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Government of the People Republic of Bangladesh

Consultancy Services for Carrying Out Feasibility Study and Review Study on Rural Growth Centre/Hat Bazar under My Village My Town Project (MVMT)



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1 INTRODUCTION

1.1 Background

Bangladesh, termed as a rising economy by most of the global financial lenders or development partners, opts to become a middle-income country by 2021 and a developed economy by 2041. The country has been formulating, adopting, appropriating and shaping its policy strategy taking in account the two goals. The goals could be seen reflected in its economic, social, financial policies. Its seven five-year plans (and now looking for the eighth five-year plan), country investment plan, delta plan and its desire for attaining the Sustainable Development Goal (SDG), could also be seen through its set objectives. The country's policy makers think attaining the SDG within 2030 could do the half of its set target to become a higher middle-income country. On the other hand, in 1950, 30% of the total population were living in the city which is 55% in 2020 and prediction says the rate will reach up to 66% in 2050 globally. Rapid urbanization and migrating to urban areas for better livelihood made the city challenging to ensure good services. Cities become overpopulated and overburdened to confirm quality life. So rural development should be identified and prioritised as a distinct objective in the broader vision of development in Bangladesh. Some key factors acknowledged in existing development literature that make rural development an absolute necessity for Bangladesh are poverty alleviation, climate change impacts, food security, and reducing pressure on urban centres in the country. Farming and related activities make up the basic fabric of rural life, contributing significantly to the overall state of rural regions in terms of income generating activities.

Growth centers and hat bazars constitute the economic lifeline of rural economy. Nearly seventy percent of the total population of the country lives in rural areas that are directly or indirectly related to agriculture for their livelihood, it is essential that the agricultural products reach the buyers through an efficient market system. It is necessary that the surplus agricultural products are brought to the markets for buyers and at the same time, inputs of agriculture, like seeds, fertilizers, pesticides and other necessities are made available on time for delivery. Not only farmers but also many kinds of traders and craftsmen have been engaged in trading at these growth centers. At the same time, these growth centers are also the only channel through which urban industrial products, modern agricultural inputs and other daily needs of rural life enter into the village economy. Besides, these are the vital centers in the rural area where off-farm employment can be generated by through improving different modes of transportation and establishing rural and cottage industries. Therefore, the growth center performs as a center of economic, social, and cultural activities in the rural areas. These are the venues where people exchange their ideas with their neighbors regarding improved methods of production and marketing and also serve as the center of recreation. For these reasons, growth centers can play an important role in the economic development of the rural areas and at the same time; contribute significantly towards local resource mobilization.

Proper planning and development of these rural markets is essential for vibrant rural economy, effective trade, and linkage between rural and urban areas of Bangladesh. This will not only integrate the whole country into a seamless network but will also ensure secure and prosperous livelihood for rural producers, especially farmers. However, the growth centers are facing terrible constraints in their functioning in the rural areas, which directly effects on the rural economy. Most of the rural markets in Bangladesh have developed in an ad-hoc manner. These markets are likely to have minimal facilities and in dilapidated condition. Not only does this make trade difficult but also results in unnecessary spoilage and losses. As such, facilities, infrastructure, management and operations are haphazard and rarely meet the changing needs of market users. The operation and maintenance of the rural market are not entirely transparent. At the same time, it is apparent that market management is weak and unrepresentative. Markets generate significant revenue, but little finds its way back for expenditure on maintenance and further development.

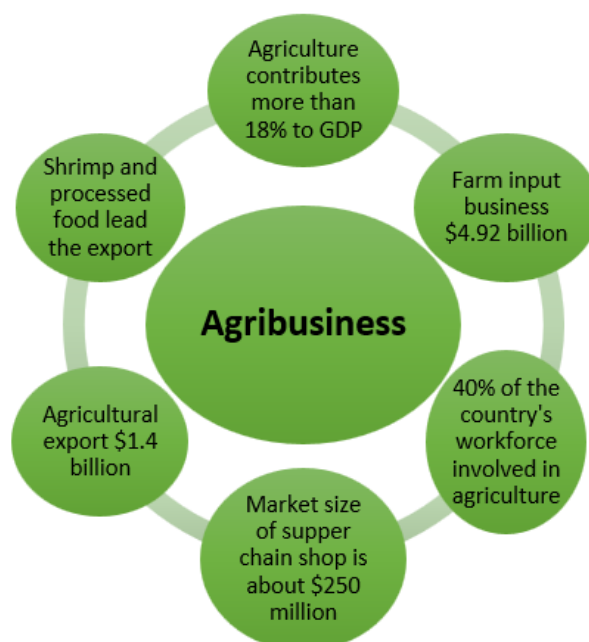
Under this current study, growth center and hat-bazar throughout the country will be prioritized for development and locations will be selected for potential township development, land-pooling study will

be conducted for making land available for rural markets, development proposal for collection centers and special markets will also be prepared. Solidaridad Network Asia along with two other consultants has been engaged by “Local Government Engineering Department (LGED)” to conduct Feasibility Study and Review Study on Rural Growth Centre/Hat Bazar under the project of ‘My Village My Town (MVMT)’. In this connection, Solidaridad is conducting the value chain study to understand the prevailing agricultural value chains that surround the market, its evolving trends, opportunities and challenges and the impact on the current market infrastructure. The results of the study will aid in formulating plans and strategies for expanding rural markets in order to promote economic and social development. The study will suggest scalable strategies for the growth of markets and value chains and propose recommendations to modernize the centers in order to capitalize on future business opportunities and to stimulate market-centric income-generating activities to ensure a thriving local economy.

1.2 Agricultural Sector in Bangladesh

A massive transition in agricultural sector is going towards ‘commercial farming from the traditional one’. Though traditional and manual tools are the mainly used in agricultural sector, this sector is still the leading driving force of the country’s economy. Share of agriculture in GDP has declined over two decades, however, share of industry in GDP has increased and share of service sector has remained constant. Since GDP is increasing over the time in Bangladesh, the growth rate of agricultural contribution to GDP is remaining constant within 3% over the years and contribution of agriculture to the national GDP is gradually decreasing. It is contributing above 18% to the country’s GDP through providing employment for more than 40% of total workforce. However, the employment in agriculture is decreasing at 1.2% over the year. Bangladesh exports horticulture and aquaculture products worth \$1.4 billion in 2018-19. The country’s farm input business is \$4.92 billion (BDT 418.2 billion). It may be due to adaptation of technology or may be inattention of young to engage with agriculture. Since 1990, export of agricultural raw materials is decreasing and import of that is increasing. Spices are the topmost agricultural item which is exporting as possessed food which is followed by juices and drinks. Among the agriculture subsectors, fish subsector registered highest growth rate followed by animal, crop and horticulture. Day by day the requirement of super chain shop is increasing. Though Agora in 2001 started first super chain shop in Bangladesh, current market size is USD 200 million to USD 250 million. However, to become middle-income country, it is now inevitable to transfer the existing extensive agriculture gradually and sustainably into a commercial one.

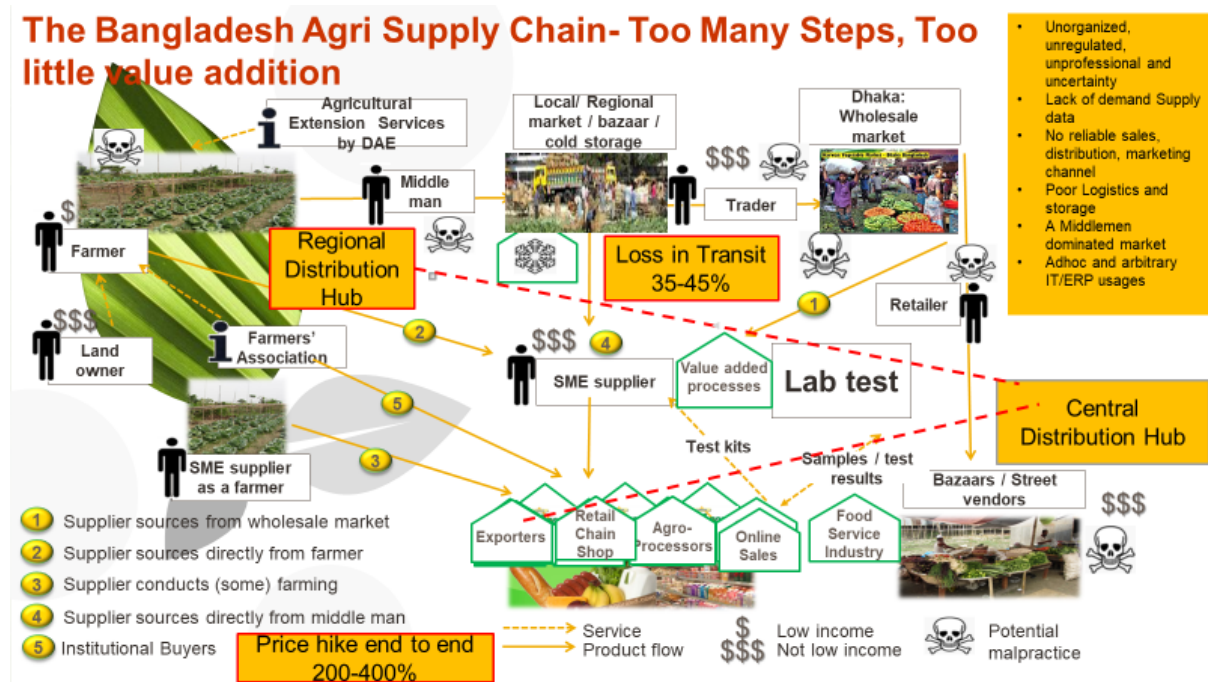
Figure 1-1: Agribusiness Contribution in Economy



1.3 Overview of Agricultural Supply/Value Chain

The Agricultural commodity supply chain in Bangladesh is very complex. The Supply chain complexity arises due to presence of various levels for the product to reach the market via multiple intermediaries. For instance, a product such as any vegetables can reach to the end consumer via at-least 4 or 5 supply chains. As a result of this complicated supply chain, produce tends to navigate through multiple stakeholders and intermediaries resulting in significant lead time, overhead costs, and degradation of quality. Further lack of standardization in the methods of production, transportation, and packaging leads to operational inefficiency in entire supply chain. For instance, the Horticultural products Supply Chain has been shown in Figure 1-2. As observed from the supply chain the final produce can reach the end consumer in at-least five -six different ways with varying complexities in terms of time, quality and cost.

Figure 1-2: Agricultural Product Supply Chain

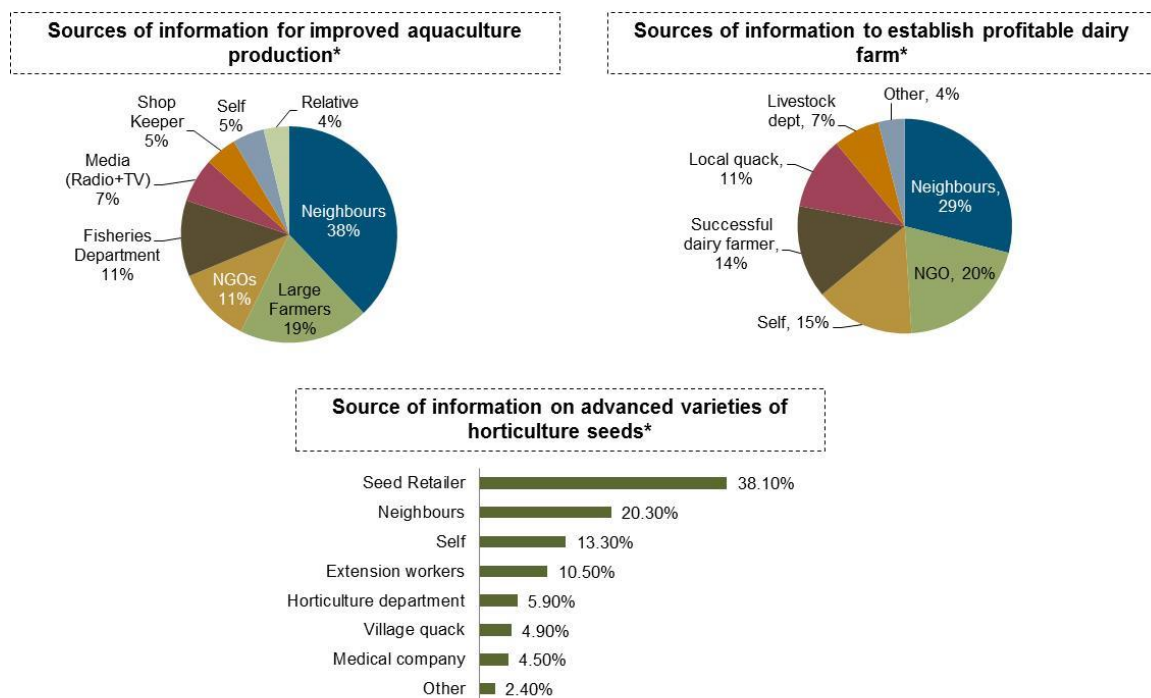


1.4 Key Gap and constrains in the supply chain/Value chain

The study identified 3 key gaps or constrains in existing supply chains for the intervention groups within the selected intervention area: 1) Limited information on production data leading to widening of demand supply gap in the industry, 2) Complex supply chain with a number of intermediaries leading to operational inefficiencies in the value chain and 3) Inadequate infrastructure facilities for farmers including post-harvest management leading to spoilage and wastage of produce. To improve the efficiencies in the existing supply chain and make it more effective, it was imperative that these challenges be addressed so as to increase the overall productivity and efficiency in the supply chain.

The First major constraint the survey identified was the lack of access to information on agricultural techniques for improving farm productivity. The farmers tend to seek information on production practices from their neighbours and opinion leaders such as large farmers in the community and input providers such as seed retail shops as shown in Figure 1-3. Government agencies and respective sector experts were not utilized for obtaining information on the various and latest farming techniques. This informal flow of information to producers usually results in the adoption of traditional agricultural techniques, leading to low productivity at the farms. The low productivity ends up widening the demand supply gap thus impacting overall supply chain.

Figure 1-3: Limited information on production techniques leading to widening of demand supply gap



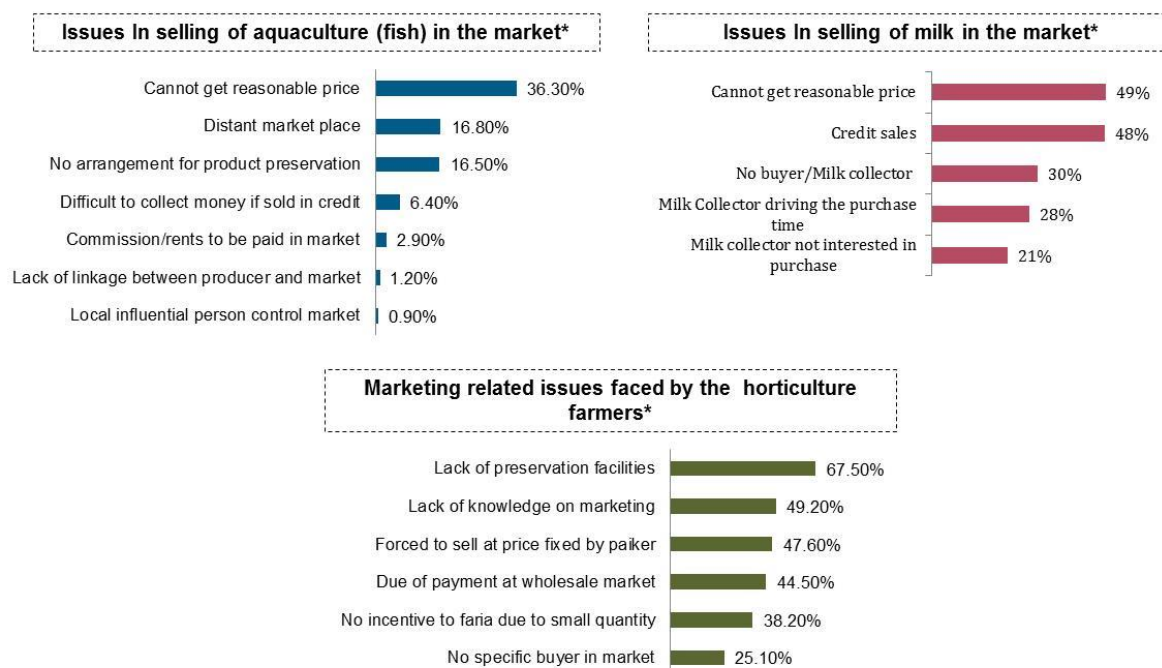
The 2nd major constraint identified was the complexity in the supply chain due to the number of levels and intermediaries, resulting in operational inefficiencies as shown in Figure 1-4. Informal relationship between the intermediaries resulted in further distortion of the supply chain. The intermediaries were found to exploit the complexity of the supply chain and had influence on both the producers and the buyers.

At the producer stage, these intermediaries tend to fix the price of the produce irrespective of its quality. This results in the farmers realizing low return on investment despite spending considerable money on enhancing quality of produce. For example, both in aquaculture and in dairy industry, primary problem faced by the producers was obtaining the right price of the produce based on quality.

Another issue arising from complex supply chain is the lack of the traceability of the produce. As these intermediaries procure the produce from farmers in an informal manner, farmer-produce mapping is missing and hence mechanism to trace the produce becomes very difficult. This becomes a significant hindrance in promotion of safe food across the supply chain.

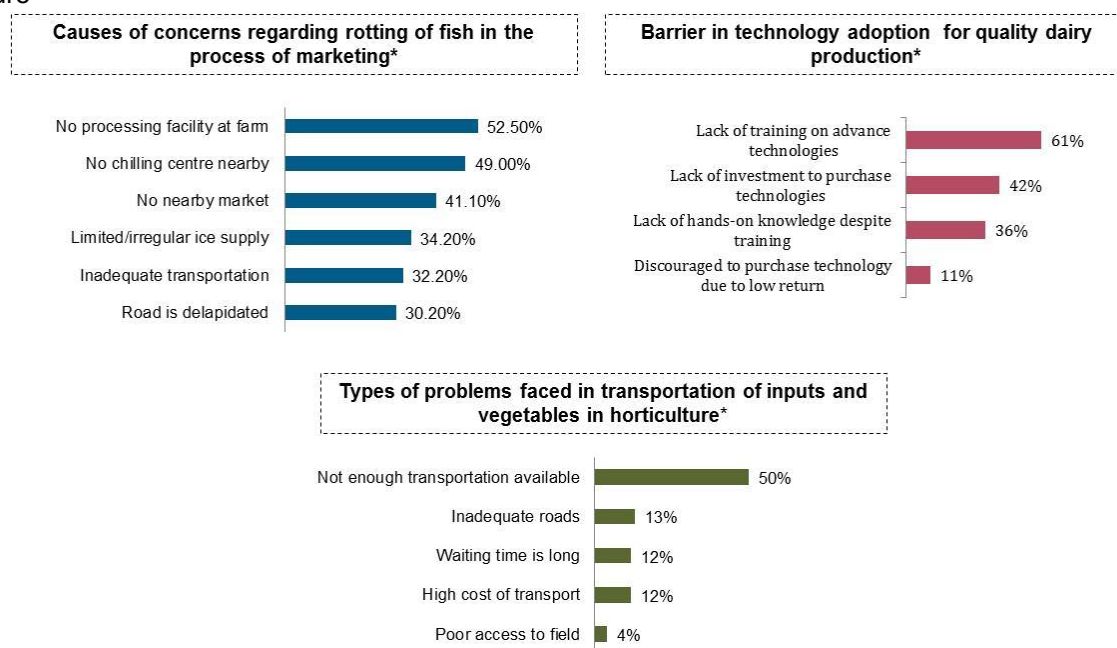
The complexity of the supply chain also increases the ‘farm gate to consumer’ time resulting in high lead time and degradation of the produce in case of perishable food items.

Figure 1-4: Complex supply chain with number of intermediaries result in operational inefficiencies



Source: Response of surveyed Market Development initiatives household, Baseline Study for Market Development initiatives programme Report

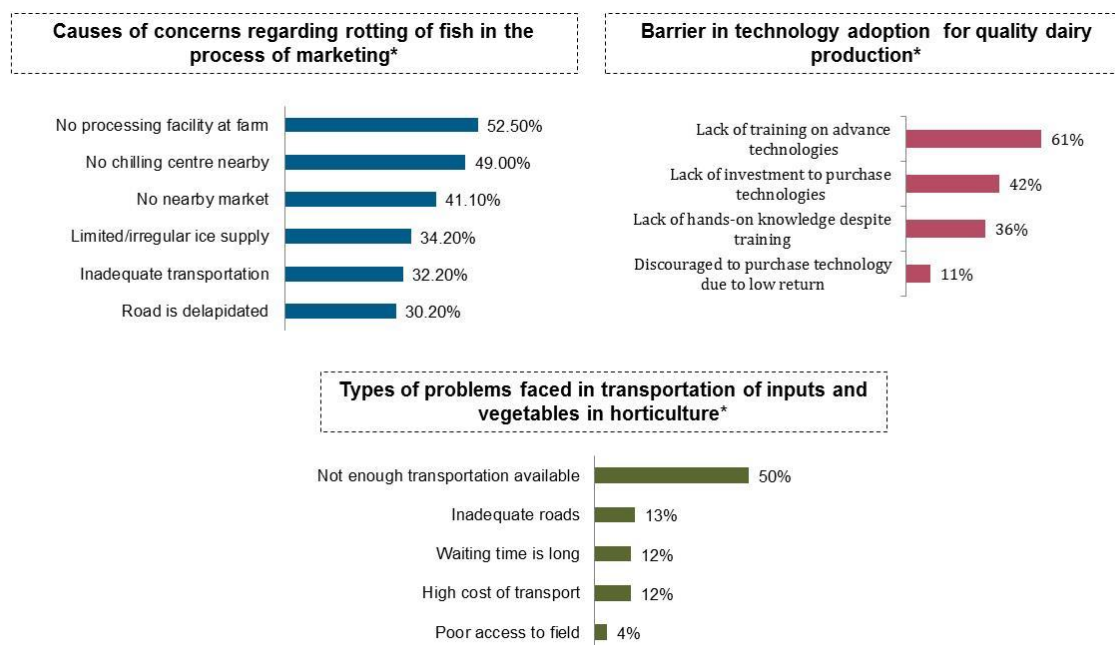
The third major constraint identified was the inadequate infrastructure facilities for farmers as well as buyers on post-harvest management facilities leading to spoilage and wastage of produce as shown in Figure 1-5



. At the farm gate stage, lack of storage and packaging facilities affect the quality of the produce leading to spoilage and reduction in the income of the producer. Moreover, dependency on the traditional methods of farming coupled with inadequate infrastructure often leads to a much lower return on investment for the farmers.

Inadequate infrastructure also creates problems at the intermediaries' and the buyer's level. Lack of proper transportation and storage facilities results in the spoilage of the produce while transporting it to the terminal markets or to the end buyers. At the marketplace lack of proper drainage and hygiene management facilities could cause the degradation in the quality of produce leading realization of lower returns for intermediaries as well as the buyers. In addition, inadequate waste management facility may lead to degradation in the environment eco-system in and around the marketplace.

Figure 1-5: Inadequate infrastructure facilities leading to spoilage and wastage of produce



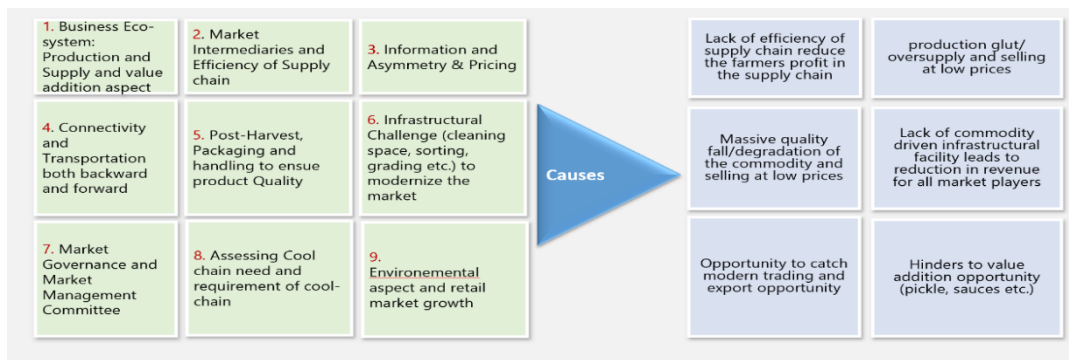
Source: Response of surveyed Market Development initiatives household, Baseline Study for Market Development initiatives programme Report

1.5 Aspects of Market-Centric Value Chain Study

Following aspects of growth center-centric value chain study have been considered which are critical to ensure the upgradation and efficiency of value chain and market models.

- a) **Business Eco-system:** The business eco-system includes important and emerging agricultural and non-farm commodity production and supply systems, as well as scenarios traded in growth centers and its catchment areas (usually 5 to 10 km). It depicts the core trading patterns of the markets and the catchment areas, including trade volume, profit-loss situations, and market infrastructure to handle the trading of important commodities in the area. This aspect also includes pricing mechanisms, the geographical significance and nature of the growth centers, stakeholders, and rural-urban connections, as well as value-addition opportunities, in order to facilitate trade, information, and knowledge flows among the actors and to make them aware of demand information to ensure deserved profit.

Figure 1-6: Various aspects of market-centric value chain study



- b) **Market Intermediaries and Efficiency of Supply chain:** The length and participation of market intermediaries are critical to perceiving the structure, efficiency, and performance of any commodity supply chain that positively and negatively affects the growth centers. In the study, these facets will be investigated thoroughly to understand the share of farmers and producers in the chain along with price dynamics.
- c) **Information Asymmetry & Pricing:** The source of demand information (such as on a particular day/season) and variability of prices at various stages will be investigated to determine the norm of studied growth centers in this regard.
- d) **Connectivity and Transportation both backward and forward market:** The current state of the transportation system in the studied growth centers will be investigated in order to understand the types of transportation used, impact on the pricing, associated stakeholders, inward and outward routes, traffic situation, and travel time required to connect to national and regional markets. This will aid in the design of an ideal transportation system that will improve the efficiency of the growth centers.
- e) **Post-Harvest, Packaging and handling to ensue product Quality :** To understand the post-harvest loss, its impact on pricing, commodity quality, the supporting service status of the growth centers, and the future need for infrastructure to meet the growing demand, post-harvest practices, packaging and handling type, mode and cost, and associated market infrastructure will be analyzed.
- f) **Infrastructural Challenge (cleaning space, sorting, grading etc.) to modernize the market:** A thorough assessment will be carried out to comprehend the market facility and its impact on trading, commodity quality, hygiene, safe food flow, and the overall image of the growth centers. This will make it easier to plan the necessary infrastructure to modernize the market and accommodate the expanding demand for trade.
- g) **Market Governance and Market Management Committee (MMC):** Current MMC structure/organogram, roles and responsibilities of MMC members, the market's revenue stream to carry out maintenance work, operation and risk management of MMC, and participation of government wings such as DAE (Department of Agricultural Extension), DOF (Department of Fisheries), DAM (Department of Agricultural Marketing), UNO (Upazila Nirbahi Officer) and the like to understand their involvement and plan to upgrade the market to respond to future growth.
- h) **Assessing Cool chain need and requirement of cool-chain:** An important focus will be given to understand the cool chain need at the growth center as well as the the low cost cool chamber at the farm and community level.
- i) **Environmental aspect and retail market growth:** In this study, the possibility of circular waste management will be investigated. The study will also look into the prospect of the growth centers diversifying its sales channels (e-commerce, f-commerce, modern trade)

2 FEASIBILITY STUDY ON AGRICULTURAL PRODUCT VALUE CHAIN. MARKET INFRASTRUCTURE INCLUDING COLD STORAGE FOR IMPROVEMENT OF PRODUCT VALUE CHAIN

2.1 Objective of the study

The broader objective of this feasibility study to examine the agricultural value chain to understand its trend, challenges and opportunities and market infrastructure including cold storage for the improvement of growth centers to foster both economic and social growth. The specific objectives of the study are given as follows:

- a) To study the prevailing agricultural value chain and understand the performance of the market chain actors in the markets
- b) To examine the factors that affect the study areas' on- and off-farm supply chains to the market.
- c) To evaluate the market infrastructure difficulties in order to respond to the need of the markets' existing and future supply and value chains.
- d) To assess the current market governance status to understand the issues and recommend to efficiently manage the market operations and maintenance
- e) To evaluate the necessities for and suggestions for developing cool chains in the studied areas
- f) To determine the efficient system and planning guideline of improving Growth Centers/Collection Centers/and Special Bazar

2.2 Limitations of the study

The study work is limited by the following limitations facing through the working period:

- a) Limitation of study period.
- b) Limitation of the line department availability of secondary data.
- c) Limitation of the almost Same nature of Market i.e., Growth Center, Collection centers, Hatbazar almost same nature in terms of trading practices, product category, design and layout, consumers type, buying nature,
- d) Limitation of resources from private and public sectors.
- e) Limited access of concrete policy and proposal for developing or designing a customize growth centers/collection centers/Hatbazar.
- f) Limitation of proper data collection due to hard-line operation and chaotic management system of the market

2.3 Scope of the Study

- a) Assess requirements of collection centers through field visit, KII, FGDs and stakeholder meetings and value chain analysis as required
- b) Recommend the design of collection centers in light with the findings.
- c) Develop operational and management procedures for collection centers.
- d) Recommendations to support and develop special markets
- e) Conduct stakeholder meetings. FGDs, and field visits to identify major challenges of agricultural value chain with respect to rural Growth Centers and Hat-bazars (both physical and non-physical aspects).

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- f) Propose replicable measures for development of markets for development of value chains.
- g) Identify demand for cold storage in different parts of the agricultural supply chain.
- h) Mapping of stakeholders and their varied demand.
- i) Review existing/potential business model for cold storage feasibility

2.4 Statement of the Problem

- a) The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production and delivery to final consumers (Porter, 1980; Kapilinsky and Morris, 2000). Value-chain analysis looks at every step a business goes through, from raw materials to the eventual end-user. The goal is to deliver maximum value for the least possible total cost (Investopedia, 2011). Market chain analysis aims to provide information on profitability for the various agents along the market chain (Ferris et al., 2001). Economic value chain analysis describes the range of activities required to bring a product to the final consumer and, in the case of international products, the extent to which intermediaries/agents gain from participating in the chain (Jacinto, 2004). A traditional food industry value chain consists of the producer, processor, wholesaler, exporter, importer, retailer and consumer.
- b) There are mainly three sets of reasons why value chain analysis is important (Kapilinsky and Morris, 2000). These are: i) with the growing division of labour and the global dispersion of the production of components, systematic competitiveness has become increasingly important, ii) efficiency in production is only a necessary condition for successfully penetrating global markets, and iii) entry into global markets which allows for sustained income growth - that is, making the best of globalisation- requires an understanding of dynamic factors within the whole value chain.
- c) Agricultural commodities specially vegetables and fish are highly perishable commodity, and its quality deteriorates very rapidly. Therefore, its quality cannot be kept unaffected for human consumption for a long time. Production and consumption areas are also widely separated. Consumers of this country normally like indigenous vegetables and fish like carps, shrimp, catfish and other small species as food fish. Production of cultured fish can be increased by making best utilization of the existing inland resources through modern and scientific methods of fish culture and fishing techniques. But the ultimate consumers have to depend on an effective marketing system to be able to purchase at reasonable prices. Similarly, the success and sustainability of agri-commodities depends on an efficient distribution system in which growth centers play a crucial role in delivering them to all types of consumers across the country and abroad.
- d) Analysis of value chains requires detailed micro-level data, which are not available in Bangladesh and are often difficult to obtain in most countries. The present study takes the first steps to collect primary data and to identify the marketing channels and the possibilities of value addition. This study analyzes how market intermediaries operate in the value chain and how it connects to growth center and demonstrates how the revenue from agri-commodity trade is distributed over the entire value chain. Finally, this study is expected to also provide some useful information to traders, farmers and policy makers to help them formulate programmes and policies related to the growth center upgradation for efficient production and marketing.
- e) The report is divided into eight sections. Following an introduction in the first section and a study of the growth center-centric value chain in the second, the third, fourth, sixth, and seventh sections present the individual growth and collection centers' findings. In the eighth section, concluding notes are presented.

2.5 Approach and methodology of the study

The study explores the current value chain scenario, problems and opportunities related to the development of growth centers, and the impact of growth centers on the development of rural townships. The study is explanatory research. Value chain analysis method has been adopted to unfold the growth centers and rural markets industry dynamics, its market actors and different service provisions, constraints and opportunities to modernize the rural growth centers in order to accelerate the rural economy. A literature review, stakeholder consultation workshop, questionnaire survey, KII (Key Informant Interviews), and focus group discussions (FGD) has been used to conduct the entire study. The study will make use of both primary and secondary data sources.

Desk review: Production and consumption data of the selected crops in selected growth centers and specialized markets have been collected for secondary data analysis from various government and non-government sources such as the Yearbook of Agricultural Statistics, LGED growth center list, and the like. The preliminary desk research aids in the development of a broad grasp of the overall sector. It has led to the identification of various market participants and nodal points within the value chain, as well as the identification of key respondents for primary data collection.

Sampling Procedure and Sample Size: The survey has been carried out purposively in locations with growth centers and specialized markets. Farmers, Bapari, Faria, wholesalers, retailers, customers, and other important stakeholders have been selected (roughly 200 relevant market actors) at random from the study area's growth centers and intensive cultivating locations.

Qualitative sampling frame and technique of data collection: Qualitative data has been collected from different market stakeholders employing FGD and KII tools. In this regard, purposive sampling method has been followed and principle of saturation has been considered for determining the sample size. A significant effort is given to conduct staff consultation to get deeper insight about the primary data which has been collected from all potential market actors.

Data Collection tools: The study is qualitative in methodological approach to collect and analyze both primary and secondary data from the selected growth centers. Quantitative data (through FGD, KII, semi-structured questions) has been collected on types of products, their volume, product movement, and price. The questionnaire has been decorated with self-explanatory guidelines.

