# AN ANALYSIS OF FARMER'S SHARE IN CONSUMER'S PRICE AND BCR (BENEFIT COST RATIO) FOR SOME SELECTED VEGETABLES IN DHAKA DISTRICT OF BANGLADESH

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**Abstract**

*This study was conducted to find out the farmer's share in the consumer's price, factors affecting gross return of vegetables production, BCR (Benefit Cost Ratio) at farmer level as well as Marketing channel of vegetables. The primary data was collected from the Savar & Keraniganj Upazilla in Dhaka District, Bangladesh. The findings of the study revealed that*

*farmer's share in consumer's price is less than 50% what consumer pays such as Brinjal(47.46%) Tomato(33.43%) and Cauliflower(38.52%).It showed that Benefit Cost Ratio (BCR) of brinjal(2.73), cauliflower(1.77) and tomato(1.75).It also revealed that human labor cost, fertilizer& manure cost ,seed cost affect gross return of vegetables production positively while irrigation, insecticide &pesticide cost affect gross return negatively. Finally, involvement of more middlemen & lack of storage facilities between farmers and consumers reduces the share of farmers in consumer's price. We can see three types of marketing channel hence, it is suggested to select suitable marketing channel having less intermediaries by the Vegetable farmers in order to get higher share.*

*Keyword: Farmer's share, Consumer, Vegetable, Retail Price, Marketing Cost, Agribusiness*

## INTRODUCTION

Agriculture is the largest employment sector in Bangladesh. As of 2016, it employs 47% of the total labor force and comprises 14.75% of the country's GDP(Gross Domestic Product). The performance of this sector has an overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, human resources development and food security. The total land area of Bangladesh is about 14.3 million ha of which about 59.8% is available for cultivation having 7.93 million hectare with 192% cropping intensity and net cropped are 152.257 million hectare (BBS 2016). During the last 12 years, the agricultural land has been declining, on average, at the rate of about 1%. About 100 kinds of crops are grown in Bangladesh such as rice, wheat, jute, potato, oilseeds, pulses, tobacco, cotton, sugarcane, fruits, and vegetables. Since rice is our staple food it covers about 77% of the total cropped area and annual production is Rice-34.71 million metric ton (BBS 2016).

Bangladesh is one of the major horticultural countries in South Asia .Nearly 100 different types of vegetable comprising both local and exotic type are grown in Bangladesh such as major winter vegetables are cabbage, cauliflower, tomato, brinjal, radish, hyacinth bean, bottle gourd, etc while major summer vegetables are pumpkin, bitter gourd, teasle gourd, ribbed gourd, ash gourd, okra, yard-long bean, and Indian spinach among others. Some vegetables like brinjal, pumpkin, okra, and red amaranth are found to grow in both the seasons.

Among them brinjal, cauliflower and tomato cover more than 25% of all vegetable production (brinjal 13.02%, tomato 9.5%, cauliflower 6.9%) and these cover about 24.01% of total land of vegetable production.

According to BBS Year Book (2016) we can see that 4.012 lakh hectare of land are being cultivated for various types of vegetables with annual production 3.874 million metric ton which is more than double in terms of area of land 1.959 million hectare, production 1.29 million metric ton of 1996-1997. It has signaled that Bangladesh is developing in agriculture sector by increasing vegetable production besides rice, wheat, maize etc. Although we have achieved food security in term of food grain but vegetable, spice, oilseed production are in shortage according to our demand besides this we started to export rice& fresh vegetables. More than 100 fruits and vegetables are exported from Bangladesh. Export of fresh fruits and vegetables from Bangladesh are significantly increased from 9.44 million$ in FY1993-94 to 182.23 million$ in FY2012-13 (Hortex Foundation Report, 2012-13). Although we have progressed in agricultural production yet we could not meet up minimum requirement of vegetable consumption 200gm per day per person but we consume only 166.1gm per day.

