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Promising Fortitude of Vegetables Worth in Dhaka City: A Supply Chain Analysis

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Abstract: Vegetables trading require some vital support of integrated supply chain system and also depend on function of intermediaries, where transport facilities are most important. The objective of paper is to analyze the role of vegetables supply chain in Bangladesh. The paper is exploring determination of vegetables price in Dhaka city which is ever-increasing fast with respect to rural market price in Bangladesh. Data were collected from different areas of Dhaka city and others districts for present study on vegetables price from rural to urban market where prices are very much discrimination. Analyzing the collected data it has been found that vegetables market and exploring the analysis of supply chain on the vegetables price is important. Study has further found that there have many barriers in vegetables market.

Keywords: *Vegetable Market, Supply Chain Analysis*

1. Introduction

Although study of vegetables price function is an area research in the field so far, even no study has been accessed to in the context of the Bangladesh. Due to lack of initiatives and availability of secondary data, so Bangladesh remains absent from the literatures on vegetables price function estimation.

Vegetables are perishable in nature and cannot be stored for longer periods, which result in very sensitive and complicated trading of these horticultural commodities and exposing big challenges to suppliers, processors and traders (Ahmad and Feher, 2009). But intermediaries are essential part of vegetables supply chain in Bangladesh. They share profit with producer. But farmer in Bangladesh cannot avoid intermediaries' for shifting their product to market (Das and Hanaoka, 2010). Intermediaries such like as faria, bepary, retailer, and arathdar. But also important function of intermediaries is transport system.

The main supply source of vegetables is rural market. Beparies are purchased vegetables by middle man or arathdar from farmers (who are growers) at rural market. Scenario of transportation system is very poor. From the beginning extra fees gave to truck drivers, unlawful money collection different groups of people from truck, additional duty for across the bridge or ferryboat, compensate for traffic jam, and same vegetables selling many times before unload at urban whole sale market, after everything else vegetables reached from urban whole sale market to urban retail market.

Select a specific vegetables price, like as Eggplant, tomato, and chili. Where compare to urban whole sale market price with rural market price to analysis by consumer or producer price index

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(This is so-called laspeyer, or base-weighted, price index); and same ways compare to urban retail market price with urban whole sale market price. In this purpose, change of measure show rural market price with urban whole sale market price, urban whole sale market price with urban retail market price, and overall changes show, after a long wait, rural market price with urban retail market price in a particular week. According to supply chain analysis, investigate on determination of vegetables price in Dhaka city. Therefore, it's necessary to:

- Understand the rural market area and its vegetables
- Understand the present supply chain of vegetables
- Analyses the weaknesses, opportunities and challenges for supply chain of vegetables
- Solutions to the vegetable supply chain towards gap between rural and urban market price.

2. Methodology

2.1 Data Sources

The main purpose of research study is to examine determination of vegetables price in Dhaka city. In order to conduct this research work and to collect the primary data, which are involved in the current system of supply chain of specific vegetables in the Bangladesh. Market price survey conducts on rural market, urban whole sale and urban retail market on a particular week, February 2nd week in FY-2011. Rural market mentioned at local market (Coatchadpur, Jibonnagar) under Jessore district and local market (Nimsar, Chandina) under Comilla district. Whole sale urban market mentioned at Kawran bazar under Dhaka district, and also urban retail market mentioned at Mirpur, Uttara and New market kacha bazar under Dhaka district. This survey based on an empirical analysis. For the purpose to bring together information, a questionnaire procedure was applied by using focus group discussion (FGD) and taking interviews from the growers, businessman and consumers and exploring the role of supply chain on the vegetables price.

2.2 Cost analysis

Cost analysis is applied to examine an investigation to the rise of vegetables price, where role of supply chain is important. This technique also helped to explore the gap between rural and urban market price.

$$C = C_1 + C_2 + C_3 + C_4 + C_5 + C_6 + C_7 + C_8 + C_9 + C_{10} + \dots + C_n$$

Where, C is total cost of vegetables per quintal, C₁ is price of vegetables per quintal, C₂ is truck rent per quintal, C₃ is extra-fees to truck driver, C₄ is unlawful money collection on the roads and high way, C₅ is additional duty on across the ferry, C₆ is cost of traffic jam for wastage per quintal, C₇ is additional cost for same vegetables selling many times on the truck, C₈ is unlawful money collection at Kawran bazar, C₉ is fees for arathdar at Kawran bazar, C₁₀ is tri-cycle rent for urban whole sale market to urban retail market and etc.

