Value chain analysis of exportable vegetables

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Nowadays, a supply chain and value chain[2] analysis is precondition to identify the constraints and opportunities of the selected agro-commodities here in vegetables export for designing appropriate intervention strategy and implementation plan for export growth and its sustainability.

1. Supply chain analysis

Supply chain is the process of planning, implementing and controlling the operations of the supply chain as efficiently and effectively as possible from point-of-production to point-of-consumption.

Supply chain development is a market-oriented approach. Supply chain analysis is precondition for preparation of activity schedule for specific intervention area. All activities of a particular chain are directed towards the market. If farms/enterprises cannot satisfy the needs (or requirements, preferences, desires) of their buyers, the buyers will sooner or later turn to another reliable supplier. It is, therefore important to understand that all stakeholders along a particular supply chain need to cooperate and coordinate their activities to satisfy the needs of the end consumer. If there is one weak link in the chain, the competitiveness of the overall value chain is endangered. This is especially true in a business environment in which local enterprises increasingly compete with foreign companies not only on the national market but also and especially for export markets. We need to understand that no individual farm/enterprises compete with each other, but the entire value chain work together.

One of the key constraints in designing any intervention in the agribusiness sector is the lack of sufficient and authentic information on the size of the farm/enterprises and values generated as well as its sub-sectors. The process will provide deep understanding of constraints and opportunities in each sub-sector (vegetables) and lead to development of activities for interventions. It will also illustrate roles and responsibilities of each stakeholder in the supply chain.

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[2]*Often the terms production chain and value chain are used interchangeably, but in fact the two have important differences. In its simplest definition, a production chain is the description of all participants in an economic activity that relate to take inputs to a final product and deliver it to the final consumers. Conversely, a value chain is understood as a vertical alliance or strategic network among a number of independent business organizations within a production chain.*

2. Value chain analysis

Value chain is a chain of activities. Product pass through all activities of the chain in order and at each activity the product gains some value. The chain of activities gives the product more added value than the sum of added values of all activities. A value chain analysis should be done to identify the actors involved in the supply chain of any sub-sector, to improve access of inputs, markets and services by mobilizing the poor farmers and policy environment towards facilitation of the chain. Value chain generally starts with the raw materials supply at the farm level and ends with consumers who make the choice to buy, or not to buy, the finished product. Any value chain has several links between the farm and the consumer such as procurement, transportation, processing, commodity storage, conversion packaging, distribution, retailing and other services.

3. Rationale of value chain analysis

Entrepreneurs including the farmers and traders are operating their business by their existing knowledge. They might have lack of knowledge on market information and process of operations in the chain. That limits the growth of the market, profitability of the entrepreneurs and ultimate satisfaction of the end consumers. The value chain analysis give greater understanding of the market players, their roles and interrelationship, of the sub sector/value chain in specific/project area. For this, any sub-sector map should be prepared after collecting the information of the whole value chain. Sub-sector map is a schematic diagram that describes the product flows and contractual relationships among farms in a sub-sector/value chain.

4. Identification of actors, services & service providers in vegetables export value chain

The following major actors, embedded services and different service providers have been identified for vegetables export value chain analysis:

Actors

- Input manufacturers/dealers/retailers
- Farmers
- Local traders/collector, suppliers
- Commission agent
- Wholesaler, retailer, grader/packer
- Transporter
- packaging manufacturer
- Processors
- exporters
- Household/supermarket consumer
- Wholesaler/importer in international market
- Retailer in international market
- Consumer in abroad (Ethnic/superstore)

Major embedded services/inputs

- Land, labor, capital/financial support/credit
- Seed/planting materials, fertilizers, pesticides/bio-pesticides, irrigation
- Equipments/machineries
- Extension services, postharvest management services
- Marketing services, transport services (local)
- Capacity building/Training
- Human resource (education, research & extension)
- Processing & packaging facilities; C&F, quarantine, customs, air/sea shipment services
- Media, ICT, Waste management, National political stability, cultural and religious practices

Major service providers

- Ministries (Policy, act, rules & regulations)
- DAE (Production, extension, quarantine & certification)
- Export Promotion Bureau (EPB)
- Hortex Foundation
- Education, training and research institutes (Agricultural Universities, NATA & NARS)
- Seed breeder farm, inputs manufacturers
- Input distributor/agent/retailer
- Access to finance (Bank/Financial Institutes)
- Access to information
- Market intelligence
- Lab (Quality, safety & certification)
- Infrastructure facilities and transport companies
- Cold storage, customs, C&F agents, Airlines/Shipping lines
- Media
- Business associations (BFVAPEA, BPEA, BAPA)
- Development Partners

5. Domestic supply chain of vegetables

Vegetables supply chain is characterized by a large number of market actors and outlets including farmers, input sellers, traders, wholesalers, commission agents, retailers, processors, exporters, transporters, C&F agents, and a number of other smaller actors, each contributing to a specific stage in the supply chain.