Due to increased demand of vegetables in home and abroad, the farmers have started to cultivate vegetable commercially in large scale from few decades. The vegetable farmer are not getting fair price for their produce due to lack of proper marketing system. If the production of vegetables increases but its proper marketing is not ensured this sector will not enjoy sustainable growth. Marketing means all activities involved in the flow of Agricultural produce from the production points commencing from the stage of harvest till these reach the ultimate consumers viz. grading, processing, storage, transport, channels of distribution and all other functions involved in the process. Though such policies are monitored by the Department of Agricultural Marketing (DAM) a wing of Ministry of Agriculture of Bangladesh, the agricultural producer still do not enjoy the share which they should enjoy. What is the reason behind this? In this paper, the researchers attempt to find out the vegetable farmers' share in consumer's price in order to know whether the involvement of more middle men in the marketing channel have a significant impact on the farmer's share as well as lack of storage facilities and factors affecting gross return of vegetables production.

**Objectives of the Study**

The specific objectives were the followings:

1. To analyze the farmer's share in consumer's price for selected vegetables.

2. To find out marketing channel for vegetables

3. To determine the factors affecting the returns of the selected winter vegetables

## REVIEW OF LITERATURE

Several studies on profitability analysis and cost production of different agricultural commodities have been done in Bangladesh. In spite of the great necessity of studies on farmer's share on consumer's price of vegetables, only a few empirical studies have so far been done in Bangladesh. Conversely, many studies have been made in many parts of the world. A brief review of the few important studies made both in Bangladesh and outside Bangladesh is presented below.

Involvement of middleman in jute disposal clearly depicts that there arise some level of marketing cost. Lower the numbers of middlemen in marketing channel higher will be farmers' share in consumers' rupees and vice-versa (Jaffer (2005) and Sudha.et.al (2005)).

According to Rehman, (1978), the regulated markets established under different Market Committees by the Assam State Agricultural Marketing Board have been unable to make transactions of notified agricultural commodities satisfactorily. For this reason, in the prevailing traditional marketing system in Assam, the producers are not getting actual prices of their agricultural produces due to their dependency on middleman to dispose their produces.

The average farm-gate prices of tilapia varied between Tk 60 and Tk 85 per kg depending on size, whereas consumer paid between Tk 89 and Tk 118 per kg. It was calculated that farmers received an average 69% of the retail price (Nesar Ahmed and Faisal Ahmed,2009) Ahmed (1979) opined that the jute growers in Assam are deprived of getting the actual prices due to involvement of middleman like commission agents in the process of marketing etc.

Goyal (1990) found after analyzing the production growth of jute during 1948-49 to 1980-81 has remarked that modern technology has not made any significant contribution in production of raw jute and suggested that there is need to develop co-operative societies to procure jute either as an agency of JCI or as a self-procurement agency at village level primary markets or secondary markets which would ensure fair prices directly to jute growers.. According to him, one of the fundamental weaknesses of jute marketing system is prices actually received by jute growers in the village or at 'Haats' are much lower than the prices that prevail in the secondary markets or the terminal market at Calcutta due to existence of long and complex chain of middleman.

It has been further observed from the study of Acharya and Agarwal, (1994) that the prices of perishable agricultural commodities are generally influenced by the forces of demand and supply. Prices of such agricultural commodities do not reflect its cost of production.

According to Khatkar et. al., (2005) have found that, in 'Marketing of Mushroom in Haryana' the major share of consumer's rupee is gone to the pockets of the middleman. He

therefore advocated the government intervention to safeguard the farmers' interest by introducing cooperative marketing and processing of agricultural products.

In their findings of Jaffer et.al (2005), showed that lower the number of intermediaries higher is the market efficiency and vice versa. A hand full of studies conducted around the world has concluded that distribution costs of agricultural products are relatively higher. In each market channel share of farmer in the consumers' rupee is relatively small as compared to that of several intermediaries due to diversified interest of the farmer, the consumer and the middleman.

