Kharuali, Ashka, Miraka and Kathali) was prepared with the help of the concerned field Assistant. The total number of broiler farmers in 4 villages (119) was considered as the population for this study. Using a table of random numbers, 50% of the broiler farmers in each of the four villages were chosen as sample. Thus, a total of sixty (60) broiler farmers were chosen to make up the study's sample. Table 1 shows the distribution of broiler farmers' population and sample size considered for this study.

Table 1. Distribution of the sampling population and sample size of broiler farmers

Name of the Upazila (sub-district)	Name of the villages	Number of the respondents	
		Sampling population	Sample size
Bhaluka	Kharuali	42	20
	Ashka	30	15
	Miraka	22	11
	Kathali	25	14
	Total	119	60

Data collection

For gathering primary data, a structured questionnaire-based survey, interviews, and Focus Group Discussions were conducted from October to November 2022. Secondary data was sourced from publications and unpublished theses. The researcher established rapport with respondents to ensure a comfortable environment where they feel free and frank while answering the questions.

Measurement of livelihood improvement

A farmer's ability to make a living was assessed by looking at how much their participation in broiler farming activities changed five specific parameters. The dimensions that were chosen have the following measurements.

i. *Change in food availability*: This is one measure of a person's level of food security. This is a measurement of how many calories or nutrients from food a person consumes in a specific amount of time, usually in 24 hours (Hoddinott, 2001). A list of 7 selected food items was included in the interview schedule to measure this variable. Each farmer was asked to mention the amount of each food item in grams he consumed during the last 24 hours. The amount of food intake was converted into food energy (kilo calorie) using the calorie chart shown in Table 2. The total food energy of a farmers was obtained by summing kilo calories for all the selected food items.

Table 2. Energy contents of some selected items of food

Food items (100 g)	Energy (K cal)
Rice	364
Wheat	341
Vegetables	35.75
Pulse	338
Fish	89
Milk	61
Egg	158

Source: FAO (1997).

The household income and expenditure survey in Table 3 is used to categorize the broiler farmers' poverty level into three groups based on intake kilocalories (Kcal) (Sheheli et al., 2014).

Table 3. Poverty level of household according to calorie intake

Categories	Kilocalories (K cal)
Below poverty line II (Hard core poverty)	Up to 1805 K cal
Below poverty line I (Hard core poverty)	1806-2122 K cal
Upper poverty line I	More than 2122 K cal

ii. *Change in household condition*: It refers to the type of household condition of the beneficiaries before and after involvement with broiler farming. For determining the respondents' household condition, 4 possible types of households such as no availability, tin, half building and building were considered. These responses were scored as: 0 for no availability, 1 for tin, 2 for half building, and 3 for building. The change in household conditions was measured based on the condition of the household score of the farmers before and after involvement in broiler farming.

iii. *Change in physical assets*: It describes the state of the farmer's household's material possessions both before and after they started raising broilers. Following the method of Das (2014), 15 items were used to ascertain the assets owned by the farmer household. Every farmer was asked to list how many of the fifteen goods they possessed. The weight of each item is determined by its cost. For example, a farmer having 1 table could get a score of 1. All the specific items of assets under possession were converted into physical asset scores of the farmers. The change of physical assets was measured based on the physical asset score of the farmers between before and after involvement in broiler farming. As seen in Table 4, the average price served as the basis for calculating each asset's possession score (Sheheli et al., 2014).

Table 4. Household asset of the farmers

SL. No.	Items of assets	Unit score
1	Chair	1
2	Bench	1
3	Table	2
4	Chowki	2
5	Khat	3
6	Almira	4
7	Wall clock	1
8	Radio	2
9	TV	3
10	Sewing machine	3
11	Showcase	4
12	Poultry	3
13	Sheep	3
14	Goat	3
15	Cattle	5
Total		40

iv. *Change in sanitation*: It was an allusion to the kind of toilets the farmers had before and after they began producing broilers. Each farmer was asked to indicate whether his toilet facilities like open place or bush, katcha and sanitary latrine. These responses were scored as: 1 for open place or bush, 2 for katcha latrine and 3 for sanitary latrine. Based on the farmers' scores for bathroom conditions both before and after they became involved in broiler farming, the change in latrine conditions was calculated.

v. *Change in income*: The total annual income of a beneficiary's family, including himself and other family members from broiler farming and other agricultural pursuits like crop production, livestock, fish farming, etc., or non-agricultural pursuits like business, labour sales, cottage industry, etc., was used to calculate the beneficiary's family income in taka. There were two stages to the process of calculating income from broiler farming or other sources. First, the income earned from raising broilers was mentioned. Second, family members' projected income from other sources (agricultural, waged labour, services, and business) was also included. The total family income was calculated by adding the various sources of income. The family income score was calculated using the total earnings in Taka. Each thousand Taka was worth a single score. The difference between a farmer family's pre- and post-involvement in broiler farming was used to calculate the income change.