In Bangladesh, the micro, small and marginal farmers are very vulnerable to the exercise and influence of market power practicing by the traders, wholesalers, retailers, processors and exporters. With a very limited control over the pricing of agricultural inputs, outputs and with inadequate market access & information, farmers are poorly rewarded for their efforts and risks they endure. Furthermore, inadequate marketing infrastructures like packhouse and quality control often results in a significant reduction in produce quality and gross returns as well as increasing huge postharvest losses.

Current postharvest management practices of vegetables presents a depressing picture. Traditional techniques which result in considerable deterioration of physical and nutritional quality are generally practiced by the farmers, traders, wholesalers. processors, exporters, transporters, retailers. Improvement of these age-old practices and adaptation of modern postharvest management technologies have now become essential in order to reduce the high levels of postharvest losses in produce so as to increase the supply for quality vegetables for the growing population. Reducing postharvest losses has been recognized by policy makers and planners as a major strategy to address food security in the country. The management of the supply chain starting from cultivation through to the final sale to consumers is one of the major options available for minimizing this waste. This however, requires the concerted action of a large number of stakeholders including farmers, farmer associations, producer organizations (POs), processors, service providers, transporters, exporters and retailers, along the entire value chain. Postharvest management of vegetables in its traditional way faces lot of problems to meet the growing demand of good quality produces in the domestic as well as export markets.

Bangladesh produces a diversity of vegetables on a seasonal as well as year round basis. Simultaneous harvesting often leads to gluts in the market and so reduces prices to the farmers. Overcoming periodic gluts necessitates the preservation and minimal processing of vegetables[3]. Market opportunities exist for processed vegetables such as dehydrated vegetables, canned vegetables, frozen vegetables, pickled vegetables, tomato ketchup and paste, potato chips, starch, flakes and other value added potato products, both in domestic and export markets.

In this context, supply chain management of vegetables has become the crucial areas of management and national focus. This area becomes even more important in the sector of agribusiness because most of the vegetables are perishable and have a very short shelf life. Farming enterprise that comprises the entire set of processes and activities required to produce[4] and then deliver it to a target market maintaining quality. Numerous supporting activities are required functioning the chain effectively such as input supply, packaging, transport and integrating the chain partners. Hortex Foundation developed a generalized supply chain map of vegetables/flow of vegetables at domestic market is shown in **Figure-1:**

[3] Minimal processing of vegetables like zero energy evaporative cooler system which was successfully demonstrated by SCDC of NATP Phase-I, Hortex Foundation at project areas during year 2008-2014 funded by the World Bank, IFAD and GOB.

[4] The term "produce" encompasses growing, transformation and manufacturing of products where the entire chain goes from farm to table with a subset of links within the chain.