Sudha. et.al (2005) has found that 'the producers share in consumer's rupee is higher where no middleman existed. It is observed from many theoretical and practical studies that it is true that farmers are exploited at all time by the middleman whether it is licensed or no licensed. Involvement of middleman in jute disposal clearly depicts that there arise some level of marketing cost. Lower the numbers of middleman in marketing channel higher will be farmers' share in consumers' rupees and vice-versa (Jaffer 2005 and Sudha.et.al 2005).

## METHODOLOGY

### Profile of the Study Area

Research was done on farmers of 10 villages of three Unions namely Amin bazar, Tetulzora Hazratpur of Savar & Keraniganj Upzilla under Dhaka district of Bangladesh. There are about 1000 farmers are cultivating vegetables in the mentioned above Unions. Out of these 70 farmers has been selected randomly for the study.

### Sources of Data

The study is involved in collection of data both from the primary and secondary sources. Different types of data and their sources are discussed under the following heads:

### *Primary Data*

Primary data have been collected through field survey. One set schedule of questionnaire was used for the respondents. During data collection 70 farmers were asked about cost items such as land use value, seed/ seedling , land preparation , tillage ( animal or ,power tiller), weeding, harvesting, fertilizer, insecticides, pesticides, irrigation, carrying, grading/ standardizing, weighing, marketing cost, interest rate of invested capital etc and also asked about source of return. The farmer mentioned that they get returns only from main product (vegetables) since they do not get any returns from byproduct of vegetable cultivation. In addition, about 20

retailers were asked to collect  data about consumer market price, supply chain of vegetables, problems they faced in vegetables marketing.

## Secondary Data

The secondary sources include govt. publications; annual reports on groundnut cultivation, seminar papers, journals, published and unpublished thesis,  and topic reelected various books, web site etc.

## Farmers' share in consumers' Price

In order to find out the farmers share in consumers' rupee, we use the following formula as given by Acharya and Agarwal (1994) in their book Agricultural Marketing in India (p-330).

$FS = \{(FP-MC)/CP\} \times 100$

Where FS= farmer's share in consumer's price

CP= retail price(Consumer price)

MC= marketing costs,

FP= price received by farmer

But, FP-MC=N(Net Price goes to farmer's pocket)

Therefore, $FS = (NP/CP) \times 100$.

In case of vegetable marketing, the final consumer accepts the fresh vegetables. So cost of fresh vegetable is included in MC. Thus,

MC= Cost of transport + labor cost(loading& unloading)+ weighing cost + storage cost + market fee.

## Descriptive Analysis

Descriptive statistical measures like sum, average, percentage etc., are used to find the crude association or variations between variables which has been presented in the form of tables. In this study, costs are measured in terms of variable and total cost basis. Per hectare profitability of growing vegetables from he viewpoints of individual farmers is measured in terms of gross return, gross margin and net return. The following profit (Π) equation was used:

$\Pi_i = P_i Q_i - TC_i$

$= P_i Q_i - (VC + FC)$

Where

$\Pi_i$ = Profit from ith vegetables

$P_i$ = Average price of the ith product (Tk/kg)

$Q_i$ = Quantity of the ith product (kg/ha)

TC = Total cost Taka/kg of ith vegetables

VC = Variable cost

FC = Fixed cost

For calculating the costs and return, the costs items are classified into two groups: (i) variable cost, and (ii) fixed cost. Gross return is calculated simply by multiplying the total volume of output with per unit of price in the harvesting period. Gross margin calculation is done to have an estimate of the difference between total return and variable costs. It has been calculated by deducting total return over variable cost.

## Statistical Technique

In order to determine the effect of the variable inputs, Cobb - Douglas forms of production function are initially estimated for vegetables. Data are converted per farm per acre to facilitate the analysis. The selected Cobb-Douglas production function model, in its stochastic form may be expressed as: $Y = \alpha X_1^{\beta 1} X_2^{\beta 2} X_3^{\beta 3} X_4^{\beta 4} X_5^{\beta 5} X_6^{\beta 6}$

The function is estimated as follows:

$\ln Y = \alpha + \beta_1 \ln X_1 + \beta_2 \ln X_2 + + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + U_i$

Where,

Y = Gross return (Tk/ha);

$X_1$ = Human labour cost (Tk/ha);

$X_2$ = Tillage cost (Tk/ha);

$X_3$ = Seed/ Seedling cost (Tk/ha);

$X_4$ = Fertilizer & Manure cost (Tk/ha);

$X_5$ = Irrigation cost (Tk/ha);

$X_6$ = Insecticides cost (Tk/ha);

i = I, 2, 3, .................n

$\alpha, \beta_1 \beta_2 ...........\beta_6$ = Regression co-efficient to be estimated and

Ui= Error term.