Overall Livelihood Score

Raw data were collected in two forms 'before" and 'after' involvement in broiler farming against each indicator of livelihood popularly known as livelihood outcomes. There was score range against each outcome. The raw livelihood outcome score was converted into a unified score to determine total livelihood score. To achieve the purpose, the observed score of each outcome was categorized into four categories: very low, low, medium and high, which were converted into numerical weightages such as 1, 2, 3, and 4, respectively. The overall livelihood score was then calculated by adding the allotted scores for each outcome. Several categories were created for the broiler farmers based on their overall livelihood rankings (Table 5).

The raw score of livelihood outcomes was converted into a unified score in the following ways- Food availability less than<1790k. cal (very low), below poverty line II (low), below poverty line I (medium) and upper poverty line (High) which scored 10, 20, 30 and 40, respectively (Sheheli et al., 2014). Changes in household conditions like no availability, tin made (low), half building (medium) and building (high) were assigned scored of 1, 2, 3 and 4, correspondingly.

Another scoring for change in sanitation no latrine (very low), bushes (low), katcha (medium), and sanitary latrine (high) was 1, 2, 3 and 4, respectively. The score against change in income 1 for each thousand of taka per year and change in physical assets score. The raw score of the selected livelihood outcomes was converted into a unified score to determine the total livelihood score in the following way.

Table 5. Overall livelihood scores of farmers

Serial No.	Livelihood outcomes	Possible range	Converted score range	Score
1.	Change in food Availability	10-40	Very low (0-10)	1
			Low (11-20)	2
			Medium (21-30)	3
			High (31-40)	4
2.	Change in household condition	1-3	Very low (0)	1
			Low (1)	2
			Medium (2)	3
			High (3)	4
3.	Change in physical assets	1-40	Very low (1-15)	1
			Low (>15-20)	2
			Medium (>20-30	3
			High (>30-40)	4
4.	Change in sanitation	1-3	Very low (0)	1
			Low (1)	2
			Medium (2)	3
			High (3)	4
5.	Change in income	Unknown	Very low (10-20)	1
			Low (>20-50)	2
			Medium (>50-150)	3
			High (above 150)	4

Rokanuzzaman (2004)

Total livelihood score of a farmer was obtained by adding this converted score in all five livelihood outcomes. Thus, total livelihood score of a farmer could range from 5 to 20 considering five livelihood outcomes from the responses like very low (1) to high (4) where five indicating very low livelihood status while 20 indicating high livelihood status.

Measurement of Problem Confrontation

By creating ten problematic assertions based on Participatory Rural Appraisal (PRA), the issues facing broiler farmers were quantified. Scores like 3, 2, 1, and 0 were assigned based on the seriousness of the problems like high, medium, low, and not at all, respectively and presented in Table 6. Each farmer's total problem confrontation score was calculated by summing the scores for all ten statements. As a result, a possible score could range from 0 to 30, where 0 denotes no problem and 30 denotes high problem.

Table 6. Category of problem and assigned score

Category of problems	Score
High	3
Medium	2
Low	1
Not at all	0

Problem faced index was computed using the following formula:

$PFI = (P_h \times 3) + (P_m \times 2) + (P_1 \times 1) + (P_n \times 0)$

Where,

P_h = Percentage of farmers with “high problem”

P_m= Percentage of farmers with “medium problem”

P1 = Percentage of farmers with “low problem”

P_n = Percentage of farmers with “not at all problem”

Here the range for the Problem Faced Index (PFI) could range from 0 to 180 where ‘0’ indicating no problem and ‘180’ indicating highest level of problem.