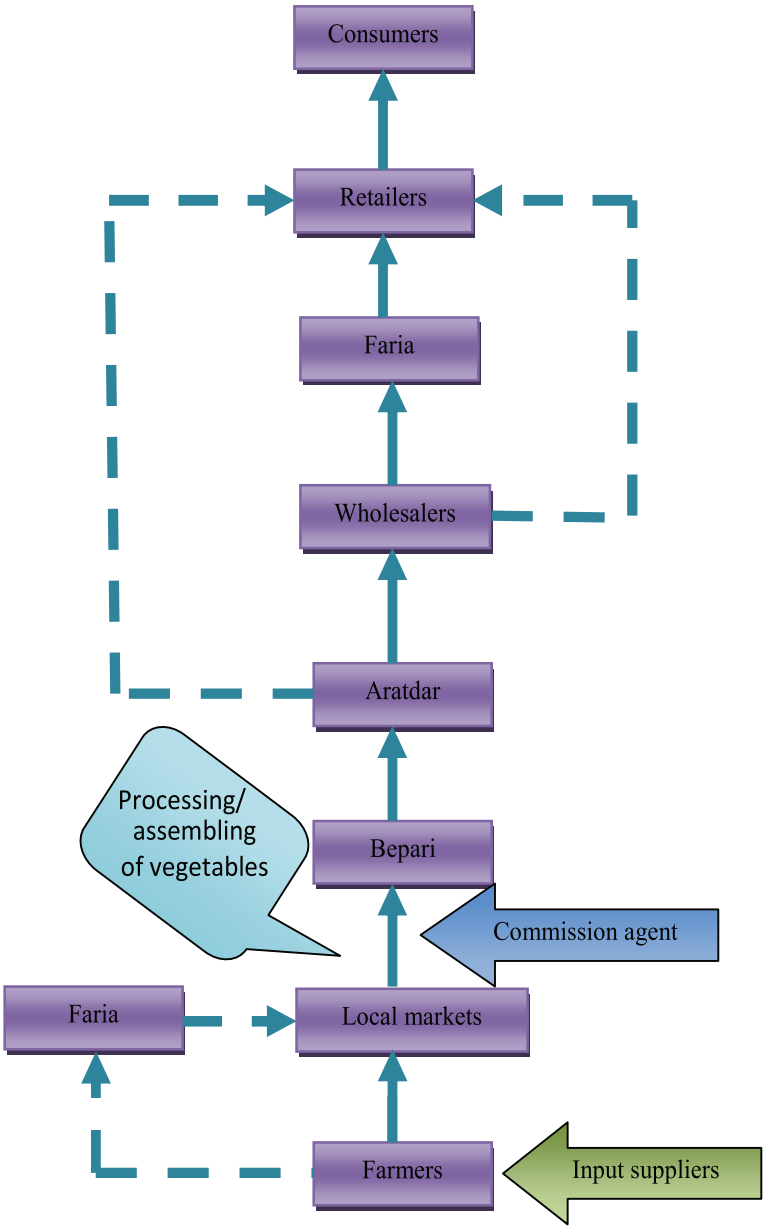


Figure-1: Generalized supply chain map of vegetables at domestic market

The stakeholders involved in the vegetables supply chain are: Input suppliers, growers, faria, bepari, commission agents, wholesalers, aratdars and retailers. All the stakeholders have specific activities to make the chain more efficient. Capacity building of each stakeholder needs to be increased to deliver proper services to make quality vegetables for the satisfaction of consumers/buyers. Different functions are associated with vegetable supply chain. The major functions are production, pre & postharvest management and marketing.

6. Vegetables export supply chain

Vegetable production is gaining increased popularity in Bangladesh over the years as per the demand of the modern health conscious consumers. The main reason for this growing demand is the awareness with regards to health promoting phyto-chemical constituents such as antioxidants, vitamins, minerals and dietary fibre. Hortex Foundation has contributed immensely to the growth of vegetables production and export promotion. Numerous high quality high yielding high value exportable vegetables are now being produced year round basis and there is no off season for vegetable production in the country.

Hortex Foundation facilitates the export of fresh vegetables in close cooperation with the Department of Agricultural Extension (DAE) and exporters under the Bangladesh Fruits, Vegetables and Allied Products Exporters' Association. Most of the vegetable exporters belong to the SME group and they export to their friends, relatives and international buyers (wholesalers/importers) in various market places major at Middle East, EU and Far East regions. This export represents the lowest segment of the market, usually known as the ethnic markets, which are more or less protective in nature, where buyers/customers are mostly either from Bangladesh or from nearby Asian countries like India, Pakistan, Sri Lanka, Nepal, Bhutan, Maldives among others.

Since the produce quality and safety consciousness is not yet high at the exporters mind, the exporters mostly remain satisfied with their traditional way of collecting the vegetables through suppliers/selected agents for export. They normally procure vegetables through middlemen/agent who collect orders from various exporters, then go to the producing areas, collect vegetables from farmers/local markets and arrange to deliver the same to the exporters processing centers on the day of shipment. The exporters then arrange vegetables for sorting, grading, washing and packaging in their own traditional way and go for export shipment. They do not use any cool chain, nor did they follow any production standard, traceability, postharvest handling and packaging protocol. As a result, the postharvest losses[5] are enormous, sometime more than 40%. Traditional exporters are not in

[5] Bangladesh produced over 16 million tons of vegetables per year. Postharvest losses of vegetables vary from 22 to 42% and cause enormous losses. This avoidable wastage of high-value produce requires serious attention of all; the farmers, the market handlers, the scientists and the policy planners as there is no sense in producing more for wasting. Growing of vegetables are highly rewarding to the farmers in terms of returns per unit area. This sub-sector is also expected to contribute significantly for food and nutritional security, employment opportunity and poverty alleviation.

a position to even fulfill the export orders of their ethnic market buyers in the present way of delivery for year round supply continuity. Recently, however, some of the ethnic market buyers, operating in countries outside the EU have started insisting for produce quality improvement and good packaging requirement. This has led to gradual but slow improvement in packaging and quality improvement of exportable vegetables in Bangladesh.

7. Vegetables supply chain in Narsingdi

Supply chain analysis helps farmers, traders, collectors, wholesaler, retailer, entrepreneurs, processors, exporters and other allied stakeholders to know who are the potential actors in the chain, what are the volume of produce is transacted, what is the flow of produce, information & knowledge exist in the chain, what are the different process in the chain and what types of business (services) are feeding into the chain. Incorporating this entire information, farmers/entrepreneurs can grow their business more efficiently.

In Shibpur/Narsingdi district, farmers bring their vegetables to the faria/local hat/bazar where a large number of paiker/traders/exporters agents procure vegetables for supply to Dhaka city markets and to the exporters. Along with this traditional concept, farmers in a group often carry these vegetables to Dhaka wholesale market and other city markets. About 90% of the vegetables from Shibpur/Narsingdi district are distributed to Dhaka City, 5% of the same are destined to other districts. 5% of the vegetables are consumed at Shibpur/Narsingdi through local traders. Outside Shibpur/Narsingdi, the primary destinations of the vegetables are the wholesale market of Dhaka city and the different marketing companies, super stores, processors and exporters.