Questionnaire Survey: Questionnaire survey mostly has been conducted on farmers and sometimes on some market actors (if needed) who involved in value chain activities of the selected areas.

KII (Key Informant Interviews): Key informant interview is an in-depth interview which has been conducted on government stakeholder which include local government, local villagers, market management committee, local elites, and publics.

FGD (Focus Group Discussion): Focus group discussions have been conducted in the targeted areas that consisted of the various market actor groups. Both open-end and some times closed-end questionnaire method have been used as core interview tool to collect the data. Fixed number of FGDs has been carried out with the various actors in different study areas to capture the overall production, processing and marketing scenario.

Training for Data collection team: There is a team of enumerators and note keepers cum coordinators who have been appointed in selected areas to collect the primary data. A two days long training will be organized for data enumerators (DE) on questionnaire. The training will follow both class room based and field practice approach.

Data collection : A four members' small group of qualitative data collection team have conducted both FGD and KII. During conducting FGD one has facilitated FGD and another one has kept the note. FGDs has been organized with six to eight persons. SNA has ensured all group members have a common feature, which is desired common criterion, i.e., market participants and non-market participants.

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Data quality assurance : A significant effort has been given to ensuring quality data collection while a two days long comprehensive training is a first building block of quality assurance. SNA proposes a robust methodology for data quality assurance. The quality of the data collection has been ensured through the following ways:

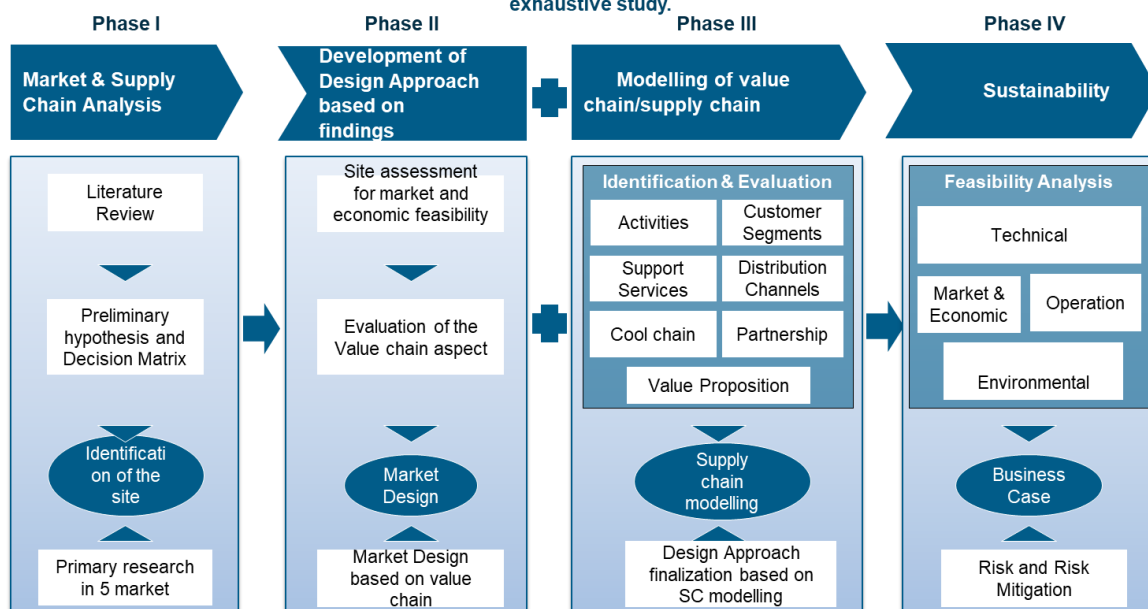
Data Validity and Reliability: Field supervisor is responsible for ensuring data quality in the field. S/He ensures spot-check. The FS conducts each process for 5% data. Re-interviews have been done on a random basis on some portions of the completed questionnaires. For FGDs and KII every evening facilitators prepare transcript in predeveloped template. During FGD conduction, the peer note taker kept rigorous notes. Along with transcript FGD and KII facilitator sends the notes to Data Analyst. After compiling and necessary cleaning of transcript the Data Analyst shares the transcripts with key experts and lead consultant for their feedback and final wrap-up.

Data Cleaning and Analysis: Qualitative data which has been derived from KII, FGD, observation and document review that explore issues related to the study objectives. An explicit field note has been kept by the QRA through paper-based approach. Finalized content is stored in word processing files (MS Word) on password protected computers.

Figure 2-1: Study Approach

Study Approach

Feasibility study for the Growth Center/Special hat bazar is divided into four phases with each phase acting as catalyst for subsequent phase. This four phased approach will enable and aid study team to conduct a comprehensive & exhaustive study.



3 SELECTION OF POSSIBLE COLLECTION CENTRES/SPECIAL BAZAR

3.1 Decision Matrix for Selecting and case study for Growth Centers/Special Bazar/Collection centres:

This market selection is based on information gathered from the market database of DAM and 15 enlisted village list of LGEDs. The objectives of the decision matrix are to;

- Mapping different types of market including special market, growth center, and collection center
- Analyze the market in terms of various variables defined from DAM database and LGED village list
- Prioritize the markets from the list
- Finalize 6 markets for case study based on the team's opinion

The markets have been ranked based on the following factors to identify six potential markets for the value chain study:

- Geographical distribution
- Market area infrastructure
- Government land allocation
- Types of commodities
- The volume of commodities
- Expert Opinions
- Lease value, and
- Special Commodity Driven Market

A. Market Area: Here, there has been mainly focused on the Government area allocated for the market. The below table shows the list of ten markets out of Fifty-eight. These markets were ranked based on the highest quantity of land allocated by the government for the market

SL#	District	Market	Covered Area	Open Area	Total Area	Rank
1	Satkhira	Nowabenki Bazar Unnayan	300	300	600	1st
2	Rajshahi	Baneswar Hat	300	200	500	2nd
3	Sunamganj	Shimulbak Bazar	400	100	500	2nd
4	Mymensingh	Tarakanda Bazar	150	300	450	3rd
5	Tangail	Kendua Hat	331	69	400	4th
6	Chapainababganj	Kansat	100	300	400	4th
7	Bogura	Mohasthan & Bazar	223	120	343	5th
8	Jessore	Jhikorgacha Powrasava Bazar	200	100	300	6th
9	Netrokona	Tomaltola Bazar	200	100	300	6th
10	Khagrachori	Joga Shola Bazar	200	100	300	6th

B. Infrastructure: In terms of **lack of infrastructure**, forty markets are ranked. Toilet, Tube well, Mosque, Playground, Post Office, School, Bank, Govt. Godown, Telephone, Private Godown, Electricity, and Drainage were used to rate the infrastructures accessible in the market. The following table shows a list of marketplaces, along with their rankings

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SL#	District	Market Name	Scores out of 12	Ranking
1.	Sylhet	Tuker Bazar	1	1st
2.	kurigram	Debdebi Hat	1	1st
3.	Dinajpur	Kalijola Agri Market (Fruit Market)	2	2nd
4.	Rangamati	Chota Harina Bazar	2	2nd
5.	Bagerhat	Faltita Hat	2	2nd
6.	kurigram	Pathardubi Grameen Bazar	2	2nd
7.	Narsingdi	Narendrapur Babu Bazar	2	2nd
8.	Faridpur	Kala mridha Hat	3	3rd
9.	Gaibandha	Dhapar Hat	3	3rd
10.	Khagrachori	Babuchara Nutan Bazar	3	3rd
11.	Netrokona	Tomaltola Bazar	3	3rd
12.	Sylhet	Perer Bazar	3	3rd
13.	Khagrachori	Joga Shola Bazar	3	3rd
14.	Sirajganj	Shaluabhita Hat	3	3rd
15.	Faridpur	Zaturdia Hat	3	3rd
16.	Natore	Singra Hat	3	3rd
17.	Gaibandha	Kamdia Hat	4	4th
18.	Pabna	Arankola	4	4th
19.	Satkhira	Nowabenki Bazar Unnayan	4	4th
20.	Kishorgonj	Indordayer Bazar	4	4th
21.	Gaibandha	Purbo Fulchhari Bazar	4	
22.	Cumilla	Sakchail	4	
23.	Gopalganj	Gonga Rampur Bazar	4	
24.	Naogaon	Kapastia Hat	5	
25.	Gazipur	Shailat Bazar	5	
26.	Chittagong	Bangla Bazar	5	
27.	Tangail	Fulbari Hat	5	
28.	Bogura	Mohasthan & Bazar	6	
29.	Narsingdi	Chalakchar Bazar	6	
30.	Tangail	Jalchatra Bazar	6	
31.	Chittagong	Abutorab Bazar	6	
32.	Khulna	Atharomile Bazar	6	
33.	Gopalganj	Baniar char Bazar	6	
34.	Mymensing	Shambogonj Bazar	6	
35.	Jessore	Jhikorgacha Powrasava Bazar	6	
36.	Rajshahi	Shimla Hat	6	
37.	Chittagong	Joulanpur Bazar	6	
38.	Sunamganj	Shimulbak Bazar	6	
39.	Satkhira	Burigoualini Hat	6	
40.	Rangamati	Jeti ghat Bazar	6	

C. Types of Commodities: The markets are ordered **according to the commodities** that are available in the market. The DAM list includes thirty commodities. The following table illustrates the market's ranking by commodity:

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SL#	District	Market Name	Scores out of 29	Ranking
1	Tangail	Kendua Hat	14	1st
2	Tangail	Jalchatra Bazar	13	2nd
3	Chapainababganj	Kansat	13	2nd
4	Gaibandha	Dhapar Hat	13	2nd
5	Gaibandha	Kamdia Hat	13	2nd
6	Sunamganj	Dharmapasha Bazar	12	3rd
7	kurigram	Debdebi Hat	12	3rd
8	Rajshahi	Baneswar Hat	12	3rd
9	Chapainababganj	Chatrajit pur Hat	12	3rd
10	kurigram	Pathardubi Grameen Bazar	12	3rd
11	Tangail	Mirzapur Hat	11	4th
12	Barishal	New Hizla Hat	11	4th
13	Mymensingh	Shambogonj Bazar	11	4th
14	Netrokona	Tomaltola Bazar	11	4th
15	Tangail	Fulbari Hat	11	4th
16	Mymensing	Tarakanda Bazar	11	4th
17	Sylhet	Hathar par Bazar	11	4th
18	Khagrachori	Joga Shola Bazar	11	4th
19	Khagrachori	Babuchara Nutan Bazar	11	4th
20	Rangamati	Chota Harina Bazar	10	5th
21	Jessore	Jhikorgacha Powrasava Bazar	10	5th
22	Gaibandha	Purbo Fulchhari Bazar	10	5th
23	Rangamati	Jeti ghat Bazar	10	5th
24	Naogaon	Kapastia Hat	10	6th
25	Narsingdi	Chalakchar Bazar	9	6th
26	Chandpur	Sachar Bazar	9	6th
27	Khulna	Atharomile Bazar	9	6th
28	Sunamganj	Shimulbak Bazar	9	6th
29	Cumilla	Sakchail	9	6th
30	Natore	Singra Hat	9	6th
31	Rajshahi	Shimla Hat	9	6th
32	Narsingdi	Hatirdia Bazar	9	6th
33	Chittagong	Abur Hat	9	6th
34	Chittagong	Bangla Bazar	9	6th
35	Chittagong	Abutorab Bazar	9	6th
36	Satkhira	Nowabenki Bazar Unnayan	9	6th

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D. Volume of Commodities: The below six markets are ranked as per volume of commodities traded in the market

SL#	District	Market Name	Quantity	Ranking
1	Dinajpur	Kalijola Agri Market (Fruit Market)	100700	1st
2	Chapainababganj	Chatrajit pur Hat	93180	2nd
3	Jessore	Jhikorgacha Powrasava Bazar	72005	3rd
4	Tangail	Kendua Hat	31475	4th
5	Chittagong	Khatungonj Bazar	30445	5th
6	Narsingdi	Hatirdia Bazar	29750	6th

E. Lease Value: The following six markets are listed as per lease value

SL#	District	Market	Lease Value	Ranking
1	Rajshahi	Baneswar Hat	5405500	1st
2	Natore	Singra Hat	1111999	2nd
3	Pabna	Arankola	1045000	3rd
4	Jessore	Jhikorgacha Powrasava Bazar	970000	4th
5	Pabna	Suzanagar Hat	669000	5th
6	Mymensingh	Tarakanda Bazar	532680	6th

F. SPECIAL MARKETS- IN GENERAL

The special markets are ranked in terms of popularity/ public opinions/ information from external sources.

SL#	District	Markets	Specialty in terms of product
1	Narsingdi	Hatirdia Bazar	Banana Market
2	Dinajpur	Kalijola Agri Market (Fruit Market)	Fruits Market
3	Gaibandha	Purbo Fulchhari Bazar	Jute and Fish Market
4	Rajshahi	Baneswar Hat	Mango Market
5	Chapainababganj	Kansat	Mango Market
6	Chittagong	Khatungonj Bazar	Onion Market
7	Pabna	Suzanagar Hat	Onion Market
8	Faridpur	Zaturdia Hat	Onion Market
9	Tangail	Jalchatra Bazar	Pineapple Market
10	Sunamganj	Dharmapasha Bazar	Rice Market
11	Mymensingh	Shambogonj Bazar	Rice Market
12	Natore	Singra Hat	Rice Market

G. SPECIAL MARKETS- COMMODITY DRIVEN; The following tables shows the special markets on the basis of production of commodities.

SL#	District	Markets	Specialty in terms of product
1	Jessore	Jhikorgacha Powrasava Bazar	Vegetable Market

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SL#	District	Markets	Specialty in terms of product
2	Gaibandha	Kamdia Hat	Vegetable Market
3	Jessore	Jhikorgacha Powrasava Bazar	Rice Market
4	Chandpur	Sachar Bazar	Rice Market
5	Chapai Nawabgonj	Chatrajit pur Hat	Mango Market
6	Rajshahi	Baneswar Hat	Mango Market
7	Jessore	Jhikorgacha Powrasava Bazar	Jute Market
8	Tangail	Kendua Hat	Jute Market
9	Tangail	Kendua Hat	Jackfruit
10	Gazipur	Shailat Bazar	Jackfruit
11	Chandpur	Sachar Bazar	Fish Market
12	Kishorgonj	Indordayer Bazar	Fish Market
13	Chapai Nawabgonj	Chatrajit pur Hat	Banana Market
14	Jessore	Jhikorgacha Powrasava Bazar	Banana Market

3.2 Summary of key Market list based on Ranked for case study

To rank the markets from different parts of Bangladesh, a total of **eight parameters** are used. After analysing, the table below provides the list of markets in order that appear in at least twice of the seven categories. From the list, we can propose/choose a potential market for the study.

SL	District	Geographical Area	Market	A. Market Area	B. Infrastructure	C. Types of Commodities	D. Volume of Commodities	E. Lease Value	F. Special Market (General)	G. Special Market (Production)	Grand Total
1.	Jessore	Coastal	Jhikorgacha Powrasava Bazar	1	1	1	1	1	0	4	9
2.	Rajshahi	Barind	Baneswar Hat	1	0	1	0	1	1	1	5
3.	Tangail	Plain/Main	Kendua Hat	1	0	1	1	0	0	2	5
4.	Natore	Barind	Singra Hat	0	1	1	0	1	1	0	4
5.	Chapainababganj	Barind	Chatrajit pur Hat	0	0	1	1	0	0	2	4
6.	Tangail	Plain/Main	Jalchatra Bazar	0	1	1	0	0	1	0	3
7.	Chapainababganj	Barind	Kansat	1	0	1	0	0	1	0	3

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8.	Gaibandha	Charland	Kamdia Hat	0	1	1	0	0	0	1	3
9.	Narsingdi	Plain/Main	Hatirdia Bazar	0	0	1	1	0	1	0	3
10.	Mymensingh	Plain/Main	Shambogonj Bazar	0	1	1	0	0	1	0	3
11.	Satkhira	Coastal	Nowabenki Bazar Unnayan	1	1	1	0	0	0	0	3
12.	Gaibandha	Charland	Purbo Fulchhari Bazar	0	1	1	0	0	1	0	3
13.	Chandpur	Coastal	Sachar Bazar	0	0	1	0	0	0	2	3
14.	Mymensingh	Plain/Main	Tarakanda Bazar	1	0	1	0	1	0	0	3
15.	Sunamganj	Haor	Shimulbak Bazar	1	1	1	0	0	0	0	3
16.	Netrokona	Haor	Tomaltola Bazar	1	1	1	0	0	0	0	3
17.	Dinajpur	Barind	Kalijola Agri Market (Fruit Market)	0	1	0	1	0	1	0	3
18.	Khagrachori	Hilly	Joga Shola Bazar	1	1	1	0	0	0	0	3
19.	kurigram	Charland	Pathardubi Grameen Bazar	0	1	1	0	0	0	0	2
20.	Rangamati	Hilly	Chota Harina Bazar	0	1	1	0	0	0	0	2
21.	Gazipur	Plain/Main	Shailat Bazar	0	1	0	0	0	0	1	2
22.	Khulna	Coastal	Atharomile Bazar	0	1	1	0	0	0	0	2
23.	Bogura	Plain/Main	Mohasthan & Bazar	1	1	0	0	0	0	0	2
24.	Kishoreganj	Haor	Indordayer Bazar	0	1	0	0	0	0	1	2
25.	Sunamganj	Haor	Dharmapasha Bazar	0	0	1	0	0	1	0	2
26.	Khagrachori	Hilly	Babuchara Nutan Bazar	0	1	1	0	0	0	0	2
27.	Tangail	Plain/Main	Fulbari Hat	0	1	1	0	0	0	0	2
28.	Rangamati	Hilly	Jeti ghat Bazar	0	1	1	0	0	0	0	2

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29.	Pabna	Plain/Main	Suzanagar Hat	0	0	0	0	1	1	0	2
30.	Chittagong	Hilly	Abutorab Bazar	0	1	1	0	0	0	0	2
31.	kurigram	Charland	Debdebi Hat	0	1	1	0	0	0	0	2
32.	Chittagong	Hilly	Bangla Bazar	0	1	1	0	0	0	0	2
33.	Gaibandha	Charland	Dhapar Hat	0	1	1	0	0	0	0	2
34.	Faridpur	Plain/Main	Zaturdia Hat	0	1	0	0	0	1	0	2
35.	Cumilla	Plain/Main	Sakchail	0	1	1	0	0	0	0	2
36.	Narsingdi	Plain/Main	Chalakchar Bazar	0	1	1	0	0	0	0	2
37.	Rajshahi	Barind	Shimla Hat	0	1	1	0	0	0	0	2
38.	Pabna	Plain/Main	Arankola	0	1	0	0	1	0	0	2
39.	Naogaon	Barind	Kapastia Hat	0	1	1	0	0	0	0	2
40.	Chittagong	Hilly	Khatungonj Bazar	0	0	0	1	0	1	0	2

Some other suggested markets which are not in the DAM list may also be taken into consideration

SL#	Districts	Upazilla	Geographical position	Name of the Markets	Major Commodity	Rank	Remarks
1.	Jashore	Jashore Sadar	Coastal zone	Satmile Barinagar Bazar	Vegetables	1	The mentioned market is a well-known vegetable collection market in southern Bangladesh that supplies vegetables throughout the country.
2.	Manikganj	Shingra	Plain land	Char Nayadangi Ekota Bazar	Vegetables	2	This is a growing vegetable market in Shingra, Manikganj market of vegetables. The market is largely a auction market and serves mostly Dhaka and its surrounding districts.
3.	Coxs bazar	Ukhiya	Caosatal	Marichya Bazar	Vegetables	3	This is a well-known retail cum wholesale bazaar in Cox's bazar. Vegetables are sold in large quantities at this bazar and mostly satisfies the local and regional demand

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SL#	Distri cts	Upazilla	Geogra phical positio n	Name of the Markets	Major Comm odity	Ra nk	Remarks
4.	Tangail	Madhupur	Plain land	Moter Bazar	Pineapple	1	Pineapple is a promising commodity of this market and being exported to different regions of the country
5.	Khagrachori	Matiranga	Hilly land	Matiranga	Pineapple	2	This is a large and well-known pineapple market in Khagrachori. The market supplies pineapple all over the country.
6.	Norshindi	Mohorodi	Plain land	Chalakchar	Banana, Growth Center	1	This market is situated in Norshindi which is famous for banana production. This is one of the biggest banana markets of Norshindi.
7.	Naogaon	Shapahar	Barind	Shapahar	Mango	1	This market is one of the most promising in the country for supplying specific types of mangos such as Gopalbhog, Khirshapat, and Langra throughout the country.
8.	Rangpur	Mithapukur	Barind	Podaganj	Mango	2	Podaganj is a market in that region where a huge quantity of mangoes is traded. Mostly are Harivanga as Rangpur is famous for Harivanga variety mangoes.
9.	Rajshahi	Puthia	Barind	Baneshor	Mango	3	The mango market is also reputed and a growing market. During the mango season, tons of mangoes of various varieties are traded and distributed around the country.
10.	Gazipur	Sripur	Plain land	Zaina Bazar	Jackfruit	1	This is a large jackfruit market in Bangladesh. From this market most of the jackfruit traded all across the country.
11.	Satkhira	Debhata	Coastal zone	Parulia	Fish	1	One of the well-known markets in the coastal area. All types of fish are traded in this market, and prawns are a key product.
12.	Sunamganj	Shantiganj	Hoar	Pagla Bazar	Fin Fish	2	This bazar is located in Sunamganj's Haor district. This market primarily trades fin fish obtained near Haor regions and the Mohasingh River.
13.	Faridpur	Zaturdia	Plain land	Zaruedia Haat	Onion	1	famous for onion selling.
14.	Pabna	Kashinathpur	Plain land	Kashinathpur Hat	Onion	2	Pabna is the location that meets two-thirds of the nation's onion need. And Kashinathpur has traded a large quantity of onions from Pabna to various locations throughout the country.

3.3 Selection of GC/Special Bazar/Collection centres for the case study

#	Districts	Upazila	Geographical position	Name of the Markets	Major Commodity	Remarks
1	Jashore	Jashore Sadar	Coastal zone	Satmile Barinagar Bazar	Vegetables	The mentioned market is a well-known vegetable collection market in southern Bangladesh that supplies vegetables throughout the country.
2	Norshindi	Mohorodi	Plain land	Chalakchar	Banana, Growth Center	This market is situated in Norshindi which is famous for banana production. This is one of the biggest banana markets of Norshindi.
3	Rajshahi	Puthia	Barind	Baneshor	Mango	The mango market is also reputed and a growing market. During the mango season, tons of mangoes of various varieties are traded and distributed around the country.
4	Gazipur	Sripur	Plain land	Zaina Bazar	Jackfruit	This is a large jackfruit market in Bangladesh. From this market most of the jackfruit traded all across the country.
5	Satkhira	Debhata	Coastal zone	Parulia	Fish	One of the well-known markets in the coastal area. All types of fish are traded in this market, and prawns are a key product.

4 FEASIBILITY ANALYSIS OF RURAL GROWTH CENTER (A CASE STUDY OF CHALAKCHAR GROWTH CENTER)

4.1 Brief about Chalakchar Growth Center

Chalkchor is a union of Monohordi upailla of Narsingdi district. It's a union level market largely (in 90% cases) a retail market (typical Union-level Growth Center) where farm & non-farm commodities and Services are primarily transacted in retail and imported from local and outside districts. There are different kinds of agri-commodity traded in the growth like banana, Betel leaf, paddy, dairy, vegetables, fruit, fish, and cane-based cotton industry. Banana and betel leaf are the main commodity or the promising commodities of this Chalakchar market.



4.2 Widespread Impact of Chalakchar Growth Center

Each growth center and rural market influences the rural economy by generating substantial market revenue. According to the field study, 28% of respondents believe that the Chalakchar market is the key trading hub and the largest growth center in the union, with people traveling at least 12 kilometers to shop. According to 29% of respondents, this growth hub provides good opportunities for the surrounding community and farmers, particularly betel leaf and banana producers. Traders from many districts come to these centers to trade bananas. It also generates employment for over 10,000 individuals in the union. The market contains 2000+ businesses of various types, and 1500+ local petty traders come to this growth center on the hat days to sell their produces, creating a tremendous economic influence in the union.

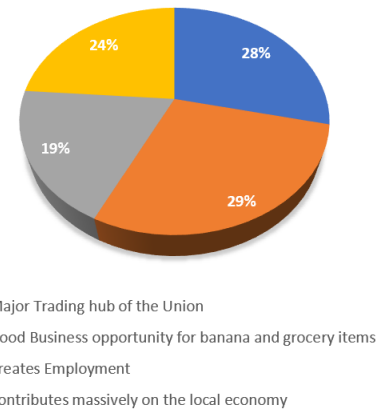


Figure 4-1: Impact of the growth center (Field Survey, 2022)

4.3 The Existing Services/Facilities Surround the Growth Center

The population served by the Chalakchar growth center enjoys a superior level of service and amenities. Additionally, the center has a significant impact on the alignments of highways, rural small hat/bazaar, social institutions, and educational facilities within the catchment areas. According to the tables, a network of social, economic, administrative, and commercial services has developed around the collection center, making the market the region's focal point. Some services, including banks, non-governmental organizations (NGOs), various types of general stores, retail markets, and government offices, are within 200

Types of Facilities	Distance
Retail markets/General store	Inside the growth center
School & College	Inside the growth center
Various govt. offices	Within a kilometer
Mosque	Inside the growth center
Bank/NGO	Inside the growth center
Bus/Taxi stand	Very close to the CC

Figure 4-2: Nearest facilities from the growth center (Field Survey, 2022)

to 300 meters of the collection center. Lastly, it is evident that the social service institutes created in conjunction with the collection center boosted the economic condition of the local population.

4.4 Evolving Business Scenario of the Collection Center in the past five years

The business center and volume has tremendously increased in the last five years which clearly indicates the importance of the growth centers in the union. We endeavored to comprehend the evolution of the business of this market over the past five years through a series of discussions with various market participants. The results of the query are represented in the table to the right.

Table 4-1: Business Growth in the last five years (Field Survey, 2022)- Approx. scenario

Shop Types	2014-15 (approx.)	2021-22 (approx.)	Increase
Grocery	45	102	127%
Fruits	20-25	50-60	150%
Grocery	250-260	500+	100%
Retail shop (for different off-farm commodities)	800-1000	2000+	100%
Vegetable	40-50	120+	140%
Bettle leaf	50-60 traders	250+ traders	317%
Fish	5 to 10	30+	200%
Different small mills	4 to 5	30+	500%

4.5 Key Stakeholders and their roles in the growth Center

Table 4-2: Key Stakeholders and their roles in existing markets

Market Actors	Key Roles in the Market
Faria	Faria is a marketing middleman who buys product from producer and producer groups and sell to wholesale market, commission agent or other traders in the local markets.
Local beparis (sometimes called local Paikar)	Large scale wholesale traders who are permanent shopkeepers and agents having their own premises in the markets. They control market prices, weight and other negotiations related to product supply chain. They sell to paikar from outside and regional retailers.
Paikar (from outside)	They are large scale traders who collect products from local markets, and send them to terminal markets or near-by large scale wholesale market
Retailers	Retailers are the small-scale traders who collects from the markets, suppliers from outside or directly from the farmers to sell it directly to the consumers in small quantity.

4.6 Current Status of major Value chain in Chalakchar Market

The following are the major agri-value chain commodities (bananas and betel leaves) that are grown locally and have enormous export potential from this union. Except for Betel leaf and Banana, the most important non-agricultural product that has the potential to be supplied from this location is tiny furniture and decorative objects made from cane.

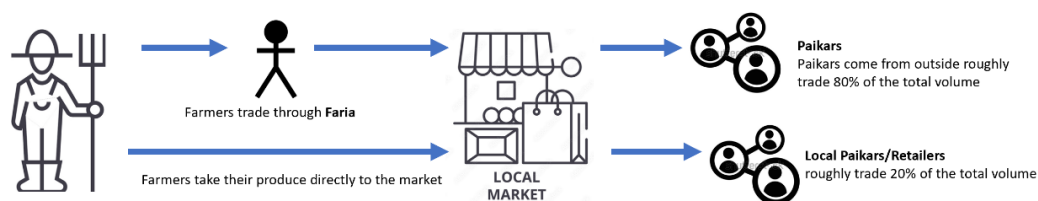
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Major Value Chain	Farm/ Non-Farm	Potential	Business Type	Remarks
Banana	Farm	High	Assembly/Wholesale	Major local Value Chain Items Cultivated locally
Betel leaf	Farm	High	Assembly/Wholesale	Major local Value Chain Items Cultivated locally
Vegetable	Farm	Medium	Retail	Imported from outside
Fruits	Farm	Medium	Retail	Imported from outside
Dairy-Milk	Farm	Low	Retail	Locally traded
Dairy- Cattle market	Farm	Medium	Retail	Locally traded
Fish	Farm	Medium	Retail	Imported from outside
Cane based small cottage industry	Non-Farm	Low	Retail Opportunity for wholesale	High Potential
Paddy	Farm	Medium	Assembly/Wholesale	Highly Seasonal

4.7 About the Banana Value chain at Chalakchar

Chalkchar, Aurjonchar (biggest market) and Hatirdiya area and it's bazars is famous for banana. Bananas are cultivated roughly on a thousand hectares of land each year, yielding 30 thousand metric tons of bananas in this zone. Of these, bananas are grown on approximately 250 to 300 acres of land at the Chalkchor Union. Major variety find in this market is 'Sagor Kola' (Amritosagar variety) . Bananas are traded in an open field (OTC) near the connecting highway. It's a leased land from the government, and the open space is quite a distance from the main market (roughly half kilometer) . Approximately 1000 to 1500 farmers congregated in this location for banana trading, while 200 to 250 buyers/paikars from various districts came into trade bananas. Major buyers come from Dhaka and Sylhet division. Major supply chain actors here include farmers, faria, Paikars, labors and transporters.



Banana Value Chain at Chalakchar

Every day 2500 to 3000 bunch of bananas (*locally called 'Kadhi'*) are traded in this market with a market value of BDT 8 to 10 lakhs. Banana is being traded all the year round yet the major peak season is Summer and early winter. The price of a bunch of bananas varies from tk. 300 to tk. 600 per kg (as per season, quality and type). Government charge 4 taka as 'commission charge' from each bunch of bananas. Therefore, roughly government earn 10,000 to 12,000 revenues from this part of market. Usually, framers do minimum sorting and grading. Post-harvest technology is also at basic level. Up to this market, farmers and middleman do not use any chemicals to ripen the banana. They do, however, occasionally use DD powder to avoid stains/ spots on the banana. The cost of loading and unloading a kadhi banana is 2 taka, and around 100 to 150 laborers are employed in this market. Farmers employ basic vehicles (Van, Nosimon, Cycle, auto rickshaw etc.) to load their produce, whereas paikars typically use small and large trucks.

4.8 Design Need to Promote Banana Value chain at Chalakchar

- Requires a dedicated place/shed area in the proposed market for banana trading. It must be in the first block of planned market design that is connected to or adjacent to the main road (as this are typically nature of assembly market)
- The dedicated place has to be well equipped with sorting, grading, small packaging and cleaning facility
- Considering the future potentials of export market, a space needs to be kept for Banana Ripening Chamber.
- The plastic crate should be introduced to reduce post-harvest loss. Through the procurement committee, 800 to 1000 crates need to be brought and distributed and managed through the MCC to reduce post-harvest loss.
- The dedicated facility will help to brand this market as 'Modern Banana Hub' of the country



Figure 4-3: Banana Cleaning facility (picture source: google)

4.9 Value addition aspect - About Banana Ripening Chamber: Value Addition Space

Considering the business potentials and export opportunity, a dedicated space from Banana Ripening Center should be kept in the stated market. The Department of Agriculture (DAM) should link with the private sector to invest in the construction of a small-scale ripening center in order to improve the export potentials of the market, as this is the country's largest banana hub. Very briefly, Banana ripening chambers are engineered to stimulate nature's ripening process by temperature control, exposure to uniform & controlled ppm of Ethylene gas, venting of CO₂ gas and reducing total ripening process to 4-6 days for best quality banana.



Figure 4-4: Banana Ripening Chamber (picture source: google)

4.10 About the Betel leaf Value chain at Chalakchar

Betel leaf is available all year around in this area, so betel leaf traded almost every day in the market. Narshingdi, Monohordi Upzilla is also well know for Betel leaf production and trading. Betel Leaf is being cultivated roughly on 300 hectares of land each year, yielding 12 thousand metric tons of betel leaf in this zone. Rampur, Khidpur, Sagardi, Shorifpur, Denegar, Shamoltoli, and Singra are the main producers of betel leaf.



Figure 4-5: The betel leaf market of Chalakchor Bazar

However, the peak season of betel leaf sale is from Baishakh to Shraavan of Bengali month in Chalakchor. Chalakchor market is not the largest market for betel leaf. This is the second largest market after Khidpur. At Chalakchor market, about 200 to 250 farmers trade betel leaf. On Hatdays (Monday and Thursday), they come to Chalakchor market to participate in trading. The supply chain is a shortened supply chain. There is no Faria in the market. Farmers come directly with their produce and sell it to the retailers. Retailers sell to the consumers.

There are two sorts of betel leaf: a tiny one known as chapil and a large one known as boli. Betel leaf amount is measured in kuri, bira and bira. One jur equals 60 leaves, and one kuri equals 40 jur. Each jur is priced at TK.600 for chapil paan and TK.1200 to TK.1600 for boli. Approximately 5000 bira (1 bira = 120 pieces of leaf) of betel leaf are traded every day in the Chalakchor market. Every day, about 6 lakh betel leaves are sold at Chalakchar Bazaar.

The trading place is open for betel leaf traders in the Chalkchar market. On hatdays, 150 to 200 farmers congregate in a packed location to trade. Even, retailers also trade in open place without having any dedicated shade place. There are roughly 80 to 100 retailers in the market who purchase from the farmers. Farmers gather, little sort and grade, count, and pack it in a unique technique using banana leaves before delivering it to market. One of the most difficult aspects of betel leaf business is its perishability. If the retailers do not sell within 2 to 3 working days, they must count the loss.