Results and Discussion

Socioeconomic characteristics of the broiler farmers

Table 7's data showed the salient features of the selected characteristics of the broiler farmers where the largest percentage (56.67%) were young, followed by middle-aged farmers (31.66%) and elderly farmers (11.67%). Younger and middle-aged people are thought to be more engaged, passionate, and active in broiler farming activities. It was also discovered that the largest percentage of respondents (46.66%) had completed secondary education, whilst 11.67% were illiterate, 30% had completed primary school, and 11.67% had completed higher secondary education or above. According to Table 7, the majority of farmers (60%) belonged to the medium family category, while 28.33% had small families and the remaining 11.67% had large families.

Table 7's results revealed that while 16.67% of broiler farmers had small farms, and 30% had large farms, the majority of farmers (53.33%) had medium-sized farms. The findings also showed that the largest portion of broiler farmers (43.34%) had medium experience in the broiler farm, followed by high experience (28.33%), low experience (23.33%), and primary experience (5%).

Table 7. Salient features of the selected characteristics of the broiler farmers

Characteristics	Scoring system	Range		Farmers (N=60)			Mean	SD*
		Possible	Observed	Category	No	%		
Age	Actual year	Unknown	21-55	Young age (18-35)	34	56.67	37.00	8.776
				Middle age (36-50)	19	31.66		
				Old age (>50)	7	11.67		
Education	Years of schooling	Unknown	0-13	Illiterate (0)	7	11.67	6.63	3.556
				Primary (1-5)	18	30		
				Secondary (6-10)	28	46.66		
				Higher secondary to above	7	11.67		
Family size	No of members	Unknown	2-13	Small (2 to 4)	17	28.33	5.50	1.961
				Medium (5-6)	36	60		
				Larger (>6)	7	11.67		
Farm size	Capacity of birds	Unknown	1-3	Small scale farm (100-500)	10	16.67	2.13	0.676
				Medium scale farm (501-1500)	32	53.33		
				Large scale farm (>1500 bird)	18	30		
Broiler farming experience	Years	Unknown	0-20	Primary experience (0.6-1)	3	5	5.97	4.388
				Low experience (>1-3)	14	23.33		
				Medium experience (>3-6)	26	43.34		
				High experience (>6 year)	17	28.33		
Training received	Days	Unknown	0-7	No training (0)	26	43.34	1.62	2.179
				Low training (1-2)	22	36.66		
				Medium training (3-6)	7	11.67		
				High training (>6)	5	8.33		
Credit received	Thousand tk. per year	Unknown	0-600	No credit (0)	34	56.67	79.75	140.960
				Small (up to 50)	7	11.67		
				Medium (51-150)	9	15		
				High (>150)	10	16.66		
Extension contacts	Scale score	0-24	0-17	Low (up to 8)	40	66.67	5.92	4.844
				Medium (9-16)	16	26.66		
				High (>16-24)	4	6.67		

Note: SD indicates Standard deviation.*

According to the data in Table 7, the largest percentage of farmers (43.34%) had no training at all, followed by 11.67% with medium training, 36.66% with low training, and just 8.33% with high training. Farmers that receive training are better able to improve the methods used in their broiler farming operations. The study discovered that people either had little or no training since they typically do not obtain adequate instruction. The data

also showed that the majority of broiler farmers (56.67%) came into the category of no credit received, followed by 15% in the area of medium credit received, 16.66% in the category of high credit received, and 11.67% in the category of small credit received. According to unofficial discussions, broiler farmers were given credit by a variety of financial institutions, including banks, non-profits, friends, youth development departments and village moneylenders. In conclusion, Table 7 revealed that the largest percentage of participants, 66.67%, had low extension contact, while 26.66% had medium extension contact and 6.67% had high extension contact.

Dimensions of Livelihood of Broiler Farmers and Their Contribution towards Livelihood Improvement

The broiler farmers' involvement in the industry has been essential in transforming their socioeconomic standing. The socioeconomic state of the broiler farmer previous to joining activities was compared with the current circumstances in order to measure changes in their livelihood status. A few of those changes are attempted to discuss in this section, with a focus on broiler farming. By analyzing data regarding previous and current changes in food availability, household conditions, physical assets, sanitation, and income of broiler farmers, one can determine the socioeconomic status of these farmers.

i. Change in food availability

The investigation reveals a significant elevation in per capita daily calorie intake among farmers after they participate in broiler farming. A discernible improvement is noted from the baseline to post-engagement, as illustrated in Table 8. Farmers were categorized into distinct groups using the food consumption score. An improvement in nutritious intake is highlighted by the comparison of energy consumption before and after engaging in broiler farming. The initial distribution among farmers in the below-poverty line II, below-poverty line I, and upper-poverty line categories is shown in Table 8. Post-engagement in broiler farming, a noticeable shift in these proportions is evident from Table 8. This transformation is associated with a significant rise in income and overall calorie intake. These findings collectively suggest an improved food consumption pattern attributed to farmers' engagement in broiler farming. Sheheli et al. (2014) reported similar findings in their study on improvement of livelihood through fish farming in Haor areas of Bangladesh.