Total cost is critically depends on additional cost, such as, extra-fees for truck rent, unlawful money collection on roads, bridge, traffic jam and wastag cost. The important component, although, is marketing function, like as, transportation, storage, processing, sorting, washing, packing and labeling, grading, financing, pricing, market information, storage and shipments, besides IT Control and logistics etc. According to Das and Hanaoka (2010), efficient agriculture marketing is critically depending on transport system. Inefficient transport service coupled with

poor storage, can lead to losses as certain crops (such as milk, vegetables, fish) deteriorate quickly overtime. On the other hand, many developing countries like Bangladesh suffer monopolistic, low volume, and high cost transport and marketing system. Weak transport and marketing system are hindering agriculture development means country development.

3. Value Chain Analysis

Intermediaries are essential part of vegetables supply chain in Bangladesh. They share profit with producer. But farmer in Bangladesh cannot avoid intermediaries' for shifting their product to market (Das and Hanaoka, 2010). Vegetables prices in any markets are not stable, especially in rainy and flood seasons when traders are those who confuse the markets. Relationship in the value chain for vegetables is very important. Payment for vegetables by urban is privileged than rural market. Besides, vegetables have been influenced by raising fuel prices, higher transport fees etc. The government has no supports vegetables supply chain through agriculture and business extension center: technical training, financial support for farmers and businessman, cold storage, highway police, market monitoring cell etc.

