Journal of Business Studies, Vol. XXXIV, No. 2, August 2013

Some Observations over Supply Chain: With Reference to Vegetables Market of Bangladesh

Mohammad Anwar Hossain[*]
Md. Nazmul Hossain[**]

Abstract: *This paper makes an attempt to describe the existing vegetable supply chain system in Bangladesh which includes number of markets, number of middlemen, and number of financing institutions. Then it shows various constraints in the existing supply chain where the problems of the vegetable supply chain are discussed thoroughly. Then, the impacts of lack of effective supply chain linkages are discussed. Finally, it shows a proposed vegetable supply chain for Bangladesh.*

Introduction

Bangladesh is witnessing rapid changes in retailing with urbanization, increase in disposable income, changing lifestyles, preferences and eating habits of its population. Bangladesh with diverse agro-climatic conditions offers both opportunities and challenges in retailing of fruits and vegetables. Concentration of production with small and medium farmers in remote areas without proper infrastructure facilities and market linkages has led to large scale inefficiencies in supply chain.

There is huge deficiency between demand and supply of vegetables in Bangladesh. One of the reasons of this deficiency is ineffective supply chain through which vegetable reaches from farmers to ultimate consumers. In the existing supply chain, there are a number of middlemen which causes a huge gap between vegetable growers and end consumers. Again the vegetable marketing information system rarely exists in current context for which the vegetable growers do not have current vegetables' price and demand information. So they cannot sell it at the right price to the middlemen. They often take loan from local money lenders who charge higher rate of interest for the loan.

A supply chain is effective at that time when it meets the demand of end consumers at the right place, at the right time and at right price. It creates benefits for all the parties involved in the chain. In case of vegetable supply chain, it needs to meet the vegetable demand of consumers effectively so that consumers, vegetable growers and middlemen get equal benefit from it. If it is not effective then the interest of any party may decreases which also impact on the overall supply chain negatively. So it has become the right time

[*] Assistant Professor, Department of Marketing, University of Dhaka, Dhaka 1000.
[**] Assistant Professor, Department of Marketing, University of Dhaka

for everyone involved in the vegetable supply chain to participate in a planned way to improve the overall performance of the system.

Literature Review

The vegetable supply chain in our country is not effective where growers of vegetables are always deprived of profit. Growers in this chain face three challenges: financing crop production; poor yields; and losses due to the elements which reduce their bargaining power significantly (The Daily Star, 2009).

Asian Productivity Organization (2007) on "Marketing System for Agricultural Products" indicated that the agricultural marketing system of Bangladesh is inefficient because of the different territories, scattered location of production areas, natural disasters and relatively poor condition of infrastructure. The report suggested that two approaches should be adopted. First approach is the establishment of regulated markets which are setup to regulate the conduct of market functionaries, promote grading and standardization of products, collect and disseminate of information. The second approach is the establishment of central wholesale markets which will provide facilities for assembling large volume of products which are properly stored, graded and packed to facilitate their auctioning. The author also highlighted some major aspects namely infrastructure required for efficient marketing of vegetables. One aspect, the author mentioned, was the marketing arrangement in terms of extent of coercion exercised by marketing institutions.

Malakar (2006) in a study on "Agricultural Marketing Systems in Bangladesh" mentioned the constraints regarding the improvement of marketing performance such as preponderance of various marketing acts, poor infrastructure. The author mentioned that only farmers could not increase the efficiency for which government support and private firms' investment were also required. He mentioned there were some agricultural markets in Bangladesh from which agricultural produces were traded such as rural wholesale markets, urban wholesale markets, urban wholesale cum retail markets and urban retail markets which had little connection with market information system. Finally the author recommended that the marketing system of farm products in Bangladesh needed to be based on modern and scientific lines. Modern techniques like contract arming, development and modernization of primary markets, retail outlets should be introduced.

(Islam and Ahsan, 2009) in a study of "Development of an Effective System for Vegetable Marketing in Bangladesh" investigated that the present market intelligence system in Bangladesh is not yet well organized. Communication system to link wholesale and retail markets in different areas has not been strengthened. Transportation is still poor. The study observed that out of 64 field offices of Department of Agricultural Marketing only 24 have telephone lines where market information are sent mostly by

mails. Farm level prices are broadcasted over radio once a week. Farmers do not get good vegetable seeds at the right time at a reasonable price.