Betel Leaf Value Chain at Chalakchar

The good part is that there is not credit business betel leaf and banana trading. Farmers have to be paid in cash for their produce. Retailers are willing to pay extra price for sorted and graded betel leaf and banana. They are currently giving premium price for sorted and graded betel leaf and banana. Farmers and retailers are not happy about the space of trading as they have to trade on open space where there is no minimum facility for trading. Farmers generally transport their products by bicycle and Nosimon (a small local battery charge vehicle). Nosimon charges between BDT 50 and 100 for transportation, depending on the distance. Retailers do not need to transport their goods. because they buy them at the Chalkchor market and sell them at retail in the same location.

4.11 Design Need to Promote betel leaf Value chain at Chalakchar

- Requires a dedicated place/shed area in the proposed market for betel leaf trading. It must be in the initial block of planned market design that is connected to or adjacent to the main road (as these are typically nature of assembly market)
- The dedicated place has to be well equipped with sorting, grading, small packaging and cleaning place
- Considering the future potentials of the market, some arot facility need to be kept in the market as the modernization and volume will certainly attract outside paikars in this market

4.12 Vegetable Supply Chain at Chalackchar

In the market, there are over 120+ vegetable retailers; 90% of the vegetables are imported from neighboring districts. However, vegetable is primarily farmed in Chalakchar's nearby unions (Khidirpur, Charmandalia, and Krishnapur), but that also goes to the Kotidiya- other part of the river.

Everyone conducts business in the open shed. The future market will require a separate shed and a vegetable cluster with sorting, grading, packaging, and cleaning facilities. In consideration of future opportunities, the market must also include the 'Arot' facility. Therefore, some area must be reserved for vegetable arots.

4.13 The design needs to ensure service facilities at Chalakchar market to promote other business/value chain

The growth center lacks the following facilities at the market:

- Unplanned functional structure
- No transport stand as the loading and unloading is poor
- Poor drainage and waste management
- Very congested inner roads which becomes muddy
- Poor toilet facilities
- No storehouse for semi-perishable agri-commodities like potato, onions and the like
- Inadequate infrastructure and enormously unhygienic
- No grading and sorting place
- No pattern of shops (like grocery cluster, pharmacy cluster)
- No space for slaughtering
- Lack of proper parking space to avoid congestion and safely reach the goods into the shop



Poor market facility at Chalakchar market

4.14 Recommendations to upgrade the market facilities

- Market management committee should be reformed, and the procurement should be formed for any investment in the market (please the recommendation of Shatmile collection center)
- Instead of scattered trade settings, the proposed design should provide cluster/block wise trading venues, such as a medication block, a livestock trading block, a fruit trading block, meat selling block, processing block (masala, oil) and so on.
- At least two display centers need to be kept promoting cane-based handicrafts in the proposed market design as Narshindi is renowned for handicrafts. The display centers can be a connecting hub for the producers and forward end market actors
- There should be enough space for 'Open Trading' (OTC) to encourage small farmers and producers to join in trading.
- Ample space is required for farm and non-farm temporarys stores at the market (not cold store as this market is largely a retail market in nature)
- To avoid traffic congestion on the way, the suggested market design should feature a separate transportation stand and circular transport path
- For trading Fish inside the market, fish Arot must be constructed. For fish retailers, sperate fish shed needs to be built under Fish block
- A separate cleaning and packaging area is also required for fish Arot. In order to promote fish trade in the market, the market should also feature an ice machine that produces quality and safe ice.
- Because there are many good smallholder farmers/farms in the area with local variety cows, a small chilling facility should be established to connect them to the formal milk market. Alternatively, some space should be set aside for a chilling center to attract private sector investment (like Aarogn dairy, Milk Vita)
- This market has to be established as one-stop service points for the farmers where farmers can avail 360-degree services and products from the markets
 - Facilities for input shop, modern storage facilities
 - Information centers formed and managed by DAE
- Along with aforementioned requirements, the markets also need to ensure following features:
 - Sperate slaughtering place
 - Separate packaging infrastructure for horticulture, fish and fruits
 - Spacious (and circular) loading and unloading place (if possible, in front of every trading block)
 - Improved drainage system
 - Spacious and blocked dumping place and waste management

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- Separate toilet for men and women
- Dedicated space for social gathering
- Information center for the farmers and relevant stakeholders
- Café and restaurant

5 FEASIBILITY ANALYSIS OF RURAL GROWTH CENTER (A CASE STUDY OF ABUTORAB AND BANGLA BAZAR GROWTH CENTER)

5.1 Brief about Abu torab Growth Center

Abu torab bazar is a historical growth center. It was established in British period. The bazaar is about 300 years old. This market is one of Mirsarai upazila's oldest and largest. It is the meeting place between 6 unions and roughly 60,000 people use this market to fulfill their daily needs. This market is located next to the economic zone's main road, and Mirsarai economic zone is approximately six and a half kilometers away. It takes about 10 to 15 minutes to get there. The size of this market is growing over time. In the future, this market will serve as an important commercial hub for the Mirsarai Economic Zone.

More than 2000 people regular visit in this market. This is strictly a retail market. Every kind of commodity is sold here. This market is registered by The Ministry of Local Government and operated by the market management committee. There is some private land, which is mostly rented to businessmen. It's close to the highway. The roads are smooth. The proposed market size is 0.5 acre, or 23,000 square feet. Bazar Time is open from 7:00 AM to 12:00 PM for perishable goods (such as vegetables, fish, and meat), while other stores are open all day, from 8 AM to 10:00 PM.



Figure 5-1: The GIS graph of Abu Torab Bazar

Neighboring markets are 1) Kailash Bazar, next to the abutorab market, is smaller than the abutorab market, 2) Samitir bazar, 3 kilometers away, is smaller than the abutorab bazar, and 3) Sadhur bazar, 5 kilometers away, is smaller than the abutorab bazar.

According to the short survey, there are 150 retailers, 15 paikars, and 150-200 temporary sellers who come on hat days (Friday and Monday) to sell their agricultural commodities. In Abutorab Bazaar, there are approximately 500 businessmen. The monthly income range is BDT 30,000 for small businessmen, BDT 60,000+ for middle businessmen, and BDT 100000+ for large businessmen. MMC takes over control of this bazar for a year after paying lease value of BDT 19.5 lacs. MMC charge khazna BDT 20-40 per day, depending on the size of the shop. MMC consists of 19 members, and they are active to bring positive change in the market.

5.2 Major Agro-Commodities

Rice, pulses, vegetables, and fish are the most commonly traded commodities in the market, and they are mostly exported from other districts and nearby unions, as rice is widely grown in the surrounding unions. This market receives roughly half of its vegetables from neighboring unions such as Ichkhali, Katachora, Baryearhat, and Durgapur. Baryearhat is the vegetable entry point to this region because this market serves as an assembly/wholesale point for vegetables from all over the country. And vegetables are transported from this market to various markets of Mirsharai.



Retail section of the market

5.3 Growth potentials of the market

As stated above, the market is located next to the Mirsarai Economic Zone which is an industrial economic zone currently under development in Mirsarai Upazila, Chittagong on the bank of Sandwip channel. It is being developed on an area of 30,000 acres and is governed by Bangladesh Economic Zones Authority (BEZA). It will have a huge impact on the market to access various commodities and facilities to meet daily essentials. It is expected that 3 million people (Skilled/Semi-Skilled/Unskilled labor supply including Foreigners) will be migrated here, and they will come up with a new 'life style' in this zone. Therefore, Consumption patterns and profiles of household will be changed with a sharp transition from food to non-food items. Market will be seen as an 'One-stop Service Point' to access diverse facilities and services (medical, recreation, schools and the like). The economic zone's impact on this market has already begun. According to the survey, it has been found that daily visitors have increased in this market. Roughly 2,000 to 2,500 visitors visit this market every day which was only 800 to 1000 2 years ago. The number of shops also increased by 20% which are mostly life-style shops like cloth, shoes, cosmetics and the like. Therefore, market centers' infrastructure and service capacity must be multiplied to adapt to the change and growth.

SWOT Analysis of the Market

<p>Strength</p> <ul style="list-style-type: none"> • Better transportation and position • Meeting of six union people, roughly 60 to 70K use this market • Popular for retailing • Various facilities are there-school, madrasa, restaurant, diagnostic center, high-end shops like electronics • Proposed future pilot village • Large land area 	<p>OPPORTUNITY</p> <ul style="list-style-type: none"> • Next to Economic Zone • Potential for business • Employment opportunities • Land sharing system (proposed) • Scope for Infrastructure development
<p>WEAKNESS</p> <ul style="list-style-type: none"> • Unplanned functional structure • No permanent structure • Waste management challenge • Poor drainage system • No sorting, grading, washing, slaughtering facilities • No toilet, storage, cold storage facilities • Special bazaar has no shed • Loading unloading creates Traffic Hazard 	<p>THREAT</p> <ul style="list-style-type: none"> • Unplanned sprawling • multiple types of bazaar in one place • Shop distribution • Conflict between private land owner

Figure 5-2: SWOT analysis of the market

5.4 Major Shops and facilities in the market

There are approximately 500 shops in the market that cover a wide range of daily necessities. Because this is the hub of six unions, the area has developed into a compact town cum market with school, college, madrasa, mosque, diagnostic center, and residence within the broader market boundary. People come to this location not only to shop, but also to use all of the amenities. As there are multiple

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entry and exit points, the market is well connected to all of these unions. The market is sprawling with no cohesive plan to meet people's needs. The shop types are given as follows:

- Motorbike service store: 2
- tailor shop: 6
- tea stall: 20
- Rice Shop: 4
- Cycle store: 3
- Cement Shop: 2
- Mobile store: 2
- Electronics: 4
- Salon: 10
- Hardware: 7
- Dental care: 1
- Restaurant: 4
- Diagnostic Center: 1
- Gamcha, lungi store: 8
- Cosmetics: 15
- Fish: 25
- Workshop: 6
- Pipe and fittings shop: 2
- Jewelry: 9
- Pharmacy: 20
- Hotel (food): 5
- Grocery: 37
- Input shop: 3
- Mobile showroom: 2
- Cloth shop: 25
- Bank: 3
- Shoe Shop: 15
- Poultry: 15
- Battel leaf: 25
- Cookeries: 3
- Vegetables: 62
-

5.5 Recommendations to upgrade the market facilities



Figure 5-3: SWOT analysis of the market

- At least two-storied building has to be built to accommodate various types of business, but primary focus should be given to agri-based commodities like fish, vegetables, meat, confectionary, grocery, fruits and the like
- There should be enough space for 'Open Trading' (OTC) to encourage small farmers and producers to join in trading.
- There should be multiple commodity-specific entry and exit path into the market to deal with the large visitor flow into the market
- Instead of scattered trade settings, the proposed design should provide cluster/block wise trading venues, such as a medication block, a livestock trading block, a fruit trading block, meat selling block, processing block (masala, oil) and so on.
- A separate cleaning and packaging area is also required for vegetable and fish blocks.
- Along with aforementioned requirements, the markets also need to ensure following features:
 - Sperate slaughtering place
 - Separate storage for agri-inputs, grocery, and semi-perishable agri-commodities

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- Separate packaging infrastructure for horticulture, fish and fruits
- Spacious (and circular) loading and unloading place
- Improved drainage system
- Spacious and blocked dumping place and waste management
- Separate toilet for men and women
- Dedicated space for social gathering
- Information center for the farmers and relevant stakeholders
- Café and restaurant

5.6 Brief about Bangla Bazar Growth Center

Bangla bazar, a local growth center, is located in the Ichakhali union, Chorsharat, Morsarai. Except for some tin-made vertical shops alongside the 20-foot road, there is no market infrastructure in the growth center. Because the market is only .5 kilometers from the economic zone's main road, it will serve as an important commercial hub for the Mirsarai Economic Zone.



Banglabazar

Figure 5-4: Current status of Banglabazar with minimum infrastructure

According to the visit, the people in the surrounding market are doing subsistence farming, and extra produce are sold in this market. It is essentially a kind of local retail market where the residents sell their extra produce and come for chit-chat. This is not a government-registered market. There used to be a two-day-a-week hat system, but it is no longer in place due to various issues, such as the fact that people prefer to visit Abu Torab Bazaar over Banglabazaar. This market attracts 200-250 people who come to meet their daily needs.

There are 35 shops in the market, such as: tea stalls: 8-10, grocery: 6, salon: 2, workshop: 2, Broiler Selling Point: 2, Fish: 1, Mobile recharge+ bkash: 3, Cement shop: 1, Input shop: 2, Hardware: 2, Cloth (gamcha, lungi): 1, Shoe: 1, tailor: 1, photo Studio+ computer: 1. There is also a primary and secondary school, as well as a madraasa, right next to the market. Bazar Time is open from 7:00 AM to 12:00 PM for perishable goods (such as vegetables, fish, and meat), while other stores are open all day, from 8 AM to 10:00 PM. However, visitors come usually in the evening to convene in the market.

Neighboring markets: 1) Abu torab market, which is 4.5 kilometers away and larger than this market; many products from this market trade to Abu torab bazar. 2) Daspara Bazar, a similar type of bazaar located approximately 1 km away. 3) Another option is Mozumdar haat, which is 2 kilometers away and larger than Banglabazar market.

5.7 Major trading commodities

Major Agri Commodity: Mostly Rice, Pulse, Vegetables, broiler are traded in market, daily trade volume include Broiler: 50-60 kg/ daily, (occasionally 200 kg), Vegetables: 60-80 kg/daily, Pulse: 80-100 kg/daily/ season (2 month), Fish: 120 kg/ daily. Every year, major agro-commodity worth 1 to 1.5 core are sold.

Major Non-Agri commodity: In the banglabazar market, there are tea stalls, clothing stores, salons, pharmacies, and grocery stores. Cloth shop earns BDT 3,75,000 per year, Pharmacy earns BDT 15,00,000 per year, tea stall earns BDT 9,00,000 per year, and sawmill earns BDT 3,12,000 per year.

5.8 Growth potentials of the market

As stated above, the market is located very close to the Mirsarai Economic Zone which is an industrial economic zone. There are four different entry and exit routes from the economic zone to the bazar. As a result, access to various commodities and facilities to meet daily necessities will have a significant impact on the market. The cost of land has already increased nearly tenfold per shotok. It is expected that low skilled labor will be migrated in the Ichakhali union who will visit this market for their daily essentials. Approximately 200,000 to 300,000 low-skilled or unskilled laborers will gradually migrate to this side, putting enormous pressure on the bangla bazar market. However, there are other adjacent markets within a 1-to-2-kilometer radius that will face similar pressure.

On top of that, the people of Ichakhali Union have a good amount liquid cash in their hand because the government acquired most of their land to build the EPZ. They have begun investing their money in the construction of low-cost lodges for rental purposes because they anticipate an influx of labor in this zone in the near future. Taking everything into account, this market has a greater potential for growth.

5.9 The changing trend from rice to poultry in the studied market area

People in the nearby markets are shifting from rice production to poultry business. Major contributing reasons include lack of land, high cost of labor, high profitability in broiler business is broiler, less risky business as this is driven by contract-growing model.

The poultry industry is gaining popularity in the vicinity of the studied market. The majority of boiler farms begin their batch with at least 1000 chicks. Each farm produces approximately 8-9 batches per year. They typically farm under contract with CP and Paragon Company. Initially, farm owners deposit BDT 1 lakh in the company and receive 1000 chicks to rare. After 30-35 days, they sell the chicken to the aforementioned company and occasionally to the market at a fixed price. Following the sale of the chicken, the company will deduct the cost of chicks and feed. The owners will keep the remaining selling price. Despite the costs of medicine, cleaning and marinating the room, hygienic environment, electricity bill, water, and so on, there is still a profit of tk. 30,000-40,000/ batch, which equates to tk. 250,000/ year (approx.)

5.10 Current status of infrastructure and Recommendations to upgrade the market facilities

In this market there are some facilities exists like there are supply of electricity in the market, shaded shops, water supply through tube wells. Except this, the market has following problems:

- The market is located on a very narrow path, as shown in the image, so there is no room to build a new market, posing a significant challenge for the designer and architect.
- On top of that, there is a school and madrasa near the market, which makes it unethical to build any market nearby.

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- There are no physical facilities in the market such as retail space, banks, toilets, drains, and so on. Therefore, it needs a major design innovation to build a market in such a narrow high where there is no ample place.

6 FEASIBILITY ANALYSIS OF RURAL SPECIAL HAT BAZAR-VEGETABLES MARKET (A CASE STUDY OF SHATMILE VEGETABLE MARKET)

6.1 About Shatmile Collection Center and its strategic importance

Shatmile-Barinagar in Jessore is renowned for its extensive vegetable cultivation and as one of the country's largest vegetable marketplaces. It is known as "vegetable village." The year-round activity of the village's farmers has earned them a reputation for planting seasonal vegetables in advance. Instead of cultivating paddy and jute throughout the year, they plant vegetables. Each day, a number of vegetable-laden trucks depart Shatmile Bazar for several districts, including Dhaka and Chittagong. Approximately three to four hundred crores worth of vegetables are purchased and sold annually in this market.

On average, Jashore farmers produce 25 tons of vegetables per hectare annually and ranks top vegetable producing district in Bangladesh in 2020. This means eight lakh tons of vegetables are grown on 32,000 hectares of land a year. After meeting local demand, vegetables are supplied to at least 40 regions of the country, including the capital. According to the Agricultural Extension office in Jashore, both vegetable land coverage and production per hectare are increasing. Following is the production scenario:

Table 6-1: Year –wise production hectare in Jashore (local DAE Office)

Financial year	Cultivation per hectare	Production (in MT)
2014-15	28,635	896,510
2015-16	27,182	514,159
2017-18	29,740	602,118
2018-19	32,470	807,741

In 2021-2022 at Jashore Sadar Upzilla, total production is expected to be around 1,39,610 MT, a slight decrease from the previous year's production of 152,061 MT (source: DAE, Jashore Sadar Upzilla). A total of 3590 hectares of land has been cultivated with vegetables in 2021–2022. On 3600 hectares of land, vegetables were grown the previous year. Vegetables are grown on 100 hectares less land this year than they were last year. The main reason for the decline in production is the unseasonal rains and a slight decrease in the amount of land. Vegetables are coming from 4 unions to this market (roughly 12 km radius) and supplies to almost 40 districts. Approximately 70-80 thousand MT of vegetables are traded yearly in the market, totaling BDT 250-300 crore. Farmers trade their produce in about 60 to 70 minutes, and nothing is left unsold at the market, demonstrating the market's high efficiency. The market alone consumes 50% of Upzilla's total production, making it the country's flagship vegetable supplying market.



According to the definition of LGED, the stated bazar is a special commodity-driven collection center that serves as the region's flagship wholesale vegetable market. It is located in the Jessore District's Haibatpur, Sadar Upazilla. This collection center (CC) is alongside the highway connecting Jashore and Jhinaydhah. The said CC is a government-registered market from which the government earns BDT 84 lac as annual lease money. The Market Management Committee (MMC), which the union's locally elected chairman leads, runs the market and uses the Khazna system to collect revenue from the market. The market's primary commodities are vegetables (bitter gourd, bottle gourd, sim, eggplant, lady finger, radish, and almost all vegetables) and a few selected fruits (Mango, Jackfruit, Litchi, Watermelon etc.). Even though there are two regular hat days (Sunday and Thursday), the wholesale market is open daily. It opens for business at 6 a.m. and roughly closes at 12 p.m. Various actors are connected in Satmail Bazar, including Farmer, Faria, Bapari, Paikar, Retailers, Input suppliers and the like. On average, roughly five to six thousand people visit the market daily, of which two to three thousand are farmers. During peak season, the number of visitors per day increases to approximately eight to ten thousand per day. The market area is 1.5 acres, and the government owns around 1 acre.



Figure 6-1: Impact of Shatmile Collection Center (Field Survey, 2022)

6.2 Widespread Impact of Shatmile Collection Center

Each growth center and rural market influences the rural economy by generating substantial market revenue. According to the field study, forty percent of respondents believe that the collection center provides a better possibility for selling vegetables because the region is largely a vegetable-growing zone, and twenty percent of respondents believe that this center strengthens the rural economy. Approximately 30% of respondents indicated that this growth center is a significant source of employment creation. 10% of respondents stated that this growth center contributed to the creation of various business opportunities.

Types of Facilities	Distance
Retail markets/General store	In the growth center
School & College	Within a kilometer
Various govt. offices	Within a kilometer
Mosque	In the growth center
Bank/NGO	Very close to the CC
Bus/Taxi stand	Very close to the CC
Nearest city center	Within a kilometer
Clinic/health care center	Within a kilometer

Figure 6-2: Nearest facilities from the growth center (Field Survey, 2022)

6.3 The Existing Services/ Facilities Surround the Collection Center

The population served by the Shatmile collecting center enjoys a superior level of service and amenities. Additionally, the center has a significant impact on the alignments of highways, rural small hat/bazaar, social institutions, and educational facilities within the catchment areas. According to the tables, a network of social, economic, administrative, and commercial services has developed around the collection center, making the market the region's focal point. Some services, including banks, non-governmental organizations (NGOs), various types of general stores, retail markets, and government offices, are within 200 to 300 meters of the collection center. Lastly, it is evident that the social service institutes created in conjunction with the collection center boosted the economic condition of the local population.

6.4 Revenue source of the collection center

MMC charges actors BDT10-12 per sack. MMC also maintains a retail market in addition to the wholesale market. The subscription fee for the vegetable shop is BDT 30/normal day, BDT70/hat day, for the fish shop BDT 180/hat day and BDT 40/normal day, for the dairy BDT 40/daily, and for the grocery BDT 180/hat day and BDT100/normal day. Some businesses are privately owned. There is electricity (costing BDT 500-600/month), water (costing BDT 200/month), a toilet (in poor condition), drainage (in the worst condition), a masjid, and bank facilities in the market. The market has both shaded and un-shaded shops. The majority of sorting and packaging is done on the road. There is no dedicated area for loading and unloading commodities.

Income Source	Hat-Day (in BDT)	Non-Hat-Day (in BDT)
Whole Sale market- Per sack	10-12/ sack	10-12/ sack
Retail market- vegetables	70/Day	30/day
Retail market- Fish	180/Day	40/day
Retail market- dairy	40/Day	40/day
Retail market- Grocery Items	180/Day	100/day
Retail market- Other Items	Monthly rent	Monthly rent

1. Electricity 500-600 taka/ shop
2. Water charge: 200/shop

Figure 6-3: Graph-4: source of Revenue (Field Survey, 2022)

6.5 Evolving Business Scenario of the Collection Center in the past five years

The market was originally founded as a vegetable market in this location to supply vegetables to various regions of the country. We endeavored to comprehend the evolution of the business of this market over the past five years through a series of discussions with various market participants. The results of the query are represented in the table to the right.

Business Area	2014-2015	2021-2022
Business Volume (in MTs)	60K to70K MT	90K-100K+ MT
Business Volume (in BDT)	Roughly 150Cr +	250 Cr+
Supply to different districts	30+ districts	50+ districts
Average people/market actor visit/day	3000-4000	7000+

Figure 6-4: Business Growth in the last five years (Field Survey, 2022)- Approx. scenario

6.6 Key Stakeholders and their roles in collection center

Table 6-2: Key Stakeholders and their roles in existing markets

Market Actors	Key Roles in the Market
Faria	Faria is a marketing middleman who buys product from producer and producer groups and sell to wholesale market, commission agent or other traders in the local markets.
Local beparis (sometimes called local Paikar)	Large scale wholesale traders who are permanent shopkeepers and agents having their own premises in the markets. They control market prices, weight and

Market Actors	Key Roles in the Market
	other negotiations related to product supply chain. They sell to paikar from outside and regional retailers.
Paikar (from outside)	They are large scale traders who collect products from local markets, and send them to terminal markets or near-by large scale wholesale market
Retailers	Retailers are the small-scale traders who collects from the markets or directly from the farmers to sell it directly to the consumers in small quantity.

In addition to the aforementioned important market stakeholders, fixed and daily laborers and transporters also represent a substantial proportion of market participants. Roughly 2000 including Foria, Paikar, bepari, labor and transporter are connected to this market.

6.7 The Supply system of the Collection Center

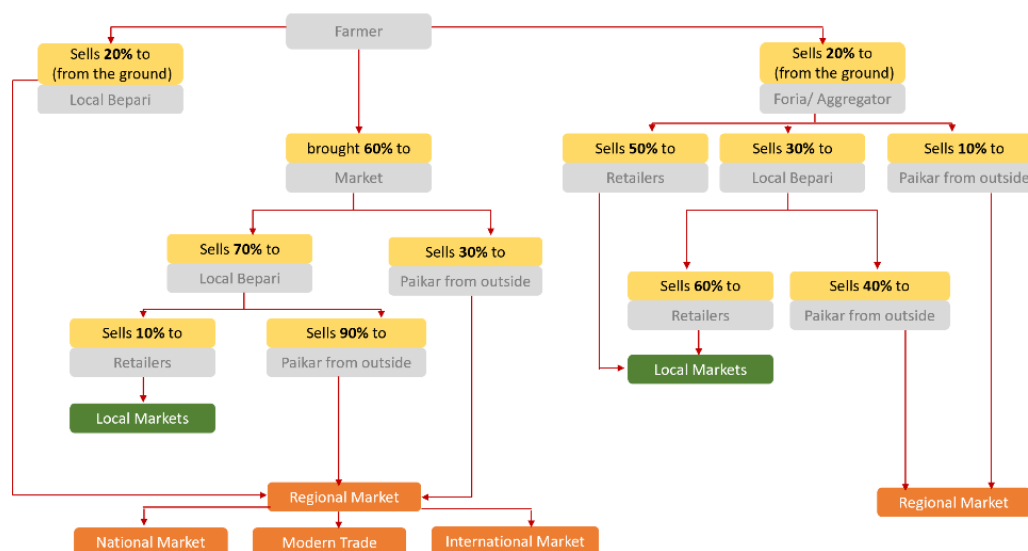


Figure 6-5: Existing supply chain scenario of Shatmile Collection Center

Middlemen undoubtedly play a crucial role in the marketing system of any kind of good by connecting producers with consumers. Farmers primarily sell their produce in the growth center since they can negotiate prices with market participants and do not need to rely on the Foria. According to the findings, they sell approximately sixty percent of their produce to market intermediaries such as local beparis and paikars. The remainder of their harvest is sold directly from the ground in order to save transaction costs and maintain product quality.

When farmers bring vegetables to market, the majority of purchasers are local beparis. They sell 70% of their produce to the local beparis due to their strong relationships and trustworthiness. In most cases, local beparis pay upfront to the farmers. On the other hand, farmers also sell to paikars who come from different districts. Typically, farmers sell less to paikars due to their enormous volume requirements, and paikars usually purchase from local beparis due to their large volume needs. Additionally, local beparis sell to retailers in the nearby marketplaces, who then sell to local consumers. In ninety percent of instances, paikars send goods to regional markets from this market, which are then distributed to national, modern trades, and international marketplaces.

Farmers also sell directly from the farmgate. Usually, they sell less from the farm gate due to aforementioned reasons. Here, retailers are the biggest buyers as they have mostly neighbors and pay upfront. Local beparis also purchase from the farmers at the farmgate due to their good relationship.

6.8 Buying and Selling: Price flow and profit margin (PM) of various market actors at the collection center

Price flow of any vegetable market is very complicated as every market actor simultaneously sells to different tiers of market actors. On the whole, in the studied collection markets, five different market actors (Farmer, foria, bepari, aratdar, paikar) are involved in trading vegetables and every actor maintain a minimum of 20-25% profit margin to sell it to the next layer.

Farmer/Producer: Surprisingly, farmers make low profit when they sell at the farm gate. The farmer sells his products at BDT22-23/kg (to bepari or foria) at a profit margin of 15-20%. The profit margin goes up to 30% when they bring the vegetables to the collection center.

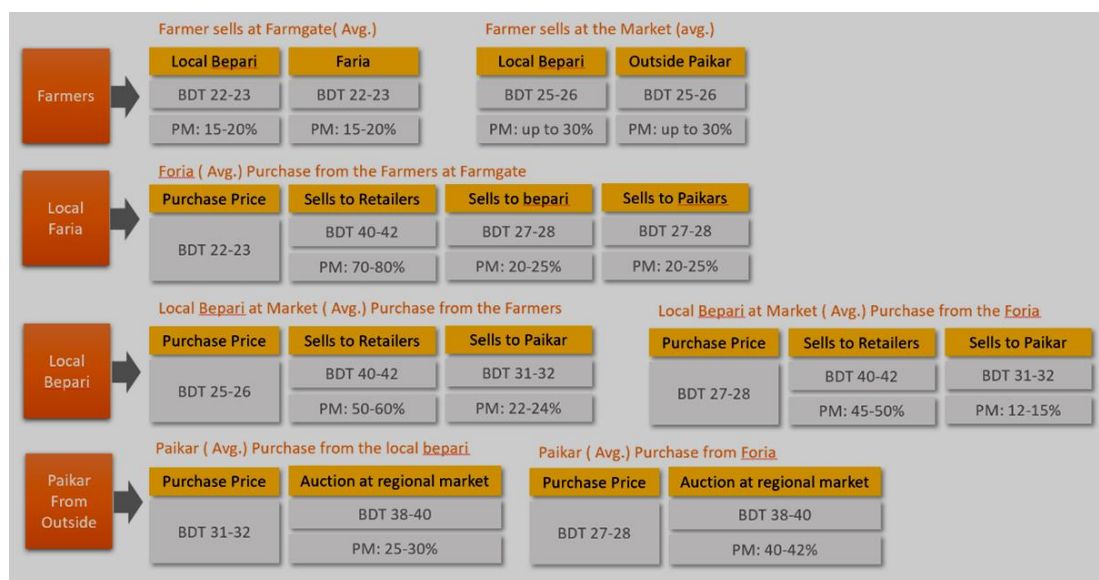


Figure 6-6: Price flow and the profit margin of various market actors

Local Faria: When selling to retailers, Foria earns a substantial margin of up to 80%. Due to the significant profit margin, local foria often sells fifty percent of the total volume to local shops. Due to the modest quantities sold o local retailers, Foria prefers to sell to local beparis and paikars and assure a profit margin between 20 and 25 percent at the collection center.

Local Bepari: At the collection center, Bapris are the most influential market participants, and they have their own space (arots) on the market. They typically deal in huge quantities and sell directly to paikars from outside the region, and they occasionally deliver vegetables directly to arots at regional marketplaces across the nation. When purchasing directly from farmers, Bepari generates a healthy margin. They typically guarantee 20 to 24 percent profit in this situation. In addition, they earn a profit of up to 50 percent when selling to local stores. However, they must also collect from Foria because they have enormous orders that are often difficult to collect form the farmers alone. In this case, their average profit falls to between 12 and 15 percent.

Paikars: Paikars usually come from outside, purchase vegetables from here and supply different regional, local and international markets. They usually collect from beparis as they can mange large volume and a small portion from the Foria as well. They also secure a profit margin of 20 to 25 percent when delivering produce to regional marketplaces across the country.

6.9 Marketing Function

6.9.1 Handling, Sorting and Grading scenario at the Collection Center

Grading is the basic function of sales transactions and is defined as the classification of products according to some standards or measures. Grading is the sorting of produce into different market quality which facilitates exchange by simplifying buying and selling as it makes the sale by showing sample and description possible. It also simplifies the concentration process and makes easier and less costly the movement of goods through the marketing channel. In the collection center, The labor handles all loading, unloading, and sorting by hand. In the collection center, there is no automated machine like a forklift in the collection center. To support these tasks, the collection center employs between 200 and 300 laborers. Because there is no distinct sorting and grading facility in the area, it is done on the open field, which increases post-harvest loss. Furthermore, no tray is employed to adequately sort and grade the vegetables. Sorted and graded vegetables, on the other hand, have premium price offerings since traders are willing to pay a premium for this.



6.9.2 Storage

The storage facilities help buyers and sellers to reduce the wide fluctuation of prices between peak and lean seasons. The storage function is primarily concerned with making goods available at the desired time and enables traders to receive better prices for their products. Because of the perishability, vegetables require specialized storage facilities matching the seasonal demand. In the stated market, there is no such storage facilities. Due to the high business efficiency, not even traders perceive the need for such amenities (trading time is below 60 minutes). However, such facilities are essential to meet the quality and traceability standards for exporting vegetables, as this zone is becoming an increasingly important export zone for the nation.

Picture-1: Manual handling and sorting at the collection center

6.9.3 Transportation in the market



Figure 6-7: Types of transportation utilized in the collection center

In the studied collection center, various modes of transportation including truck (5MT, 2MT capacity), lorry/pickup, local vehicles such as nosimon, battery auto, and the like are used. For long-distance

transportation, the traders use 5MT and 2MT vehicles, while Foria/Traders use small lorries for intercity transportation. Farmers typically use local vehicles such as the Nosimon, Rickshaw, Van, and others. Approximately 15,000 to 20,000 trucks of various sizes come at this market to transport the vegetables, which cost about BDT 35 to 40 core per year. It is worth noting that transportation costs increase by at least 30 to 35 percent each year.

In the market, there is no dedicated transport stand to handle such a massive load of transport. Furthermore, the lack of a circular transportation path within the market causes a terrible traffic jam on the highway. Every year, 15 to 20 accidents occur in the market's vicinity. As a result of this, 4 to 5 people are killed (source: market actors). Because of traffic jams and long lines near the ferry, transportation lead time is increasing year after year. The average travel time to Dhaka and other nearby districts is 14 hours.

6.9.4 Post-harvest loss and packaging scenario at the market

The total post-harvest loss from field to the market is approximately 15%. Pre and post-harvest losses in the field are 10%, transport losses are 1-2%, sorting and grading losses are 2-3%, and loading-unloading losses are 1-2%.

Plastic is the major packaging material used in the market. The core findings in this regard are given as follows:

- Bag Size (in kg): 20, 25, 50, 80. Market Committee charges BDT 8-10/ per sack
- Plastic bag increases post-harvest loss by up to 3% (source: various market actors). In 70 to 80 percent of cases, plastic bags are only used once.
- Use of plastic cerate can reduce post-harvest loss, but traders are not interested to use it as they cannot overload the truck with the cerates.