The retailers are collected vegetables mostly from the Dhaka wholesale markets. Marketing companies and super stores are also collected vegetables from City traders/suppliers who other way around collected vegetables from Shibpur/Narsingdi through traders. Vegetables supply chain map at Shibpur/Narsingdi district is incorporated in **Figure-2.**

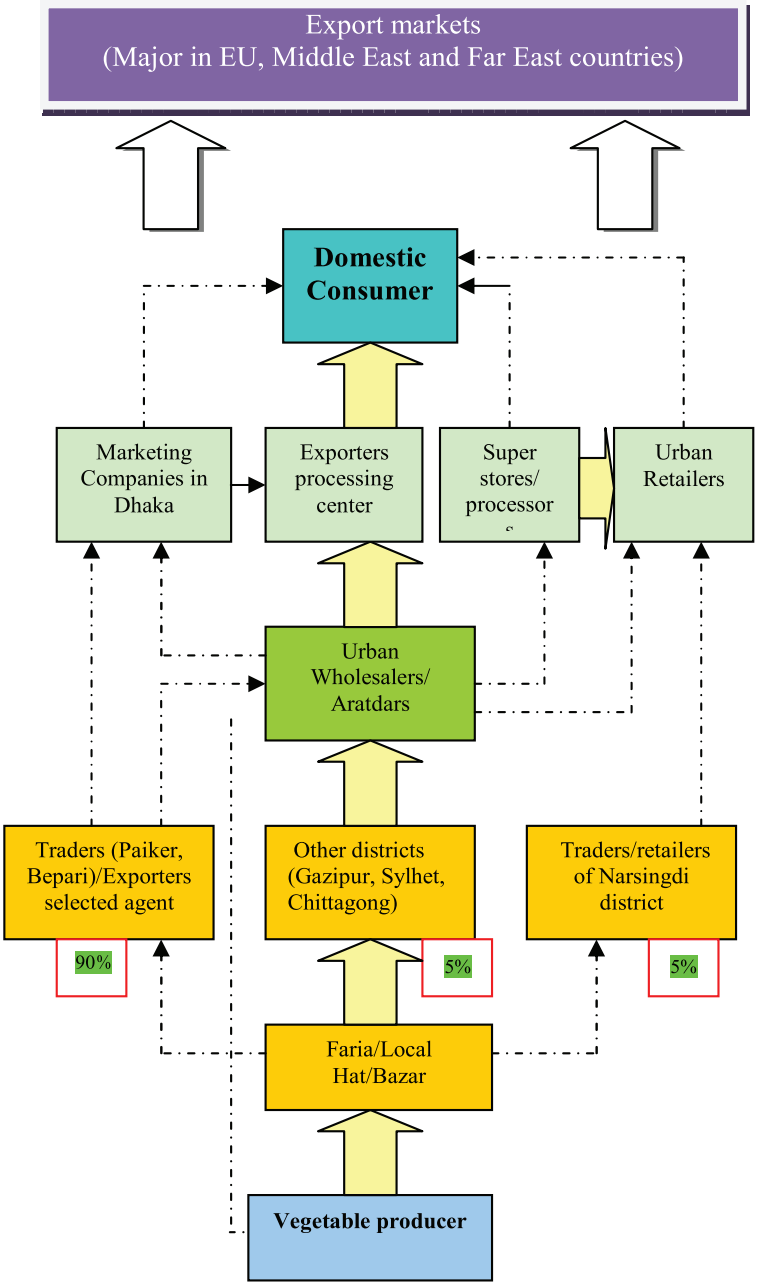


Figure-2: Supply chain map of vegetables at Shibpur/Narsingdi

Large numbers of local traders are associated with vegetables trading in Shibpur. Supply chain analysis reveals that most of the actors in the supply chain have acute lack of knowledge on produce quality & safety, sources of microbial & chemical contamination of vegetables, proper postharvest management like sorting, grading, washing, packaging, transportation. As a result postharvest loss is incurred at different stage of the supply chain. To make the export supply chain of vegetables more functioning, capacity building of different stakeholders along the chain need to be strengthened for promoting vegetables export.

8. Designing value chain diagram of brinjal

Shibpur upazila of Narsingdi district is considered as the important exportable vegetables producing area in Bangladesh. Vegetables contribute significantly in the local economy and national GDP. However, the vegetables sub-sector has been running with acute constraints despite huge potentials. Shibpur upazila holds a number of roadside markets where brisk transactions take place between the farmers and traders/selected agent and they supply brinjal to major wholesale markets of Dhaka City and to the exporters. To understand the constraints and opportunities, value chain maps are developed and interventions are identified to mitigate the constraints.