Elias (2007) in a study of "Marketing and Credit for Increased Vegetable Production" mentioned that vegetables have not yet attracted the attention of the public sector for a credit program. Credit is required for efficient production and utilization of vegetables marketing. Mostly it is traders who contract the farmers in advance and provide credit for vegetable production on the condition that products would be sold to them. It was observed by the study that traders pay less than the prevailing market price. The author also mentioned that in recent times, the NGOs concerned with agricultural activities are getting interested in vegetable production effort, and tend to fill in a gap lying between farmers, researches, extension works and in a matter of providing credit facilities.

Fazlur (2008) in a study on "Agricultural Marketing System in Bangladesh" highlighted the lack of market information as one of the reasons for the low price received by the growers. The author mentioned that public sector market information systems like Directorate of Agricultural Marketing, Directorate General of Food and the Food Planning and Monitoring Unit are not updated so the existence of these systems is not much helpful for the farmers. The author also urged private enterprise to invest in this marketing system.

Objectives of the Study

The overall objective of the study is to analyze the existing vegetable supply chain operating in Bangladesh. The specific objectives of the study include –

- to analyze the current market structure and its performance;
- to analyze the number of middlemen, their roles and effectiveness;
- to identify major constraints, opportunities of production and supply;
- to analyze the impact of inefficient supply chain on vegetable growers and consumers; and
- to suggest a proposed supply chain system for effective vegetable market.

Methodology

Nature of the Study:

This is a Descriptive Research, because the main objective of this research is to find out the existing vegetable supply chain operating in Bangladesh and the problems which make the supply chain ineffective.

Method of Data Collection:

Data were collected from secondary sources. Secondary data on total land size, trend of vegetable production, number of markets and middlemen, and other data relevant to the study were collected.

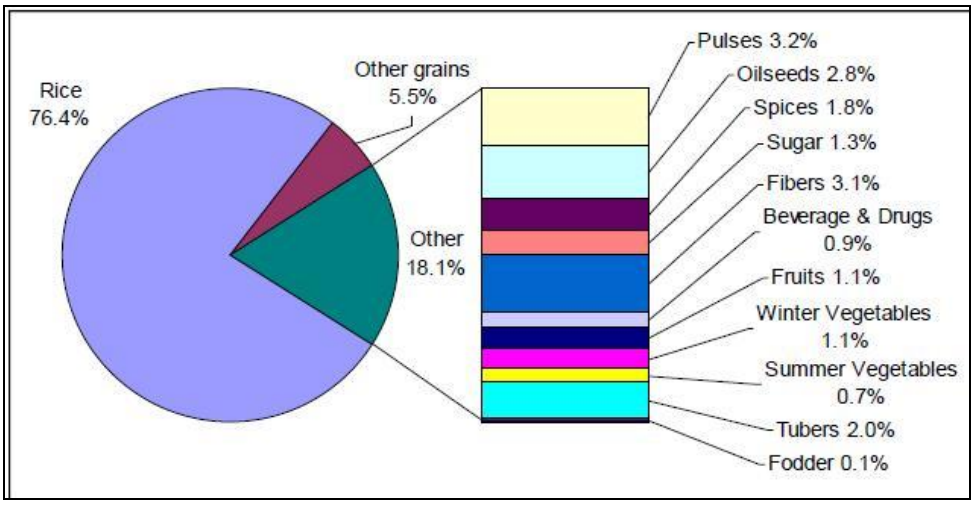
Sources of Data:

Secondary Data were collected from research papers, articles, websites, journals, newspapers etc.

Current Vegetable Production in Bangladesh

In Bangladesh vegetable crop occupied only 1.8 percent of total cultivable land. The per capita supply of vegetable is one-fifth of cereal production while it is double in case of developed countries. It is because farmers find few incentives and encouragements to grow vegetables. The overall distribution of cropped area is shown below:

Figure-1: National Distribution of Cropped Area in 2007/08.



Source: Bangladesh Bureau of Statistics Agricultural Wing.

So in the above figure we see that, the distribution of cropped area for vegetables is less than some other cereals. It is much less than that of rice. However there is very lucrative market for vegetable in national and international level. But still the production is not enough to meet the demand of all these markets and the quality of produced vegetables is not good enough to meet the requirements of those markets.