Figure 6-8: Packaging at the collection center

6.9.5 Cost Implication of the Post-harvest services at the collection center

The post-harvest costing in the market includes packaging, labor and washing cost. 90 percent of packaging is made of plastic because plastic sacks cost 15 to 20 taka per sack compared to 50-60 taka for jute sacks. In total, 1.4 to 2.0 million sacks are used for transportation each year, with a value of more than two corer taka. In the market, 250 to 300 laborers are employed, and they charge BDT 10 to 12 per mound for manual handling. Every year, the total labor cost exceeds four cores. The cost of washing, sorting, and grading ranges between 70 and 0 lacks taka per year. MMC earns roughly BDT 1.4 core from sacks alone, charging BDT 10 per sack.

6.9.6 Financing

The financing function is the advancing of money by someone to carry on the business. For effective operation, financing is of crucial importance in the whole marketing system of fish. The source of finance for the market chain actors in the studied market are shown in following table.

Table 6-3: Financing options (Field survey, 2022)

Sources of finance	Market participants (%)			
	Farmer	Bepari	Paiker	Foria
Own fund	65	78	80	76
Bank	2	5	11	0
NGO	25	12	8	20

Sources of finance	Market participants (%)			
	Farmer	Bepari	Paiker	Foria
Friend and relatives	4	5	1	4
Dadon from Aratdar/bepari	4	0	0	0
Total	100	100	100	100

The majority of vegetable producers, aratdars, paikers, and retailers are self-funded, as seen in the table. Other sources of financing for farmers include non-governmental organizations, friends and family, and dadon. A small amount of bepari funding comes from banks and friends and family. Paikers obtain loans from banks, NGOs, and family and friends. In addition to their own funds, retailers also borrow money from NGOs and family and friends.

6.9.7 Market Information

Market information is a facilitative function required for efficiently operating marketing system. In the studied market, visiting the markets and use of telephone/mobile phones are the most common sources of collecting market information for all value chain actors.

Table 6-4: Sources of market information for farmers and intermediaries (Field Survey, 2022)

Sources of market information	Market participants (%)				
	Farmer	Foria	Aratda/Bepari	Paiker	Retailer
Collecting information from the market	80	60	58	73	92
Fellow traders	51	70	45	43	25
Email/Internet	0	0	0	0	0
Telephone/mobile	60	90	90	87	55

6.9.8 Pricing

The pricing scenario reveals that all market/value chain participants respond to market prices, which are established based on the availability of vegetables- the demand and supply dynamics at the collection center. This enables large dealers such as Beparis and Paikar to organize price-regulating syndicates.

Table 6-5: Sources of market information for pricing information (Source: Field survey, 2022)

Sources of market information	Market participants (%)				
	Farmer	Foria	Aratda/Bepari	Paiker	Retailer
Open bargaining	25%	40%	35%	20%	80%
Auction	0%	0%	0%	0%	0%
Based on going market prices (based on the demand and supply situation)	70%	50%	90%	90%	30%
Prefixed prices	0%	0%	0%	0%	0%
Cost-plus method	0%	0%	0%	0%	0%

6.10 Current status of Infrastructure (Challenges)



Figure 6-9: Current status of infrastructure

The existing market were observed to face several constraints such as poor infrastructure, lack of modern machine and equipment, poor process flow for products, etc. that lead to ineffective market linkage between producer and the buyer. The key inefficiencies in the present market system in the region have been described herewith.

(a) Limited space inside the collection center: In terms of trading volume, the core trading area (below 100 decimal) within the collection center is extremely constrained. Every day during the season, 10 to 12 thousand market actors visit the market to engage in trading.

(b) Sorting, grading, cleaning, and packaging are being done on the way. There is no separate space for these facilities

(c) Highly unplanned layout with improper drainage system: Most of the markets observed has unplanned layout in terms of drainage facility and waste management. Due to lack of a proper drainage system water logging issues and in extreme cases mud morass has been observed in the market premises making trading very difficult. It is not good for the quality of products and also creates problem in the loading/unloading of product from and within the markets.

(d) Little/ No planning for space for loading and unloading: There is very little space designated for loading and unloading vegetables within the market's premises. In most of the markets, pick-up trucks are witnessed loading and unloading in a completely unorganized manner. It also causes lengthy motorway traffic jams. Every year several accidents took place due to the trading on the high way. During the peak season, over 60 percent of trading takes place on the road. Importantly, this may cause an imbalance in the flow of produce within the market's premises, resulting in longer lead times for produce to depart the market.

(e) Poor waste Disposal System: The waste disposal system of the collection center is very poor to describe. Every day the whole market generates a minimum of 2 to 3 MT organic waste but there is a lack of proper management options for these wastes. At the finishing of hat days, the whole market is cleaned by the sweepers. But it is not regular and adequate. In addition, due to a lack of garbage cans, solid wastes are discarded haphazardly, creating an unpleasant stench and unsightly appearance.

(f) Sanitation condition: Though there are two public toilets found but their condition is very bad. Servicing is not regular and adequate. As they are in deteriorating condition, people do not want to use them.

(g) Unavailability of proper storage system: Due to lack of storage space in the markets, farmers are bound to sell their produce on the same day or with 24 hours so that the produce does not get wasted. This leads to lower price realizations which in turn is a loss in revenue for both farmers and arotdars (less commission). The lack of transitional cold storage and capacity for value addition will limit the collection center's import potential.

(h) Manual weighing: Most of the markets observed utilized traditional weighing methods based on balance with very less presence of digital weighing system in the markets. Inaccurate manual weighing methods lead to loss of up to 10% of the produce (100 gram per kilogram) to farmer.

(i) Lack of modern machine and equipment: The market as a whole is labor-centric, which increases tractional costs and degrades the quality of vegetables. There should be lifting devices and folding load transporters to reduce manual handling.

(j) No shed facility: Due to open field without any shade, it's getting highly difficult to trade during the rainy season. Sometimes, they have to stop trading

(k) Limited/No space for Input business: There is dedicated place for input business as well as no information center is there.

6.11 Current service status of Market Management Committee (MMC)

Although MMC has a spot in the market, they hardly ever perform any market maintenance. There is no organizational structure and no chain of command; they are only there to collect the revenue. MMC is led by a local chairman, with little emphasis on improving market facilities and administration. MMC does not have a standard operational or revenue collection manual. There is no active trade committee in the market because the MMC opposes its formation.

6.12 Stride of Department of Agricultural Marketing (DAM) about the market

Interview with the regional officer of DAM reveal that they are to construct a 7200+ SQFT shaded space with some basic amenities near this market, but they are unable to find suitable land. Market participants, on the other hand, expressed their deep concern over the necessity of constructing such a little place. They had already constructed some trading space within the market, which is currently being utilized as a vehicle stand. Market participants agreed that this is an isolated government initiative. DAM is also collaborating with farmers and dealers to establish links for direct sourcing. To shorten the chain, they are taking preventive steps like arresting local intermediaries who are making syndicate to control the price. DAM has also devised a strategy to strengthen the ability of chosen market actors in order to increase vegetable value addition. In the market, they will train actors to manufacture chips, pickles, jam-jelly, and dry cabbage.



The trading place of DAM has been converted into an automobile stand

6.13 Recommendations to grab future opportunities and improve the service facilities

There are ample opportunities if the current shortcomings can be overcome by introducing new facilities in the market arena. Followings are the recommendations:

- **The Padma bridge** has radically shortened the time it takes to ship vegetables from this market to various regions. This market's supply and demand curve will be triggered by the reduced travel time, allowing it to contribute effectively to the national vegetable supply chain. Therefore, the market must be equipped with modern facilities to meet the growing demand
- **A technical procurement committee is required:** The market has the potential to become a landing pad for modern trade to directly engage with farmers. Modern grading, sorting, and packaging facilities are necessary to maximize on the opportunity. In this approach, investment should be made to establish these facilities alongside infrastructural development. The market

management committee should levy fees for the services. Under the leadership of the local LGED and UNO, a technical committee must be established for the acquisition of all types of infrastructure and make a robust business plan (at least for five years) to ensure positive return-on-invest(ROI).

- **Market management committee (MMC) needs to be reformed with added responsibilities:**

A robust composition of the market committee is crucial for operating and managing the market. According to the local LGED circular, a seven-member committee (07) is typically responsible for infrastructure management, maintenance, and transfer. The circular is excessively concerned with store allocation, payment of service charge and other dues, agreement with shopkeepers, cancellation of agreement, deposit, and distribution of proceeds. Although the MMC is engaged to manage these tasks, its participation in market management should have been greater. The representation of significant businesspeople in the MMC is limited or nonexistent, which casts doubt on the process of inclusive decision making. Considering the shortcomings, it is proposed to build a two-tier organizational structure as follows:

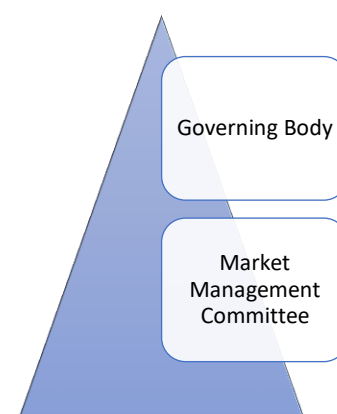
- **Governing Body** (under the leadership of Upzilla Nirbhai Officer along with other existing local government officials as stated in the current circular)
- **Market Management Committee** (under the leadership of elected Chairman who will be reported to Upzilla Nirbahi Officer)

The proposed market management committee should include the following positions to ensure the proper maintenance of the market:

- Field Officers (market operations)- At least 3 positions. These positions are salaried positions
- Security head- 1 position salaried
- Accountant- 1 position salaried
- Socially acceptable local elites- 2 positions
- Business representatives from the market- 4 to 5 positions (elected from the business community of the collection center)

The major responsibilities of the MMC include the followings:

- Manage day-to-day workings of the Market.
- Maintain the market yard facilities.
- Provide necessary facilities for the marketing of notified agricultural produce in the market yard.
- Supervise the conduct of the market functionaries.
- Regulate the opening, closing and suspending of transactions in market yard
- Enforce the conditions of a license/Registration
- Collect, maintain and disseminate information in respect of:
 - sale prices and movement of notified agricultural produce
 - production, processing, and storage of notified agricultural commodities and
 - any other relevant information
- Take all possible steps to prevent adulteration and to promote grading and standardization of notified agricultural commodities
- Levy, recover and receive fees, subscriptions and other sums of money to which PMO is entitled



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- Employ necessary number of officers and servants for the efficient functioning of the market
- Regulate the entry of persons and the vehicular traffic into the market yard
- Despite a vegetable hub, the overall market infrastructure is exceedingly poor. The market can be a modern regional hub if the following opportunities can be ensured
 - More space is needed to be acquired/extended to increase the trade areas. Innovative shedding is required with enough light and air flow
 - Commercial Grading, cleaning space inside the market
 - Circular transport path with loading and unloading facility and a stand (can be placed outside)
- This market can be easily turned to an export hub as the market sits on the vegetable's pockets. Following facilities need to be ensured
 - Modern packaging infrastructure
 - Transitional cold storage that can store 24 to 48 hours
 - Robust transport facility
 - Export clusters formed and managed by DAM & DAE which will be connected to this market
- This market has to be established as one-stop service points for the farmers where farmers can avail 360-degree services and products from the markets
 - Facilities for input shop, modern storage facilities
 - Information centers formed and managed by DAE
 - Dedicated transport facilities for the farmers managed by MMC
 - Other vertical services like space for various packaging materials
- MMC must take the lead in ensuring that these facilities and services are well-managed. To ensure efficient maintenance, a separate revenue model of the facilities must be made to justify the investment.
- Enough value addition space should be allocated to garb future vegetable value addition opportunities (headed by DAM)
- Social facilities need to be built/improved
 - Toilets (outsourced to well-maintain the facility)
 - Resting place
 - Café/restaurant
- Organic fertilizer processing facility can be built to process daily organic residue. Drainage facility must be renovated
- Small machines like fork-lifter, small carrier need to be introduced without delay to reduce manual labor and post-harvest loss and to enhance efficiency and quality of the commodities
- Behavior change is the key to ensure that the market actors are adopting the new changes in their business practice. The newly proposed market management committee should be educated on the new market behaviors that will be implemented following the building of new market facilities.

7 FEASIBILITY ANALYSIS OF RURAL SPECIAL HAT BAZAR -SPECIAL FISH (A CASE STUDY OF GAZIRHAT AND PARULIA SPECIAL FISH MARKET)

7.1 Brief about the Gazirhat and Parulia Fish collection Center

Parulia and Gazirhat Bazar are well-known fish wholesale markets (Baghda & Golda) in Sathkhira's Debhata Upzilla. These markets are located in a favorable strategic location, on the Shatkhira-Kaliganj route. The distance between the market is 6 to 7 km. Although this is a government-registered market, there

is a significant amount of private land in the main market where substantial market structures are being constructed? Both markets are accompanied by small retail markets/growth centers. In the case of the Parulia market, it is accompanied by the Sokhipur retail market (just opposite of the highway). Gazirhat has a retail market inside the main market. This market is open every day. The majority of the area is shaded. This market's main products are prawns, shrimp, fin fish (Rui, Telapia, Katal, Silver carp, and so on), crabs, and so on. Fish is traded here all year, but the peak season for baghda is September to December, for golda is March to June/July, and for fin fish is all year. The market is a good revenue source for the government.

Parulia collection center is approximately 1 acre in size. There are roughly 1200 different tiers of local and regional stakeholders are connected to the market, including Arothdhar, Paikar, Foria, labor, and transporters. The market also connects 2000-3000 farmers and supplies 30 different regional markets across the country. Roughly 2000 to 3000 market actors visit the collection center every day. The market has 90 arots for auctioning fish, 30 depots for selling to institutional buyers, two ice factories, and three ice crushers. Aside from the general sales market, there are retail markets where various daily necessities are traded.

Gazirhat is also a government-approved market. The market is approximately 1.5 to 2 acres in size. In addition, the market connects over 5000 farmers and supplies 40 different regional markets throughout the country. Every day, approximately 3000 to 4000 market actors visit the collection center. Around 1500 market actors, including Arothdhar, Paikar, Foria, labor, and transporters, are connected to the market. The shop allocation is as follows: Arot: 106 (only 25-30 operational during the off-season and 70-80 during the peak season); Depot: 35; 3 Ice factories (2 operational); and 6 Ice crushers (2 to 3 are operational). It also has retail markets where all kinds of daily necessities are traded.

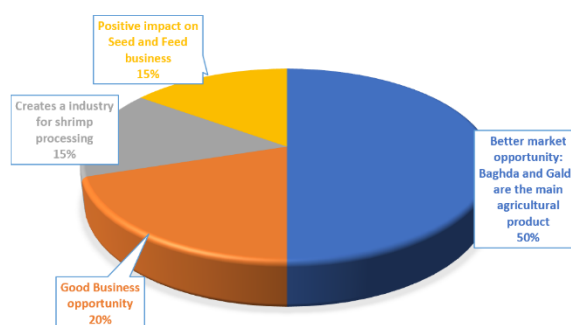


Figure 7-1: Impact of the CC (Field Survey, 2022)

7.2 Widespread Impact of two Fish Collection Center

Each growth center and rural market influences the rural economy by generating substantial market revenue. According to the field survey, fifty percent of respondents claimed that the Debhata Upzilla is ideal for growing Golda and Baghda. It is in high demand across the nation, and at least 15 shrimp export processing farms are linked to these two markets. Despite the drowning business scenario, 20% of respondents believe that the marketplaces offer excellent business possibilities, and business actors from at least forty distinct regional markets come to the market to trade fish. The widespread farming and trading have a good effect on the seed and feed business, as they are essential inputs for shrimp farming, as a result of the extensive farming and trading. In addition, 15% of respondents indicated that

these markets are essential for the development of an exporting sector, as about fifteen shrimp-supply processing industries are linked to this market.

7.3 Production Scenario of the Upzilla where the market operates

There are 9258 hectares (69,157 bighas) of fish cultivated land in Upzilla. The total production from this land ranges between 8300 and 9000 MT. In 2021-2022, total Baghda production was 3800-3900 MT, 1000-1100 MT Golda, and 3500-4000 MT white fish. According to the DOF, production is declining primarily due to a lack of high-quality seeds, increased production costs, and declining international markets. As a result, farmer profits are declining. In 2019-2020, production costs per bigha ranged from BDT 25,000 to 30,000, with sales per bigha ranging between BDT 45,000 and 50,000. In contrast, the cost of production per bigha in 2021-2022 was BDT 35,000 to 40,000, with sales ranging from 40,000 to 50,000.

From the interview we found out the following reasons of decreasing production and profit. In the backward market, we found the following reasons:

- Lack of quality PL. High mortality rate. Illegal importing and trading near the border,
- The soaring production cost is making it an unprofitable business
- The erratic fall in water salinity results in low production of Baghda which is the main crop here,
- The optimal production of Baghda and Golda is limited by semi-intensive and traditional farming.

On the other hand, the forward market contains the following problems:

- Loosing export market due to unlawful practice of jelly pushing and water soaking. Out of 40 to 45 processing companies, barely 10 to 12 are operating
- The poor market infrastructure portrays the entire industry as standing on unhealthy and illegal business practices
- Lack of inclusive planning and facilities of government to foster the industry.

7.4 Evolving Business Scenario of the Collection Center in the past five years

In the past five years, the market has not expanded as anticipated due to various reasons explained in the above. As an upshot, farmers are losing interest and to some extent reduced the production volume. However, we endeavored to comprehend the evolution of the business of these markets over the past five years through a series of discussions with various market participants. The results of the query are represented in the table to the right.

Figure 7-2: Business Growth in the last five years (Field Survey, 2022)- Approx. scenario

Business Area	Parulia Bazar		Gazirhat Bazar	
	2014-2015	2021-2022	2014-2015	2021-2022
Business Volume (in MTs)	2500 MT+	2200-2300 MT	2800-3000MT	3000-3500MT+
Business Volume (in BDT)	90-95 Cr+	110-115 Cr+	Roughly 110 Cr	135 Cr+
Supply to different districts	20 districts	30+ districts	20 districts	30+ districts
Average people/market actor visit/day	1500-2000	3000+	2000+	3000+

7.5 Market scenario of the Collection centers

Table 7-1: Yearly trade volume at the fish collection centers

Type of fish	Parulia: Yearly Trade Volume (MT)	Gazir hat: Yearly Trade Volume (MT)
Baghda	900-950 MT	1250-1300 MT
Golda	200-250 MT	350-400 MT
White fish	1000-1100 MT	1400-1800 MT

The trading scenarios in both markets look promising. The annual trade volume of the Parulia collection center is around 2200-2300 MT, with a monetary trading value of BDT 100-115 core. The market's catchment area is approximately 0 to 4 kilometers from where farmers come to trade. 25–26% of the total output of the Upzilla is consumed by the market. The market is also highly efficient in terms of the short time it takes to sell the fish to the next layer; it takes about an hour to sell the produce, and no unsold commodities remain in the market. Approximately 65 percent of the fish are traded during the peak season, with the remaining 35 percent traded during the off-season.

The annual trade volume at the Gazirhat collection center is between 3000 and 3500 MT, with a BDT 127–135 core trading value. About 30 to 35 percent of the Upzilla's total production is consumed by the market. The market is also very effective at selling fish to the higher layers, leaving no fish at the market that is unsold.

7.6 Key Stakeholders and their roles in collection center

Table 7-2: Key Stakeholders and their roles in existing markets

Market Actors	Key Roles in the Market
Aratdar	The aratdars are at the centre of the entire marketing system and their role goes far beyond what one would normally expect of a commission agent, including financing of suppliers and buyers, and often dealing on their own account (Coulter and Disney, 1987). When fish arrives at the wholesale markets, aratdars take the responsibility and control of each sale. They sell the fish through an auctioning system and get a commission of 3% to 4% depending on fish species. Most of the time aratdars recruit koyal (person who organizes auction by uttering and offering different prices for buyers for sale). Koyals have a significant role on pricing the fish. There are two types of aratdars: aratdar-1 (in cases where distance between production and consumption point is very low) who collects fish from local wholesalers or directly from local fishermen and sell it to paiker, bepari, and retailers. Aratdar- 2 generally operates in large cities or trading zones and receives fish from the paiker (wholesalers) and through second time auctioning, selling to retailers. Aratdars advances short-term credit to bepari, paikers and retailer up to a week's duration.
Paiker/Bepari	A Paiker is a middleman in the fish marketing chain; often covers the assembly function in the chain, acting as Dadandar at the same time; depending on the location sometimes also referred to as wholesaler or retailer. They are also called Bepari
Account Holder	A/C holders act as the commission agent and constitute the major profit-making actors in the shrimp value chain with the least risk. They take 10 Taka/kg as commission from the processing plant. A/C holders finance paikers and farmers and provide credit to the processing plants, receiving payment only after the processor has shipped to his/her overseas customers. So, in turn the A/C holders do also influence the processing plants. They are very influential in the value chain and determine prices. Due to their influence in the market, the farmers, bepari or depot owners cannot sell the shrimp directly to the processing plants.
Processing Company	Shrimp processing industries buy most of their shrimp through the A/C holders, who may in turn buy from farmer, bepari and depot owners. Processing plant

Market Actors	Key Roles in the Market
	owners are inclined with four or five A/C holders to collect their entire quantity of shrimp. Shrimp is processed and packed as per foreign buyer’s requirement at the processing plant and sent to the airport for overseas shipment. Processing plant owners makes all the payment through A/C holder
Depot holder	Shrimp depot owners are permanent shopkeepers having their own premises and staffs in markets. They are the intermediary between farmers and commission agents. Their shops (establishments) are called ‘depot’. This group of traders mostly offers <i>dadon</i> - cash as loans to farmers, in return for buying the shrimp at a pre-fixed price, which may be well below the market level. Adulteration, if any, in shrimp/prawn like filthing, injecting water etc. is performed on the depots or sub-depots. But recently in the shrimp industry depot owners are in back foot position because of increasing <i>beparis</i> group who purchase shrimp from farmers via <i>aratdars</i> at reasonable prices and sell the shrimp to A/C holders.
Retailers	Retailers, the last intermediaries of fish marketing channel, do not have any permanent establishment but they have fixed places in the market centre or are wandering with hari (aluminium pot) on head from door to door. Usually, retailers buy fish from aratdar and sell directly to ultimate consumers.

7.7 The Supply/Market system of the Gazirhat and Parulia Fish Collection Center

Similar in nature, the supply chains of Gazirhat and Parulia Fish Collection Centers both involve several tiers of middlemen in the market, including farmers, foria, arothdars, paikars (of which one type is local and the other is not), company agents, and processing firms. Farmers are the producers; they sell their fish primarily to arothdars and *Graph-*

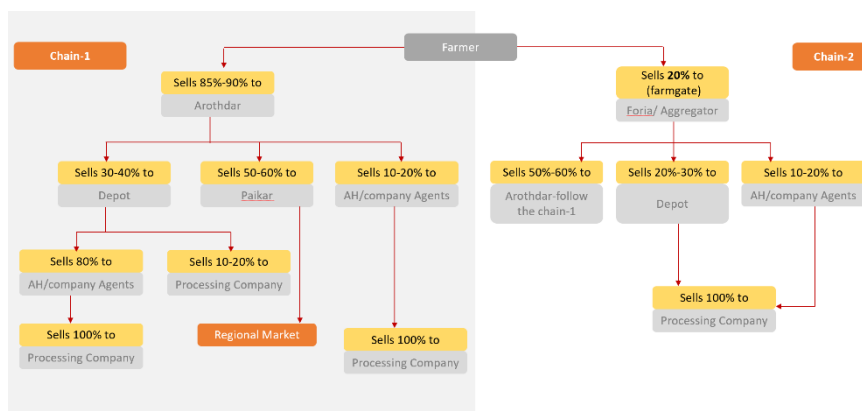


Figure 7-3: Existing supply chain scenario of fish collection center

a small amount to aggregators known as farias, who buy goods from farms and resell them to dopts, arothdars, and company agents.

Arothdars are the local market intermediaries who facilitate the auction system between farmers and forward market actors in exchange for a commission. Farmers, paikar, and faria typically use this channel to market actors to sell their fish.

Once it has been gathered, paikar—both local and imported— usually transported fish to regional markets where it is sold to urban and peri-urban consumers. Company agents work for the fish processing companies that typically export fish to other nations. They primarily collect from the depots, with some collection coming from the aggregators. Depots typically sell fish to company agents directly, but they occasionally also sell to other market participants like paikars.

7.8 Buying and Selling: Price flow and profit margin (PM) of various market actors at the collection center

The market actors in these two markets share the same supply chain, and the price and profit flow are identical.

- **Arot** charges 2% commission from the farmers and also whoever purchases through arothdars like Paikar, Depot, Agents and the company.
- **Paikar** usually purchase fish (all kinds) from the Arotholders. He ensures a minimum of 25% to 35% profit margin to sell to the regional markets
- **Foria/Local Aggregators** purchase fish from the farmers and mainly sell it to the Arotdars. In this channel, they ensure a 10-15% profit. In another channel, they sell to the processing companies through depots and account holders. In this channel, they have to give 10 to 15 taka commissions to depots and agents from their profit. Therefore, their profit drops to 5% to 10% in this channel
- For processing companies and company agents, **depot holders** buy only shrimps (Baghda and Golda) primarily from arots and some from Foria/ aggregators. Every day, processing companies declare their prices and specifications, depending on which Depot collects fish and supplies it with a profit margin of 5% to 20%.
- **Company agents/Account holders**, like Depots, buy fish (Baghda and Golda exclusively) primarily from Depots and some from Foria/aggregators. Every day, processing companies declare their prices and specifications, depending on which account holders/agents collects fish and supplies it with a profit margin of 2% to 8%.



Figure 7-4: Unhygienic post-harvest management at the fish collection center

7.9 Marketing Function

7.9.1 Handling, Sorting and Grading, cleaning and packaging scenario at the market

Sorting, grading, and packaging are done in a highly unhygienic setting. Both inside and outside the arots, it is done on the damp floor. It spreads germs and harms the fish's body. The ice factory on the market supplies ice for the traders (1:1). The ice quality is a significant issue because of the high concentrations of iron and other microorganisms in the water. Traders frequently use cock sheets to move fish over long distances. They use cock sheets that can be purchased from stores, both new and used. Arots are tiny and do not follow any HACCAP regulations. Arots are small and do not adhere to any HACCAP guidelines and there are no floor tiles, tray, gloves, or water line in the arots. Manual weighing in almost 100% cases which makes it difficult for farmers to receive a fair weight and price.

7.9.2 Storage

The storage facilities help buyers and sellers to reduce the wide fluctuation of prices between peak and lean seasons. The storage function is primarily concerned with making goods available at the desired time and enables traders to receive better prices for their products. Because of high perishability, fish requires extremely specialized storage facilities matching the seasonal demand. Only the processing plants in the shrimp industry use proper storage systems for export to the world market. Other intermediaries use only ice to transport fishes from one place to another. Surprisingly, no refrigerated vans are used to transport fish. Live white fish is transported from one place to another using water in the plastic drums. If the distance is long, water is then changed twice or thrice depending on the distance. Though all intermediaries use ice during marketing, their use of ice in fish is not scientific for which quality of fish gets affected. While retail selling, some use ice and some do not.

7.9.3 Cost Implication of the Post-harvest services at the collection center

As previously stated, traders use cock sheet as a packaging material when transporting fish over short and long distances. According to total trade volume, approximately 260,000 cock sheet boxes are used in both markets for transporting fish with trade values ranging from BDT 1.5 to 2 crore. In the two markets, over 400 workers are employed. Every year, labor bills of BDT 4.5 to 5 crore are paid in these two markets. The majority of arots and depots have permanent labor. Ice addition is critical to maintaining fish quality while transporting. To use, ice is first cubed and then threshed. In total, there are 5 ice factories and 9 ice threshers in the two markets. Fish processing and transportation costs range from BDT 1.2 to BDT 1.5 crore per year.



Figure 7-5: Unhygienic ice grading and application

7.9.4 Transport system in the market

Various modes of transportation are used in the studied collection center, including truck (5MT, 2MT capacity), lorry/pickup, and local vehicles such as nosimon, battery auto, and the like. There is a high pressure of transport in the collection center, but there is no transportation stand, and the route to the market is extremely congested, resulting in a massive traffic jam. Every year, only 5000 trucks arrive at the market to transport fish, with the transport cost ranging between BDT 8 and 9 crores.

7.9.5 Sources of finance

Table 7-3: Sources of finance (Field survey, 2022)

Sources of finance	Market participants (%)						
	Farmer	Depot	Aratdar	Paiker/Bepari	A/C holder	Processing plant	Retailer
Own fund	51	72	100	60	70	43	100
Bank	0	20		0	30	57	
NGO	8	5		2			
Friend and relatives	1	0		0			
<i>Dadon from Aratdar</i>	40	3		38			

According to the data, approximately 40 percent of farmers continue to rely on Dadon from the Aratdar for seed and feed. In exchange, they must sell their produce to Aratdar during the season. This is how

Aratdar is expanding their business and making farmers reliant on them for fish trades. This also provides Arottdhar the ability to regulate the price, which is generally detrimental to the farmers. In other instances, Paikar also receives dadon or credit from the Aratdar, but they do not rely on it because they have many other choices to purchase and sell fish. Other market participants typically obtain loans from banks and are primarily self-funded.

7.9.6 Pricing Mechanism

Table 7-4: Sources of Pricing Information (Field survey, 2022)

Pricing methods	Market participants (%)							
	Farmer	Depot owner	Aratdar	Paiker	Retailer	Bepari	A/C holder	Processing plant
Open bargaining	29	0	10	53	100	30	0	99
Auction	60	0	99	37	0	0	0	0
Based on going market prices	29	0	0	30	0	70	0	15
Prefixed prices	0	100	0	0	0	100	100	0
Cost-plus method	0	0	0	0	0	0	0	0

In the study areas, all intermediaries are involved in buying and selling of fish. Depot owners, *bepari* and AC holders of shrimp marketing chain follow prefixed prices set by the processing plant. Farmer, *aratdar*, *paiker*, LC *paiker*, and processing plants practice open bargaining, auction and going market prices method for fixing price of their products in varying degree.

7.10 Current status of market infrastructure (including challenges)



Figure 7-6: Poor Sewerage and waste management

There are many problems that are contains in the fish collection centers. On the whole, condition of market infrastructure is very poor and exceedingly unhygienic which threatens the overall quality standards of fish processing, exporting and consumption. Proper drainage of a storm and waste water is very essential to ensure a working environment in a market. Logging of water makes the area muddy and unhygienic, which creates inconvenience in carrying out market activities. The drainage facility should be increased because the portions of the market become inundated during the rainy season. The entire road of the market become muddy and sleepy, due to the absence of proper drainage system. The market maintenance is poor as the market authority is not enough concern for giving the requirement of buyers and sellers. The sewerage facility also needs to be improved; The condition of the toilets is appalling, as they are not serviced regularly. Due to the deteriorating condition, people do not want to use them. Proper parking space in the market is needed to avoid congestion and to safely reach the goods into the shop. For lack of space, it becomes tough for the buyer to move the market easily. There is no designated space for loading and unloading fish at the study markets. The accumulation of fish along the roadway causes congestion and damage to internal roads. In a nutshell, followings are the current status of the infrastructural challenges:

- Poor drainage and waste management. Min. .5-1 MT/day waste are being produced in the market

- No cleaning facility and team to clean the market. MMC barely clean the market
- Very limited space inside and outside the market create huge traffic.
- The ice-making water and procedure as a whole are extremely filthy and constitute a grave hazard to both fish and human health.
- No good quality café/ restaurant
- There is no dedicated loading and unloading space inside the market
- Public toilets are in terrible state. No resting place for the market actors
- There is dedicated space for input business as well as no information center is there.
- Sorting, grading, cleaning, and packaging are being done on the way. There is no separate space for these facilities
- The market lacks storage and freezing facilities for fish, which are essential for preserving the quality of the fish.

7.11 Current service status of Market Management Committee (MMC)

MMC has a market presence, but they rarely perform market maintenance. There is no organizational structure or chain of command; they exist solely to collect revenue. The MMC is led by a local chairman, and little emphasis is placed on improving market facilities and administration. MMC lacks a standard operating or revenue collection manual.

7.12 Recommendations to grab future opportunities and improve the service facilities

After studying the Parulia and Gazirhat markets, we have come up with some recommendations for these two markets to grab the future opportunities. The following are some suggestions:

- Infrastructure must adhere to HAACAP standards for all arot and depots (including floor, washing, small sorting grading space, air circulation). Since they are the first gatekeepers to ensure quality for exporting fish, the depot must be larger than the arots to accommodate the processing of fish in a well-recommended manner.
- Every market must be equipped with spacious landing station which includes washing, sorting, grading and packaging space in preparation for export and transit to regional markets.
- Every market must have well-equipped cold storage, especially to increase export opportunities
- To accommodate the heavy loads of fish during the peak season, a spacious inner-road (minimum 6 to 8 feet) must be ensured between each arot.
- Circular transport path with loading and unloading facility and a stand (can be placed outside)
- To ensure the flow of traffic throughout the market, a wide road (at least 15 to 20 feet) must be there inside the market. This road will be connected to the main circular path.
- It is necessary to construct a underneath drainage system as well as a circular dumping space. To manage the waste water produced every day, a green water circulation facility must be built.
- A well-equipped cleaning team must be recruited to ensure a hygienic trading environment, which is a crucial pre-requisition for exporting fish
- To transport fish, a deep tube well must be installed in the marketplace to produce food-graded ice.
- Small (folding) load-carrier must be introduced to the markets to effortlessly carry the fish from the market gates to different arots/depots. This will bring traffic discipline and reduce manual labor
- This market has to be established as one-stop service points for the farmers where farmers can avail 360-degree services and products from the markets
 - Facilities for input shops
 - Shops for hatchery/nursery to sell quality PL
 - Information centers formed and managed by DOF
 - Other vertical services like space for various packaging materials

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- A technical procurement committee is required: The market has the potential to become a landing pad for modern trade to directly engage with farmers. Modern grading, sorting, and packaging facilities are necessary to maximize on the opportunity. In this approach, investment should be made to establish these facilities alongside infrastructural development. The market management committee should levy fees for the services. Under the leadership of the local LGED and UNO, a technical committee must be established for the acquisition of all types of infrastructure and make a robust business plan (at least for five years) to ensure positive return-on-invest (ROI).
- Formation of the MMC working committee as suggested in the Shatmile Bazar to improve the service quality and maintenance.
- MMC must work with the government authority (UNO, DC, Police, DOF) to introduce digital weighing scale to stop giving less weight to the farmers.
- MMC must take the lead in ensuring that these facilities and services are well-managed. To ensure efficient maintenance, a separate revenue model of the facilities must be made to justify the investment.
- Behavior change is the key to ensure that the market actors are adopting the new changes in their business practice. A facilitating org. must be deployed to facilitate the change, otherwise all go in vein.