Cost of production of brinjal per bigha (33 decimal) in Shibpur is calculated at Tk. 61015, gross return Tk. 126000 and net return Tk. 64985. It indicates that brinjal cultivation is profitable for the farmers. Farmers' average selling price of brinjal was Tk. 18 per kg. However, market prices of brinjal remain higher during the period of July – September. The average price (per kg) was Tk. 20 for traders, Tk 32.6 for wholesalers and Tk. 37 for retailers. This value chain can be made more profitable for the farmers by developing contract farming, place of farmer-market linkages/pack house, involvement of exporters during production, postharvest management and mass use of sex pheromone trap[6], yellow trap use minimizing the input cost primarily for reducing the use of chemical fertilizers, pesticides, per unit increment of productivity through replacing local varieties with high yielding improved varieties, adding value through sorting, grading, washing and improved packaging, use of cool chain transport promoting export and minimizing the role of market intermediaries in the supply chain.

Present Government of Bangladesh is attaching high importance in terms of agricultural policies and programs for producing horticultural crops especially fruits & vegetables, developing modern PHM technology and agro-commodity export through diversification of produces and markets. Government has taken different initiative and measures to ensure supply of safe and quality vegetables in the market by managing proper PHM.

Government has given importance to render support relating to establish modern PHM technologies like Commodity Collection and Marketing Center (CCMC), Pack house, Collection point through development project. One such project is National Agricultural Technology Program – Phase II Project (NATP-2) funded by the Government of Bangladesh, WB, IFAD & USAID.

To improve value chain development of crop/horticulture and market linkage activities of smallholder farmers' in selected 30 upazilas under 22 districts, NATP-2 is funding the Hortex Foundation providing technical services in value chain development for selected high value crops as a 'Strategic Partner' to the DAE. The method emphasizes on adoption of improved PHM practices for high value horticultural crops, and showcasing these activities through better marketing solutions like the CCMCs, Collection Point (CP) and extending such linkages for the value chain actors. The smallholder farmers are organized in production clusters as CIGs of 20 or 30 members in each group, who are further federated into a 400 to 600 members Producer Organization (PO) in each upazila incl. Shibpur, Raipura and Belabo upazilas of Narsingdi district.

Under NATP-2, improved PHM practices (sorting, grading, washing, packing) has been taught by Hortex Foundation through hands-on training for the DAE Cadre Officers, CIG farmers, traders, exporters, POs. Already the trained farmers, traders, POs have started adopting, by using plastic crates, sorting mat, grading table, full washing facility complete with source tube well, pipes, pump machine, overhead tank and a wash-bay (house), ceiling fans for drying, packaging and regularly using the facilities of the CCMC and CP for PHM works. The essence of proper marketing of vegetables lies with PHM. Quality assurance and food safety of vegetables are the prime needs that are also served by adopting proper PHM practices at CCMC and CP.

A sample value chain analysis and value addition of brinjal on one crop season is incorporated in **Figure-3** and **Figure-4** respectively. Calculation of monetary gains along 4-phase value chain of brinjal at domestic market and export value chain of brinjal is also incorporated in **Figure-5** and **Figure-6** respectively.

[6] The most serious insect of brinjal is shoot and fruit borer. To control insect damage, higher doses of insecticides with shorter intervals are very often practiced by the farmers. In case of brinjal, the major disease is bacterial wilt. The major insecticides uses by the farmers are of the Cypermethrin (Superthion) groups, whereas the major fungicides are Dithane M45, Thiovit, Minicaper and Redomil. It is noted that sex pheromone trap is gaining popularity in control of insect pests to avoid chemical residues in brinjal. The trap is in use to control insect pests, where porous plastic tubes containing 2-3 ml pheromone attract male moth for 6-7 weeks. Still, the rate of adoption of the technology is lower, and the farmers are increasing their production cost by spending for both on the pheromone trap and the chemical pesticides side by side. However, they admitted that, the sex pheromone trap alone can control insect pest by 80%. Many of the brinjal farmers of Shibpur adopted sex pheromone trap technology to control insect attack supported by DAE, NATP-2.