Existing Supply Chain of Vegetables

A. Number of Markets:

There are broadly four types of market in the existing supply chain of vegetable in Bangladesh. These are:

Rural Primary Markets:

Primary market is held once or twice in a week and it often deals with commodities which are required by the local rural people. In this market vegetables are directly sold to the local consumers. The basic producer or primary markets at village level are the haats, in which the trade is characterized by direct sales of small quantities of produce by growers to village traders or retail sales to rural consumers.

Assembly and Secondary Markets:

These are larger markets where greater quantities of produce are disposed of either by growers themselves or by village traders. These markets are usually located within larger settlements and as well as operating on a periodic basis for assembly purposes they may operate as daily retail markets, serving nearby urban populations.

Terminal Markets:

Urban wholesale, wholesale/retail and retail markets are located near to large consumption areas. For the retail markets permanent retailers predominantly handle the transactions. In the wholesale markets transactions are by wholesalers or commission agents and only larger growers and marketing cooperatives are likely to bring produce. It is the central or wholesale markets from where distribution starts.

Other Markets:

In case of horticultural marketing, channels other than through markets exist, including, direct on-farm sales and, the use of pre-harvest contractors who purchase the produce while it is still on the trees and arrange for harvesting, packaging and transport to wholesale outlets.

So, the number of existing markets in the Northwest by district is shown by Table-1.

Table-1: Existing Markets in the Northwest by District.

District	Types of Market/Hats (Number)								Village served	Catched Area Radius (km^2) (km)		Density ('000 persons)
	Rural /Primary		Assembly /Secondary		Urban /Terminal		Total					
Bogra	91	8%	99	12%	5	15%	195	10%	12.8	19.92	2.52	21.3
Dinajpur	359	33%	92	11%	7	20%	458	23%	7.9	14.52	2.15	10.52
Pabna	198	18%	88	10%	8	24%	294	15%	9.2	16.56	2.3	17.22
Rajshahi	182	17%	279	34%	3	9%	469	24%	13.5	20.13	2.53	17.03
Rangpur	261	24%	270	33%	11	32%	542	28%	6.9	17.83	2.38	17.89
Total	1,091	100%	828	100%	34	100%	1,958	100%	10.1	17.59	2.37	15.93

*** Comprising urban wholesale, wholesale-cum-retail and retail markets**

*** Of which 545 are classified as growth centers by the planning Commission**

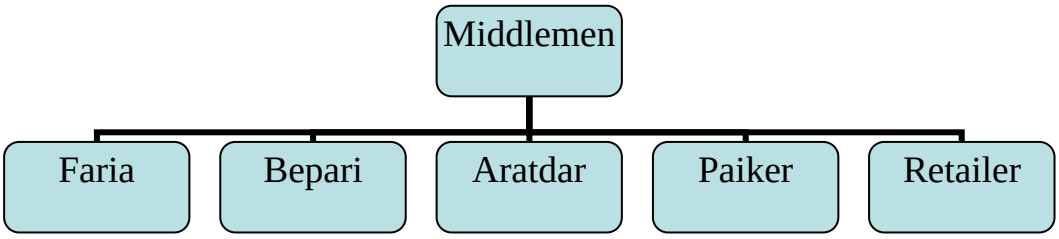
Source: Tracey-White 2000.

In the above table we see that there is more rural primary market (1091) than secondary or assembly market (828). Among the five districts Dinajpur has highest (359 or 33%) rural primary market whereas Bogra has lowest in number (91 or 8%) only. In case of Assembly or secondary market Rajshahi (279 or 34%) and Rongpur (270 or 33%) has highest number than the other three districts. Meanwhile, in Urban or terminal market Rangpur has highest (11 or 32%) and Rajshahi has lowest (3 or 9%) in number. Apart from this, the total number of market in the above five districts is 1958 whereas, Rangpur has highest number of market (542 or 28%) and Bogra has lowest number (195 or 10%).

B. Number of Middlemen:

There are five categories of middlemen from farm gate to ultimate consumer. They help the vegetables reach from growers to consumers. They are faria, bepari, aratdar, paiker and retailer.

Figure 2: Different Categories of Middlemen.



Source: Md. Jahangir Alam (2010).