## ANALYSIS AND FINDINGS

### Marketing channels

Marketing channel is the way through which vegetables go to the consumer plate from the farmer's field. Marketing channel plays a significant role to dispose vegetables in the market. They perform various marketing activities such as transportation, grading, sorting, storing etc. From the study we can see three types marketing channel.

Small farmers produce small quantity and sell their vegetables at village market (Ati Bazar, Hemayetpur) or Upazilla market (Ganda Kacha Bazar, Savar, Dhaka) and want to sell their produce to retailer expecting to have higher price than faria or wholesaler. Above all small farmers try to avoid marketing middleman.

Large farmers produce large volume of vegetable sell their produce either at village market or Upazilla market at Savar. They sell their vegetables to faria who works as a commission agent on behalf of Bepari, wholesaler. Bepari purchases large volume of vegetables from various faria and sell their vegetables to retailers in small volume. Sometimes wholesaler performs grading, sorting, storage function if needed.

Sometimes super shops like Meena Bazar, Agora, Swapno employ faria as commission agent to purchase fresh vegetables from farmers.

I came to know that farmers use Van, Pickup Van, headload, Rickshaw, Horse car as a mode of transportation

1. Farmer(large)-----Faria (commission agent)------Bepari/wholesaler--------Retailer--------Consumer.
2. Farmer-------faria(commission agent)--------------Super shop-------------consumer.
3. Farmer(small)--------Retailer ----------Consumer.

Table 1: Computation of Farmer's share for some selected vegetables

(Cauliflower, Tomato, Brinjal)

| Particulars | Tomato(40kg) | Brinjal(40kg) | Cauliflower(100nos) |
|---|---|---|---|
| Average price(Farmer Received) | **600** | **800** | **1200** |
| Average Consumer Price | **1600** | **1500** | **2700** |
| Marketing fee(4% of sale) | **25** | **33** | **60** |
| Transportation | **40** | **50** | **80** |
| Loading& unloading | **5** | **5** | **20** |
| Storage | **0** | **0** | **0** |
| Weighing | **5** | **5** | **0** |

Source: Field survey 2015

***For Cauliflower,***

Consumer price, CP=Tk.2700        Farmer's price, FP= Tk.1200

Marketing cost, MC= Tk.(80+60+20)= Tk.160

Net Price Received by Farmer, NP=Tk.(1200-160) =Tk.1040

Farmer's Share, FS=(NP/CP)x 100%= (1040/2700)x100%=38.52%

Similarly;

**For tomato,** Farmer's Share 33.43%

**For Brinjal,** Farmer's Share 47.46%

From the above computation of farmer share(FS) we can see that farmer share is less than 50% of all selected vegetables such as Cauliflower(38.52%), Brinjal(47.46%)and Tomato(33.43%).

Table 2: Price gap tables at various level of marketing middleman

| Marketing Channel | Tomato(Tk/40Kg) | Brinjal(Tk/40Kg) | Cauliflower(Tk/100Nos) |
|---|---|---|---|
| Farmer ( sale price) | 600 | 800 | 1200 |
| Faria( sale price) | 0 | 900 | 1400 |
| Bepari/wholesaler (sale price) | 900 | 1000 | 1800 |
| Retailer ( sale price) | 1600 | 1500 | 2700 |

Source: Field Survey, 2015

From the above table we can see that highest level price gap is seen at wholesalers to retailers for all vegetables. Farmers sell their vegetables at village market at low price because they do not feel comfortable for taking their vegetables at terminal market due to time consuming, lack of storage facilities, lack of proper transportation for vegetables. As a result they sell their vegetables at village market at market going price and sometimes they are faced to forced sell their vegetables to prefixed wholesaler/ bepari for money lending.

