



A Comparative study between the Profitability of Vegetable Cultivation and Poultry Farming at Trishal Upazilla

Laily Akter ^{1*}, Most. Tawabunnahar ²

¹Lecturer, Department of Economics, Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh

²Lecturer, Department of Statistics, Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh

Email address:

* Corresponding author: lailyakter05@gmail.com (L. Akter)

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Abstract: *The study was conducted to assess the comparative profitability between vegetable cultivation and poultry farming of Trishal Upazilla. The primary data were collected from 100 respondents of this area who are directly involved in these two sectors. The Benefit-cost ratio method was used to compare the profitability and this study got that vegetable cultivation and poultry farming both were profitable and vegetable cultivation was more profitable than poultry farming. So the development of agriculture including vegetable cultivation and poultry farming indicates the development of Trishal Upazilla.*

Keywords: *Cost of production, Return, Profitability, Vegetable cultivation, Poultry farming.*

1. Introduction

Bangladesh is an agricultural developing country with half of it's population are related to agriculture. Vegetable cultivation and poultry farming are two indispensable part of agriculture which are improving with modern technologies and contributing in the economic growth of Bangladesh by generating income and employment, reducing poverty. The climate and natural conditions of Bangladesh are suitable for vegetable cultivation and poultry farming (Begum, S 2000). This study involves the analysis of profitability of vegetable cultivation and poultry farming of Trishal Upazilla (having land area 15.49 km) as a model of Bangladesh. Maximum cultivable land of this upazilla are used for vegetable cultivation and poultry farming to meet the demand of our daily diet, poultry meat, egg and other vitamins. So to build a healthy nation it is necessary to reduce the problems faced by the growers. An important way of helping the growers is to reduce their production cost and to raise the price of these products to be more competitive and profitable.

2. Objectives of the Study

The main objectives of this study are:

- To analyze the current status of vegetable cultivation and poultry farming in terms of production and net returns.
- To identify the cost of production of both vegetable cultivation and poultry farming.
- To assess the profitability of both vegetable cultivation and poultry farming.
- To compare the profitability between vegetable cultivation and poultry farming.

3. Literature Review

Literature review refers to the examination of other works previously done by other researchers on economic analysis of vegetable cultivation and poultry farming of Bangladesh. We have found that in our country several studies have been made by several researchers on illustrated topic.

Z. Monsura, A.H. Rokhsan and F. Tahmina, (2010) calculated benefit cost ratio for some selected winter vegetables like brinjal, Tomato Cabbage etc. and found that vegetable growing is a profitable farm activity in short-run.

Begum, S. (2000) calculated cost and return of both broiler and layer firm. And found that both kinds of species provide benefits to farmers. And she said that poultry farming is a profitable business in Mymensingh district.

Ahmed, M.F.U. (2001) made an economic analysis of broiler production under PROSHIKA SUPERVISION and private management. And he found that PROSHIKA provides better training to farmers and their productivity is greater than private management.

Akhter, F. (2006) found that Trishal is a centre point of vegetable cultivation, vegetable cultivation is very profitable here and many people are related to vegetable cultivation.

A recent work by Chowdhury, M.S.R. and Chowdhury, M.M. (2015) on “Profitability Analysis of Poultry Farming in Bangladesh: A Case Study on Trishal Upazilla in Mymensing District.” In this study they analyzed the poultry farming condition of Trishal Upazilla and found that Poultry Farming is profitable business. In our study we extended the profitability analysis of poultry farming comparing with the profitability analysis of vegetable cultivation.

4. Methodology

This study is based on primary data for which we have conducted a survey in Trishal Upazilla under Mymensingh District and six villages named Birrumpur, Chokrumpur, Solimpur, Chikna, Izarabond, Durduria have been selected. In case of poultry farming from chickens, ducks, turkey, swan, pigeons, only chicken layer has been selected for three months. In case of vegetable production from summer and winter vegetables we have selected summer vegetables for three months. From 100 respondents 50 are poultry farmers and 50 are vegetable farmers. The survey has been conducted in the months of April, May, and June of the year 2019. To calculate net return we have used following formula-

- a) Net return = GR - GC (where, GR = Gross return and GC = Gross Cost, GC = TFC + TVC, where TFC = total fixed cost and TVC = total variable cost).

To calculate benefit cost ratio we have used following formula-

- b) Benefit cost ratio: $\frac{\text{Gross return}}{\text{Gross cost}}$

5. Condition of Vegetable Cultivation in Trishal Upazilla Based on Field Survey

In Trishal Upazilla farmers produce Ceylon, Spanish, red leaf, jute leaf, teasel guard, pumpkin, string bean, green leaf, arum, bitter guard, brinjal, ladies figure, cucumber, etc. In this area vegetable production is a profitable business and maximum farmers are related to vegetable production.