Farias:

Farias are small scale rural traders who purchase vegetables from growers either in village or from primary markets and sell them to beparies or local retailers.

Beparies:

Beparies are rural assemblers who generally purchase vegetables from secondary markets or directly from the growers through farias in village and transport them to the central wholesale markets for urban consumption through retailers.

Aratdars:

Aratdars are commission agents who charge commission from both beparies and paikers. They have permanent staff and establishments in the wholesale markets and arrange sale of vegetables from bepari to paiker who further sell vegetables to the retailers.

Paikers:

Paikers are regular traders who generally purchase vegetables from the beparies through aratdars and sell vegetables to retailers or consumers.

Retailers:

Retailers generally purchase vegetables from the beparies through aratdars and sell them directly to consumer. They have permanent shop in retail market or they have markets on open air outside the markets called foot-path. However, in rural areas retailers purchase vegetables directly from the growers and sell them to rural consumers.

So here, in general vegetables supply chain starts from vegetable growers. From them, beparies buy vegetables. From many beparies, aratdars buy vegetable who later sell them to paikers. Then vegetable retailers buy from paiker and sell them to ultimate consumer. In this way, vegetables reach from vegetables growers to ultimate consumers.

So the existing supply chain of vegetables is as follows:

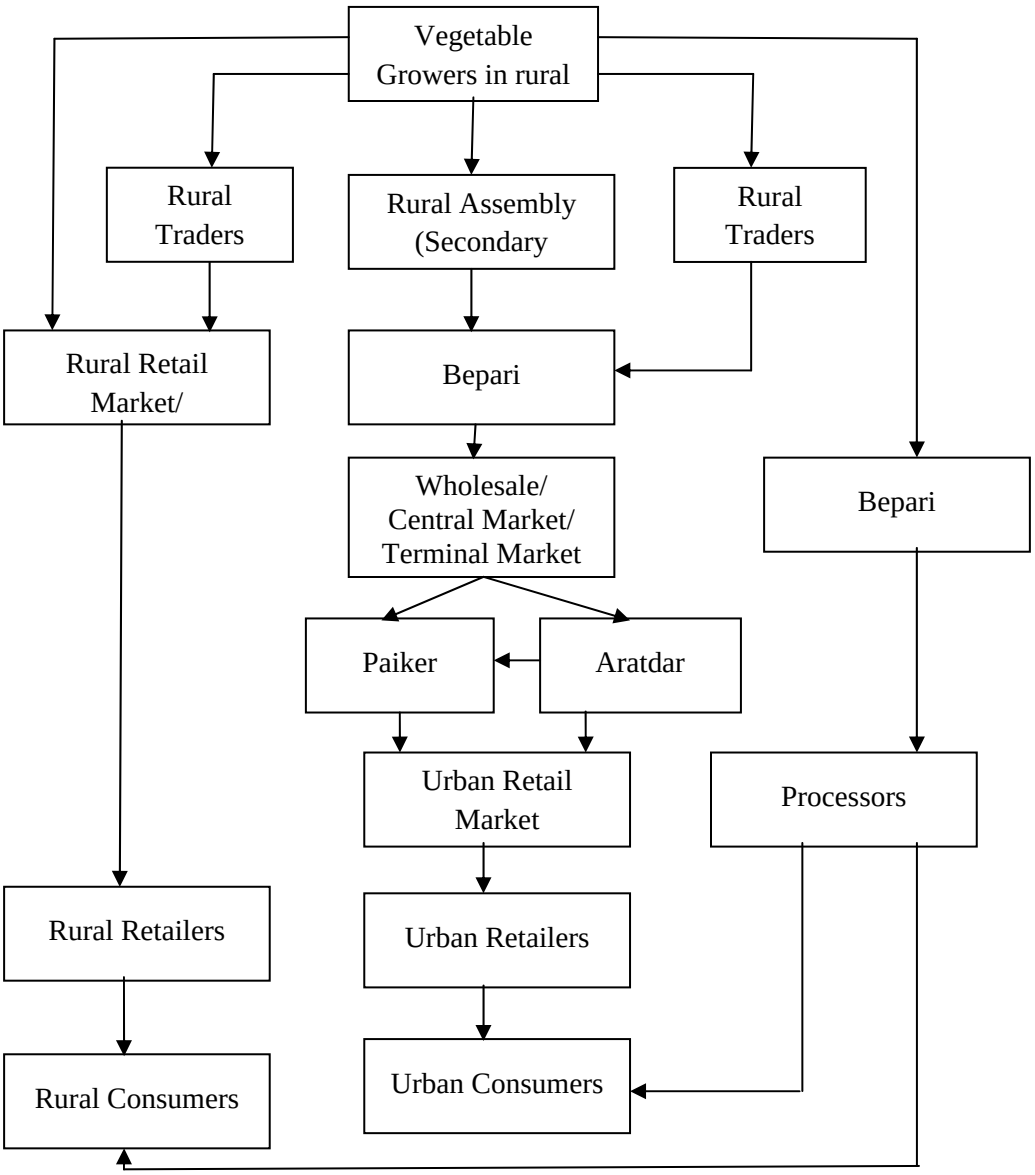


Figure 3: Existing Vegetable Marketing Channel in Bangladesh.

Source: Md. Jahangir Alam (2010).

Constraints in the Existing Supply Chain

Policy Constraints

The policy constraints are several. Firstly there is no mechanism in place to ensure compliance with regulated standards of operation. Secondly, regulated standards of operation are either outdated and outmoded, or unable to be met due to technical reasons. Thirdly, policy formulation is ad-hoc and frequently designed to confer a pecuniary benefit to one or more selected interest groups. Fourthly, implementation of policy is ad-hoc and patchy.

Institutional Constraints

In Bangladesh there are many institutional constraints. In terms of the vegetable physical markets, there are problems of multiple ownership and control of the land on which the market is built, the market infrastructure itself, the market operations, and the market revenue collection systems.

Infrastructure Constraints

Infrastructure constraints in the marketing system are chronic. Markets are congested and have developed in an unplanned manner. Most vegetable markets lack basic support facilities such as warehouse, cold storage facilities, potable water, drainage, or vehicle access for loading and unloading.

Human Resource Constraints

Most of the parties involved in the existing supply chain are not highly educated. So most of them are not aware of modern technology and skills which could increase vegetable production rapidly and contribute to vegetable quality and minimize cost.