Faria is a small trader who acts as commission agent for wholesaler/ beparideals with large volume of vegetables commission for 5-10% of purchased price. Sometimes Faria purchases from village markets and takes vegetables to primary or secondary market and sells at high price(profit of 20-30% of purchased price) to bepari. They do not perform any marketing function except buying, selling and transportation.

Wholesalers/bepari deals with large volume and various types of vegetables at a time. They need to perform various marketing function such as sorting, grading, storing, packing and financing etc. They play a significant role in the vegetable market by controlling demand and supply in our country. They sell their vegetables to retailers into small volume and sometimes sell to other wholesalers. Actually they sell their vegetables for 20-40% profit of purchased price. Retailers deals with ultimate consumer of vegetables and highest level price gap seen between retailers and wholesalers. Retailers charge highest level price in the market and generally profit level more than 50% of purchased price in the market. They charge more price due to many reasons found such as lack of storage, deals with small volume of vegetable, lack of owned capital, market changes frequently etc.

Table 3: Per Acre costs and returns of some vegetables production

| Items | Brinjal | Tomato | Cauliflower |
|---|---|---|---|
| A. Gross Return(Tk) | 192033.00 | 137200.00 | 151200.00 |
| B. Variable Cost(Tk) | | | |
| Human ( family& hired) | 33363.20 | 39200.00 | 42000.00 |
| Tillage(Animal , Power tiller) | 2860.00 | 3360.00 | 5040.00 |
| Seed | 5070.00 | 5600.00 | 7000.00 |
| Fertilizer& Manure | 11993.80 | 11200.00 | 12600.00 |
| Pesticides/ Insecticide | 5444.40 | 6300.00 | 5040.00 |
| Irrigation | 2633.80 | 2800.00 | 3360.00 |
| Total | 61365.20 | 68460.00 | 75040.00 |
| C. Fixed Cost(Tk) | | | |
| Land use  cost | 5200.00 | 5600.00 | 5600.00 |
| Interest on operating capital | 3697.20 | 4443.60 | 4838.40 |
| Total | 8897.20 | 10043.60 | 10438.40 |
| D. Gross Cost (B+C) | 70262.40 | 78503.60 | 85478.40 |
| E. Gross Margin(A-B) | 130668.20 | 68740.00 | 76160.00 |
| F. Net Margin(A-D) | 121771.00 | 58696.40 | 65721.60 |
| Benefit Cost Ratio(A/D) | 2.73 | 1.75 | 1.77 |

Source: Field Survey, 2015

From the above table we can say that cost of production per acre of land for Tomato Tk.78503.60, Brinjal Tk. 192033, Cauliflower Tk.85478.40 and total return for Tomato Tk.137200, Brinjal Tk.192033, Cauliflower Tk.151200. Benefit Cost Ratio(BCR) of tomato 1.75, brinjal 2.73 and cauliflower 1.77. It is shown that brinjal is one of the most profitable vegetables due to year round production and consumption. Tomato and cauliflower are grown in winter season in Bangladesh.

Table 4: Showing Market participants' share on consumer price

| Items (%) | Tomato | Brinjal | Cauliflower |
|---|---|---|---|
| Actual Share of farmer in consumers' price | 21.63 | 30.97 | 17.39 |
| Share of cost of cultivation | 15.87 | 18.83 | 21.13 |
| Share of middlemen | 23.94 | 18.87 | 10.87 |
| Share of transport cost | 2.85 | 3.33 | 3.42 |
| Marketing margin | 35.71 | 28 | 48.57 |
| Total | 100 | 100 | 100 |

It may be said from the above table that percentage of marketing margin is greater than actual farmer share, share of cost of cultivation, share of middlemen and transportation cost. Highest percentage of profit margin goes to retailer pocket which is applicable for all vegetables.