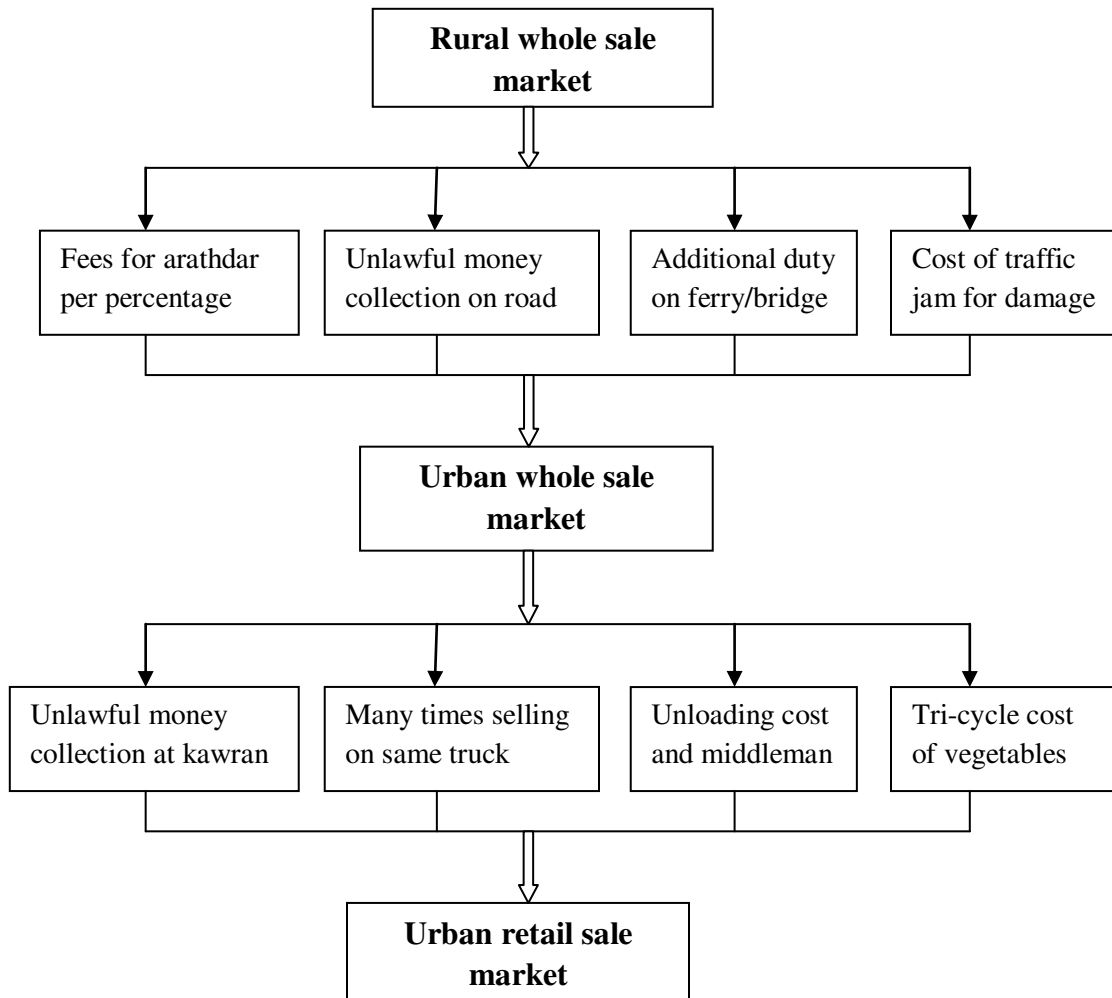


Figure-1: Scenario of present supply chain of vegetables in the domestic market

In the value chain of vegetables in the Bangladesh, farmers are main suppliers who supply by intermediaries most of vegetables to urban market in supply chain. Some farmers sell to traders and mostly selling in rural market because of many barriers in supply chain and middle man convenience to farmers and compared to retailing their own product.

4. Identification of Elements of Costs

4.1 Cost Increase of Vegetables

Price increasing tendency of vegetables depend on many variables, such as, fees for arathdar per percentage, Unlawful money collection on road, Additional duty on ferry, Cost of traffic jam for wastage, Same vegetables selling many times on the truck, Unloading cost and middleman fees, Tri-cycle cost of vegetables.

C_1 is price of vegetables per quintal; Eggplant is 1600 taka per quintal, tomato is 1700 taka per quintal, and chili is 2400 taka per quintal, which excluding fees for arathdar 6 taka per percentage at rural market,

C_2 is truck rent (mention at 5 tons, 1 ton=10.1604 quintal); from Jessore to Dhaka is 17000 taka,

C_3 is extra-fees to truck driver for over loaded, approximately 1000 taka per truck,

C_4 is unlawful money collection on the roads and high way, approximately 1000 taka per truck,

C_5 is additional duty on across the ferry for quick serial, approximately 500 taka per truck,

C_6 is cost of wastage for traffic jam, Eggplant is wastage 3 kg per quintal, tomato is wastage 10 kg per quintal, and chili is wastage 2.5 kg per quintal,

C_7 is unlawful money collection at Kawran bazar, approximately 1000 taka per truck,

C_8 is additional cost for same vegetables selling many times on the truck, but we avoiding errors, assume that, one time selling of vegetables and profit is 20%,

C_9 is fees for arathdar 6 taka per percentage at Kawran bazar,

C_{10} is tri-cycle rent (mention at average 3 quintal) for urban whole sale market to urban retail market are 300 taka; so tri-cycle rent is 100 taka per quintal.

3.2 Cost Measure of Vegetables

C_1 is Eggplant is 1696 taka per quintal, tomato is 1802 taka per quintal, and chili is 2544 taka per quintal, which including fees for arathdar 6 taka per percentage at rural market.

C_2 is truck rent is average 334.6 taka per quintal,

C_3 is extra-fees to truck driver for over loaded, approximately 19.7 taka per quintal,

C_4 is unlawful money collection on the roads and high way, approximately 19.7 taka per quintal,

C_5 is additional duty on across the ferry for quick serial, approximately 9.8 taka per quintal,

C_6 is cost of wastage for traffic jam, Eggplant value is 50.9 taka per quintal; tomato value is 180 taka per quintal, and chili value is 63.6 taka per quintal,

C_7 is unlawful money collection at Kawran bazar, approximately 19.7 taka per quintal,

C_8 is additional cost for same vegetables selling many times on the truck, Eggplant is 339.2 taka per quintal, tomato is 360.4 taka per quintal, and chili is 508.8 taka per quintal,

C_9 is Eggplant is 122.1 taka per quintal, tomato is 129.7 taka per quintal, and chili is 183.2 taka per quintal,

C_{10} is tri-cycle rent (mention at average 3 quintal) for urban whole sale market to urban retail market is 100 taka per quintal.