5.1. Firm size and employment generation

In Trishal Upazilla from various vegetable farms we have selected 50 farms as sample. From them 21 farms (1-10 Khata) are small firms, 19 farms (11-20 khata) are medium, and 10 farms (21-above khata) are large farms. Among these farms total 130 labors are employed. So it is a large source of employment generation.

Table 1: Firm size

Particulars	Small (1-10)	Medium (11-20)	Large (21-above)
No. of farms	21	19	10
Percentage	42	38	20
No. of labor	50	55	25
percentage	39	42	23

Source: Field survey 2019

5.2. Education level of respondents

In our study area illiteracy rate is high 36%. The education levels of respondents are as follows-

Table 2: Education level

No. of respondents	Illiterate	Below SSC	SSC	HSC	Graduation
50	18	20	8	2	2
percentage	36	56	16	4	4

Source: Field survey 2019

5.3. Sources of seeds, fertilizer, irrigation and system of land cultivation

In this area maximum farmer use hybrid seeds and some of them use seeds produced in their farms. Here farmers use both organic and chemical fertilizers. For irrigation they use deep tube well and sallow machine. Some farmers use plough fir cultivation and maximum use power tiller. That is they using modern technologies for producing vegetables.

5.4 Profitability Analysis

To assess the profitability of vegetable farm we should first calculate cots and returns that come from the farms. In case of vegetable farming cost is again classified as (1) fixed cost and (2) variable cost. Variable costs include cost for labor, power tiller, seeds fertilizers, irrigation, insecticides; fence etc. on the other hand fixed cost was calculated for land use cost and cost for machine and tools. On the return side gross return, net return and benefit cost ratio were determined. Now calculation of cost items are presented as follows-

Table 3: Total cost of vegetable cultivation per farm per season

Cost items	Unit	Average unit price	Average total cost	Percentage
A) Variable cost	TK		92084	
Labour cost	Per day	450	38250	33
Power tiller	Per khata	350	5600	5
Seeds	Per 3 months	--	8280	7
Fertilizer	Per 3 months	35	14700	13
Irrigation	Per hour	250	10500	10
Insecticides	--	--	2254	2
Fence	--	--	5000	4
Others cost	--	--	7500	7
B) Fixed cost			22404	
Land use cost	Per 3 months	--	12956	11
Machine and tools	Per 3 months	--	9448	8
C) Total cost (A+B)			114488	

Source: Field survey 2019

Based on this table cost items can be presented by following pie chart-

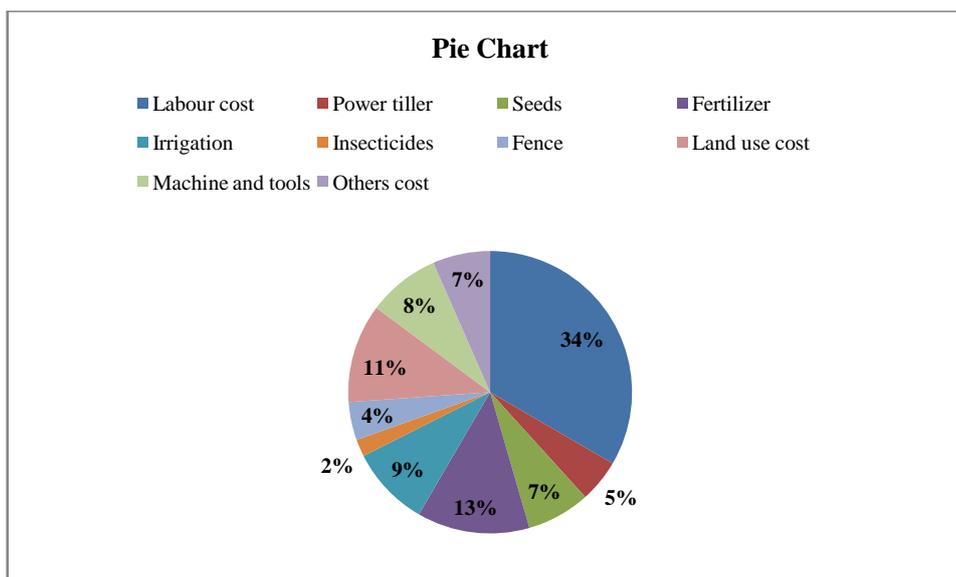


Figure 1: cost of vegetable cultivation (variable and fixed)

5.5 Gross Return

Gross return per khata was calculated by multiplying the total amount of product and by product by average farm gate price. In our study area average gross return is 160,556 per farm. That is, gross return is the summation of return from main products and by products.