8 FEASIBILITY ANALYSIS OF COOL CHAIN FACILITIES FOR RURAL GROWTH CENTER/ COLLECTION CENTER AND SPECIAL HAT BAZAR

8.1 Background

Bangladesh is one of the largest producers of Vegetables, Fish and Fruits. It is ranked 3rd in the world in terms of total production of vegetables. With a total production of about 30 million MT of fruits & vegetables. But if we look at the extent of processing, it processes just about below 1% of the production, while for China it is 40%, US 65% & Malaysia 85%. Hence, most of the fruits & vegetable that is produced in Bangladesh, is consumed in fresh form.

The large quantity production is also associated with a very large quantity of wastage. The Fruits, Vegetables and fish with high post-harvest losses ranging between 25 to 35% especially seasonal vegetables, Potato, Tomato and Onion, mango, Banan, Jackfruits, pineapples, Litchi etc. While the reasons of losses are many, one of the simple & easiest explanation given is that the post-harvest losses are due to lack of the cold chain facilities. Some of the cold chain facts about Bangladesh are as below:

According to industry estimates, approximately 60% of perishables are transported between cities each year. Of this figure, about 95% moves via non-reefer mode and only 5% is transported by reefer. Of this, majority of the refrigerated vehicles (>80%) are utilized for milk and milk products transportation and rest of fish through ice. The percentage movement of fruits & vegetables through cold chain is negligible, while in USA it is around 80-85%, in Thailand 30-40%.

Potato which occupies 90% of the volume of the cold store does not use refer transport either for inward or outward movement from the cold stores.

Now the million-dollar question is that despite the huge wastage, why is the cold chain engagement is so low in Bangladesh? Bangladesh with its diverse climate can produce any kind of Fruits & Vegetable at any point of time at some location or other. To cater to the fresh demand, the crops are grown round the year, but the production geographies keep changing as per the crop-climate requirements. Typically, any consumption point has to undergo 3-4 season/supply arrangements during a year for the same crop. From a perspective of logistics, simple transportation is a nightmare for such a situation, leave alone the cold chain. The cost of the cold chain transportation becomes prohibitively higher (about 2/3 times) than the ambient transport. One of the reasons for high freight is also because of the non-availability of the reverse load. The other issue with cold chain is that inadequacy of the first & last mile connecting infrastructure. These are almost non-existence. We grossly lack pre-cooling facilities at the farms. Similarly, our vegetable vendors lack temperature-controlled outlets. So, there are question marks around the cold chain integrity for movement till the consumer.

Bangladesh has about cold stores with holding potato occupies 90% of volume of these but, it generates only about 20% of revenue. Technically speaking single commodity potato cold stores are not viable. But their survivals are owing largely to the potato trading & money lending business rather than rental on storage. The farmer's stored potato serves as collateral to Banks for financing the cold stores owner. The cold store owner uses the finance to buy & stock potato or lend it to the farmers against his potato stock. As the stocks move to the cold stores, it gets consolidated at fewer hands who happens to be owners of the cold store. These handful of people are in a position to influence the price. This leads to volatility in potato prices despite maximum cold store utilization and even for normal production year.

Onion not only brings tears to the eyes of the housewife but also has history of bringing down the government. The story is quiet opposite here. There is lack of right kind of technically correct, ventilated

& air circulated cold stores. Significant investments do not come for Onion storage as the capacity utilization is less than 4 months

For Fruits & Vegetables the cold chain is not just bringing temperature down, but it also has to manage an entire range of the other parameters which could impact its life. Fruits & Vegetables in general are live products & they continue to respire. There are a host of parameters like Humidity, Ethylene, Carbon dioxide, Oxygen & Nitrogen can impact the life of a particular item. Certain items may need multiple parameter management while for many investments cannot be justified on the back of the low product value. But for the products like Banana, Mango, Pineapple which are single season, such Controlled Atmosphere (C.A.) management is beneficial as it can improve the shelf life up to 3-4 months in a cold store even more. The constrain in those fruits is that there is not adequate cold store available in the major growing areas.

Products sensitive to ethylene should not be stored together with products producing ethylene. Exposure to ethylene may soften the flesh, adding bitter taste to the product or/and accelerate ripening. Each of the fruits & vegetable have different storage requirement it may not be feasible to club two items together for cold chain unless both items have similar storage requirements.

Building cold chain for Fruits & Vegetables is not just adding fleets of refer trucks or adding cold store capacities. There is a lot of technology involved in managing & maintaining the temperature & other parameters. The frozen Fruits & Vegetables segment of the refer transport even today falters in maintain the required -18deg C temperature. The existing cold chain industry also has to transform to more reliable, capable & technically competent. The standards and practices have to be evolved & percolated down, even to the levels of truck drivers.

Any cold chain for Fruits & Vegetable has to be a viable cold link between farmers & consumers. Both the production centres & consumption point's needs to be planned for appropriate crop, season, price, quality & freight. The cold chain must appreciate the product shelf-life, storage requirements, demand & supply situation. These can provide price stability, reduce volatility & wastage which would benefit both consumer & farmers, but these will come at a cost.

Modern storage of fruits and vegetables is virtually absent in Bangladesh. Cold storage facility is only available for potato. However, there are a very few multi-chambered and privately-owned low temperature storage facilities in Baramati, Dhaka and one In Airport where the wholesalers and exporters keep high-value fruits/Vegetables, particularly the imported apples, orange, dates, pears and grapes also exportable vegetables which required large investment. However, from last couple of years many research organizations, development projects, govt. line departments are trying to replicate low-cost farmers' friendly cold storage which operates by renewable energy like solar

8.2 Why Needs of Cold store Facilities at Rural Growth Center/ Collection Center and Special Hat bazar Level

Bangladesh is predominantly an agro-based country and agriculture sector contributes about 12.5 per cent of the GDP, employs over 45 percent of labour force.

In the global climatic zones, Bangladesh is a tropical country where average daytime temperature ranges between 23 degrees Celsius to 34 degrees Celsius. Most of the fruits, vegetables and fish traded from farmers harvest to GC/CC/Hat bazar and distributed to multiple destination. In the pick seasons due to over production or over harvest or less demand sometimes lot of products remain unsold even in transit time for one day or 2 days sometimes due to the less volumes right quantity buyers to do not get for one truck at that situation farmers and buyers faces lot of challenges for their products.

On a global scale, Food and Agriculture Organization FAO, has estimated 30-40 per cent loss of all vegetables and fruits due to, in part, perishability and absence of proper post-harvest storage, processing plants and transportation facilities.

In a such situation, due to inadequacy of post-harvest cold storage facilities, the farmers suffer a huge loss and damage of perishable produces and become victims of exploitation by middlemen and local wholesalers at both producers and consumers end. According to feasibility study by PKSF (2017), demands for cold storage is growing among farmers, fisheries and rural small businesses for short term preservation of perishable Agro-products near wholesale rural markets but there is hardly initiative for small scale cold storage. Banks and financial institutes are sceptic to lend money to small ventures due to uncertainties in grid power supply, processing and transportation barriers and constraints. In traditional business culture, "Cold Storage" is assumed as a large size (2,000-5,000 tons of Potato storage only with huge investment, high electricity bills, and also unpredictable profit or loss due to unreliable power supply frequent load shedding. The irregular supply of grid electricity is a major problem faced by cold storage owners. As a temporary solution, cold storage owners invest for costly standby generator which is unreliable and hazardous too. Therefore, small farmers are discouraged to invest in cold storage by banks and other lenders until pilot projects demonstrate success.

8.3 Business Case for Small scale transit time cold storage facilities at Growth Center/Collection centers/hat bazar;

8.3.1 Business Model

Since, all the farmers and local traders and MCC belongs to community. therefore, the cold storage will be established under the Growth Center/CC/ Special hat bazar. As the integral part of the market component the management of the cold storage will also be the MCC. The executive committee of MCC will manage and looks after the day-to-day business. The farmers of the adjacent area and traders of the adjacent market, regional buyers and exporters are the major customers of this cold store. Both farmers and traders will have to pay the fixed price for per kg of product based on the fees determined by the committee. Due to limited space the market potential, export potential and high value products will get priority to store the product during the time of high demand. Profit from this business will be distributed for bearing the overhead cost. At least one paid employee is required to monitor the day-to-day activities of the cold stores.

To minimise loss and maximise profits, both the existing and future cold storage owners are actively seeking "mini solar cold storage (of average 8-10 tons capacity)" as the best alternative sources of dependable, sustainable, cost effective and environment friendly sources of power. Solar power is a god gifted natural sources direct current (DC) from the Sun in daytime, and battery backup during nighttime uses in case of grid power outage. Solar powered mini cold storage has become exciting innovative technology among farmers both in on-grid and off-grid areas of Bangladesh.

To turn loss and damage into profit, the Government of Bangladesh encourages dissemination of mini cold storage with solar and other alternative power back through SREDA (Power Division). With the Govt approval, PKSF has granted finance for two pilot plants which will be installed (6-8 tons capacity) to ensure development of income generating activities among farmers and middlemen suppliers of safe food. Successful operation of pilot solar mini cold storages will encourage hundreds of new investors to invest for the purpose.

8.3.2 Design of the Mini Cold Storage

The design of the cold storage is depending on its storage volume; the product will be kept in cold storage and other things. Maintaining low temperature and right humidity is very critical. Most of the fruits are perishable or have a very limited life after harvest if held at normal harvesting temperatures. Cold storage can be combined an environment added with carbon dioxide, sulphur dioxide etc. according to the nature of the product to be preserved. The cold storage of perishables has advanced noticeably in recent year, leading to better maintenance of organoleptic qualities, reduce spoilage, and longer self-lives. The advances have resulted from joint action by phycologists to determine the

requirement of vegetables and fruits and by refrigerating specialist and to design and run refrigerating machines accordingly

There are some steps need to follow to build a mini cold storage. Like:

- The Capacity of the cold store at community level should be 50-200 MTs with a minimum 4-5 single unit (chamber) and every unit should have the capacity of 8-10 MTs in which community run it cost effectively.
- Proposed size, capacity, product will be the based on the community requirements and nature of the products. It may vary case to case
- Proper connectivity by road, drainage facilities, and elevation of the side should be considered.
- The load bearing strength of the soil should be tested, and suitable rack design is proposed
- Permission from the local authority for the construction of cold storage should be taken
- The product and its market size should be evaluated, and property matched to the capacity of the cold storage
- Pressure and vacuum testing for refrigeration is an important aspect of safety
- Water used in cold storage area should be soft
- The people operating the system should be trained on working and maintaining the system
- Cold storage should always plan for standby equipment
- Power supply to the cold storage should be provided as per as requirements or an alternative source should be kept ready at hand.
- The cold storage should have alarms, fire extinguishers and fire exit design properly
- Insurance for the cold storage plant, and its machinery is a precautionary measure which cannot avoided

8.3.3 Product for Mini Cold storage

Based on the Geography and seasonality and nature of the traded commodity in the market, the product to be selected. The study suggested that for fruits category the transit time cold store facilities is require for commercially viable products like Mango, Banana, pineapple, jackfruits, Lichi etc. For vegetables Tomato, green chilli, bottle gourd, papaya, pointed gourd, bitter gourd, bean, Taro, brinjal etc need cold store facilities. One of the big challenges is that cold room to destination the product must be transported by refer van. Otherwise, the quality of the products will damage.

There some products shown in the table with optimum temperature recommended for different fruits and vegetables. Some perishable commodity temperature is given below in box:

Product	Temperature		Relative Humidity (%)	Approximate Storage Life
	°C	°F		
Bananas, green	13-14	56-58	90-95	14 weeks
Bean sprouts	0	32	95-100	7-9 days
Bean, dry	4-10	40-50	40-50	6-10 month
Broccoli	13-14	55-60	85-90	2-6 weeks
Cabbage, early	0	32	95-100	3-6 weeks
Cabbage, Late	0	32	95-100	5-6 weeks
Carrots, bunched	0	32	95-100	2 weeks
Carrots, mature	0	32	98-100	7-9 months
Carrots, immature	0	32	98-100	4-6 weeks

Product	Temperature		Relative Humidity (%)	Approximate Storage Life
	°C	°F		
Cauliflower	0	32	98-100	3-4 weeks
Cucumbers	10-13	50-55	95	10-14 days
Custard apples	5-7	41-45	85-90	4-6 weeks
Eggplants	12	54	90-95	1 week
Guavas	5-10	41-50	90	2-3 weeks
Jackfruits	13	55	85-90	2-6 weeks
Lemons	10-13	50-55	85-90	1-6 month
Lychees	1.5	35	90-95	3-5 weeks
Mangoes	13	55	85-90	2-3 weeks
Mongos teen	13	55	85-90	2-4 weeks
Mushrooms	0	32	95	34 days
Papayas	7-13	45-50	90-95	7-10 days
Pineapples	7-13	45-55	85-90	24 weeks
Potatoes, early crops	10-16	50-60	90-95	10-14 days
Potatoes, late crop	4.5-13	40-55	90-95	5-10 months
Pumpkins	10-13	50-55	50-70	2-3 months
Radishes, winter	0	32	95-100	24 months
Radishes, spring	0	32	95-100	34 weeks
Strawberries	0	32	90-95	5-7 days
Sweet potatoes	13-15	55-60	85-90	4-7 months
Tamarinds	7	45	90-95	3-4 weeks
Tomatoes, mature-green	18-22	65-72	90-95	1-3 weeks
tomatoes, farm -ripe	13-15	53-60	90-95	4-7 days

8.3.4 Farmers Benefit

- Usually farmers harvest their Fruits/vegetables and sell immediately to traders from their farm gate or in local hat. Sometimes they get low price due to seasonal heap and need to immediate sells even in credit due to lack of storage facility. So, if there has a storage facility, farmers can store their harvested products up to 5- 10 days and sell it when the price raise within this time period.
- On the other hand, due to small quantity it is not feasible for them to carry their produced products in regional arot though the price usually varies from farm gate to regional arot is 2-3 Tk/Kg. During the study period, the study team found that o the price of Cauliflower was 20 Tk Pcs. at village level whereas on the same day the price was 30Tk/Pcs at regional arot. So, if they store their produced 3 to 4 times harvested products then it will helpful to create large volume and getting more profit by bring and selling this in regional or national market
- Moreover, farmers can minimize the postharvest loss from 5 to 7%.

8.3.5 Risk and Risk Mitigation

- Farmers are unaware of appropriate harvesting system such as proper pre and post-harvest activities before storage. use of appropriate harvesting techniques, carrying from the field, curing on cool & shaded place, sorting and grading etc. If these activities are not properly done, vegetable will rot during storage no matter how effectively the store is managed.
- Risk associate with the nature of vegetables. Some vegetable is sensitive to ethylene and some are producing ethylene. If there two types of vegetable store at a time there is a risk of spoilage.
- Due to natural weather like sudden fluctuation of temperature and humidity the inside environment may vary accordingly
- Moreover, large traders who import potato from other districts can effectively use the store house for potato preservation because during the time from March to June there is less production of vegetable.
- Cold store determines unit price on the basis of space and time. Similarly, the natural store will charge BDT 1.00 for 1kg vegetables for 15 days. Farmers can bring back his/her products any of the days within 15 days slot by paying 1 taka for 1 kg vegetable. For promotion of this service, WMG can provide technical knowledge to farmers and traders on the post-harvest management. They will share the appropriate harvesting technique, grading and sorting technique, packaging and transport system etc. provides the market information as well. WMG can communicate with buyers who can get a large volume from this storage point at any time

9 MARKET LINKAGE MODELS IN SOUTH ASIA AND POSSIBLE SYNERGIES FOR GROWTH CENTER/ COLLECTION CENTER AND SPECIAL BAZAR

The agriculture segment in South Asia is typically characterized by small, fragmented farms, weak infrastructure in terms of electricity supply and water availability and over involvement of intermediaries at various levels resulting in a fragmented and less effective agriculture supply chain. Improvement of marketing linkages between the farmers (who are highly fragmented and subsistence farming is prevalent) and the wholesale end-buyers (that may include significant number of organized private players) necessitates a strong private sector participation backed up by appropriate government policy and legislative frameworks. Such market linkage programs could include provision of developing a market infrastructure for connecting the farmers with organized private sector buyers, provision of inputs supply to improve productivity and agricultural extension services such as providing training on best agriculture practices to improve productivity of the farmers¹. Some of the market linkage models across South Asia² have been discussed in the subsequent sections.

9.1 Market linkage models in South Asia

The last two decades have seen significant level of economic and trade liberalization across various South Asian nations. The impact of liberalization on the Agriculture sector could have possibly opened external markets opportunities (e.g. fresh vegetables, frozen aquaculture products, processed products, etc.) as well as opened doors for significant private sector investment in the sector. The potential to impact livelihood of millions of people employed in the sector, betterment of capacities of farmers and producers could potentially have been achieved through effective market linkage programs. However, barring a few success stories, the private sector participation in effective market linkages in South Asian region remains low. The largest economy in the region India has some good examples of market linkage models with significant private sector participation that will be explored in the subsequent sections.

9.2 Market linkage models in India

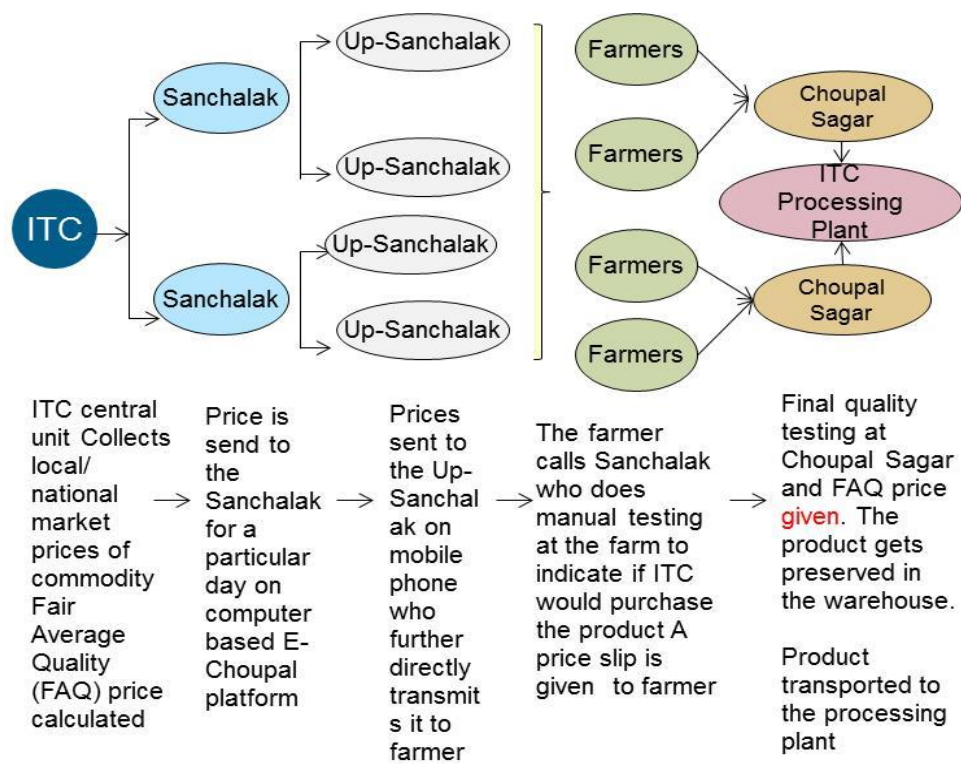
Some of the key market linkage models in India with significant private sector and public private sector involvement include ITC e-Choupal, Srinji Mega Food Park, Hariyali Kisan Bazaar (HKB) Aadhar Wholesale, Tata Kisan Sansar and Reliance Fresh. A few of these models have been discussed in the subsequent sections.

ITC e-Choupal

e-Choupal is an agriculture market linkage initiative of ITC Limited, one of India's leading consumer goods companies with strong presence in the food and beverages segment. The e-Choupal program aims to link directly with the farmers for procurement of agricultural and aquaculture products like soybeans, wheat, coffee, and prawns.

Since its inception in the year 2000, the e-Choupal program has benefitted more than 4 million farmers in India. The business model of e-Choupal with key stakeholders has been shown in Figure 9-1. The Sanchalak and Up-Sanchalak are ITC identified farmers whose responsibility is to facilitate smooth transactions between the farmer community and the buyer (i.e., ITC) to maintain a continuous and effective supply chain.

Figure 9-1: ITC e-Choupal Model



Source: Solidaridad/ Solidaridadprimary research

Some key success factors of the ITC e-Choupal model include:

- Strong backward linkage with the farmer community to ensure steady supply of the raw materials.
- Completely integrated model as the materials procured are utilized internally for ITC owned brands (for instance wheat for Ashirwad flour). Collaboration with large FMCG companies such as McDonalds ensures a steady demand of the agriculture produce at e-Choupal.
- Strategic location advantage: The e-choupals are located strategically very close to the highway for ease of access to the farmers.
- Trust of farmers on ITC due to its constant community involvement like construction of check dams, training on input activities, free agri input supplies
- Information kiosks for providing market information coupled with continuous knowledge sharing on farming practices. High end Calibration and weighing facilities and weight assurance to the farmers
- Additional income for the sanchalak and samyojak for being part of ITC E-Choupal model. In addition, these farmers receive free training on best farming practices
- Auxiliary services such as input supply (fertilizers, high yield seeds) and general merchandise supply to the farmers at affordable rates

Some of the key constraints that the ITC e-Choupal model has to face:

- Delay in payment to the farmers due to operational and regulatory constraints. ITC can only reimburse and settle claims against invoices in a period of 3-5 days and cannot pay immediately and directly to farmers
- Local competition has been increasing with the local Agriculture market players selling/ buying the produce at low prices. ITC is constrained to buy the produce at a designated price due to its strict internal policies

- Strict government regulations on cap on 1 license for trading (One license could cost up to 5 crores for trading a commodity such as wheat in certain parts of India)

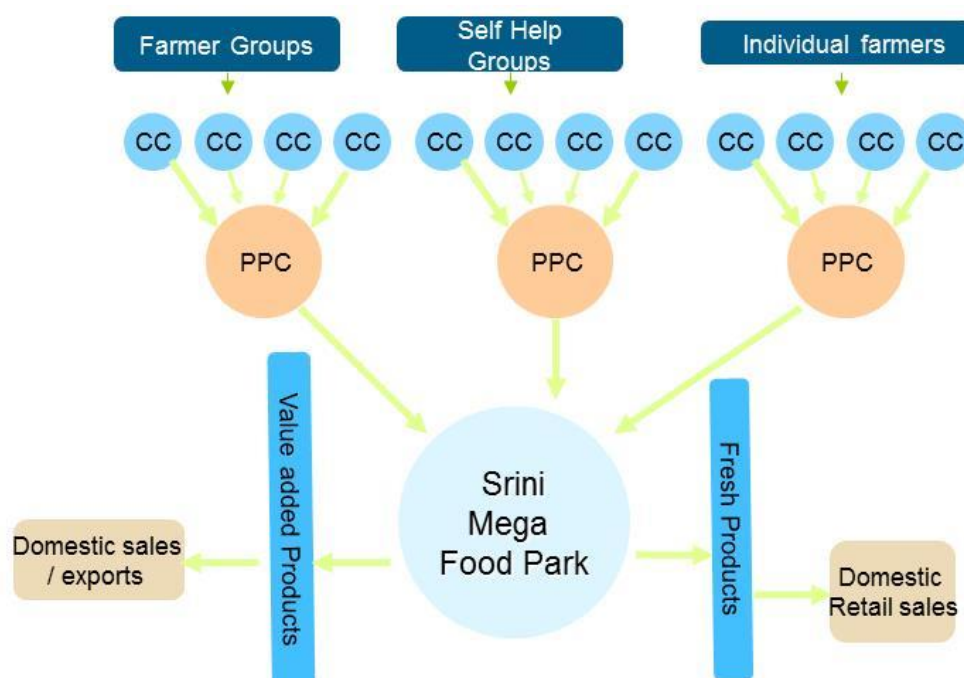
Srini Mega Food Park

The Indian government in 2010 approved a proposal to set up mega food parks to encourage the Agro food-processing sector in India. With the aim to benefit all the key stakeholders in the agriculture value chain: farmers, retailers, exporters, and food processors, the first Mega Food Park 'Srini' was established in southern state of Andhra Pradesh in India in 2011-12.

Srini Mega Food Park is spread over an area of 147 acres and has modern facilities for pulping, IQF (individually quick frozen), bottling, tetra packing, modular cold storage, warehousing, and advanced testing lab. It aims to strengthen the market linkages and benefit the local farming community by creating a supply chain infrastructure for processing and manufacture value added and premium pricing products.

Since its inception in 2012, the Srini Mega Food Park has been able to establish good backward linkages with self-help groups and individual farmers. Srini works on an extended Hub and Spoke model with Spokes acting as collection centres and primary processing centres and Hub as the central processing facility as shown in Figure 9-2.

Figure 9-2: Srini Mega Food Park Model



Source: Srini Mega Food Park website, Ministry of Food processing Industries India

The salient features of the operational model are:

- Collection centers (CC's) are managed by self-help groups. Farmers can sell their produce at the CC's at competitive prices compared to other wholesale markets
- Produce is transported to Primary Processing Centers (PPCs) where they are sorted, graded, washed and packed.
- Produce is transported to the "Fresh Market", or in case of processing grade produce, to Central Processing Center using fleet of reefer trucks and vans

Some key success factors of the Srini Mega Food Park model include:

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- Strong backward linkage with the farmer community to ensure steady supply of the raw materials
- Good Industry linkage for selling processed fruits and vegetables
- Strategic location at the near the border of three major production states for horticulture products in India

Some of the key constraints that the Srini Mega Food Park model has to face:

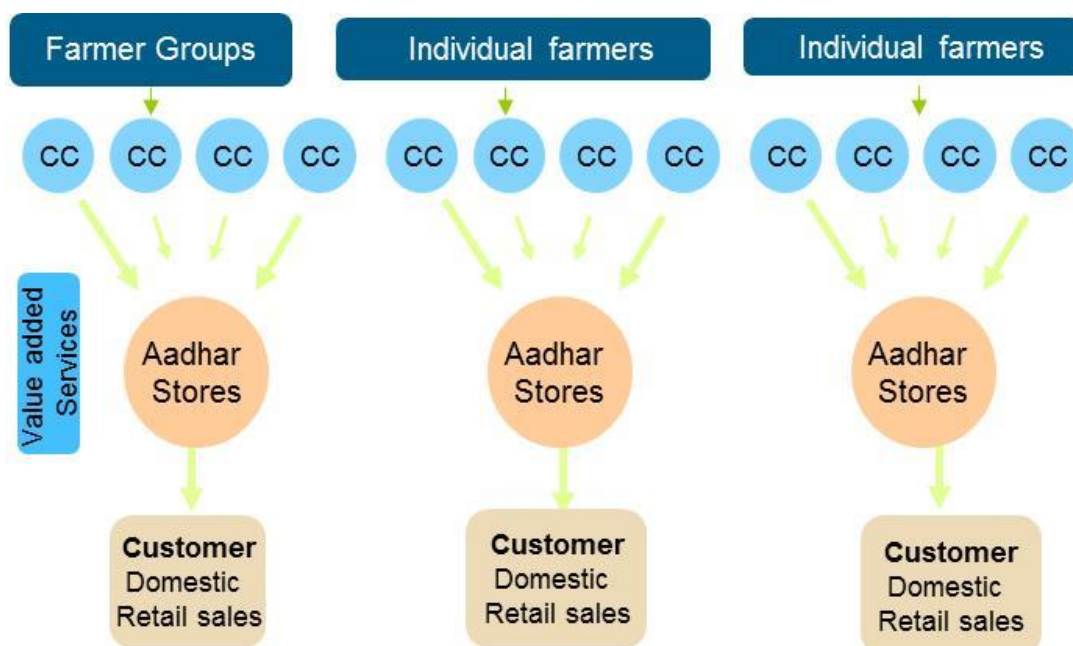
- Working capital challenges (due to inventory management and cash management) has limited the growth of the company post 2013
- Corporate Governance issues (role and image of the board of directors) has warded off interests from other potential investors in the food park

Aadhar Wholesale Trading and Distribution Limited

Aadhaar started in 2002-03 as retail store for the rural and semi urban customers with each store catering upto 20 villages in its radius. The stores not only offered complete agricultural solutions and products for the farmers but also a wide range of commodities including food, grocery, apparel, footwear, home appliances, furniture, kitchenware and hardware for the daily requirements of the farmers. The stores were owned and operated by Godrej Agrovet industries, a subsidiary of Godrej, an Indian major consumer products company.

A significant stake in Aadhaar was obtained by another Indian conglomerate 'Future Group' in 2011-12 and the Aadhaar stores are now being transformed from retail store to a wholesale store. The operating model is being changed to hub and spoke model. At the same time, Future group has decided to appoint franchisees to run the Aadhaar retail outlets. The size of a hub store will be around 10,000 sq.ft. and the spoke centres will be spread across 3,000 sq.ft. area. The operational model of the Aadhaar has been shown in Figure 9-3.

Figure 9-3: Aadhaar Wholesale Trading and Distribution Limited Model



Source: Godrej Aadhaar website, Future group website (accessed in August 2014)

The salient features of the operational model are:

- Collection centers (CC) where the farmers sell their products. The CCs are in very close vicinity or within the Aadhaar Stores

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- Aadhar Stores business model is mainly based on the franchisee model
- Customers categories include both retail and local businesses in the area

Some key success factors of the Aadhar model include:

- Provides value added services such as technical guidance on soil and water testing
- Provides information on weather and price rates
- Has developed best practices program for different crops grown in its region of operations and advises farmers on ways to implement these programs
- Each Aadhaar has team of qualified agronomists who interact with farmers and travel to farms to educate them on farm practices

Some of the key constraints that the Aadhar model has to face:

- The purchases made by farmers remained small and that affected scalability in the rural areas. The volumes of sales could not make up for the costs. Godrej sold off its stake to Future group in 2011
- The logistics costs were too high. The stores were spread thinly over a large geography, resulting in high transport costs
- Since power supply is erratic in villages, most of these stores needed to be run on generator set — the cost of running these generators was high.
- These stores are finding it difficult to displace traditional shops. Rural markets work on credit and relationships. The new-age Aadhar stores did not give credit facility to the buyers and were always seen as outsiders

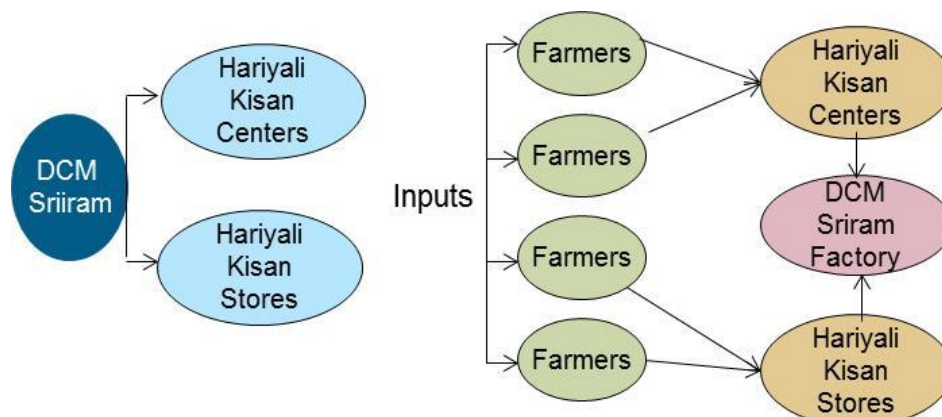
Hariyali Kisan Bazaar (HKB)

Hariyali Kisaan Bazaar, started in 2002, was India's biggest rural retail chain by sales that at its peak operated more than 230 store across rural and semi urban areas in India. The Hariyali Kisan Baazar is owned and operated by the DCM Sriram group, a leading Agro input company from India.

During the first phase of the launch of Hariyali Kisaan Bazaar, the first few centres started as an agri-store near sugar factory owned by DCM Sriram and had a catchment area that was sourcing sugarcane directly from farmers. Following the initial success of the model, HKB started a centre which provided Agriculture extension services (such as training) to farmers. By working in the same catchment area from where the produce was procured, HKB ensured that the farmers were benefitted due to improved accessibility of quality inputs.

However, the HKB stores were soon diversified and started to operate as a retail chain with apparels and general merchandise also being on sale. Given the capital intensive nature of retail chain business, large capital investment was made to develop the retail chains and stores. These HKB stores opened across tier III and IV towns and cities in India based on the rural requirement. However, the HKB stores were not popular, and DCM Sriram decided to minimize its operations post 2010. Below figure shows the operational model of Hariyali Kisan Bazaar.