Table 8. Classification of the farmers according to their food availability

Categories	Number of the farmers		Percentage of the farmers		Average (K cal)	
	Before	After	Before	After	Before	After
Below poverty line II (up to 1805 K. cal)	6	3	10	5		
Below poverty line I (1806-2122 K. cal)	52	4	86.67	6.67	1922.15	2239.57
Upper poverty line (>2122 K. cal)	2	53	3.33	88.33		

ii. Change in household condition

The alteration in household structures among farmers before and after engaging in broiler farming is detailed in Table 9. It outlines the distribution of various types of households within the surveyed farmers. Preceding their involvement in broiler farming, the predominant housing arrangement comprised tin-made houses for the majority, while a notable percentage resided in half-building structures and a minority in entirely constructed buildings. There has been a noticeable change since the start of broiler farming, with a larger percentage of farmer families now living in half-buildings, followed by those in fully constructed buildings, and a lower percentage in tin-made homes. This shift indicates an enhancement in living conditions attributable to participation in broiler farming.

Table 9. Classification of the farmers according to their household condition

Categories	Number of the farmers		Percentage of the farmers		Average (score)	
	Before	After	Before	After	Before	After
Tin (score 1)	38	1	63.33	1.66		
Half building (Score 2)	21	38	35	63.33	1.383	2.333
Building (Score 3)	1	21	1.66	35		

Table 10. Classification of the farmers according to their physical assets

Categories	Number of the farmers		Percentage of the farmers		Average (score)	
	Before	After	Before	After	Before	After
Low asset possession (up to 20)	18	0	30	0		
Medium asset possession (21-30)	36	7	60	11.67	24.11	31.7
Highest asset possession (31-40)	6	53	10	88.33		

iii. Change in physical assets

Table 10 displays the results of the farmers' physical assets score both before and after they became involved in broiler farming.

According to Table 10, eighteen farmer families had low asset ownership prior to participating in broiler farming, sixty percent of families had medium asset possession, and ten percent of families had the highest asset possession. Following their engagement in broiler farming, 11.67% of farmer families possessed medium-sized assets, 88.33% of families had the largest-sized assets, and none had low-sized assets. Because the farmer family participates in broiler farming, their asset possession score went to 31.7 from 24.11, which is higher than the typical family asset score. The substantial shift in asset ownership is undoubtedly improving the broiler farmers' standard of living.

iv. Change in sanitation

Change in sanitation of the farmers before and after involvement with broiler farming has been shown in Table 11.

Table 11. Classification of the farmers according to their sanitation

Categories	Number of the farmers		Percentage of the farmers		Average (score)	
	Before	After	Before	After	Before	After
Bushes or open place (score 1)	32	2	53.33	3.33		
Katcha latrine (score 2)	27	24	45	46.67	1.483	2.4667
Sanitary latrine (score 3)	1	30	1.67	50		

According to Table 11, 53.33% of farmer families used bushes or open spaces before to starting a broiler farm, 45% used katcha latrines, and 1.67% used sanitary latrines. Following their involvement in broiler farming, 46.67% of farmer families used katcha latrines, 50% utilized sanitary latrines and 33.33% used buses or open areas. An increase in the percentage of farmers using sanitary latrines indicates that beneficiaries' knowledge of health and sanitation is growing. Additionally, it shows improved sanitation conditions brought on by broiler farming activity.

v. Change in income

Table 12 displays the farmers' income changes both before and after they involved in broiler farming.

Table 12. Classification of the farmers according to their income

Categories	Number of the farmers		Percentage of the farmers		Average (Thousand Tk. Per year)	
	Before	After	Before	After	Before	After
Low income (up to Tk 50000)	7	0	11.67	0		
Medium income (Tk 50001-150000)	49	20	81.67	33.33	104.67	205.58
High income (>150000)	4	40	6.67	66.67		

As can be seen from Table 12 above, the average annual income rose from TK. 104.67 thousand to TK. 205.58 thousand. Prior to engaging in broiler farming, 11.67% of farmers had low income, 81.67% had medium income, and 6.67% had high income. Following their entry into the broiler farming industry, none of the

farmers had poor income, 33.3% had medium income, and 66.67% had high income.

vi. Comparative Change Pattern in terms of 'Before' and 'After' Involvement in broiler farming Activities

This section delineates discernible patterns of change in key aspects—food availability, household conditions, physical assets, sanitation, and income—resulting from farmers' engagement in broiler farming activities. The relevant findings are presented in Table 13 for comprehensive reference.