Total cost of vegetables per quintal(C) = $C_1+C_2+C_3+C_4+ C_5+C_6+C_7+ C_8 + C_9 + C_{10}+ \dots + C_n$

Total cost of Eggplant per quintal(C) =
 $1696+334.6+19.7+19.7+9.8+50.9+19.7+339.2+122.1+100 = \text{TK. } 2711.7$

Total cost of Tomato per quintal(C) =
 $1802+334.6+19.7+19.7+9.8+180+19.7+360.4+129.7+100 = \text{TK. } 2975.6$

Total cost of Chili per quintal(C) =
 $2544+334.6+19.7+19.7+9.8+63.6+19.7+508.8+183.2+100 = \text{TK. } 3803.1$

Table-1: Vegetables cost price from rural market to urban retail market

Name of vegetables	Rural market cost price (rm) TK. per quintal	Urban whole sale market selling price(uw) TK. per quintal	Urban retail market cost price(ur) TK. per quintal
Eggplant	1696	2611.7	2711.7
Tomato	1802	2975.6	2975.6
Chili	2544	3703.1	3803.1

At rural market price of vegetable, cost price of Eggplant is 1696 taka per quintal, tomato is 1802 taka per quintal, and chili is 2544 taka per quintal. After everything else, reached at kawran bazaar, same vegetables selling many times on the loaded truck, but we avoiding errors, assume that, one time selling of vegetables, cost price of Eggplant is 2611.7 taka per quintal, tomato is 2875.6 taka per quintal, and chili is 3703.1 taka per quintal. At the closing stages, reached at urban retail market, cost price of Eggplant is 2711.7 taka per quintal, tomato is 2975.6 taka per quintal, and chili is 3803.1 taka per quintal.

Table-2: Vegetables selling price from rural market to urban retail market

Name of vegetables	Rural market cost price (rm) TK. per quintal	Urban retail market cost price(ur) TK. per quintal	Urban retail market selling price(ur) TK. per quintal
Eggplant	1696	2711.7	4000
Tomato	1802	2975.6	4500
Chili	2544	3803.1	5500

At rural market price of vegetable, cost price of Eggplant is 1696 taka per quintal, tomato is 1802 taka per quintal, and chili is 2544 taka per quintal. After everything else, selling price of Eggplant is 4000 taka per quintal, tomato is 4500 taka per quintal, and chili is 5500 taka per quintal.

5. The Results

Price difference become increasing because the increase number of intermediaries. Price difference, on the contrary, become lessening because the reduce number of intermediaries. Matin et al (2008) shows that price at outlet at distant market (Dhaka) become almost double higher than that at farm. Several studies on analysis of supply chain on determination vegetables price in Bangladesh pragmatic that rural and urban market price is wide gap. Sabur (1990) showed marketing for eggplant and tomato was as higher as 74%. Perishable product marketing depends on many intermediaries due to the absence of requisite infrastructure and cause huge delivery cost and physical wastage. So Several studies on the supply chain transportation system and various unlawful activities are most vital reason for price discrimination between rural and urban market.

The analysis of supply chain is one of the most vital factors in formatting the price mechanisms. The supply chains of vegetables are dominated by traditional businessmen (middlemen). Without growers and consumers, all groups of businessmen are benefited by many ways. Growers got for vegetables, like as, eggplant is 1600 TK/Quintal, tomato is 1700 TK/Quintal and chili is 2400 TK/Quintal, urban consumers, other hand, paid for same eggplant is 4000 TK/Quintal, tomato is 4500 TK/Quintal and chili is 5500 TK/Quintal. So change in price of eggplant is 150%, tomato is 164.7%, and chili is 129.1%. So, growers and urban consumers toward between show wide gap. Unfortunately this gap creates not improvement of growers and urban consumer's living standard and effect of this gap is sinking purchasing power.