Figure 9-4: Hariyali Kisan Bazaar Model



Source: Hariyali Kisan Bazaar website, Business Standard news website (accessed in August 2014)

Some key success factors of the Hariyali Kisan Bazaar model include:

- Provided value added services such as technical guidance and other support services to improve farm productivity and net returns for farmers.
- Salesmen in these bazaars besides offering guidance on cropping patterns and technology issues also held training courses at various Hariyali centres and even visited the farmers' fields to offer on-the-spot problem-solving counsel

Some of the key challenges that the Hariyali Kisan Bazaar model had to face:

- Lack of rural network for reaching up to the farmers. Weakened backward linkage with the farmers and farmer groups
- Too much diversification into retail business and less focus on the Agro based products. The focus of the center shifted to make it a one stop shop for farmer (merchandise, apparels, footwear, etc.) rather than a center for quality inputs, fertilizers and pesticides, which lead to less preference for store to a farmer

9.3 Market linkage models in Bangladesh

Bangladesh has great potential for agricultural production given the fertility of the soil in major parts of the country, but the country has been facing severe challenges in food security and food safety over the last few decades. The agriculture and agribusiness contribution to GDP in Bangladesh was estimated at about 35% in 2012-13 (in-case the forward and backward linkages are taken into consideration)³. However 60% of the country's workforce is absorbed directly or indirectly by the agriculture segment and hence arguably effective market linkage programs are crucial for the betterment of the workforce by providing them with reliable and better sources of income.

The market linkage programs in Bangladesh are mostly driven by the Government and Donor/ Development agencies with very low private sector participation. Off-late some e-commerce companies have been observed to create market linkage by connecting the farmers with the consumers, but the activity is still at a very nascent stage in Bangladesh. Low level of industry confidence in the sector and a highly fragmented and inefficient supply chain could be some of the reasons of poor private sector participation in market linkage programs in Bangladesh. Some of the notable Government/ Donor/ Development agencies sponsored market linkage programs have been discussed briefly below.

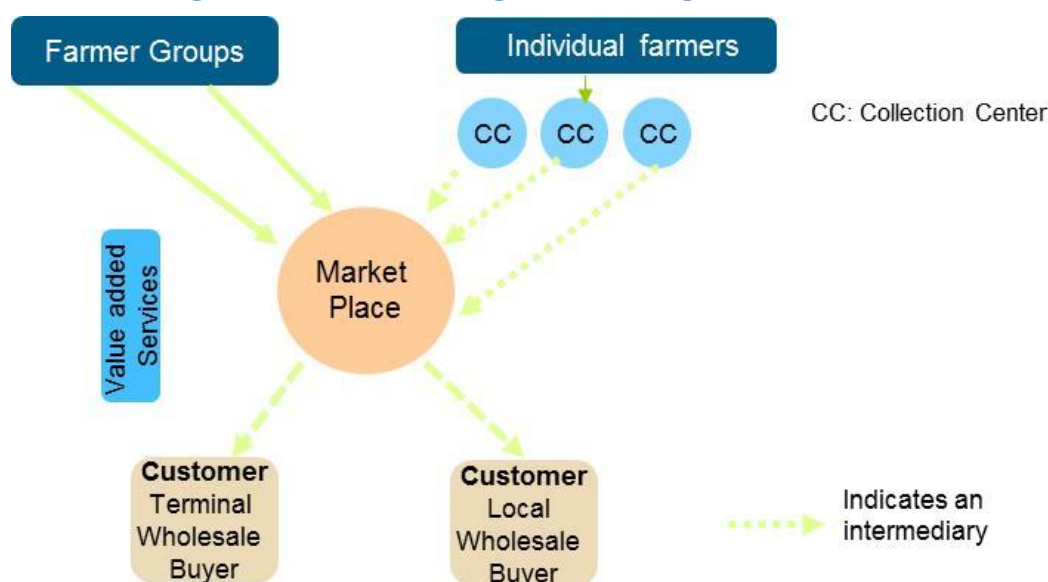
³Bangladesh Bureau of Statistics (BBS), October 2013

9.3.1 ADB SCDP Project, Bangladesh

Funded by the Asian Development Bank (ADB), the project aims at fostering commercialization of agriculture in Bangladesh through interventions to promote diversification into high-value crop categories. One of the key objectives of this project was to strengthen the value-chain integration by developing backward and forward linkages between farmers and consumers, through establishing wholesale market in various parts of Bangladesh. Conceptualized in 2007 and formally launched in 2010 the project has established several trading markets complexes across various regions in Bangladesh in order to create an effective linkage between producer and end customer.

The operational model for one such marketplace operating in Bogra/Mahasthangarh Market in Northwestern part of Bangladesh has been shown in Figure 9-5. The model follows a traditional Hub and Spoke system for operations as evident from the figure.

Figure 9-5: ADB/SCDP Bogra/Mahasthangarh Market Model



Source: Solidaridad primary research and analysis 2014

Some of the key observations seen from this model include:

- Arotdars (the Traders) play the most important role in the market transactions as the key intermediaries between the suppliers and buyers
- Suppliers to these markets included farmer groups and intermediaries such as farias that aggregate produce from farm gate and supply it to the Arotdars
- Key Buyers include terminal market buyers from Dhaka and Chittagong. Some of the produce also went to the local markets

9.3.2 CARE Rangpur Market, Bangladesh

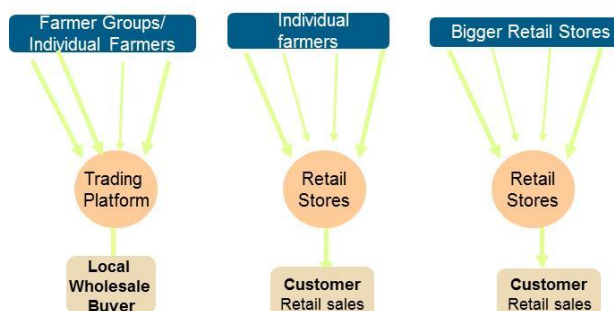
CARE is one of the leading development agencies that has been working in Bangladesh since 1949. CARE Bangladesh's efforts are mainly focused on disaster relief, school, pre-school feeding food security and livelihoods; health and nutrition; agriculture and natural resources; climate change adaptation; women's empowerment and reduction of violence against women. Its recent focus has been on food safety and availability to be achieved through effective market linkage programs. CARE has made significant contribution in reducing food insecurity in Bangladesh through implementation of programming interventions in the areas of livelihood and food security.

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The CARE Rangpur 'Assembled Market' is one of successful examples of market linkage programs in Bangladesh. The market has been operational since 2011 and is now in the process of expansion to increase its trading capacity. The operational model of the Rangpur market is shown below.

Figure 9-6: CARE Rangpur Market Model



Source: Solidaridad/Solidaridad primary research

Some of the key observations as seen from this model include:

- The market has trading facility for retail as well as wholesale operations.
- Farmer groups/ individual farmers can utilize the market either for retail or for wholesale trading after approval from MMC at minimum costs and commission.
- Future expansion plans include developing a storage space near to the market for bulk buying traders and suppliers
- Facilities include bank overdraft facilities for relatively larger buyers such as input shops. Mobile Money platforms such as B-Kash utilized for larger trade transactions. DG set is managed and operated by a local entrepreneur

Besides the two models discussed above, some of the other important agriculture market linkage programs in Bangladesh have been discussed herewith.

10 ANALYSIS OF DESIGN APPROACH OF GROWTH CENTER/SPECIAL HAT BAZAR/COLLECTION CENTER.

10.1 Site estimation and space Allocation

The growth center/Special hat bazar in the rural area were not established with specific site estimation system, rather government allocates sites and areas for the function randomly. For future renovation or new growth center/hat bazar development site estimation should be done by keeping at least 50 years plan. In this case site estimation system should be robust in which during design/renovation, planners can consider the significant issues like the available space requirements, capacity, nature of product to be traded, road network, parking, loading unloading, transport, traffic, crowding, waste management etc.

Food and Agriculture Organization (FAO) proposed ‘demand approach’ and ‘supply approach’ for estimating consumption, from which we can find the estimated sales areas for catchment population. However, due to lack of multiple challenges and long-term planning rural growth center/special hat bazar in the community are not growing in appropriate method, which causes insufficient space of products for serving the buyers-sellers and community, chaos in the service, traffic congestion etc. Future projection is also very essential concern which has been never considered in the current system.

Again, the internal layout, road, open space, green, built area ratio are important for a growth center/hatbazar. According to Food and Agriculture Organization (FAO), a rough rule-of-thumb for the portion of the site covered by buildings should be around 20 - 30 percent, road space and parking between 50 - 60 percent and other uses, including drain reserves 10 - 20 percent of the total area. Here the existing situation is described with pie charts as follows Figure 10-1.

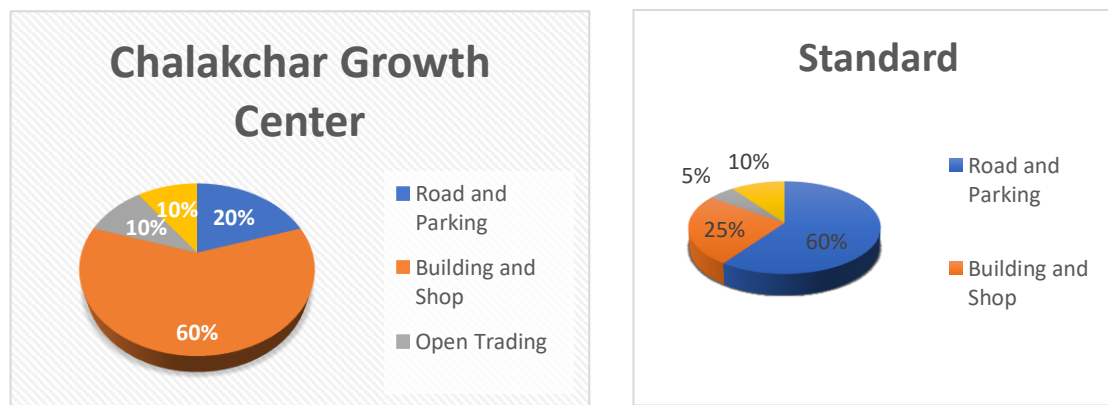


Figure 10-1: Existing Situation of Chalakchar Growth Center

10.2 Market Segmentation or Zoning

Zoning can be considered by the selling products of the Growth Center/Special bazar. Zoning in the growth center should be based on the multiple product category like Grocery, cloths, households, Agro input, medicine, stationary, fruits, vegetables, fish, Meat, Poultry, handicrafts, If the growth center performed both wholesale and retail that’s also should be considered in the zoning. Importantly the service unit like storage, processing zone, slaughterhouse, should be in the separate zone. Two broader types of items are found in Special hatbazar; ‘Perishable Item’ and ‘Non-perishable Item’. Perishable item needs quick trading facilities and generates more waste, for examples vegetable, fruit, fish. Whereas non-perishable item needs long term storage facilities and generates dry waste, for examples cereals, roots and tuber. Again, zoning can be done by wet zone items and dry zone items. The Perishable item, such as fish, is a wet zone item whereas vegetable and fruit are semi wet zone items. Non-perishable items are generally the dry zone items.

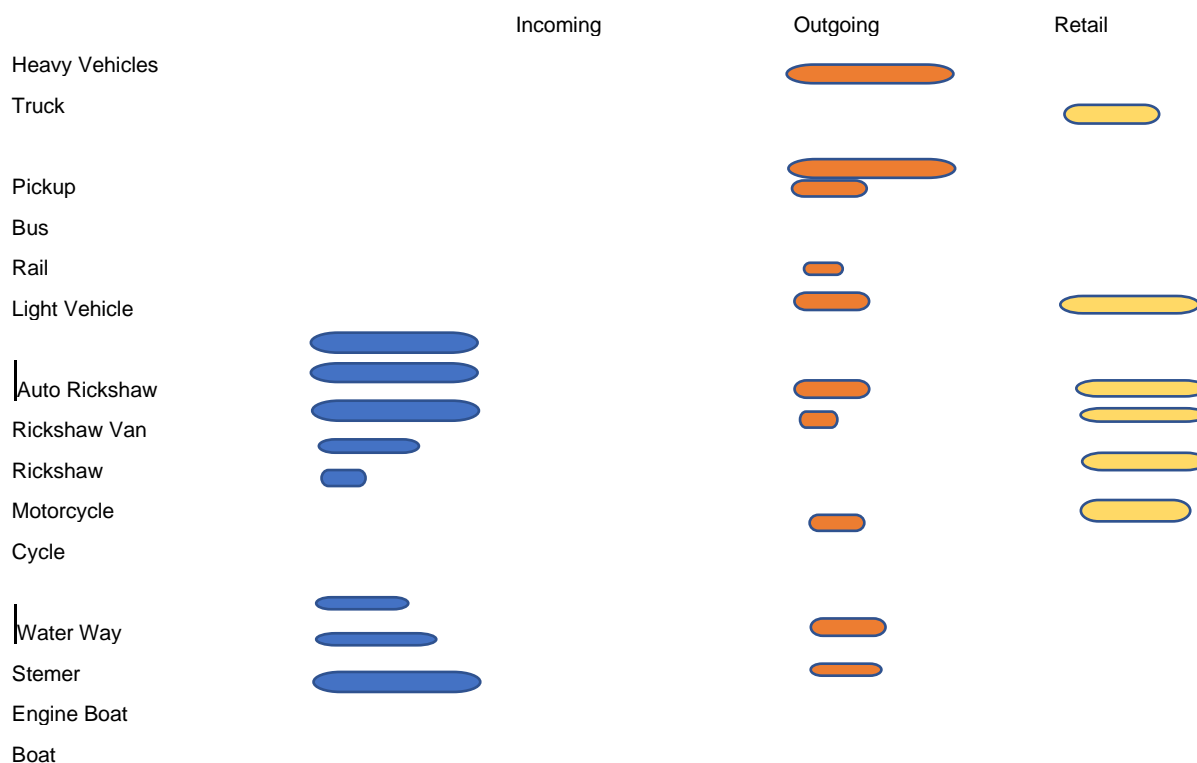
Currently there is no appropriate zoning system in the growth center or special hatbazar in the rural community. Lack of planning guide, authority’s concern, owner’s concern and proper zoning have been observed in the markets which create problems in waste management, human resource management, trading, loading unloading system, unit details etc. Here Chalackchar, Satmaile, Parulia bazar and others market have been surveyed for understanding the current zoning system and plot them to in functional layout.

10.3 Transportation System, Traffic Management and Loading-Unloading

Transportation system of a Growth center/Special market is very critical as different types of vehicle approach here every day for loading unloading. Both heavy and light vehicles are involved with the operation of wholesale and retail market. Heavy vehicle like, truck, pickup, covered van etc and light vehicle like, auto rickshaw, rickshaw van, rickshaw (a local non-motorized vehicle), motorcycle and cycle arrive here in parallel, which create traffic congestion and conflicting situation. Poor and inadequate parking facility is one of the major problems of wholesale markets in the city (Figure). There is no separated space for loading unloading. As a result, loading unloading system occupies the entire road which creates traffic congestion.

In the wholesale and retail markets of rural market, both heavy and light vehicle are allowed in same roads which create very chaotic situation. Auction is a very significant event for this sort of function but there is no space for Auction has been found during field survey. For functional purpose, we can find 3 broader types of vehicles, incoming vehicle, outgoing vehicle, and vehicle of retails. Incoming vehicle carries bulk product from rural or district assembly market and mostly involved with unloading process. Outgoing vehicle carries product from city wholesale market to the city retail market and mostly involved with loading process. Some vehicles come to the retail market.

Figure 10-2: Analysis of types of vehicles in the Growth Center/Special hatbazar. (Source: field surveyed data)



System: Incoming traffic → Parking → Unloading → Auction Shop → Loading → Out going

From observational survey, the flow of product through transportation and loading unloading system is found as above.

10.4 Category wise Unit Design approach

Survey team surveyed around 500 shops for searching the existing shop unit detail. In the design planner should bring design innovation considering the existing user's preference like Location, size, grid pattern, corridor width, display type, storage type etc of every individual component should be taken as concern issues. Area required for storage, tukri (bamboo basket in which labour carries goods on head), sacks, bundle have also been planned. According to sold products, units can be divided in five large categories, and these are vegetables, fruits, fish, Grocery, cereals and households.

10.4.1 Vegetables

Existing shop or unit size comes from structural system. The corridor is generally 6 ft, if it is road then 10-20 ft and occupied by the shop products. Two types of planning grids are found; firstly, based on structural members and secondly by dividing the site in equal span. Generally, there was no defined space for display and storage in the existing units. Sleeping facilities are in mezzanine floor (drop ceiling). Everyday a bulk amount of vegetable trade occurs under this very functional unit. For semi perishable items (Potato, onion, garlic, ginger, roots, tubers etc) shop size are generated from structural system as same as the case of vegetables. These types of units need space for semi-permanent storage. Future Conceptual Sketch of existing those units is crucial.

Figure 10-3: Collected from secondary data



10.4.2 Fruits

Existing shop size come from structural system. These types of units need spaces for trading, pre and post handling, sorting, grading, packaging, storage and scope for washing and value addition space is requiring in the design planning. Commercial fruits like Mango, guava, banana, pineapple, jackfruits etc. needs special type of market in the producing area where farmers-buyers can able to keep stock long time.

Figure 10-4: From Secondary Research



10.4.3 Fish

A massive structural system change is requiring in fish unit. The design planners must have to consider the circulation system of the market since it is a very unique for the product type. The fish market trades in very short time. Fish markets deals with ice and water as a result corridor are always flooded with water. This type of unit needs well drained, spaces for packing, ice crushing and display. Fish market needs refrigeration system for short term storage. Fish is a quick rotten item so there is always a bad smell found in this market. So, ventilation system must be considered in restricting or new design.

Figure 10-5: From secondary Research



10.4.4 Grocery and Cereal

Existing shop size comes from structural system and this type of units need spaces for long term dry storage and wide corridors. This type of unit is the larger than other type due to its long-term storage facility. Again, this type of unit allows loading unloading truck in the unit corridor or common space which is a very important concern. These units have defined space for display, office, and storage.

Figure 10-6: Secondary Research



10.5 Small Scale Cottage Industry and Processing

Small Scale processing facilities of Agricultural products should be kept in some markets based on needs. Such small-scale processing units will meet local needs and subsequently will create entrepreneurship and employment. Areas that produce more seasonal fruits like mango, pineapple, jackfruits, banana even different types of handicrafts, those areas Women and youth initiatives should be plan for cottage industry development.

10.6 Facilities for Agriculture Technical information centre and Digital Services

As farmers require different type of Agro- input and Agro- machineries in a rural hat bazar. In that case there should be provision for farmers to get extension and various digital services from rural Growth Centre/Special hat bazar.

10.7 Consumer Behaviour

This is a crucial metric for understanding the market, particularly the commodities on which the market/growth center should concentrate and trade. In urban marketplaces, non-food items are prioritized over perishable food items, while the opposite is true in rural markets. Therefore, it is necessary to identify and analyse consumer segments that describe customers' socio-economic levels, requirements, tastes, characteristics, interests, religious beliefs, and lifestyles, as well as the demand for each product in terms of frequency, availability, quality, price perception, affordability, and willingness to pay. This will identify to design the marketplace to meet the future need of the customers.

10.8 Access to finance (Bank MFIs)

10.9 Market Traders' Association

The issue of market traders' associations is complex and is strongly connected to the local political context. If traders' associations exist, a detailed analysis should be carried out to understand their role inside the community. Sometimes associations are politically supported, and a real lobby could exist between the association and the local government. Market traders' associations - or cooperatives - should be promoted through training aimed at making traders aware of the various benefits including the opportunity to reduce their transaction costs.

10.10 Waste Management

Waste management is very significant for Rural Hat bazar. The waste generates from rural hat bazar both raw organic waste and dry crust which are rotten quickly and creates an unhygienic environment in the market. Again, the collection of waste from internal roads, parking spaces and corridors interrupt the general activity of the market. But if the waste is not removed quickly, it will create odor, insects,

germs etc. The design plan of the hat bazar should incorporate a robust system to remove wastes which is currently unavailable in market. In the plan It is very important to identify the volume and type of wastes generate in different spaces to introduce rapid removal system. From the survey, it is found that highest percentage of wastes are collected from the Loading-unloading Bay and second highest percentage from unloading bay parking. The shops, loading bay and retail area produce relatively lower percentage of waste than the unloading bay. To manage organic waste from the market environment friendly bio fertilizer plant should be kept in the design plan.

10.11 Human Resource Management

People of different levels have been occupied with different types of activities in the hatbazar. So, it is essential to consider the functional needs of people or stakeholders related with this function. 'Bapary' (local term of the people who buys goods from producers in village assembly market and take goods to city wholesale markets by suitable transport), 'Arottdar' (local term of the people who store these goods in the wholesale market), Labour, waste collector, truck driver, retail seller, retail buyer, office staff, consumer etc can be stated as stakeholders of this function. Each of these stakeholders required different functional arrangements for example, a group of people who reside in the market, requires accommodation. Basically, the stakeholders of the wholesale market require four types of functional facilities. They are accommodation, meal/food, recreation, toilet and bathing facilities. Again, the source of meal or refreshment is several small roadside shops and cafeteria. There are no recreation facilities for the stakeholders are found in the existing marketplaces. There are insufficient numbers of bathing and toilet facilities available in the existing market which is very unhealthy and unhygienic. All these facilities should be taken into consideration while finalizing the market design.

Figure 10-7: Existing accomodation system



10.12 Recommendation for Design Approach

From the above discussion, it is found that the existing growth center/Special hat bazar need to be redesigned, restructured, renovated, and refurbished. As the urbanization is growing faster, there is also need for expansion of the markets for which the authority should establish a proper operational manual for maintaining hat bazar. In order to make the market infrastructure sustainable, maintenance activities are also necessary.

Based on field survey and comparison with standards, the following remarks can be drawn.

- For designing and planning of growth center/Special hat bazar require identification of a site that is appropriate in terms of size and in line with the development of transport links to and within the urban area. The space requirement should be calculated according to demand or supply approach. It is very essential to fix the catchment population with future projection. If the area is not adequate from government or local authority, the private land polling strategy could be better option under PPP model.

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- Internal zoning should be defined with proper percentage of build area, road with parking area and other functions should be based on perishable and non-perishable items. It will be better if the fish market can be placed separately at a distance from the other functions as the operation and maintenance of this market is different from others.
- A very vital feature of market design has become the ease of circulation, parking and manoeuvring of vehicles. Adopting one-way circulation, central zoning of markets and ring road system is better for wholesale kitchen markets according to Food and Agriculture Organizations (FAO). It is better to avoid crossroads. There should be good number of parking facilities with proper dedicated unloading and loading bay. This area should be designed for improving the system. There should be spaces for auction as well.
- All units should be designed considering its need and flexible function. For example, Units for vegetable and fruit need short term storage facilities and watering facilities where as units for cereals and roots and tuber need long term storage facilities. The unit size should be flexible so that owners have the options to have different size of units. Corridor for circulation, grid system for units, storage and display facilities etc should be designed properly. Lighting and ventilation should be ensured for every unit.
- Proper accommodation, meal/food facilities, recreation, bathing and toilet facilities should be ensured in the area.
- Waste should be treated as 'wealth' like renewable source. Waste collection system should be operated 24 hours in the market areas and there should be authorized workers for waste collection. As wholesale kitchen markets generate maximum organic waste, hence waste treatment plant or disposal system should be near to market area or within the market area.
- As a huge chunk of land used for market activity, occupied only the ground floor so multiple use of land can be introduced, specially the roof and underground. Roof can be use as rainwater collector or can produce solar energy power. Underground space can be used as extra parking or designed biogas plant.
- The products of the growth center/Special markets can be polluted by the exhausted smoke from truck or another vehicle. A green smoke barrier as a buffer can be designed between road and shop areas.

11 VALUE CHAIN/SUPPLY CHAIN ASPECT BUSINESS CASE FOR GROWTH CENTER/SPECIAL HAT BAZAR

The existing market were observed to face several constraints such as poor infrastructure, lack of modern machine and equipment, poor process flow for products, etc. that lead to ineffective market linkage between producer and the buyer. The key inefficiencies in the present market system in the country have been described herewith.

11.1 Information Asymmetry

- Little information on demand: There is absence of a suitable mechanism to predict the demand of particular product in a season and on a given day in the market. Over supply with no awareness on demand leads to distress selling resulting in realization of lower profits to farmers and even to the traders. For instance, all the farmers in the country have grown cucumber owing to its huge requirement and profitability last year. It resulted in bulk production of cucumber this year owing to larger supply over demand. Finally, the farmers need to sell cucumber at lower prices which results in loss to both farmers and traders (who earns commission on price of cucumber per kg)
- High variability and ambiguity in the minimum prices for starting the trading: It was observed that there is no standard mechanism to decide initial price at which auction could start in the market on a given day. It depends on the buyer and sometimes on the trader who starts auction based on their analysis of the quality of product. This may again lead to realization of lower profits to farmers and even to the traders

11.2 Poor infrastructure

- Shed facility for trading not sufficient: Most of the observed markets start auctioning of their products in open or under a roof with no proper shed facility. This may lead to degradation in the quality of products.
- Highly unplanned layout with improper drainage system: Most of the markets observed had unplanned layout in terms of drainage facility and waste management. Due to lack of a proper drainage system water logging issues and in extreme cases mud morass were observed in the market premises making trading very difficult. It is not good for the quality of products and also creates problem in the loading/unloading of product from and within the markets.
- Unavailability of proper storage system: Due to lack of storage space in the markets, farmers are bound to sell their produce on the same day or with 24 hours so that the produce does not waste. This leads to lower price realizations which in turn is a loss in revenue for both farmers and arotdars (less commission)

11.3 Lack of modern handling machine and equipment

- a) Auctioning being carried out on floor without maintaining proper hygiene: The trading was observed to happen at the floor of the market complex with minimum consideration for the hygiene requirements. This may further lead to germ infestation and eventually degradation in the quality of products once they are transported to longer distances.
- b) Manual weighing: Most of the markets observed utilized traditional weighing methods based on balance with very less presence of digital weighing system in the markets. Inaccurate manual weighing methods in some cases were observed to lead to loss of up to 10% of the produce (100 gram per kilogram) to farmer.

11.4 Poor layout of the facility leading to imbalance in the flow of products within the market

- a) Little planning for space for loading and unloading: There is hardly any allocated space for loading and unloading of goods inside the market premises. In most of the markets the pick-up trucks were observed to load and unload in a totally unplanned way inside the market premises. This may lead to imbalance in the flow of produce within the market premises and hence more lead time for the produce to leave the market.
- b) Absence of standard operating procedures with in the market premises: Absence of mechanism for proper flow of goods was observed inside the market premises. Unloading, sorting, grading, and auctioning of goods were found to occur all at the same place leading to lot of confusion for the buyers and commotion inside the marketplace.

11.5 Ineffective procedures for quality check

- a) Dependency on traditional methods for checking the quality: Manual sorting and grading with visual quality check of the products was observed in most of the markets. There is absence of machinery and equipment for checking the quality of products apart from the dairy category that had S&F and Fat testing machines.
- b) No mechanism to preserve the quality of the produce: The aquaculture product which comes to the market was observed to be not iced in the proper ratio of ice: fish=1:1 which leads to degradation in the product quality. In addition, the horticulture products kept at the bottom may get destroyed during transportation for longer distances due to improper loading mechanism.

11.6 Poor Traceability/transparency

- a) No traceability for recording of information: Absence of mechanism to maintain the records of the source of supply of the product was observed in most of the markets. Information on the source of supply of the product is not available to consumers (such as exporters, processors, etc.) who demand the traceability of produce. It thus becomes very challenging to ascertain the source of low-quality products. In addition, lower traceability leads to incorrect information to the customer and monopoly of middlemen in deciding prices.
- b) No mechanism to decide on the minimum support prices: Farmers are just informed of the expected prices in the market without given any indication on the minimum support price. Minimum support prices could be based on the prices observed in different wholesale markets or even through government agencies.

These inefficiencies observed both in the supply chain and existing markets create a scope for development of efficient growth center/hat bazar. The growth center/special hat bazar is expected to improve the backward and forward linkage and make the supply chain more efficient through:

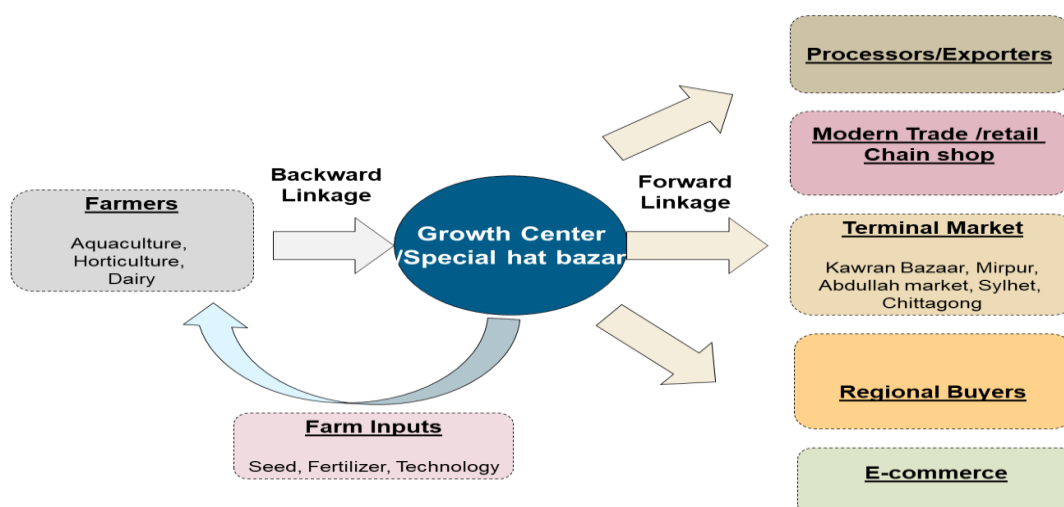
- Contributing to sustainable agricultural and rural development with focus on achieving food and nutrition security: The growth center as an effective market linkage initiative will enable collaboration between the producers and various stakeholders thereby will facilitate supply chain efficiency of produce in Bangladesh. This market linkage will assist in developing the economic and social capital of the country
- Improving market competitiveness through technological, commercial, and institutional innovation: The growth center improvement initiatives will look to work with different buyer segments (such as local, terminal buyers, processors/ exporters) thereby increasing the visibility of produce from the region on a national scale. The market development initiatives are expected to promote best practice in infrastructure and process that will aim to set an example of how efficiency can be brought in agri-market linkage initiatives.

- Reduction in Transaction cost: growth center will aim to reduce transaction cost by reducing the handling time, making intermediaries more efficient and getting a fair value for produce as per the product quality.
- Empowerment of local supply chain actors and building a strong ecosystem: market development initiatives will look to build on the initial collectivisation work done under the producer's group from different cluster and create an enabling environment for entrepreneurship. It will also aim to enhance the efficiency within the existing supply chain thereby benefiting the different stakeholders.
- Lead to increase in transactional volume: This would be done by increasing the accessibility and enhancing the value of products and services across the supply chain.

The concept of market development initiatives as a solution for efficient Backward and forward market linkage.

Figure 11-1: Growth center/Special Hat bazar design approach for market inefficiencies

Growth center/ Special hat bazar design approach for market inefficiencies



Key principles for the design of business Case for Market development initiatives

The Business Model design of the market development initiatives is based on nine parameters that aim to create, deliver and capture economic as well as social value across the Agriculture supply chain. These nine parameters aim to answer the critical questions on the objectives and operations of the market have described in briefly herewith (Details description in PPP model)

1. **Key stakeholders and customer segments:** Who are the important stakeholders and customer segments for our business model?
2. **Key requirements and value proposition for the identified stakeholders:** What are the key requirements of our stakeholders from the market? What value could we deliver to them through the market?
3. **Key activities (Operations):** What are the key activities that market has to carry out to meet the value proposition for different stakeholders? What bundles of products (product mix) and services will the market be offering to its stakeholders
4. **Key resource required to run those activities:** What are the key resources (human resources, machinery, plant etc) required for running and operating the market

5. **Distribution channel:** What are the proposed channels for distribution of the products/services to different stakeholders?
6. **Partnerships and collaborations:** What are the key motivations for partnership? Who could be the strategic partners for market? Which are the key activities that the partner is expected to perform
7. **Organization and legal structure:** What could be the organization structure that could involve all the stakeholders? What are the advantages and disadvantages of the different legal structures?
8. **Cost structure:** What are the key cost drivers for the market? What are the major fixed costs and variable costs parameters envisaged in the business model?
9. **Revenue streams:** What are the important revenue streams for the market f?

These nine parameters will be explored in detail based on their applicability and suitability for the business model design in the subsequent sections (**PPP study**)

12 LIST OF MAJOR STAKEHOLDERS

The three stakeholders have been segmented (as seen in Bangladesh) and their roles in the proposed market have been described below

12.1 Producers

The producer category in the case of market consists of farmers / farm households in Aquaculture, Horticulture and other category in the country. It is anticipated that the farm households under line dept. initiatives/ intervention in the identified surrounded market will be the major supplier to the proposed market

12.2 Intermediaries

Intermediaries play a critical role in the agriculture market landscape in Bangladesh connecting the producers and customers to ensure an integrated supply chain. The number of intermediaries may be a challenge in the supply chain as it leads to inefficiency in terms of cost, quality and time. An optimization in the number and level of intermediaries could ensure efficiency in the supply chain. It should be noted that the aim of the market development initiatives is not to eliminate the intermediaries completely but to optimize the existing processes in the supply chain to make these intermediaries more effective.

The type of intermediaries and their roles vary across the three product categories (Aquaculture, Horticulture and Dairy) across the supply chain in Bangladesh.