Table 13. Comparative change status in terms of 'before' and 'after' involvement in broiler farming activities

Sl. No.	Dimensions of poverty	Mean		Observed t-value with 1 df
		Before	After	
1	Food availability (K cal)	1922.15	2239.57	9.516*
2	Household condition (score)	1.38	2.33	1.0444*
3	Physical asset (score)	24.12	31.70	15.300*
4	Sanitation (score)	1.483	2.47	10.594*
5	Income (Thousand Tk. Per year)	104.67	205.58	1.0379*

Food availability

The study reveals an increase in farmers' average energy intake before and after their involvement in broiler farming. The associated Table underscores a noticeable improvement in caloric intake, suggesting enhanced dietary habits attributable to broiler farming. The statistical analysis, as presented in Table 13, manifests a significant change, affirming an improvement in food consumption. Broiler farming can enhance dietary intake, improving health outcomes and quality of life for farmers and their families. This shift is driven by economic empowerment, allowing farmers to afford a diverse, nutritious diet, thus enhancing their standard of living.

Household condition

The positive transformation in the household condition of farmers before and after their involvement in broiler farming signifies an improvement in the overall quality of living. This observed shift, indicative of enhanced well-being, is substantiated by a thorough statistical assessment detailed in Table 13. Broiler farming offers economic benefits, boosting community resilience, social dynamics, and pride, potentially leading to improved housing, amenities, and living conditions.

Physical asset

The examination of physical assets underscores a significant augmentation in the average family asset score consequent to farmers' involvement in broiler farming. This enhancement is substantiated by a detailed statistical analysis presented in Table 13.

Broiler farming positively impacts asset possession through increased income streams, diversification of economic activities, and improved financial stability. Farmers accumulate assets like agricultural equipment and housing, contributing to individual households' economic well-being and community development, and acting as a buffer during economic shocks.

Sanitation

The observed positive change in the sanitation score of farmers' families following their engagement in broiler farming activities is noteworthy and substantiated by the calculated t-value presented in Table 13.

The improvement in hygiene practices in farming households may lead to health benefits and improved quality of life. This is likely due to increased income from broiler farming, which allows families to invest in sanitation infrastructure and education.

Income

The discerned substantial rise in average family income, attributed to engaging in broiler farming activities, carries significant implications and underscores the economic advantages of such agricultural pursuits. The statistical analysis, as meticulously outlined in Table 13, serves as a robust empirical foundation.

Broiler product sales generate revenue, boosting farming households' financial standing and enabling informed choices in healthcare, education, and overall well-being.

Change in Overall Livelihood Status of Broiler Farmers under Study Area

Table 14 indicate that considering before involvement in broiler farming, overall livelihood score range of the farmers varied from 10-20 with an average 13.55 against the possible score 5-20. Not a single person was found in the category very low of livelihood status. Majority (81.66%) of the farmers belongs to low

livelihood status category followed by 16.66% and only 1.66% of the farmers belonged to medium and high livelihood status categories, respectively. After involvement in broiler farming overall livelihood score range was found to vary from 14 to 20 with an average 18.02 against the same possible score range like before. There was no farmer belonged to vary low category after involvement in broiler farming similar to before. The majority of farmers (56.66%) fell into the medium category, followed by those who belonged to the high and low categories, which were 1.66% and 41.66%, respectively.

Table 14. Change in overall livelihood status of the farmers involved in the broiler farming.

Categories according to livelihood status of the farmers	Percentage of the farmers		Mean and Standard deviation		T value with 1 df
	Before	After	Before	After	
Very low status (5-9)	0	0	13.55	18.02	18.626
Low status (10-14)	81.66	1.66			
Medium status (15-18)	16.66	56.66			
High (>18-20)	1.66	41.66			
Total	100	100			

Table 14 indicates that overall livelihood of broiler farmers under the study area has improved due to involvement in broiler farming. The mean of the overall livelihood score before and after situation reveals the improvement of livelihood status, which is further supported by the significant t-value (18.626). Similar findings were reported by Mozumdar et al. (2009) in their study concerning about broiler farming which is termed as an approach to improve rural livelihood. Similar findings were also reported by Akter et al. (2023) in their study of livelihood changes of rural women due to working in the fish processing industry.