Informational Constraints

In terms of the Market Information System in Bangladesh, the Bangladesh Bureau of Statistics and the Department of Agricultural Marketing collect and disseminate most of the production, supply and price information. The Department of Agricultural Marketing (DAM) provides market data and a limited amount of market information, but no market intelligence. There is no analysis of price trends, variability (other than ranges), or supply or demand conditions.

Insufficient Processing Capacity:

Existing vegetable markets have few processing capacities. Harvested vegetables are not graded or sorted or packed in a standard way. Doing this processing could increase the bargaining power of vegetable growers.

Lack of Cold Storage

Storage facilities for vegetables in Bangladesh are limited. The Bangladesh Agro-processors Association (BAPA) has only 18 enterprises on their (outdated) list of members. In terms of vegetables, only 5 of their members are involved in processing, of which 3 of them have not been actively involved in the industry for the past two years.

Informal Tolls

In the existing vegetable supply chain, middlemen have to provide various informal tolls while transporting vegetables from growers to urban retailers. Transporting vehicles in the path are stopped several times many times to provide tolls by various authorities having political shelter (The Daily Star, November 5, 2008).

Lack of Effective Linkages among Stakeholders

The core problem for agribusiness development in Bangladesh is the lack of effective linkages among stakeholders. There are many middlemen between vegetable growers and consumer. So vegetable growers often do not know the preference of consumer, market price, demand and existence of new markets. So they do not often get reasonable price for cultivated vegetables. At the same time, consumers have to pay high price as vegetables are carried by several middlemen who add different mark ups at the various stages of existing supply chain.

Seasonal Fluctuation of Prices

Vegetable growers suffer from the seasonal fluctuation of prices. When production increases, consumption also tends to increase simultaneously, but the vegetable growers find it difficult to sell his produces at a reasonable price. When production is low, the price of vegetable increase and as a result consumption of it decreases.

In equilibrium in Supply and Demand of Vegetable

Production of vegetable is not evenly distributed in all parts of the country due to agro ecological limitation. The soil and climate of Bangladesh is more suitable for the cultivation of winter vegetables rather than summer vegetables which reveals seasonal deficit of vegetable production in the country. Thus it needs policy intervention to ensure equal supply of vegetables during the whole year for a better nutritional balance and for stable price for vegetables throughout the whole year.