5.6 Net Return

Net return is a very useful term to analyze and compare performance of enterprise. It is calculated by subtracting total cost from total return. In our study area average net return is 46068.

Table 4: Total cost, total return and benefit cost ratio of the farm

Items	Unit	Average total cost and return
A)Gross cost	Per 3 month	114488
B)Gross return	---	160556
Sale of vegetable	---	105556
Sale of by product	---	55000
C)Net return (B-A)		46068
D)Benefit cost ratio (B/A)		1.41

Source: Field survey 2019

From the information of this table a bar diagram can be drawn as follows:

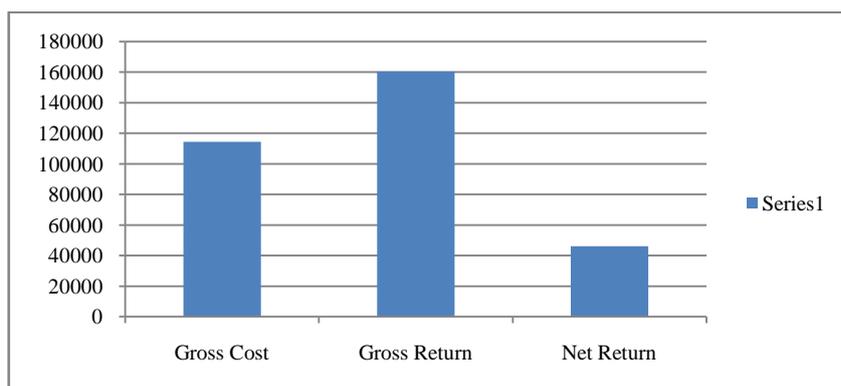


Figure 2: Gross return, Gross cost and Net return per vegetable firm

5.7 Benefit Cost ratio (BCR)

BCR measures the efficiency of the farm. In case of vegetable cultivation BCR is 1.41. It is positive and indicates that vegetable farms are efficient.

5.8 Different problems faced by vegetable growers

In our study area vegetable farmers face a number of problems presented by a table.

Table 5: Different problems faced by selected vegetable growers

Nature of problems	No. of Responding farms	Percentage
A) Economic problems	33	66
Lack of capital	14	28
Inadequate supply of good quality seeds	10	20
High prices of fertilizers	6	12
Unavailability and high prices of insecticides	3	6
B) Social and natural problems	22	44
Attack by pest and diseases	9	18
Vegetable damage by domestic animals	7	14
Loss of production due to theft	6	12
C) Marketing problems	23	46
Low market price of product	9	18
Storage problem	6	12
Lack of market information	8	16

Source: Field survey 2019

5.9 Condition of poultry farming in Trishal Upazilla based on field survey

5.9.1. Firm size and employment generation

In Trishal Upazila we have selected 50 layer farms as sample. Among them 25, 18 and 7 farms are small, medium and large respectively. Among these farms total 105 labors are employed. Thus, it's a large source of employment generation.

5.9.2. Education level of respondents

Education grows skill among people. Educated person can manage his farm properly. The education level of respondents is as follows-

Table 6: Education level

No. of respondents	Illiterate	Below SSC	SSC	HSC	Graduation
50	10	15	15	7	3
percentage	20	30	30	14	6

Source: Field survey 2019

Though 20% people are illiterate and 80% are literate they can manage farm properly and it helps them to earn more profit.

5.9.3. Sources of food, light and heat

From 50 respondent's only three farms has food production machine. And remaining farms purchase food for birds from market at market price. On the other hand, for light and heat they use electricity, generator and solar power.

5.9.4. Uses of bird's excrement

One can use the excrement in three ways. Such as, one can sale it, or can throw away or someone uses it as fertilizer in their vegetable land.

Table 7: Uses of bird's excrement

Number of household	Thrown away	Soled	Used as fertilizer
50	10	35	5
Percentage	20	70	10

Source: Field survey 2019

5.10 Profitability Analysis

Profit maximization is the main goal of producer. To earn more profit producers want to maximize profit by minimizing cost. The main aim of layer farm is to produce egg. After egg production rejected birds are sold for meat.

A. Total cost

Cost items are classified as fixed cost and variable cost. Poultry production includes various cost under the following heads-

1. Fixed cost

It includes housing cost 122100 per 3 months, electricity bill 8600 per 3 months and equipment cost 18930 per 3 months.