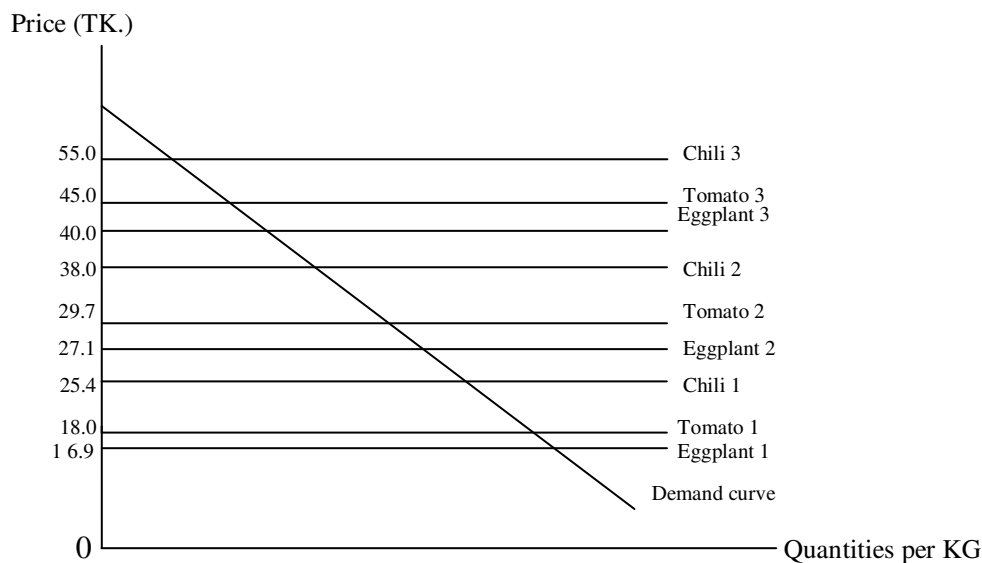


Figure-1: Marginal cost and benefit in rural and urban domestic market³

Tasnoova et al (2006); Matin et al (2008); Rahman et al (2006) made field survey in different region in Bangladesh on different agri-product and found that intermediaries in the market were in small number but they were organized. So they dominant farmers and compel them to sell product at lower price as farmers has no way to bring back the product from market as it involve

³ 1 indicate that rural market, 2 indicate that urban whole sale market, 3 indicate that urban retail market

extra cost. Rahman et al (2006) found their own survey that one of the main reasons for not getting good price in the involvement of local broker (dalal).

In the figure, demand curve is marginal benefit for all consumers, which are same for rural and urban consumers. But we assume Eggplant, Tomato and Chili 1, 2, 3 are average cost (AC), that is, supply curve. At the rural market, greater quantities for lower price, where consumer surplus is maximum, at the urban whole sale market, moderate quantities for moderate price, where consumer surplus is moderate; but at the urban retail market, lower quantities for higher price, where consumer surplus is smaller. According to Ahmad and Feher (2009), Effective participation by the government authorities in international standard setting (e.g., participation in international, regional and national codex committees) is a must to develop a base and establish a platform of Supply Chain Management (SCM) of fruits and vegetables in Hungary.

6. Conclusion

The government has a responsibility to ensure fair competition and transparency of supply chain of vegetables. Effective management of government can reduce gap between rural market price and urban retail market price. In addition, effective pricing mechanisms are necessary for supply chain of vegetables. The improvement of transport system and information system has an impact on the price and supply circumstances. Such transportation and information can contribute to the orientation of growers, the efficient distribution of food supplies in the country and inter-market collaboration. It was concluded from this study that the analysis of supply chain is not completely transparency, which result in management gaps throughout the whole chain system. Therefore, in order to develop closely integrated system of supply chain of vegetables and consequently, bridging the gaps between rural and urban retail market approaches of supply chain, there is an awful need to implement the superiority management system from ruling class. Government, in these cases, takes some necessary steps and how to ensure about controlling on market price and role of supply chain of vegetables. Government has very active role to set up, management and monitor the market very closely. Establish competitive market for direct transaction between growers and consumers.

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