Inadequate Credit for Vegetable Production

Vegetable cultivation is highly labor intensive and cost oriented. However, most of the farmers have little access to institutional credit for supporting their production. As

vegetable production is highly expensive and there exists a high degree of risk and uncertainty of natural calamities and hazards, there should be policy support for institutional credit exclusive for the production of vegetables.

Inadequate Transport Facilities

Transport of vegetable from production place to primary markets and also to central markets is inefficient, and costly. Vegetable growing areas do not have proper link roads with the adjacent markets and thus growers face serious problem in carrying vegetables to the adjacent markets.

Absence of Government Regulation in Central Markets

There is shortcoming of imposing regulations in the wholesale market by the government as it was proofed by higher charges of market commissions by the aratdars which incur a part of profit that might be incurred by the other market participants. Thus there is a strong need for imposing market regulations for not only wholesale markets but also for other primary and secondary markets.

The Impact of Ineffective Supply Chain Linkage

The lack of effective linkages among stakeholders in a supply chain has several consequences. Perhaps the most obvious consequence is the presence of supply chain bottlenecks. Bottlenecks results in produces from farmers not flowing to the market in the amount and quality necessary to ensure high and stable returns. Therefore, the overall volume of trade is reduced; this implies that the vegetable growers and enterprises are not able to reap the benefit from higher rural income and employment. In turn, a weak rural economy reduces the scope for investment and leads to low growth. In the absence of effective linkages among stakeholders the scope for innovation is also limited. One effect of a low rate of innovation is low farm vegetable productivity which results in low comparative advantage; another effect is missed market opportunities. Together these two effects results in low competitiveness of agriculture in Bangladesh. Without effective linkages among stakeholders, success cases of entrepreneurships remain isolated and do not induce an adequate growth of the agribusiness sector.

The ultimate impact of the core problem of absence of effective supply chain linkages is low growth of vegetable business development resulting in a low growth of the rural economy and aggregate growth. Given the overwhelming presence of the poor in rural areas, the low growth of the rural economy means persistence of poverty. Also because of this situation, there are large number of middlemen existing in the vegetable supply chain for them different mark ups are added at different level of the supply chain which

increase the price of vegetable and they use the ignorance of vegetable growers to exploit them by not offering competitive price.

Proposed Vegetable Supply Chain

The proposed supply chain is nothing but integration of activities of involved participants like farmers, banks, NGOs etc. Farmers have to form an association which will deal with other stakeholders. In the executive body of this association, there will be representatives of farmers, local authorities and other related parties.

At pre-harvesting level, farmers will collect loan from existing banks and NGOs. The farmers' association will facilitate loan collection and repayment. Then the dependency on local loan lenders will decrease who charge higher and also the tendency of farmers to sell vegetables after cultivation as early as possible to repay the loan of local lenders to get rid of high interest will also decrease.