2. Variable cost

It includes labor cost 73500Tk, feed cost 990,000 Tk, veterinary cost 13200Tk, bird purchasing cost 84000 Tk, transportation cost 14000 Tk and other cost 8200Tk per 3 months.

Table 8: Total cost of poultry production per farm per season

Cost items	Unit	Average unit price	Average total cost	Percentage
A)Variable cost	Tk		1182900	
Labor cost	Per 3 months	26500	73500	6
Feed cost	Per Kg	45	990000	80
Veterinary cost	Per 3 months		13200	1
Bird purchasing cost	per bird	35	84000	6.5
Transportation cost	Per bag	30	14000	1
Other cost	--		8200	.5
B)Fixed cost			149630	
Housing cost	Per 3 months	--	122100	10
Electricity bill	Per 3 months	--	8600	.6
Equipment cost	Per 3 months	--	18930	1.5
C)Total cost			1332530	

Source: Field survey 2019

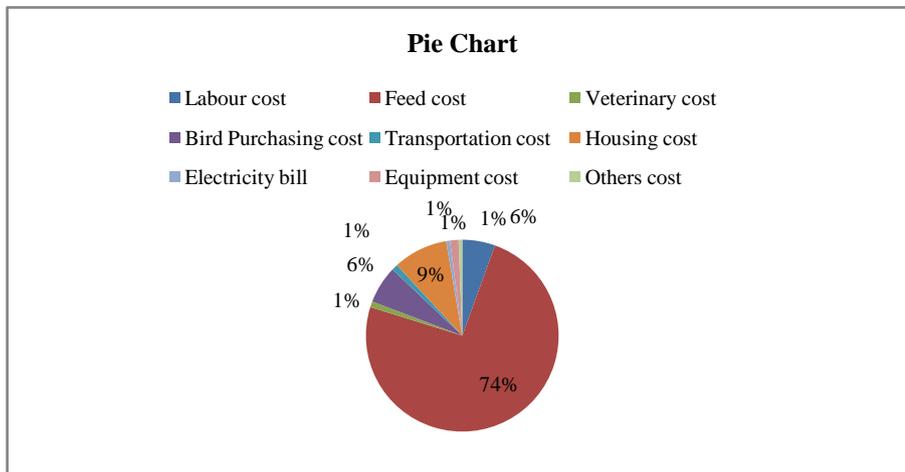


Figure 3: Cost of broiler production (variable and fixed cost)

B. Total Return / Gross Return

The return item includes sale of bird, egg and bird’s excrement. After the egg production a rejected bird is weighted as 1 kg to 1.5 kg and 1 kg is sold for 150 tk. to 200 tk. And a farm provides 80% -98% eggs. So a farm with 1000 birds gives on an average 890 eggs per day. And by selling birds excrement a farm also gets a lump sum payment. These 3 items provide total return to the farm.

C. Net Return

Net return is the amount obtained by deducting all the cost from the gross return.

Table 9: total cost, total return and benefit cost ratio of the farm

Items	Unit	Average unit price	Average total cost and return
A)Gross cost	--	--	1332530
B) Gross return	--	--	1671445
Sale of bird	Kg	200	536200
Residual	--	--	14494
Egg	Hali	30	1120751
C)Net return(B-A)			338915
D)Benefit cost ratio(B/C)			1.25

Source: Field survey 2019

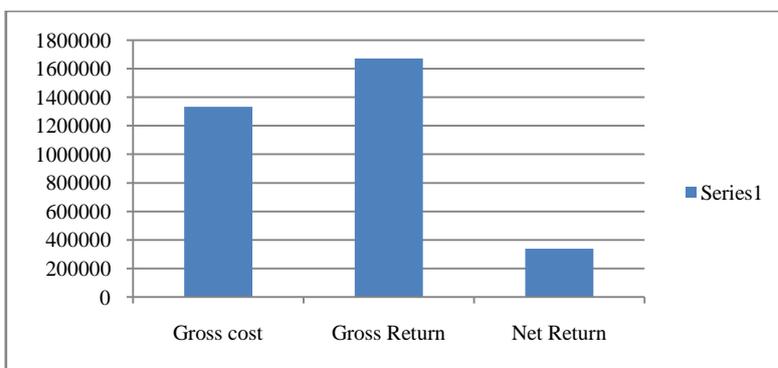


Figure 4: Gross return, Gross cost and net return per poultry farm

D. Benefit cost ratio

Benefit cost ratio indicates return per tk. invested. It represents financial feasibility of the farm. The BCR of poultry farm is 1.25. It indicates poultry farming is profitable and financially efficient.