Overall Problems Faced by the Broiler Farmers

Despite Bangladesh's increasing potential for broiler farming, there are still issues that farmers face in this field. Typically, broiler farmers deal with a variety of issues. Table 15 shows that the broiler farmers' overall problems varied from 0 to 30, with a mean of 16.5 and a standard deviation of 1.702. The farmers were categorized into three groups—low, medium, and high—based on their score.

Table 15. Distribution of broiler farmers according to their overall problems

Categories of respondents	No. of respondents	Percentage of respondents	Mean	Standard deviation
Low problem (up to 10)	0	0	16.5	1.702
Medium problem (11-15)	19	31.67		
High problem (15-30)	41	68.33		

According to the research, over 68.33% of farmers experienced high broiler farming problems, compared to 31.67% and 0% who had medium and low problems, respectively. This suggests that if the various issues that farmers confront are not resolved in any way, broiler farming will not reach the intended level. Poojitha (2018) conducted a study on problems faced by contract broiler poultry farmers where the researcher found high level of problems faced by the broiler farmers while raising broilers.

Problems Faced by Broiler Farmers in Broiler Farming Activities

The majority of farmers in the research area cited broiler disease problems as their main concern when it came to raising broilers (Table 16). Ali et al. (2015) reported similar findings as broiler diseases were the major concern for the farmers in the study area. A significant proportion of farmers stated that the second issue they were facing was the high cost of feed and day-old chick (doc). Similar findings were reported by Islam et al. (2016) at the villages of Khulna district of Bangladesh. The third issue facing broiler growers was the high cost of vaccines and medications. Due to insufficient information and expertise regarding the administration of feed and vaccines that affect the development rate and health condition of birds, broiler farmers in the research area were unable to achieve the projected growth in their flocks. Similar findings were reported by Cervantes (2015).

Table 16. Problems faced by the broiler farmers while participating in broiler farming activities

Problems	Level of problems				PFI	Rank order
	High	Medium	Low	Not at all		
Problem of site selection	0	4	31	25	39	10
Unavailability of quality feed and doc (day old chick)	12	23	21	4	103	5
Lack of knowledge on species selection	0	26	24	0	76	6
Lack of knowledge on application of broiler feed and vaccination	1	47	12	0	109	4
High cost of vaccine and medicine	20	33	7	0	133	**3**
High cost of feed and day-old chick (doc)	48	12	0	0	168	**2**
Broiler disease problem	51	9	0	0	171	**1**
Lack of marketing facilities	0	25	19	16	69	7
Unavailability of extension service	3	12	34	11	67	8
Lack of financial problem	1	10	33	16	56	9

In our study area, broiler farmers could not earn expectedly due to lack of marketing facilities. They did not have the accessibility to the distant market place for selling of farm produce. Unavailability of extension services rank as eighth position. As a beginner of broiler farming farmers needs stable financial support. The broiler farmers, in the study area, got financial support from different NGOs, banks and their relatives but they did not get according to their needs. They could not utilize the money for their expected activities. So that, it was ranked as ninth problem and site selection rank as tenth problem in the study area.

Conclusion and Recommendations

The livelihood circumstances of farmers before and after they began raising broilers were compared in this study. Food availability, household condition, physical assets, sanitation, and income were the five main areas of attention for the inquiry. Mean values for every component of livelihood that was taken into consideration showed statistically significant differences between the two periods. As a result, it is clear that engaging in broiler farming has improved the farmers' ability to generate earnings from a variety of sources and drastically altered their living conditions. Although raising broilers has the potential to improve livelihoods, a significant percentage of broiler farmers faced moderate to severe problems. The prevalence of broiler diseases, the high cost of feed and day-old chicks, and the high cost of vaccines and medicines were the three main problems that stood out.

The recommendations made for broiler farming include investigating ways to ease financial strains through reasonably priced feed and vaccines, as well as collaborating with governmental and non-governmental organisations to strengthen market ties and promote innovation and research in order to improve farmers' livelihoods.