For the aquaculture supply chain, the following intermediaries are of importance:

- Arotdars: Brokers and trade facilitators in the marketplace
- Paikers: Transporters and suppliers for the terminal⁴ markets (terminal paiker) or regional markets⁵ (regional paiker)
- Depot Owners / Account Holders: Suppliers to the processing and export-oriented industries

For the Horticulture supply chain, the following intermediaries are of importance:

- Faria: Aggregators that aggregate produce at farm level and bring it to the market for trading
- Arotdars: Brokers and trade facilitators in the marketplace

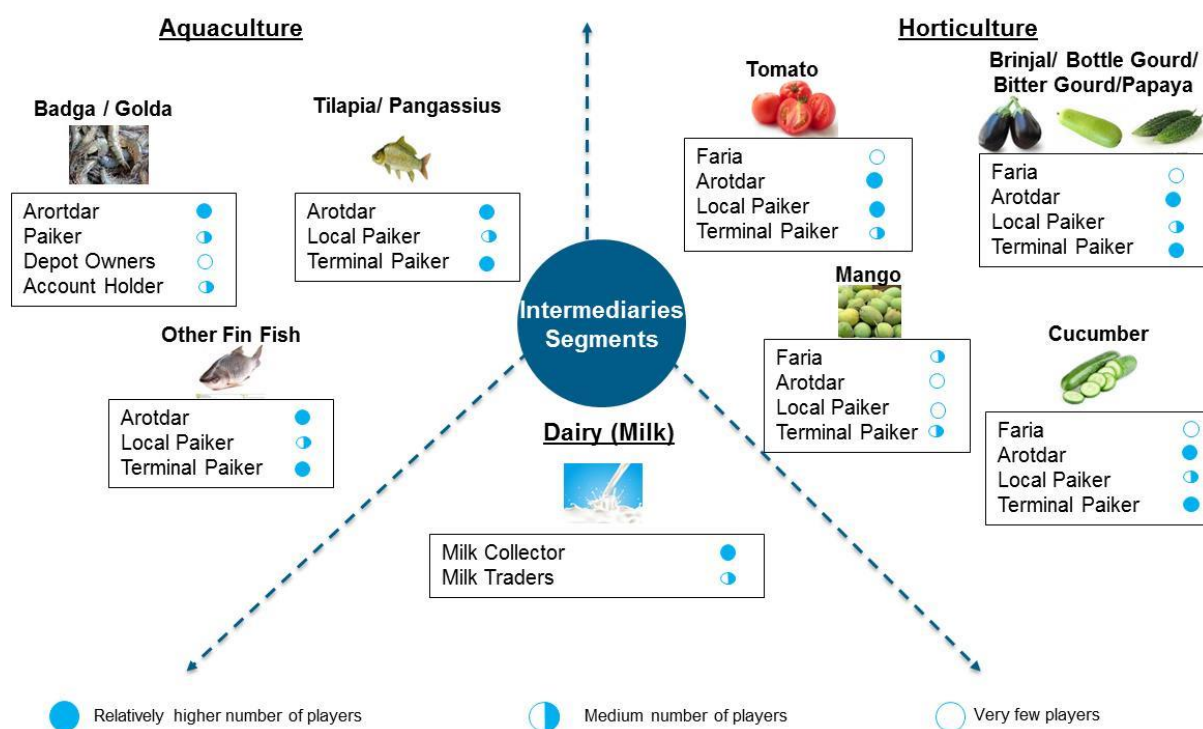
- Paikers: Transporters and suppliers for the terminal markets (terminal paiker) or regional markets (regional paiker)

For the dairy supply chain, the following intermediaries are of importance:

- Gwalas (Milk Collector): Aggregators that aggregate produce at farm level and bring it to the market for trading
- Milk Traders: Transporters and suppliers for the regional markets

A comparative analysis of all these key intermediaries across the three product categories has been shown in Figure 12-1.

Figure 12-1: Intermediaries and their concentration as per product categories



Source: Solidaridad primary research and analysis

Figure 12-1 indicates that amongst the intermediaries, the Arottdars have a very strong presence in almost all the product categories in the Aquaculture and Horticulture segments. Similarly, Gwala (Milk Collector) has a very strong presence in the dairy (milk) segment in Bangladesh. These considerations would be taken while designing the operational model of the market and for identifying the product flow in the growth center.

12.3 Customers

Customers are the most important category of stakeholders for the GROWTH CENTER as the demand drivers. The revenues and profits for the growth center/Special bazar will be driven by the demand of the customers.

There are different segments of customers across the three product categories (Aquaculture, Horticulture and Dairy) in Bangladesh. Both Retail consumers and wholesale buyers (that buy in bulk) have been considered for purchasing goods from the growth center.

For the aquaculture category the following customer segments have been identified:

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- Processors/ Exporters: Export oriented customers that focus on high value products (such as Bagda/Golda)
- Terminal Market Buyer: Wholesale customers that supply to the terminal markets and focus on white fish categories
- Local Market Buyer: Wholesale customers that supply to the local markets and focus on local fish categories including white fish
- E-Commerce Firms: An upcoming customer category that focuses on safe food and premium category products (such as Bagda/Golda) in major urban markets

For the Horticulture category the following customer segments have been identified:

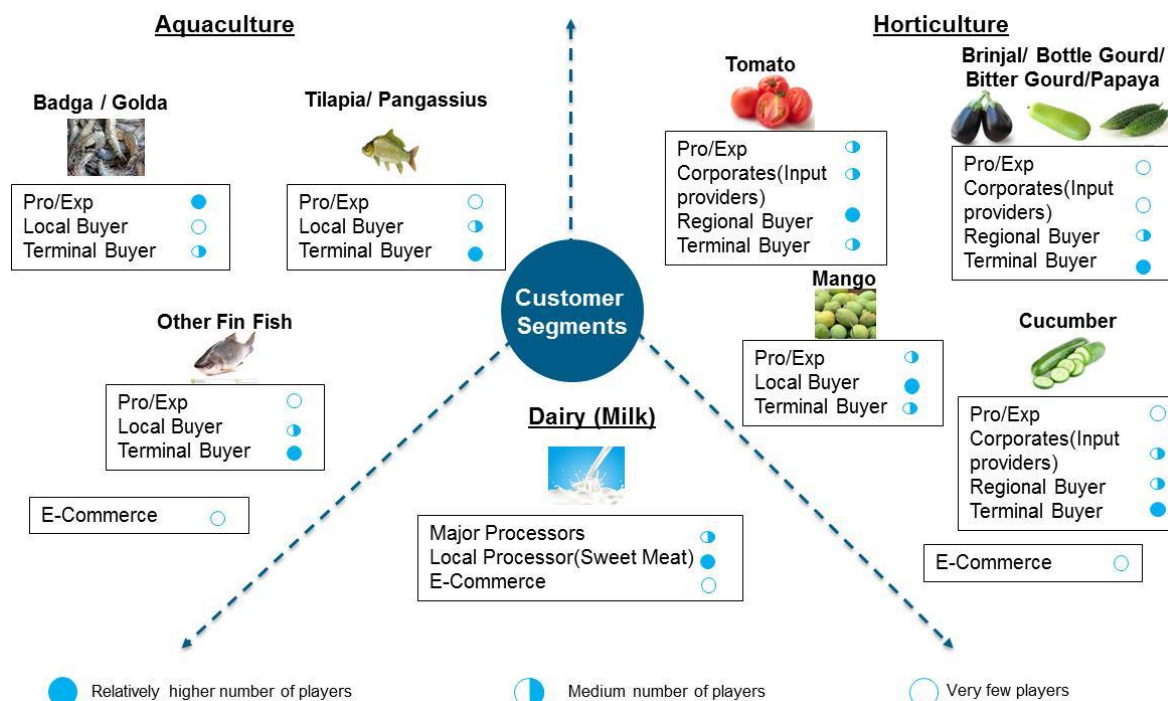
- Conglomerates (Input providers): Major conglomerates that are vertically integrated (or planned) across the agriculture supply chain. For example, a few seed companies in Bangladesh are planning to sell the end premium products to the markets
- Processors/ Exporters: Export oriented customers that focus on horticulture products required for the Bangladeshi diaspora in Europe and other parts of the world
- Terminal Market Buyer: Wholesale customers that supply to the terminal markets in major urban cities
- Local Market Buyer: Wholesale customers that supply to the local markets
- E-Commerce Firms: An upcoming customer category that focuses on supply of safe food in major urban markets

For the dairy category the following customer segments have been identified:

- Major Processors: Organized milk processors in Bangladesh that require bulk amount of milk for processing
- Local Processors: Local processors in the region that may utilize milk to produce assorted and value-added products. These may also include sweet meat shops in the region
- E-Commerce Firms: An upcoming customer category that focuses on supply of safe and pasteurized milk in major urban markets

A comparative analysis of all these customer segments across the three product categories has been shown in figure based on the activity in terms of numbers of players observed during field visit of the study.

Figure 12-2: Customer segments and their concentration as per product categories



Source: Solidaridad primary research and analysis

Figure 12-2 indicates that the processors / exporters in aquaculture segment; terminal / regional market buyers in the horticulture segment and local processors in the dairy segment have a very strong presence in their respective product categories. These considerations would be considered while designing the operational model of the specific growth center/Special hat bazar and for identifying the product flow in the market.

13 KEY REQUIREMENTS OF THE STAKEHOLDERS AND VALUE PROPOSITION

Understanding the requirements of various stakeholders of the market development initiatives and converting these requirements to economic and social values is the key objective of the business model. In other words, market development initiatives and value proposition to different stakeholders must be identified and utilized as an integral part of the business model design.

The key requirements of the stakeholders for the market (i.e., Producers, Intermediaries and Customers) were identified through focus group discussions and in-depth interviews during the course of this project. Based on the requirements of these stakeholders

Producers

The key requirement of the producers across the product categories has been summarized in the Table 13-1. The value proposition that the GROWTH CENTER would offer has been presented in the right-hand column that augurs well to meet these requirements.

Table 13-1: Requirements of Producers and value proposition through market development initiatives

Key Requirements of the producers	Value proposition through the Market development initiatives
Aquaculture Category	
Fair weighting for the produce: The present traditional weighing system through 'balances' is not very accurate and results in improper measurement of weight and hence loss of revenues	A reliable weighting system (such as electronic scales) would improve trade volumes (fair weight) leading to more income for farmers
Transparent and fair pricing: The present pricing system is governed by the local traders and intermediaries with very less standardization	Competitive pricing w.r.t. to terminal markets. Farmers would inform on the daily prices of their product category to ensure transparency
Horticulture Category	
Transparent and fair pricing: The present pricing system is governed by the local traders and intermediaries with very less standardization	Competitive pricing w.r.t. to terminal markets. Farmers would informed on the daily prices of their product category to ensure transparency
Better transportation: The transportation system is not fully developed to pick the produce from farm gate. Farmers are dependent on intermediaries such as Farias for transportation	Transportation and aggregation facility at the market development initiatives would enable the farmers to improve trade volumes leading to more income for farmers
Affordability and availability of quality inputs such as high yielding hybrid seeds, and quality fertilizers	Availability of quality inputs at the market with expert advice would assist the farmers to improve the yield of their crops per acre
Dairy	

Key Requirements of the producers	Value proposition through the Market development initiatives
Fair measurement and transparent pricing for the milk: The present traditional measuring system is not very accurate and results in loss of revenues. The present pricing system is governed by the intermediaries (gwalas) with no benefits given for high quality milk (based on Fat and S&F content)	A reliable measuring system would improve trade volumes (fair weight) leading to more income for farmers. The payment to farmers would be done based on the quality of milk (Fat and S&F content) thereby promoting good cattle rearing practices
Availability and affordability of support service provider such as veterinary services on timely basis would result in improvement of productivity of the cattle	Availability of quality inputs at the market with expert advice (veterinary services) would assist the farmers to improve the yield of their cattle and earn more income

Source: Solidaridad primary research and analysis

These considerations would be taken while designing the operational model of the market and while designing the infrastructure and facilities at the market.

Intermediaries

The key requirements of the Intermediaries across the three product categories have been summarized in Table 13-2. The value proposition that the market would offer has been presented in the right-hand column that augurs well to meet these requirements.

Table 13-2: Requirements of Intermediaries and value proposition through GROWTH CENTER

Key Requirements of the Intermediaries	Value proposition through the GROWTH CENTER
Clean and reliable infrastructure for trading and adequate temporary storage facilities in the marketplace	Less product wastage due to efficient flow of products would lead to higher trading volumes and more earnings for the intermediaries
Auxiliary services such as boarding and lodging, canteen, especially for traders who come from distant terminal markets and have to make a transition stop	Adequate infrastructure for auxiliary services at affordable rates would attract long distance terminal buyers to the market
Lower Operational costs in terms of lower values of rent and electricity	Utilization of renewable energy technology and affordable building construction practices would lower operational cost for the intermediaries
Flexibility in trading hours would allow the traders to synchronize operations with the harvesting time of producers as well as with the preferred trading hours by customers	A flexible market opening/ closing timing would allow for more trading volume and hence better revenue realization for the intermediaries
Safety and credibility in the transactions and cash management as majority of the transactions are cash transactions	Safe and credible financial system through formal channels (banks, MFI, etc.) or mobile money (such as B-Kash) would improve the credibility of the market

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Consistency in the supply of produce specially for products with high seasonality	Less impact of volatility in the supply through proper storage facilities at the market
---	---

Source: *Solidaridad primary research and analysis*

These considerations would be taken while designing the operational model of the market and while designing the infrastructure and facilities at the market.

Customers

The key requirement of the producers across the three product categories has been summarized in below table. The value proposition that the GROWTH CENTER would offer has been presented in the right-hand column that augurs well to meet these requirements.

Table 13-3: Requirements of customer segments and value proposition through the market

Key Requirements of the Customers	Value proposition through the market
Aquaculture Category	
Traceability of the product to ensure regulatory and quality requirements especially for export oriented and processed products	Traceability of the product with information on producer and location would enable the customer to meet the regulatory and policy requirements
Transparent and fair pricing: The present pricing system is governed by the local traders and intermediaries with very less standardization	Competitive pricing w.r.t. to terminal markets. The buyers would inform on the daily prices of their product category across similar markets to ensure transparency
Timely delivery of the produce to preserve quality is very critical as aquaculture products are highly perishable and may have to be discarded if the quality is poor	Transportation and aggregation facility at the market would enable reduction in delivery times to the customer. In addition, use of refrigerated vans for transportation would preserve the quality of the produce
Horticulture Category	
Traceability and quality control is important for the customers focusing on safe and premium products such as conglomerates (input suppliers)	Traceability of produce with information on producer and location would enable the customer to meet its requirements and charge premium pricing
Transparent and fair pricing: The present pricing system is governed by the local traders and intermediaries with very less standardization	Competitive pricing w.r.t. to terminal markets. The buyers would inform on the daily prices of their product category across similar markets to ensure transparency
Temporary storage would be very useful for products that have high seasonality and may be utilized by the processing industries (such as tomato)	Less impact of short-term volatility in the supply of products through proper storage facilities at the market

Source: *Solidaridad primary research and analysis*

These considerations would be taken while designing the operational model of the market and while designing the infrastructure and facilities at the market.

a. Key activities carried out by the market across the 3 product categories

The operations at Growth center/Special hat bazar should be designed and formulated to benefit the entire key with significant value additional multiple levels in the supply chain. Key activities by market across all the product categories, namely aquaculture, horticulture and dairy have been discussed in the subsequent sections.

i. Aquaculture and Horticulture

Producers

Fair weight and fair price are the major requirements of both horticulture and aquaculture producers. The operations and activities at the market should be designed to meet these requirements:

- Fair weight through digital weighing system along with proper loading and unloading facility
- Communication on the market rates
- Display of information on prices and availability of inputs
- Facilitation of transportation of the produce from the farm gate (to be paid by producers)
- Trade receipts for ensuring fair price practices and traceability

Intermediaries

Intermediaries require good trading facilities with availability of the produce. The operations and activities at the GROWTH CENTER should be designed to meet these requirements:

- Setting hygiene standards through tiled floor for effective trading and auctioning
- Proper cleaning and washing to maintain hygiene before and after trade

Customers

Customers require high traceability (up to producer and farm level), good packaging to preserve the quality, transparency in prices and fair weighing. The operations and activities at the market should be designed to meet these requirements:

- Information on the source of produce (up to farm level) to ensure traceability
- Receipts of trade for ensuring fair price practice
- Fair weight through digital weighing system
- Sorting (manually or mechanized) to avoid mixing of spoiled / ripen and good quality products
- Grading to ensure that prices are charged as per grade
- Efficient packaging to preserve the quality
- Facilitation of transportation of the produce (to be paid by customers)

Value added service

In addition to fair trading, market should provide additional value-added services to different stakeholders to improve its competitive advantage

- Storage of products in a temporary storage facility to preserve quality of the product. Cold storage facility may be offered to certain product categories
- Packaging of the aquaculture produce in ice for preserving quality. Provision of an ice factory in the premises of the market
- Access to financial services including credit facilities for various stakeholders through formal financial channels (banks, MFIs, etc.)
- Training to farmers on modern agriculture practices

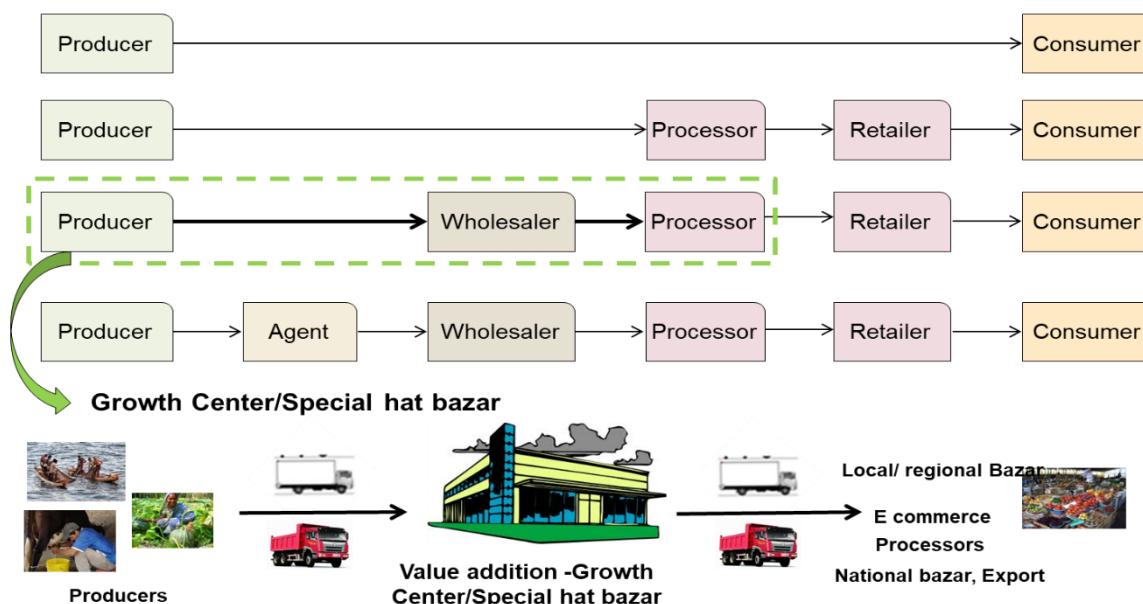
- Provision of supply of quality inputs through input store in the market

Distribution channel

A distribution channel for the Growth Center/Special hat bazar refers to how the produce is reaching to the end buyers from the farm gate. There are several ways that the produce can reach the end buyer (a wholesale buyer in this case) as shown in Figure Distribution channel for the market.

14 DISTRIBUTION CHANNEL

Distribution channel



15 OPERATION MODEL DESIGN OF THE GROWTH CENTER/ SPECIAL HAT BAZAR

The operational model design is a representation of how the Growth Center/Special hat bazar would operate through its various business units in order to accomplish its function of creating value for different stakeholders. The operational model typically defines various business processes (i.e. product flow design), activities carried out by different business units and facilities /infrastructure required for different business units to carry out the day to day activities. A detailed and robust operational model would enable strategic decision making for future expansion or diversification of the market in new geographies or product categories.

Subsequent sections would elaborate on the operational model design of the market. Operational models from similar market linkage programs in India and Bangladesh will be explored and key principles for designing the operational model will be identified. A framework will be developed in line with the requirement of the customers to decide on the appropriate operational model of the growth center/special hat bazar. The product flow design, infrastructure and facilities for the market will be decided based on the operational model design. The section would conclude with an analysis of the efficiency achieved through market initiatives in the existing supply chain in terms of cost, time and quality for different stakeholders.

Operational model observed for various agriculture market linkage programs in India and in Bangladesh

Some of the key agriculture market linkage programs in India and in Bangladesh (as discussed in section 5.1) were analysed to understand their operations and operational model. It was observed that the market linkage programs in general followed either one of the two models:

- a) Hub and Spoke Model
- b) Point to Point Model.

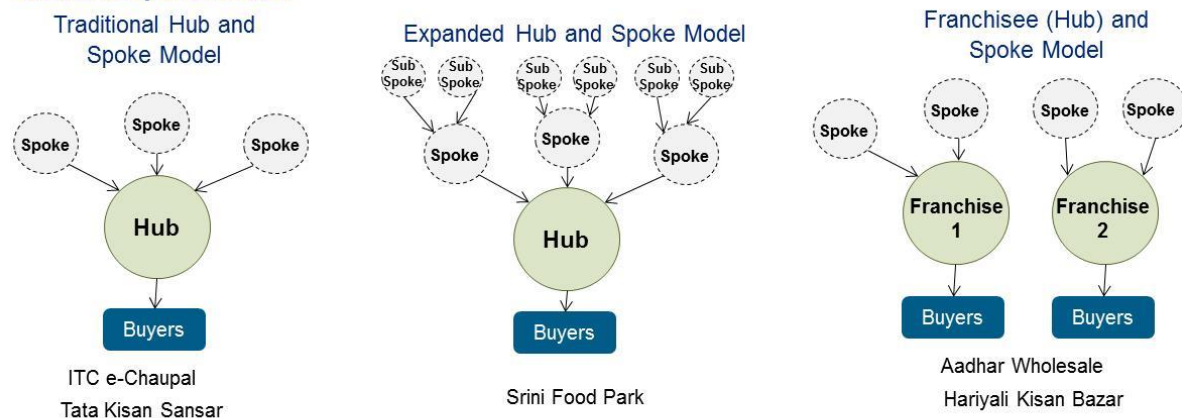
At-least three modifications or extensions were observed in the Hub and Spoke model. The first model consists of the traditional Hub and Spoke Model with a central hub and various spokes in which all processes and activities moves along spokes connected to the hub. ITC e-choupal, Tata Kisan Sansar were observed following this operational model. The second model 'Expanded Hub and Spoke Model' was an extension of the traditional model wherein additional levels and layers of spokes were observed. Srini Food Park is following this operational model. The third model 'Franchisee (Hub) and Spoke Model' was popular with the retail stores with focus on B2B or B2C buyers with several hubs and dedicated spokes. Reliance Fresh, Aadhar Wholesale and Hariyali Kisan Bazar were observed following this model. In almost all the cases the spokes acted as collection centres for aggregation of the produce and the Hub acted as the trading facility.

The point-to-point model is relatively simple with the collection centre directly supplying to the customer without any levels. This model was observed in McCain Foods India for sourcing Potatoes.

Figure 15-1 summarizes the two operational models along-with examples of a few companies utilizing these models.

Figure 15-1: Various operational models observed in agriculture market linkage programs in South Asia

Hub and Spoke Model



Point to Point Model



Source: Solidaridad Analysis 2014

All the operational models are unique in terms of the typical product mix they are suited for, and the governance and corporate structure followed to maintain and manage operations. A comparative analysis of all the operational models as discussed above has been shown in the table below. These parameters will be considered while designing the operational model of the Growth Center.

Table 15-1: Typical characteristics, product mix and governance structure for various operational models

Operational details	Typical Product Mix	Typical Governance Structure
Hub and Spoke Model		
<ul style="list-style-type: none"> Spoke typically act as collection centres for farmers /famer groups. Basic sorting and grading may occur at spoke Hub is the trading platform connecting the famer with the buyer. The produce is checked for quality and packaged as pert the requirement of the customer 	Combination of different agriculture commodities but usually limited to 2-3 product categories	<ul style="list-style-type: none"> Public Private Partnership (PPP) Model: The Spokes are run and managed by farmer led cooperatives. The Hub is typically run by private sector corporates Farmer Owned Model: Both Hub and Spoke run and managed by farmers Corporate Owned Model: Hub and Spoke run and managed by private sector corporates (processors, input providers)
Expanded Hub and Spoke Model		
<ul style="list-style-type: none"> An extension of the Hub and Spoke Model The additional spoke usually acts as Primary Processing Centers (PPC) where the produce is sorted, graded, washed and packaged PPC could also directly supply to buyers Hub usually consists of a processing facility where the processing is completed 	Product Mix is highly diversified ranging from processed food such as Juice, Pulp to Frozen Foods to Fresh Fruits and Vegetables	Public Private Partnership (PPP) Model: The first level Spokes (Collection Centres) are usually run by farmer groups or farmer led cooperatives, the second level spoke (Primary processing) and Hub (Central Processing) is usually run and managed by private sector corporates
Franchisee (Hub) and Spoke Model		
<ul style="list-style-type: none"> Popular with retail stores with focus on B2B or B2C buyers though B2C models are more common The Spokes act as collection centers where farmers sell their products. The Spokes are in very close vicinity or within the Hub Hub or Franchise is an outlet that could sell both to retail as well as wholesale buyers 	Product Mix is highly diversified for all categories of products that do not require much processing before use (fresh fruits, vegetables, milk etc.)	The collection centres as well as franchisee centres are usually run and managed by private sector corporates
Point to Point Model		
<ul style="list-style-type: none"> Simple point to point business model. Farmers bring the produce to Collection Centers from where it directly goes to a dedicated buyer. 	Practical model for one product category per collection center	<ul style="list-style-type: none"> The collection centers are usually run by private sector corporate (usually exporters & processors) Collection could happen through dedicated farmers (contract

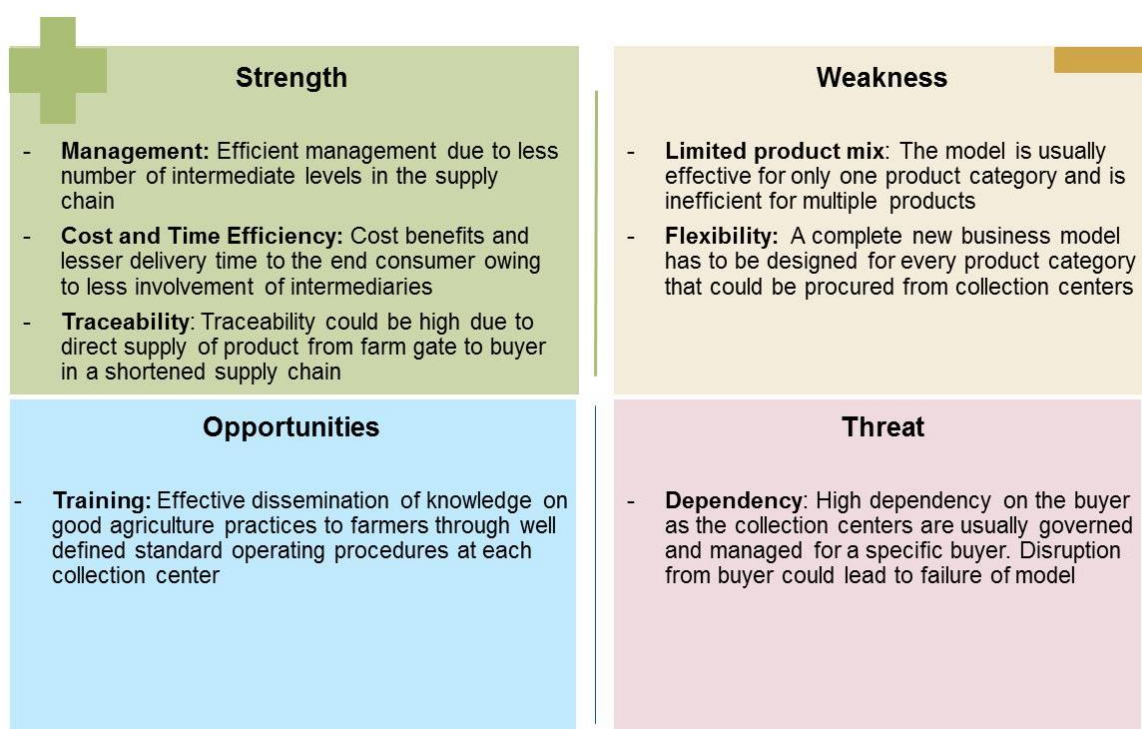
Operational details	Typical Product Mix	Typical Governance Structure
<ul style="list-style-type: none"> Basic sorting and grading could be done at collection centers 		farming) or producer groups or cooperatives

Source: *Solidaridad Analysis*

An overview of the internal strengths and weaknesses, and external opportunities and threats that the two operational models (i.e. Hub and Spoke and Point to Point) face it is presented in Figure 19-7

Figure 15-2: and Figure 15-3 in the form of a SWOT analysis.

Figure 15-2: SWOT Analysis for Hub and Spoke model



Source: *Soldaridad Analysis*

Figure 15-3: SWOT Analysis for Point to Point model

<p style="text-align: center;">Strength</p> <ul style="list-style-type: none"> - Aggregation: The model is useful in efficient sourcing from a large number of disparate small-scale farmers and aggregation at hub - Scalability: More spokes could be created with increase in production at various location and with requirement of new products - Quality Assurance: Quality check at each step (both hub and spoke) to ensure safe food supply chain 	<p style="text-align: center;">Weakness</p> <ul style="list-style-type: none"> - Higher Capital Costs and management of Working Capital is a challenge due to the multiple number of spokes - Linkage: High interdependency between hub and spoke makes it difficult to manage demand and supply in effective way - Management: Management of the spokes could be a challenge due to multiple product categories and varied location
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> - Entrepreneurship: Opportunity to develop large number of local entrepreneurs in the region for management of multiple spokes - Knowledge Sharing: Development of an ecosystem through sharing of best management and operation practices at various levels - Optimization: Opportunities exist for allocating optimum number of resources at different spokes depending on demand and supply in a season 	<p style="text-align: center;">Threat</p> <ul style="list-style-type: none"> - High dependency on hub: Integration between hub and spoke is critical and even a temporary failure at the Hub would disrupt the entire supply chain - Monitoring and Evaluation: Monitoring of the daily activities of spoke (especially with huge number of spokes) is difficult and could lead to fraudulent practices (such as theft)

Source: *Solidaridad Analysis*

Some of the critical parameters for market operational design (as per the requirement of the customers discussed in section 6.3) can be met through proper utilization of the Hub and Spoke model and Point to Point model. For instance, the Hub and Spoke model due to its multiple levels seems to be most suited for products requiring aggregation, quality check and efficient packaging. Similarly, the point-to-point model is much easier to manage and most suited for single product category. The subsequent sections would deep dive in the operational model design of the market.

16 OPERATIONAL MODEL DESIGN FOR THE GROWTH CENTER/HAT BAZAR

The requirements of different customer segments (as discussed in section 6.2) would be utilized to design the operational model of the growth center/special hat bazar such that customer value proposition could be accomplished. The competitive priorities for all the customer segments (i.e. aquaculture, horticulture and dairy or milk customers) could be segmented under the three main categories for efficiency improvement: Cost, quality and time.

Various customers under the three products categories were inquired and asked to rate their priorities or the value proposition that they would wish to achieve through market development initiatives. The top five key priorities for different customers (as collected and analysed during the primary research) can be segmented under the three main categories for efficiency improvement: Cost, quality and time are:

Cost Efficiency

- **Aggregation** of the produce at the growth center/special hat bazar to achieve economies of scale and sufficient volumes for trading
- A **transparent and fair pricing** system with respect to other terminal markets that would improve the credibility

Quality Efficiency

- **Traceability** of the produce to the product farmer and location. This would ensure that the export guidelines and requirements are met for certain customer segments. In addition, this would assist the customers to trace the source back in the supply chain in case of any quality assurance issues. Traceability could be a source of competitive advantage to the market development initiatives
- **Efficient Packaging** and/or Storage of the product. This would ensure that the quality is preserved and product flow between various stakeholders is optimized

Time Efficiency

- **Reduced time of delivery** for the products. Most of the products traded at the growth center/Special hat bazar (identified in section 3) are highly perishable items and hence timely delivery is critical to ensure that quality is preserved, and better price realizations are achieved.

The five parameters identified above will be utilized in deciding on the suitability of the operational model (Hub and Spoke or Point to Point etc) for various customer segments at the market development initiatives.

17 FRAMEWORK FOR CHOOSING APPROPRIATE OPERATIONAL MODEL FOR THE GROWTH CENTER/SPECIAL HAT BAZAR

All the key customer segments were asked to rate the importance and preference of the five identified parameters with respect to the operational design of the market development initiatives. Based on the level of importance and preferences, three color codes green, yellow and blank (no color) were allocated. Green color indicates that the identified parameter is of utmost importance to the customer and the customer is willing to pay or travel extra distance for the product. Similarly, a blank box indicates low priority for the buyer and no extra price is being paid for the product/service.

Based on the interviews with key buyer/customer segments the preferences for the identified five parameters has been plotted and shown in Figure 17-1.