5.11 Different problems faced by poultry growers

In our study area vegetable farmers face a number of problems presented by a table.

Table 10: Different problems faced by selected poultry growers

Nature of problems	No. of Responding farms	Percentage
A) Economic problems	34	68
Lack of capital	17	34
High price of food	13	26
Lack of credit institution	4	8
B) Social and nutritional problems	37	74
Outbreak of diseases	20	40
Environment pollution	9	18
Lack of communication facilities	8	16
C) Marketing problems	16	32
Lower price of egg	10	20
Lack of competitive market	6	18
D) technical problems	8	16
Lack of training facilities	8	16

Source: Field survey 2019

5.12 Comparison of profitability between vegetable cultivation and poultry farming

In this section a comparison has been made to assess relative profitability between vegetable cultivation and poultry farming by following heads-

Table 11: Profitability comparison

Particulars	Vegetable cultivation	Poultry farming
1) Employment generation	About 130 persons are employed.	About 105 persons are employed.
2) Invested capital	Less capital is invested.	More capital is invested relative to vegetable cultivation.
3) External effect	Has no negative impact on environment.	It pollutes environment by throwing bird's excrement and bad smell which rise social cost.
4) Labor cost	Labor cost is relatively low which leads to raise net return.	Labor cost is higher relative to vegetable cultivation.
5) Education level of farmers	Illiteracy rate is high.	Illiteracy rate is low.
6) profit condition	It provides more return relative to investment.	It provides less return relative to investment.

Source: Field survey 2019

In summary we can compare these sectors by analyzing their gross cost, gross return, net return and benefit cost ratio.

Table 12: Comparison according to gross cost, gross return, net return and benefit cost ratio

Items	Average total cost and total return in vegetable cultivation	Average total cost and total return in poultry farming
A) Gross cost	114488	1332530
B) Gross return	160556	1671445
C) Net return	46068	338915
D) Benefit cost ratio	1.41	1.25

Source: Field survey 2019

More money is invested in poultry farming relative to vegetable cultivation. So profit earned from vegetable production is higher than poultry production.

5.13 Percentage of profit earned from invested capital

In case of vegetable production investment of tk. 114488 brings return of tk.46068. So investment of tk. 100 brings $(46068 \div 114488 \times 100 = 40.25\%)$ profit.

On the other hand, in case of poultry production investment of tk.1332530 brings return of tk. 338915. So, investment of tk. 100 brings $(338915 \div 1332530 \times 100 = 25.43\%)$ profit. So in case of percentage of profit vegetable cultivation is more profitable than poultry farming.

5.14 Comparison in terms of benefit cost ratio

In case of vegetable cultivation BCR is 1.41. That is 1tk investment brings return 1.41tk. And in case of poultry production 1tk investment brings 1.25tk only.

6. Findings and Result discussion

From our study area we have found that in case of percentage production profitability is higher for vegetable production than poultry production. Again in case of BCR it is higher for vegetable production than poultry production. That is, a vegetable farm is relatively efficient than poultry production. As Trishal Upazilla is a model of Bangladesh, we can say

that, the climate of Bangladesh is suitable for vegetable cultivation. So, in case of Bangladesh vegetable cultivation is more profitable than poultry farming.

7. Summary and Recommendations

Poultry and vegetable are two important segments of agriculture. At present, a large number of educated unemployed persons are related to poultry farm and vegetable production. These sectors play important role to solve poverty, unemployment and malnutrition problem. But farmers of these sectors face various problems. To overcome these difficulties the following recommendations are put forward-

- a. Government should take necessary steps to provide adequate financial support and price support to make sure minimum profit in both poultry farming and vegetable production.
- b. Quality of poultry feed should be increased.
- c. Government should formulate national development policy to sustain present growth of poultry production and vegetable cultivation.
- d. Government should also provide storage facilities. So that farmer can sale product at the time of high price.
- e. More research should be taken to improve the quality of feed, vaccine, seeds, etc.
- f. Government should provide training to young people so that they can produce quality product by using quality seeds, organic and bio-fertilizers.
- g. Government and mass media should take initiatives to reduce information gap to reduce diseases.

8. Conclusion

The economy of Bangladesh depends on agriculture to a great extent. In respect of nutrition poultry meat and egg and vegetables are excellent source of protein and vitamin. These sectors are really helpful for income generation, women empowerment and nutritional improvement for the family. Though, both farms are profitable, the BCR is high for vegetables than poultry production in the study area. And in our study area 85% farmers opined that either poultry or vegetable production helped them to improve their life style. Thus, there is potentiality for further improvement of these sectors.

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