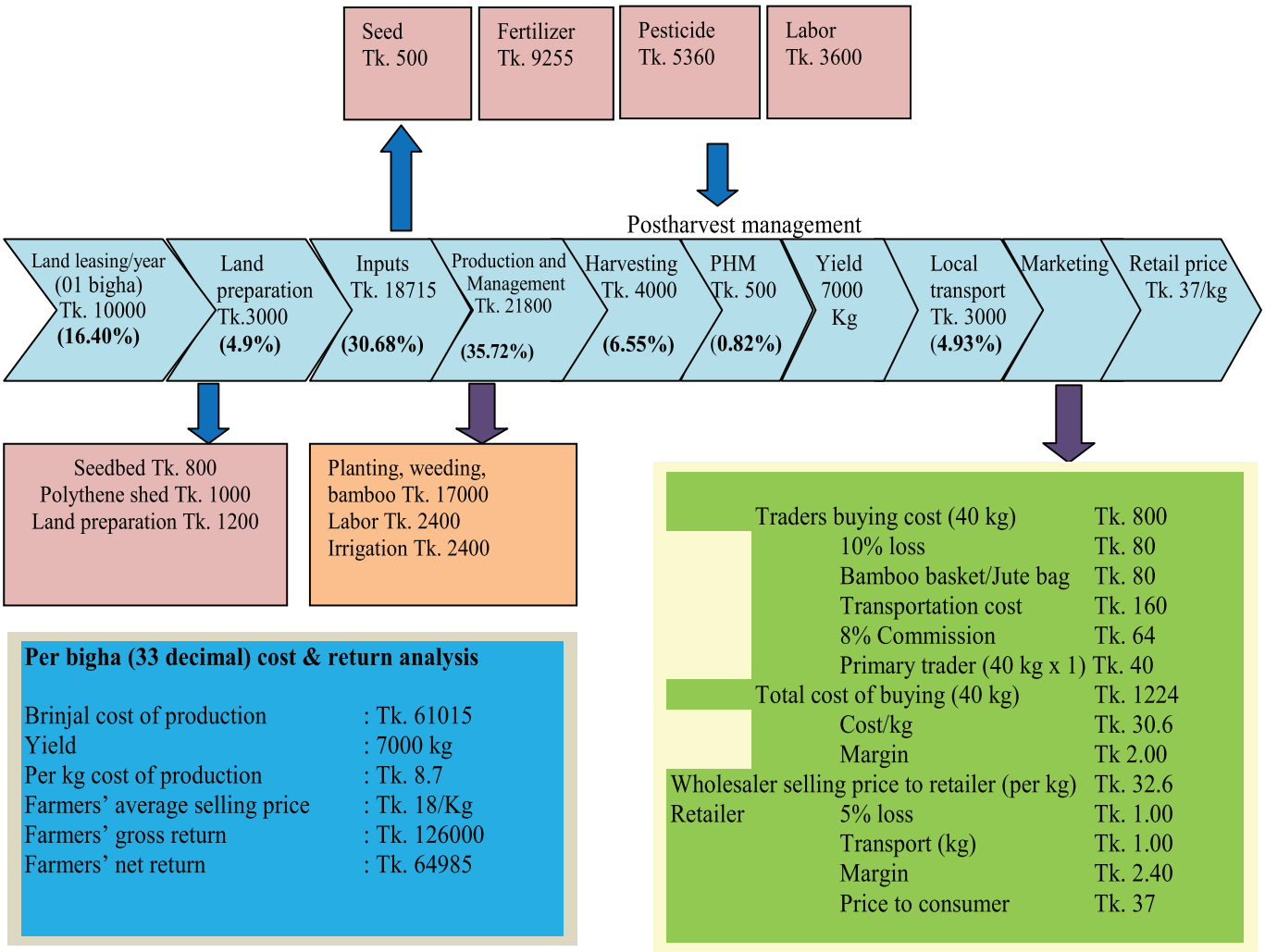


Figure-3: Value chain analysis of brinjal

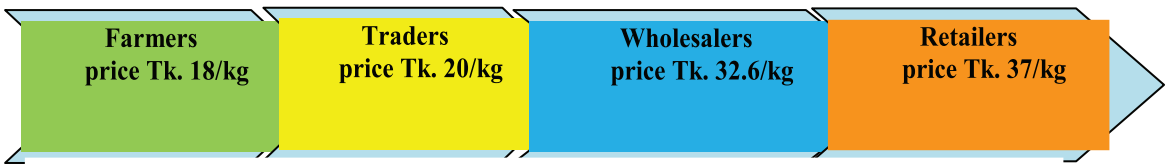


Figure-4: Value addition of brinjal at domestic market

The value addition by different stakeholders is greatly varied along the supply chain.

PRIMARY PRODUCER = Brinjal farmer
(*delivers vegetables/brinjal to buyer/consumer*)
- Production Costs (PC) = Tk. 8.7/kg
- Sales Price (SP) = Tk. 18/kg
- Marketing Profit (MP) = SP - PC = Tk. 9/kg

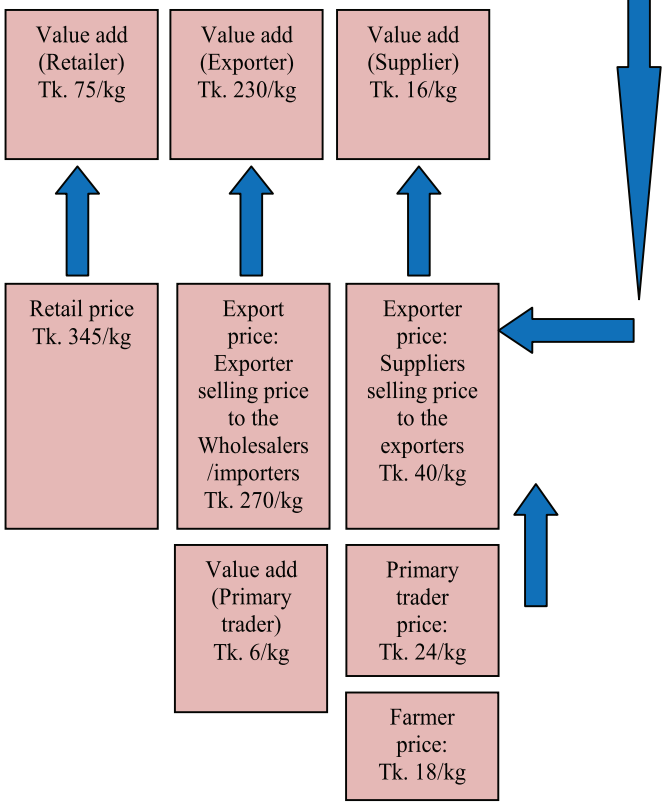
PRIMARY MARKET = primary trader/collector/faria
(*supply to the traders*)
- Purchase Price (PP) = Tk. 18/kg
- Marketing Cost (MC) = Tk. 1/kg
- Sales Price (SP) = Tk. 20/kg
- Marketing Margin (MM) = SP - PP = Tk. 2/kg
- Marketing Profit (MP) = MM – MC = Tk. 1/kg