References

Akter, S., Rahman, M. Z., Rahman, S., Akter, S., & Uddin, M. N. (2023). Livelihood changes of rural women due to working in the fish processing industry. *Journal of the Bangladesh Agricultural University, 21*(1), 96-108.

Ali, M. (2016). Intervention of Bio-Security in Broiler Farming of Bangladesh (Doctoral dissertation, University of Rajshahi).

Ali, Y., Jahan, S., Islam, A., & Islam, M. A. (2015). Impact of socio-economic factors on production performance of small and medium size broiler farming in Bangladesh. *Journal of New Sciences*, 15.

Badol, J. R. (2019). Benefits of Poultry farming (Broiler and Commercial Layer) in Bangladesh. *Global Animal Nutrition Network*, 27-33.

Cervantes, H. M. (2015). Antibiotic-free poultry production: is it sustainable? *Journal of Applied Poultry Research*, 24(1): 91-97.

Das, A. K. (2014). Improving livelihood of fish farmers through fish farming in Tarail Upazila under Kishoreganj District, MS Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Etuah, S., Ohene-Yankyera, K., Liu, Z., Mensah, J. O., & Lan, J. (2020). Determinants of cost inefficiency in poultry production: Evidence from small-scale broiler farms in the Ashanti region of Ghana. *Tropical animal health and production*, 52: 1149-1159.

FAO. (1997). National aquaculture sector overview. FAO, USA.

Hennessey, M., Fournié, G., Hoque, M. A., Biswas, P. K., Alarcon, P., Ebata, A., ... & Barnett, T. (2021). Intensification of fragility: Poultry production and distribution in Bangladesh and its implications for disease risk. *Preventive Veterinary Medicine*, 191: 105367.

Hoddinott, J. (2001). Food Security In Practice: Methods for Rural Development Project, Internationally Policy Research Institute, Washington DC.

Islam, F., Akther, B., Khatun, A., Harun-Or-Rashid, M., & Hossain, M. S. (2016). Profitable broiler farming at the villages of Khulna district in Bangladesh. *Journal of Bioscience and Agriculture Research*, 8(01): 678-684.

Kabir, M. S., Asaduzzaman, M., & Dev, D. S. (2015). Livelihood improvement through family poultry farming in Mymensingh district. *Journal of the Bangladesh Agricultural University*, 13(2): 247-256.

Kawsar, M. H., Chowdhury, S. D., Raha, S. K., & Hossain, M. M. (2013). An analysis of factors affecting the profitability of small-scale

broiler farming in Bangladesh. *World's Poultry Science Journal,* 69(3): 676-686.

Luo, J., Taylor, C., Nebl, T., Ng, K., & Bennett, L. E. (2018). Effects of macro-nutrient, micro-nutrient composition and cooking conditions on in vitro digestibility of meat and aquatic dietary proteins. *Food Chemistry*, 254: 292-301.

Mehedi, H., Shajahan, K., & Abdul, K. (2020). Enhancing Resilience through Women Empowerment and Livestock Production in Selected Areas of Satkhira District of Bangladesh. *Journal of Entrepreneurship and Business Resilience*, 3(2): 53-72.

Mozumdar, L., Farid, K. S., Ahmed, J. U., & Rahman, M. W. (2009). Broiler farming: An approach to improve rural livelihood. *Journal of the Bangladesh Agricultural University,* 7(2): 395-402.

Poojitha, S. (2018). A study on problems faced by contract broiler poultry farmers. *International Journal of Research in Humanities*, 6, 111-116.

Rabbani, G., & Ahmad, B. (2021). Production and profitability of small-scale broiler farming in selected areas of Dinajpur district, Bangladesh. *International Journal of Agricultural Research, Innovation and Technology (IJARIT),* 11(1): 69-73.

Rahman, M. T. (2017). Role of agriculture in Bangladesh economy: uncovering the problems and challenges. *International Journal of Business and Management Invention*, 6(7).

Rokanuzzaman, M. (2004). Impact of Community Based Fisheries Management Project on Livelihoods of a Fishing Community in a Haor Area of Sunamganj District, MS thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Saleque, M. A. (2017). Livelihood Enhancement through Agricultural Development (LEAD) project of BRAC–An innovative model for improving livelihood of smallholder farmers. BRAC International, Tanzania.

Sheheli, S., Sarker, M. A., Dev, D. S., & Das, A. K. (2014). Improvement of livelihood through fish farming in Haor areas of Bangladesh. *Bangladesh Journal of Extension Education*, 26(1&2): 77-84.