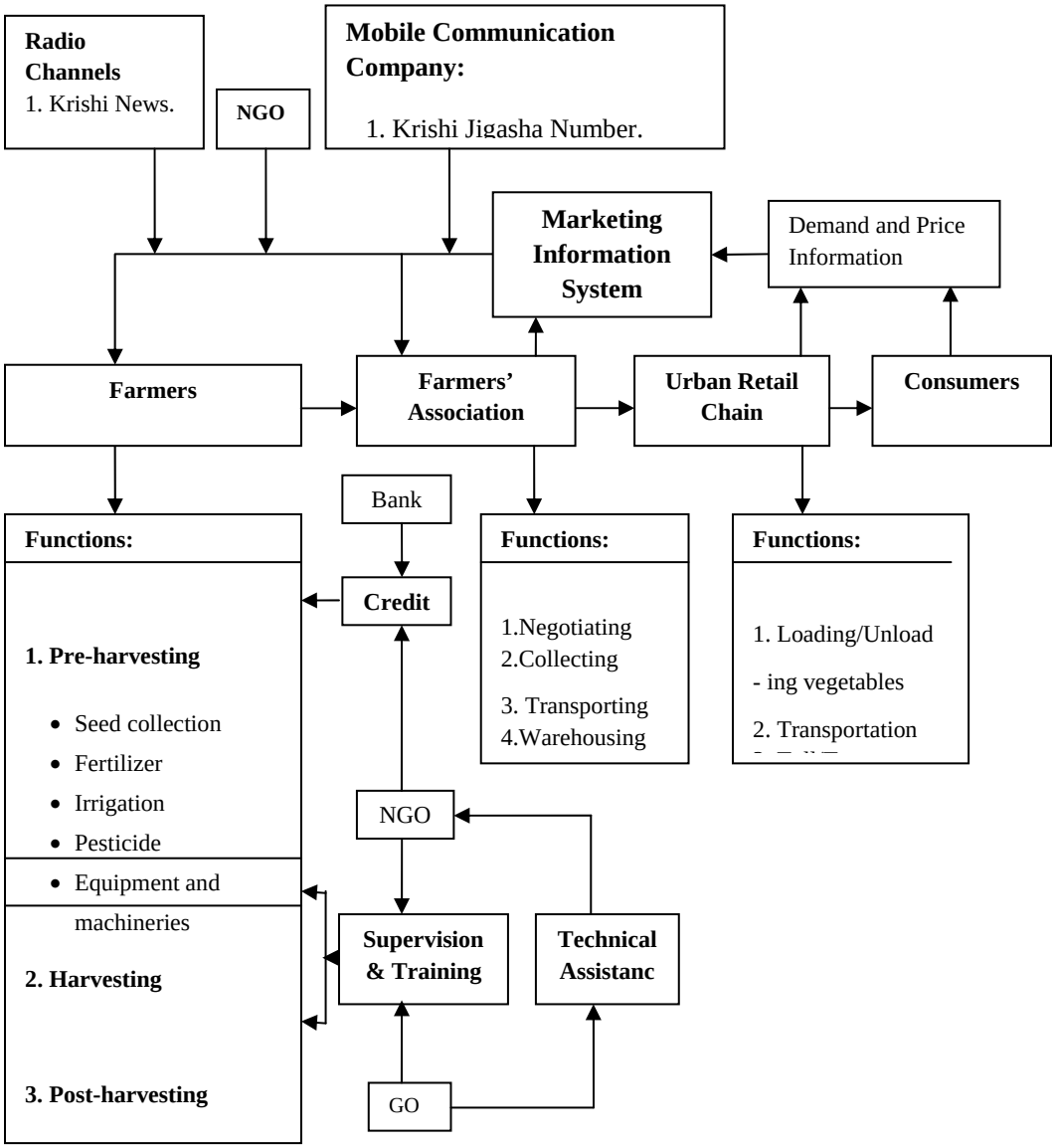
At harvesting and post-harvesting levels, the farmers' association will also arrange training and supervision with the help of NGO and GO to ensure that cultivated vegetables are healthy and risk free.

After post harvesting, the farmers' association will contact with various middlemen including urban retailer and supermarkets to supply the harvested vegetables. Then it will negotiate with them about the price of harvested vegetables and it will collect and warehouse those vegetables.

After collecting vegetables, this farmers' association will select root and arrange transportation to send those vegetables to the contacted parties.

While selling those vegetables, the representatives of the farmers' association will collect information about vegetable demand and price and other necessary information. To inform this information to all farmers, the association will disburse information to various radio channels, NGOs and mobile telecommunication companies who will inform the information to farmers by their various programs and means. They will disburse the information as performing their social responsibilities. By getting this information, farmers will be able to cultivate those vegetables demanded by consumers and will not be exploited by middlemen in terms of price. Farmers will also know about new markets and export potentiality of vegetables.

Figure 4: Proposed Vegetables Supply Chain.