## Regression Analysis

The results indicated that the Cobb-Douglas production function fitted well considering R and F-value. The coefficient of determinations ($R^2$) was 0.92 which indicated that about 92 percent of variations of the gross return were explained by the independent variables included in the model in case of brinjal. The F-value 123.25 of the equation was significant at one percent probability level implying that the variation in gross return depended mainly upon the explanatory variables included in the model.

Table 5: Regression Analysis

|  | Coefficients | Standard Error | P-value |
|---|---|---|---|
| Intercept($\alpha$) | 6.050 | 0.746 | 2.32797E-11 |
| Human Labor Cost($\beta_1$) | 0.411*** | 0.064 | 1.72845E-08 |
| Irrigation Cost($\beta_2$) | -0.032 | 0.018 | 0.077755118 |
| Pesticides& insecticide cost($\beta_3$) | -0.070 | 0.041 | 0.091410381 |
| Fertilizer & Manure Cost($\beta_4$) | 0.095** | 0.048 | 0.053616127 |
| Seed Cost($\beta_5$) | 0.096** | 0.042 | 0.025183823 |
| Tillage Cost($\beta_6$) | 0.052 | 0.043 | 0.23306337 |
| Multiple R=0.959 | $R^2$ =0.9214 | F-value =123.256*** | |

Note: *** Significant at 1% level ** Significant at 5% level * Significant at 10% level

Human labor cost is one of the major cost items in vegetables production that includes land preparation, seed sowing/ seedling planting, earthening up, weeding, fertilizer& manure application, insecticides application, harvesting, grading, sorting of vegetables etc. Human labor cost affects gross return of vegetables significantly.

Fertilizer & manure increase soil fertility that affect yield of vegetables positively. Regression table indicates that higher cost of fertilizer& manure increases gross return of vegetables.

Seed cost affects gross return of vegetables production significantly. It means higher seed cost indicating better quality of seed or seedling. Better quality seed yields better that ensures higher gross return.

Tillage cost does not affect gross return of vegetables production significantly. Because total yield of vegetables do not depend upon tillage of land. Tillage procedures and land preparation do not vary according to varieties of vegetables or soil etc.

Irrigation cost affects gross return of vegetable production negatively that higher irrigation is required for soil which has less water containing capacity is less fertile. As a result higher cost of irrigation does not increase gross of vegetables.

Higher cost of Insecticides or pesticides indicates severe attack of diseases that affects yields of vegetables negatively. Insecticides or pesticides are applied to lower crop damages when crops are infested by various insects or pests.

## CONCLUSION

Vegetable(s) is one of the most significant agricultural crops in term of it's contribution to our national Gross Domestic Product (GDP) as well as having food value. BCR of this study shows that farmers can earn more than 1.5 times for all vegetables but still it is so poor according to the retail price of the vegetables. Farmers get only less than 50% of retail price such as Cauliflower(38.52%), Brinjal(47.46%), Tomato(33.44%). These percentages are also lower in the remote area of Bangladesh .If the  marketing  middle men are  decreased  or the behavior of marketing  middle men are possible  to  control  for avoiding  malpractices, market monitoring  is ensured  famers' share will be higher and, as a results condition of farmers will be better.

## FURTHER STUDIES

Most of the population of Bangladesh is directly or indirectly dependent on the agricultural sectors and most of the employment (47%) sectors are  circled  in  agricultural base. So it is high time our concentration should be increased in the agricultural sector. There are many kinds of cereal crops, oilseed, and vegetables are cultivated here and some are directly used for food; some are used in industrial sectors. This paper will signal to decide in policy making for development of agriculture sectors specially on vegetables how to ensure farmer's welfare to fix up the  problems of fluctuation of price, regular supply of input at reasonable price, monitor activities of middle man, how to maximize benefit of farmer and consumer  etc. In addition, this paper will work as a pathway to carry out future research on marketing of agricultural crops, supply chain & value chain analysis of agricultural crops.

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