SECONDARY MARKET = secondary trader/selected agents
(*supply to wholesaler/market*)
- Purchase Price (PP) = Tk. 20/kg
- Marketing Cost (MC) = Tk. 10.6/kg
- Sales Price (SP) = Tk. 32.6/kg
- Marketing Margin (MM) = Tk. 12.6/kg
- Marketing Profit (MP) = MM - MC = Tk. 2/kg

RETAIL MARKET = retailer/seller (*retail marketing*)
- Purchase Price (PP) = Tk. 32.6/kg
- Marketing Cost (MC) = Tk. 2/kg
- Sales Price (SP) = Tk. 37/kg
- Marketing Margin (MM) = Tk. 4.4/kg
- Marketing Profit (MP) = MM – MC = Tk. 2.4/kg

Figure-5: Calculation of monetary gains along 4-phase value chain of brinjal (domestic market)

A four-phase value chain shows above 200% rise in price for brinjal from Tk. 18/kg at the farm gate to Tk. 37/kg as the final retail price at Dhaka City.



Per kg cost of brinjal for supplying to the exporters from the traders (supplier buying cost for export market):
Suppliers/selected agent buying cost of brinjal from primary traders: Tk. 24
5% loss: Tk. 1
Labor (loading, unloading):Tk. 2
Primary packaging: Tk. 2
Transport: Tk. 2
Others/Road expenses: Tk.1
Profit margin: Tk. 8
Selling price to the exporters: Tk. 40
Exporter buying cost:

Note: Our exporter pays Tk. 40.00/kg on an average price for brinjal to their suppliers/selected agents for export. However, recently started contract farming production of brinjal in some areas in Bangladesh, where the exporters purchased brinjal and other vegetables from the farmers directly by Tk. 40-50/kg for export.

Brinjal export outlay on various heads	Value (in TK./Kg)
i. Exporters purchase price from the Suppliers	40.00
ii. Local transportation charges	1.71
iii. Labor cost (loading and unloading)	2.85
iv. Grader and packer charges	2.00
v. Airfreight charges (UK)	170.00
vi. Marketing agents (C&F) costs on 1000kg shipment	1.71
vii. Service provider charges incl. GSP, lab test	1.00
viii. Quarantine charges (Phytosanitary certificate)	0.35
ix. packaging costs	10.00
x. Bank Charges	2.00
xi. Miscellaneous	4.00
xii. Total cost	235.62
xiii. Sale value of brinjal in UK (2.5GBP/Kg) @ TK 108/GBP (Average unit export price of vegetables received by the exporters from the importers/wholesalers)	270.00
xiv. Exporters gross profit	34.38/Kg
xv. Add cash incentive support provided by Govt.@ 20% FOB	TK. 20/Kg
xvi. Ecport income	54.38/kg

Figure-6: Export value chain of brinjal

Brinjal is one of the major exportable vegetables in Bangladesh. It is exported mainly for the importers/wholesalers to ethnic markets in abroad. Many actors are involved in the supply chain of brinjal such as input suppliers, farmers, collectors, traders, suppliers and exporters. Most of the exporters collected brinjal from the farmers through their selected suppliers/agent and some of them also collect from the CCMC, local market and Shambazar/Karwan bazar of Dhaka City. Brinjals are sorted, graded, washed and packed in paper carton boxes for air shipment without maintaining cool chain for transportation to the Central Pack house or direct airport in Dhaka.

In the value chain analysis, land leasing and land preparation was estimated 16.40% and 4.9% of the total cost of production, while inputs, production & intercultural operation, harvesting, postharvest management (PHM) and local transport cost incurred 30.68%, 35.72%, 6.55%, 0.82% and 4.93% respectively. In export value chain, there is a huge price gap between farmers' price and retail price at the overseas market in UK. Farmers sell their brinjal at the price of Taka 18.00 per kg while an ethnic consumer in UK purchase price is seen Taka 345.00/kg (Figure-6). Due to lack of special air cargo for fresh produce, quick transport, infrastructures among other facilities, the cost of marketing increases significantly. Careless handling of the brinjal, poor packaging, and sometime delay in transit causes serious damages and postharvest losses including cost of quarantine certificate and customs clearance which also increases the cost of brinjal marketing. The farmers 'share in consumer' price could be increased by minimizing (not eliminating) the role of market intermediaries in the existing supply chain and improve marketing system. And hence, contract farming and pack house should be developed for ensuring quality and safe produce and supporting better price for the farmers. Inadequate market infrastructure facilities, under developed marketing system, inadequate transport systems, lack of efficient market information system hinders in developing strong value chain of brinjal.