Concluding Remarks

The climate and land of Bangladesh are suitable for the cultivation of plenty vegetables for which vegetable growers can produce sufficient vegetables. But due to the lack of assistance and other incentives at the production level, farmers do not cultivate as much vegetables as needed. Again cultivated vegetables do not reach to end consumers

efficiently and effectively. The lack of facilities like warehouse or processing centers reduces the bargaining power of vegetable growers because vegetables have inelastic supply and demand curves for which the price of vegetable is volatile. The number of middlemen in existing vegetable supply chain is large for which the end consumers have to pay higher price because of adding mark up in the grower's selling price. As the vegetable growers have no market information, middlemen exploit them in terms of price. Again the local money lenders charge high interest rate for the loan for which vegetable growers have to sell vegetable as quickly as they can after cultivation to repay the loan. In a program of BTV, Farmer's Development, Dr. Atiur Rahman who is the governor of Bangladesh Bank said that now the Bangladesh Bank has formulated various farmers' friendly policies. Under this policy the private banks have provided loan more than 2500 crore to the farmers including vegetable growers. Reduction of the number of middlemen is possible by developing a farmers' association which will perform many activities which are now performed by middlemen. Again for the development of marketing system, both private and public investments are needed to come forward.

References

Agrico, 2004. Agricultural Development Project, Bangladesh. Consultancy Report, Ministry of Agriculture, Government of Bangladesh.

Asian Productivity Organization, 2007. Marketing System for Agricultural Products. Available from: Available from: http://www.apo-tokyo.org/ [Accessed on 20th November, 2010].

Ali A M M Shawkat 2009. Will supermarkets in Bangladesh be super for small farmers? The Daily Star.

Available from: http://www.thedailystar.net/newDesign/index.php [Accessed on 17th November, 2010].

Asif Md. Kamal, 2010. The Role of Agricultural Marketing in Living Standard of Bangladeshi Peasants. Presented at the 17th Biennial Conference held on 8-10 April, 2010. Osmani Memorial Auditorium and Institution of Engineers, Dhaka, Bangladesh.

Alam Md. Jahangir, 2010. Export Marketing of Vegetables in Bangladesh. Bangladesh. Bangladesh Academy for Rural Development.

Bangladesh Bureau of Statistics Agricultural Wing, 2008. Major & Minor Crops Statistics-2008 & 2009 . Available from: http://www.bbs.gov.bd/Home. [Accessed on 10th November, 2010].

Bangladesh Economic Review 2008, Agriculture, Chapter – 7, PP. 93-104. Available from: http://www.mof.gov.bd/en/index.php?option=com_content&view=article&id=71&Itemid=1

&phpMyAdmin=GqNisTr562C5oxdV%2CEruqlWwoM5 [Accessed on 22nd November, 2010].

Bangladesh Bureau of Statistics Agricultural Wing, 2008. National Distribution of Cropped Area in 2007/08. Available from: http://www.bbs.gov.bd/Home. [Accessed on 10th November, 2010].

Chopra, S., (2009), Supply Chain Management. 5th ed. India. Pearson-Prentice Hall.

Fazlur, 2008. Agricultural Marketing System in Bangladesh. Bangladesh. Consultancy Report, Ministry of Food. Dhaka.

Hossain and Arangzeb, 2009. Marketing and Economic Development. Bangladesh, Bangladesh Academy for Rural Development, Comilla.

Islam and Ahsan, 2009. Development of an Effective System for Vegetable Marketing in Bangladesh. Bangladesh. BARC, Agricultural Economics and Rural Sociology Scientific Paper No. 7, PP.-27- 35.

Kohls Richard L. and Uhl Joseph N, 2002. Marketing of Agricultural Products. 9th Ed. India. Prentice Hall.

Ken D. Duft, 2009. Agribusiness Management, USA. College of Agriculture, Washington State University.

Malakar, 2006. Agricultural Marketing Systems in Bangladesh. Consultancy Report, USAID/BRAC, Dhaka.

Mital R. K, 2008. Vegetables Production and Marketing a Country Paper, Presented in a conference organized by Asian Productivity Organization. Tokyo. Japan.

Press Release, Mymensingh, 2010. Vegetable market building project costs increased. The Daily Star. Available from: http://www.thedailystar.net/newDesign/index.php [Accessed on 17th November, 2010].

Tracey-White, 2000. Vegetable Trade and Market Prospect. Presented at Export Potential of Tropical Agricultural Products in Asia, held on 31 July 2001. APO, Indonesia.

World Bank, 2010. High Value Agriculture in Bangladesh, Bangladesh Development Series, Paper No. 21. Agriculture and Rural Development Unit, South Asia Region.

Xian Zhu and Mona Sur, 2008. High-value agriculture and agri-business in Bangladesh. The Daily Star. Available from: http://www.thedailystar.net/newDesign/index.php [Accessed on 17th November, 2010].