Meanwhile with the support of DAE and Hortex Foundation under NATP-2, organization of Producer Organization (PO) and Commodity Collection and Marketing Center (CCMC) at the production areas are being placed to overcome the constraints associated with quality production, PHM, market access of the smallholder farmers with better price and export promotion of vegetables by linking with potential traders and exporters. Integration, coordination and capacity building of all value chain partners need to be strengthened developing efficient supply chain of vegetables including brinjal promoting export.

9. Constraints and opportunities

Several constraints have been identified during the value chain analysis of exportable vegetables. However, there has been a significant potential of vegetables farming to raise the productivity and farming as a business. The following major factors that limit vegetables farming growth can be summarized as under in Table-1.

Table-1: Constraints & opportunities of vegetable farming

Constraints identified	Opportunities prevailed
Farmers do not know exactly about quality seed, fertilizers, pesticides, bio-agents and the selection criteria of planting materials of vegetables during buying	Formation of farmers group and build capacity of the smallholder farmers through proper training
Lack of knowledge of the farmers on improved production management of vegetables	Provide necessary extension services to build capacity of the smallholder farmers for advanced vegetables farming and PHM through proper training
Lack of quality inputs like seed, fertilizers, pesticides	Develop linkage for farmers with the reputed input suppliers, Govt. extension department and NGOs
Lack of vegetables collection point and processing center at field level	Establish adequate numbers of collection point and processing center at field level for advanced PHM and linking farmers, traders and exporters with the collection point and processing centers
Lack of effective transport system to carry vegetables from farm gate to market/exporters processing center	Ensure cool chain transport and develop farmers group marketing system minimizing the cost of transportation during supply to the exporters processing center or airport
Inappropriate wholesale market	Develop good infrastructure with modern facilities for the national wholesale market/distribution center maintaining hygiene
Farmers are lacking of defined buyer i.e. no link with the organized buyers e.g. traders, wholesaler, exporters, processors, superstores	Develop direct farmer-market linkage by facilitating group farmers to link with the local traders, wholesaler, exporters, processors, super stores as group marketing approach
Lack of updated knowledge on food quality and safety	Create awareness and provide training to relevant stakeholders on GAP, protection of microbial, chemical and physical contamination of vegetables
Limited contact of Extension and Marketing Department developing vegetables farming as a business	Develop effective linkage among the vegetables farmers, DAE, Hortex Foundation, traders, exporters, Business Association
There is a constraint of financial and input to scale up contract farming of vegetables.	DAE, Hortex, Business Association can facilitate in linking the vegetable group farmers with the bank, financial institutes, exporters, superstores, processing industries for establishing effective contract farming to promote vegetables export from Bangladesh.

10. Identification of interventions

Constraints need to be prioritized based on importance and immediate demand according to the actor. Several interventions have been identified for implementation of vegetables farming as a business to promote export. Some of the interventions are presented in Table-2.

Table-2: Identification of possible interventions

Value chain actors	Existing constraints	Proposed interventions
Farmers	lack of capital	Timely disbursement of loan arrangement from Bank/FIs for vegetable farmers
	lack of technical knowledge on updated production and PHM	Capacity building of farmers through proper training for GAP implementation
	lack of market information	Develop Horticultural Crop based Market Information System
	Lack of proper business plan and enterprise experience of farmers	Business plan needs to be developed to bring vegetable farming as a business. Govt. and private sectors can come forward for larger investment developing contract farming
Traders	lack of finance	Timely delivery of loan on easy terms
	Inadequate facilities of transportation	Arrange cool chain/pick-up van for transporting vegetables from farm gate to market and exporters' hand
	Lack of facilities at market place	Improvement of market facilities in terms of space, sanitation, sorting, grading, washing, cool chamber
Input suppliers	There is a demand for quality inputs i.e. seed, fertilizers, pesticides, machineries/equipments	To satisfy the demand of farmers for quality inputs, it is need to be ensured by Govt. and private sectors
Service providers	Inadequate linkage among value chain actors to share the available business information	Develop Horticultural Crops Knowledge Bank and disseminate through ICT based communication network
	Lack of knowledge and experience on updated technology	Develop VegVC related training module/manual and improve capacity of the VC actors
	Lack of institutional capacity	For export promotion of vegetables, different organizations/institutions who are involving production, extension, PHM, research and facilitator of market linkage needs to be strengthened both of technically and financially.