Figure 17-1: Framework for selecting the important parameters for deciding the operational model for Growth Center/Special hat bazar

		Cost Efficiencies		Quality Efficiencies		Time Efficiencies
		Aggregation (economies of scale)	Auctioning at fair prices	Traceability	Efficient Packaging/Storage	Reduced time
Horticulture	Regional Buyer	Medium Preference	Medium Preference	Low Preference	Medium Preference	Medium Preference
	Terminal Buyer	Medium Preference	Medium Preference	Medium Preference	High Preference	Medium Preference
	Processor/Exporter	High Preference	Low Preference	High Preference	High Preference	Medium Preference
	Corporates (Input providers)	High Preference	Low Preference	High Preference	High Preference	Medium Preference
	E-Commerce	High Preference	Low Preference	High Preference	High Preference	High Preference
Aquaculture	Regional Buyer	Medium Preference	High Preference	Low Preference	Medium Preference	Medium Preference
	Terminal Buyer	Medium Preference	High Preference	Medium Preference	High Preference	High Preference
	Processor/Exporter	High Preference	Low Preference	High Preference	High Preference	High Preference
	E-Commerce	High Preference	Low Preference	High Preference	High Preference	High Preference
Dairy	Regional processor	Medium Preference	Low Preference	Low Preference	Low Preference	Medium Preference
	Processing Industry	High Preference	Low Preference	Medium Preference	High Preference	High Preference

■ High Preference
 ■ Medium Preference
 Low Preference

Source: Solidaridad Analysis

Based on the above framework, the two most important decision criteria for the buyers across all product categories have been identified as:

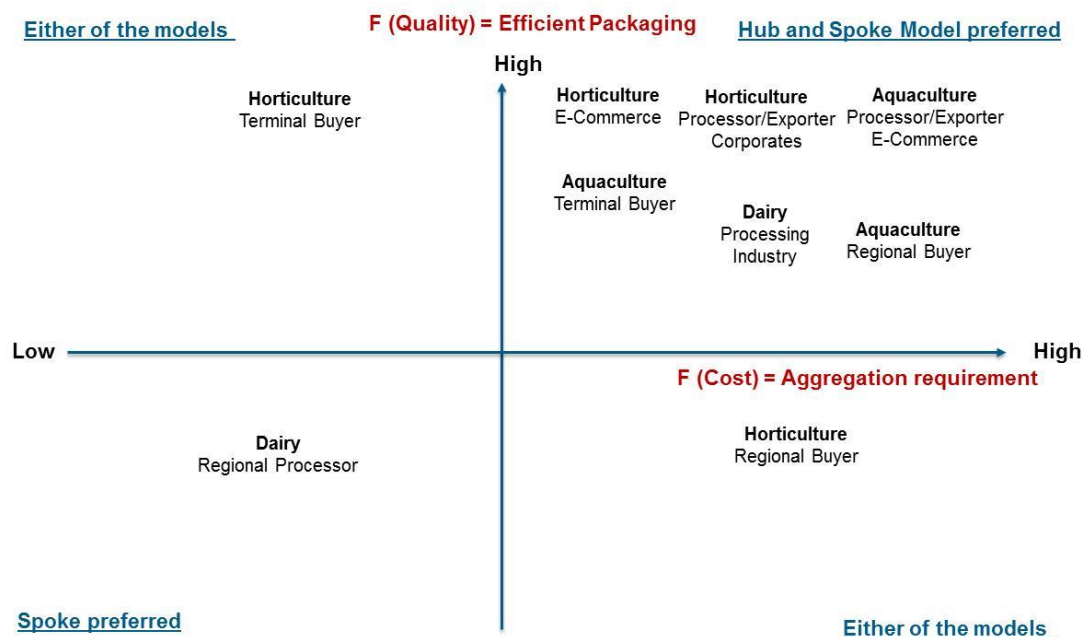
1. Aggregation of the product for economies of scale and cost efficiency and
2. Efficient Packaging/Storage of the product for quality efficiency

These two parameters will be utilized to decide on the applicability of business model (i.e. Hub and Spoke or point to point model) for different customer segments of the market development initiatives. As indicated in section 7.1 the Hub and Spoke model is suited for aggregation of the product and for multiple levels of quality check and efficient packaging. Hence it may be concluded that:

- For a buyer requiring high level of aggregation of the product and high level of packaging the Hub and Spoke model is preferred
- For a buyer requiring low level of aggregation of the product and low level of packaging the Spoke model (point to point) is preferred
- For the buyers requiring any other combination of requirements either Hub and Spoke model or Spoke model (point to point) could be utilized

Based on the above assertions, different categories of buyers for the market development initiatives may be placed in various brackets to identify the suitability of an operational model as shown in Figure 17-2.

Figure 17-2: Framework for choosing appropriate operational model for the GROWTH CENTER



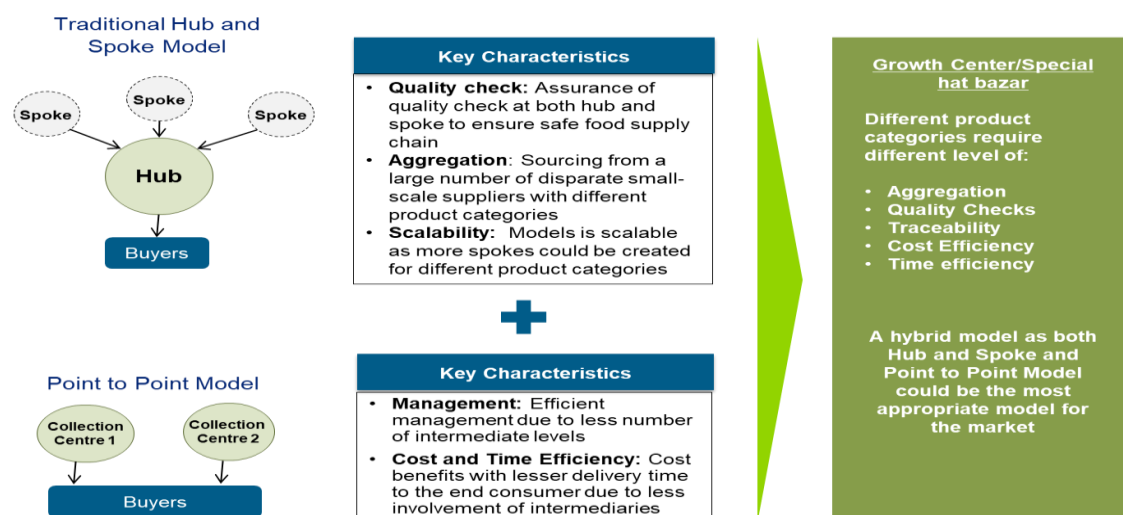
Source: Solidaridad Analysis

18 PROPOSED OPERATIONAL MODEL OF: HYBRID MODEL

The operational design of the market development initiatives should meet the requirements of all type of customer segments and hence a hybrid model i.e., a combination of Hub and Spoke and Spoke model (point to point) model is proposed. The Spokes in the would act as the collection centers and the Hub will act as the central marketplace for trading. Such a hybrid model would ensure that the requirements of all the customer segments are met through the Growth Center/ Special hat bazar. The proposed hybrid model of the market development initiatives has been shown in Figure 18-1 below.

Figure 18-1: Proposed operational model of the GROWTH CENTER: Hybrid Model

Proposed Operational model for Growth Center/ Special hat bazar: Hybrid Model



Source: Solidaridad Analysis

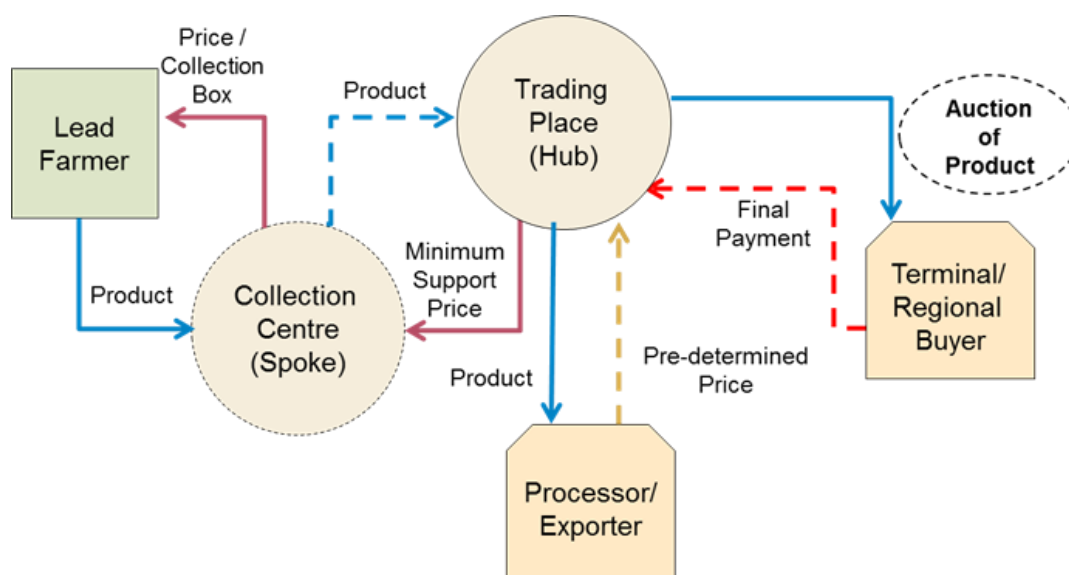
19 PRODUCT FLOW DESIGN FOR THE OPERATIONAL MODEL

As indicated in the section above, Growth Center/Special hat bazar should adopt a hybrid model for creating an effective linkage between the producer and the consumer. A few horticulture products could reach the end buyer (such as terminal market) directly through spoke but aquaculture products which require efficient packaging to preserve quality need to flow through hub. The product flow design for different product categories has been discussed in detail below:

i. Product flow design for Aquaculture products

Producers could send the product to collection centre individually or after aggregation through lead farmer in a pre-specified container. Collection centre would weigh, label, and transport the product to hub. Hub performs value added services such as sorting, grading, and packaging as per requirement of different customers. For terminal and regional market, auctioning could take place in the hub and for customers like exporter/processor and e-commerce companies' direct shipment could be sent through hub after proper packaging as per their requirement. Product flow and specific function of each entity is described below.

Figure 19-1: Product flow design for Aquaculture products

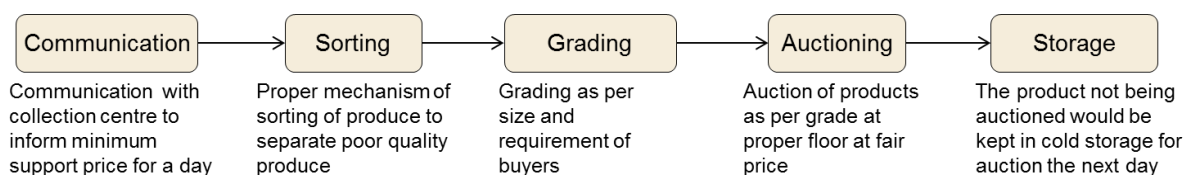


Source: Solidaridad Analysis

Role of Hub (Trading Place)

- To decide the minimum support price to be offered to farmer before the auction using information from market, buyers, and corporates
- To communicate minimum support price for a day to collection centre which further communicate it to farmer
- To provide facility for digital weighing, sorting, grading, icing and packaging for maintaining quality of produce.
- Provide facility for laser scanning to ensure traceability
- To perform auction for terminal and regional markets
- To store the product being unsold on a given day in the cold storage
- To manage all the cash/credit transactions

Figure 19-2: Activities carried out by the hub for aquaculture products

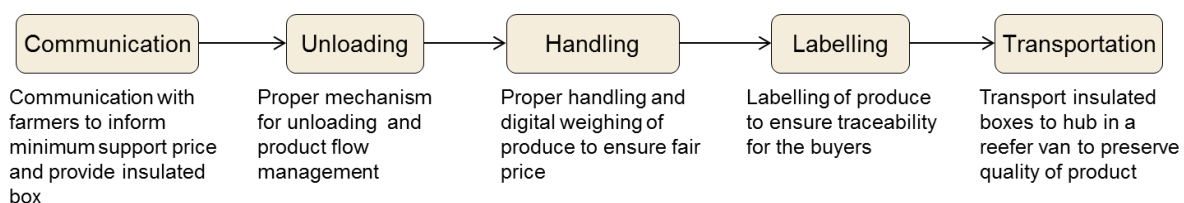


Source: *Solidaridad Analysis*

Role of Collection Centre

- To communicate minimum support prices offered by hub, on a daily basis, to the lead farmers & to distribute pre-weighed insulated box to farmers interested in selling their produce to Special hat bazar/ Growth Center
- To collect, weigh, label and transport the product to hub
- Utilization of ICT for recording the source of supply for ensuring traceability (such as utilization of bar codes and scanning machines)
- Provide printed receipts of weight to farmer to ensure fair trade practice
- Communicate about quality inputs available at the hub and their prices to the farmers.
- Training to farmers on the modern agriculture practices using ICT (Computer, internet, etc.)

Figure 19-3: Activities carried out by the spoke for aquaculture products



Source: *Solidaridad Analysis*

Role of Lead Farmer

- Lead farmer should communicate minimum support prices to farmer received for a particular aquaculture product on a particular day from collection centre
- Farmers willing to sell could collect pre-determined containers from collection centre and transport the same with product to GROWTH CENTER directly or through lead farmer

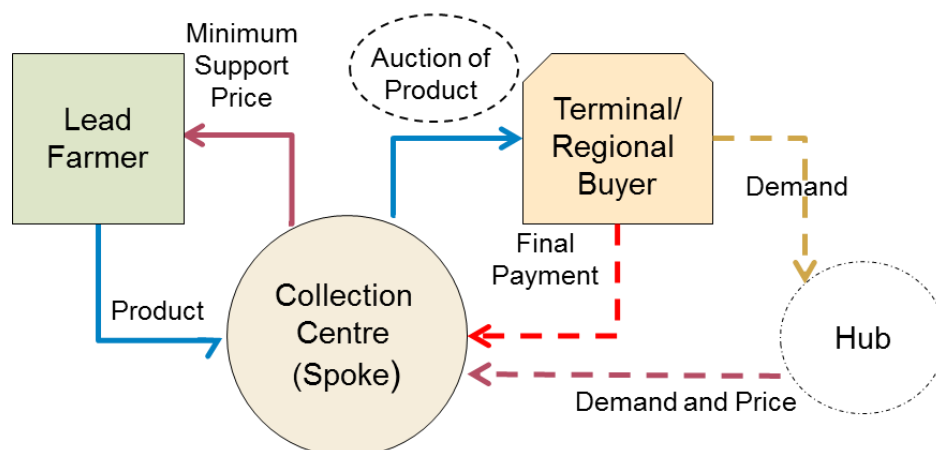
ii. Product flow design for Horticulture products

In horticulture, product could either flow directly to buyer (such as terminal markets) through collection centre (spoke) or could come to hub (for buyers such as conglomerates like ACI, Isaphani Group, etc. and terminal markets). The sorting, grading and packaging requirement for terminal market could be fulfilled at the spoke but specific packaging, labelling, and quality checks with traceability for each horticulture product could be provided only at the hub. Both the product flows are discussed in detail below.

1. Product transfer directly through collection centre (spoke)

Collection centre could directly sell product to terminal and regional market traders on negotiated prices as discussed in section 7.2. Producers would aggregate the produce and bring it to the collection centre. Collection centre would perform activities such as sorting, grading, and basic packaging for the terminal or regional market traders.

Figure 19-4: Product flow design for Horticulture products



Source: Solidaridad Analysis

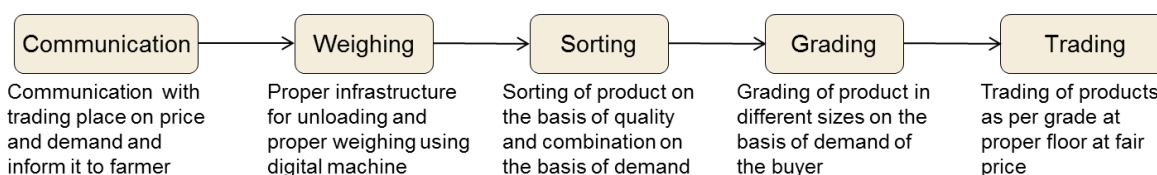
Role of Hub (Trading Place)

- Aggregation of demand for a particular product on a particular day from terminal and regional buyers
- According to demand, hub will allocate a collection centre or two from where the buyers can directly trade for the required horticulture products
- Communication of demand to collection centre and to prepare a roadmap for buyers in case there are 2 to 3 collection centre in small radius for fulfilling demand of buyers
- Communicate minimum price at which negotiation should start with the buyer for a particular product on a particular day

Role of Collection Centre (Spoke)

- Communicate minimum prices at which negotiation /auction will start for the day
- Communicate demand on a particular day to lead farmer and discuss if the same could be aggregated on that day at the spoke
- Weighing, sorting, and grading for the buyers
- Fair Trading and negotiation to receive fair price for the farmers
- Provide printed receipts of trading to farmer and the buyer as a fair trade practice
- Communicate about quality inputs available at the hub and their prices to the farmers.
- Training to farmers on the modern agriculture practices using ICT (Computer, internet, etc.)
- Aggregation of soil sample and provide to Soil Resource Development Institute (SRDI) for information on quality of soil and improvement mechanisms

Figure 19-5: Activities carried out by the hub for horticulture products



Source: Solidaridad Analysis

Role of Lead Farmer

The lead farmer, where possible, will be developed into entrepreneurs whose role will be work with the GROWTH CENTER in smoothening out the demand-supply imbalance of agricultural produce. In some

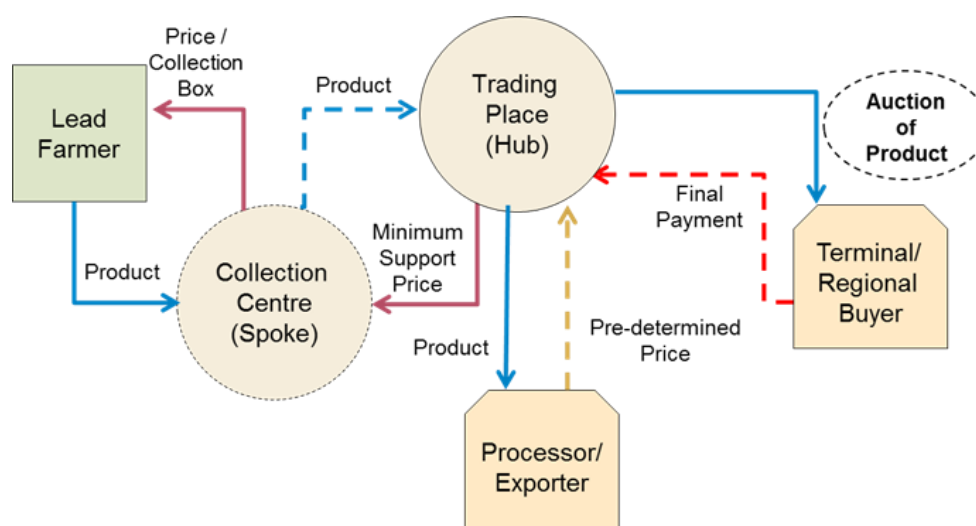
instances, they will also be responsible for managing demo farms and be a role model for other farmers in the region.

- Communicate minimum support prices to farmer received for a particular horticulture product on a particular day from collection centre
- Liaise with hub in ascertaining upcoming product requirement and working with local farmers to plan harvesting
- In case of shortfall link with other Market Development initiatives groups in the region and in case of excess product liaise with the hub to find alternate markets/customers

2. Auction of products through Hub

Producers would bring the product to collection centre individually or after aggregation through lead farmer. Collection centre would weigh, label and transport the product to hub. Hub performs value added services such as sorting, grading and packaging as per requirement of different customers. For customers like exporter/processor and e-commerce companies' direct shipment could be sent through hub after proper labelling and packaging as per their requirement. Product flow and specific function of each entity is described below.

Figure 19-6: Product flow design for Horticulture products (2)

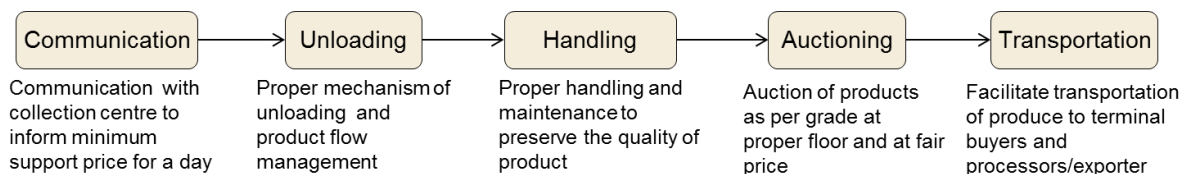


Source: SolidaridadAnalysis

Role of Hub (Trading Place)

- To decide the minimum support price to be offered to farmer before the auction using information from market, buyers, and corporates
- To communicate minimum support price for a day to collection centre which further communicate it to farmer
- To provide facility for digital weighing and special packaging for processors and input providers
- To perform auction for terminal and regional markets
- To provide traceability to premium buyers (exporters, input providers, etc.) till the producer level
- To manage all the cash/credit transactions

Figure 19-7: Activities carried out by the hub for horticulture products

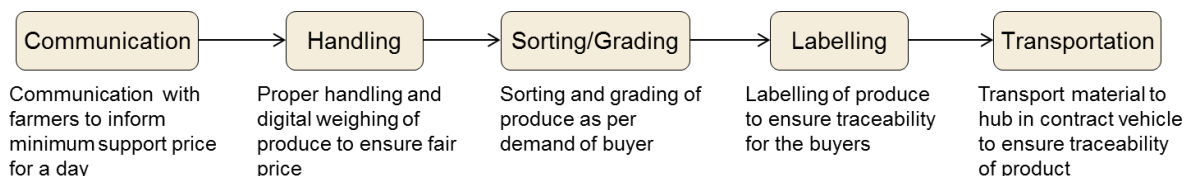


Source: *Solidaridad Analysis*

Role of Collection Centre

- To communicate minimum support prices offered by hub on a daily basis to the lead farmers
- To collect, weigh, sort, grade, label and transport the product to hub
- Utilization of ICT for recording the source of supply for ensuring traceability (such as utilization of bar codes and scanning machines)
- Provide printed receipts of weight to farmer to ensure fair trade practice
- Communicate about quality inputs available at the hub and their prices to the farmers.
- Training to farmers on the modern agriculture practices using ICT (Computer, internet, etc.)
- Aggregation of soil sample and provide to Soil Resource Development Institute (SRDI) for information on quality of soil and improvement mechanisms

Figure 19-8: Activities carried out by the spoke for horticulture products



Source: *Solidaridad Analysis*

Role of Lead Farmer

The lead farmer, where possible, will be developed into entrepreneurs whose role will be work with the GROWTH CENTER in smoothening out the demand-supply imbalance of agricultural produce. In some instances, they will also be responsible for managing demo farms and be a role model for other farmers in the region.

- Communicate minimum support prices to farmer received for a particular horticulture product on a particular day from collection centre
- Liaise with hub in ascertaining upcoming product requirement and working with local farmers to plan harvesting
- In case of shortfall link with other Market Development initiatives groups in the region and in case of excess product liaise with the hub to find alternate markets/customers

20 FACILITIES AND INFRASTRUCTURE TO BE PROVIDED IN GROWTH CENTER FOR SUCCESSFUL OPERATIONS

To perform the activities listed in section 7.4 for each product category, proper facilities and special infrastructure will be needed at the GROWTH CENTER. The infrastructure and facilities need to be customized and would be different for different product categories. Facilities and infrastructure requirement for each product category is listed below.

i. Facilities and infrastructure for aquaculture products

For aquaculture products, there will be a hub and spoke models for all the products and hence, facilities and infrastructure requirement at both will be critical.

Table 20-1: Facilities to be provided and infrastructure requirement at the collection centre (spoke)

S. No.	Facilities	Infrastructure
1.	SMS/Text facility using mobile giving an indication on pricing and demand	IT infrastructure (computer, mobile) for connection with hub and with farmers
2.	Loading and unloading facility followed by accurate weighing of products	Washing and cleaning facility if there is possibility of ripening due to poor hygiene
3.	Weighing, loading facility of produce in the reefer van	Insulated box for transporting the produce from farm gate to spoke to hub
4.	Labelling facility to ensure traceability	Bar Code machine and printer
5.	Transportation facility to collect from farmers and to transport produce to hub	Transportation vehicle (e.g., reefer van) mostly to collect produce from farm to spoke to hub
6.	Maintenance of records on the source of supply from different farmers	Small area for training to farmers on the modern agriculture practices
7.	Training to farmers on the modern agriculture practices	Receipts machine for both proper weight and price printing

Source: *SolidaridadAnalysis 2014*

Table 20-2: Facilities to be provided and infrastructure requirement at the trading place (hub)

S. No.	Facilities	Infrastructure
1.	Labelling reading facility to ensure traceability	IT infrastructure (computer, mobile and laser scanning machines)
2.	Trading and auctioning facilities for the produce based on grade and quality	Receipt machine for both trade prices and weight as transparent and fair-trade practice
3.	Storage facility for keeping the produce not being sold on a particular day	Equipment like forklift for easy transfer within hub, modern machinery, etc.
4.	Assessment of minimum support prices by analysis of market prices from different places	Auction and trading platform along with units for packaging of products
5.	Display of average rate for the day at the market for the community as fair-trade practice	Ice factory for packaging and cold storage for keeping the unsold produce
6.	Transportation facility to be managed by hub to collect produce from different spokes and to transport produce to distant buyers	Transportation vehicle for transporting product from spoke to hub and from hub to distant buyers
7.	Value added services such as access to credit, access to reasonably priced inputs	Rainwater harvesting, water treatment plant and solar power generation
8.	Support and Auxiliary Services such as canteen, medical facility, financial services	Auxiliary infrastructure such as ATMs, small stores for inputs, petrol pumps, etc.

Source: *SolidaridadAnalysis*

ii. Facilities and infrastructure for horticulture products

For horticulture products, there will be a hub and spoke model for some customers (input providers, processors, etc.) and there will be direct supply through collection centre for some customers (terminal and regional markets). Facilities and infrastructure requirement at both will be critical and is depended on operational model

1. Direct supply of product through collection centre to terminal and regional market buyers

Table 20-3: Facilities to be provided and infrastructure requirement at the collection centre (spoke)

S. No.	Facilities	Infrastructure
1.	SMS / Text facility using mobile giving an indication on pricing and demand	IT infrastructure (computer, mobile) for connection with hub and with farmers
2.	Loading and unloading facility followed by accurate weighing of products	Proper floor (tiled or concrete) for loading and unloading of product with digital weighing machine
3.	Washing to maintain freshness of fruits and vegetables	Drainage system to manage the water and drainage flow
4.	Sorting and grading of products for selling of products as per demand of buyer	Equipment for sorting and grading as per requirement of buyers
5.	Maintenance of records on the source of supply from different producers	Chalan or computer to maintain record of farmers coming to sell their produce
6.	Training on use of quality input and communication of rates for quality inputs available at hub	Rate chart for input products and supply of inputs to farmers from the hub
7.	Receipts of trade to both producer and buyer as a fair-trading practice	Printer for printing both fair weight and price
8.	Transportation facility to be paid by the producer and the buyer	Transportation vehicle for transfer of produce to and from collection centre

Source: *SolidaridadAnalysis 2014*

Table 20-4: Facilities to be provided and infrastructure requirement at the trading place (hub)

S. No.	Facilities	Infrastructure
1.	Assessment of minimum support prices by analysis of market prices from different places	IT infrastructure (computer, mobile) for connection with buyers and spoke
2.	Training on use of quality input and communication of rates for quality inputs available at hub	Auxiliary infrastructure such as small stores for inputs, etc.

Source: *SolidaridadAnalysis 2014*

2. Auction at hub or direct supply of product to conglomerates like input providers

Table 20-5: Facilities to be provided and infrastructure requirement at the collection centre (spoke)

S. No.	Facilities	Infrastructure
1.	SMS / Text facility using mobile giving an indication on pricing and demand	IT infrastructure (computer, mobile) for connection with hub and with farmers

S. No.	Facilities	Infrastructure
2.	Loading and unloading facility for the produce	Proper floor (tiled or concrete) for loading and unloading of product
3.	Weighing and loading facility of produce in the transportation vehicle	Digital weighing machine and slip to label the produce container
4.	Labelling facility to ensure traceability	Bar Code machine and printer
5.	Transportation facility to collect produce from farmers and to transport to hub	Transportation vehicle (e.g., pink up truck) to collect produce from farm to spoke to hub
6.	Maintenance of records on the source of supply from different farmers	Receipts machine for both proper weight and price printing
7.	Training to farmers on the modern agriculture practices	Small area for training to farmers on the modern agriculture practices
8.	Washing and cleaning facility to maintain freshness of the product	Drainage system to manage the water and drainage flow

Source: *SolidaridadAnalysis*

Table 20-6: Facilities to be provided and infrastructure requirement at the trading place (hub)

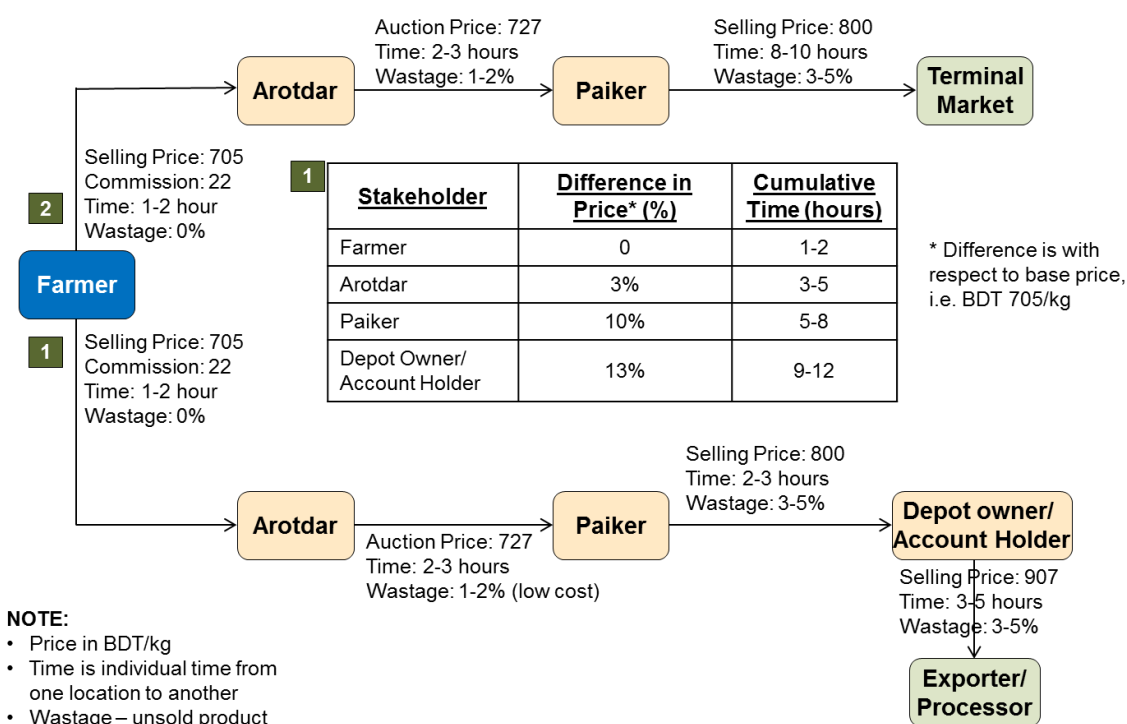
S. No.	Facilities	Infrastructure
1.	Labelling reading facility to ensure traceability	IT infrastructure (computer, mobile) for connection with buyers and spoke
2.	Trading and auctioning facilities for the produce based on grade and quality	Receipt machine for both trade prices and weight as transparent and fair-trade practice
3.	Storage facility for keeping the produce not being sold on a particular day	Cold storage infrastructure to keep the produce not being sold on a particular day in the market
4.	Assessment of minimum support prices by analysis of market prices from different places	Auction and trading platform along with units for packaging of products
5.	Display of average rate for the day at the market for the community as fair-trade practice	Equipment like forklift for easy transfer within hub, modern machinery, etc.
6.	Transportation facility to be managed by hub to collect produce from different spokes and to transport produce to distant buyers	Transportation vehicle for transporting product from spoke to hub and from hub to distant buyers
7.	Value added services such as access to credit, access to reasonably priced inputs	Rainwater harvesting, water treatment plant and solar power generation system
8.	Support and Auxiliary Services such as canteen, medical facility, financial services	Auxiliary infrastructure such as ATMs, small stores for inputs, petrol pumps, etc.

Source: *Survey Analysis*

21 VALUE CHAIN FOR SHRIMP THROUGH SPECIAL HAT BAZAR

Currently the value chain for terminal market is different from value chain for corporates. For the product to reach terminal market, paikers earns the highest revenue at the cost of risk of wastage during transportation and inability to sell at the distant market owing to competition by other paikers. The corporates on the other hand are dependent on account holder, who deals with paikers or arotdars and get the produce at the doorstep of corporates.

Figure 21-1: Analysis of value chain for shrimp through Special hatbazar



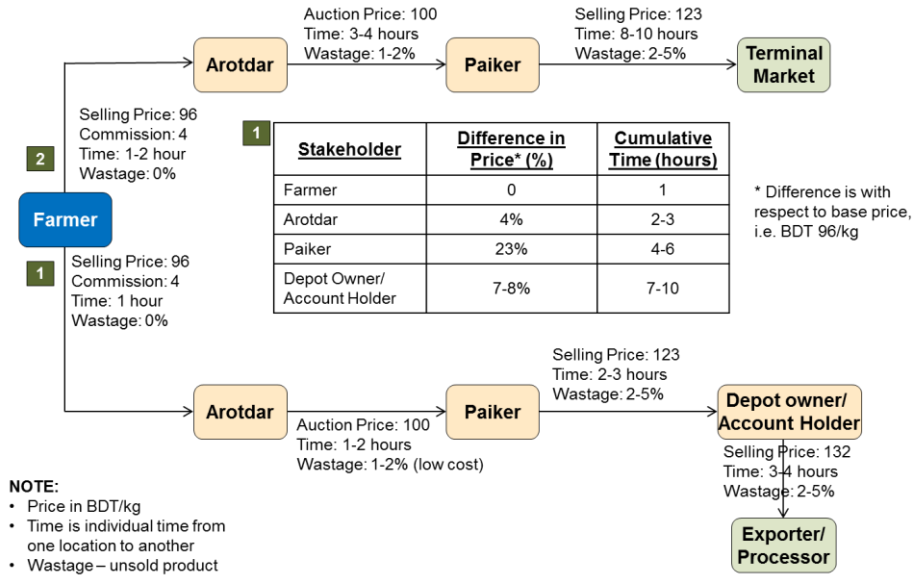
Source: Analysis 2014

Growth center is expected to create a direct linkage between the farmers and end consumers through arotdars who will operate in the growth center/special bazar complex and also it will facilitate supply of product directly to corporates. By establishing a linkage between farmers and corporates, Growth center/special bazar will bring a difference in the lives of farmers and their revenue is expected to increase by 3% and the corporate will also get premium quality product at cheaper price. The exporter and the account holder both would get products at 2-3% (quality product at BDT 890 from Growth center/special bazar instead of BDT 907 currently) lower price which would eventually benefit both the farmer and the end consumer. Exporters (processors) will also get bagda in 6-9 hours instead of 9-12 hours currently which would also play an important role in keeping the quality of fish. (Source: Solidaridad Analysis 2014)

21.1 Value chain for white fin fish through Special hat bazar

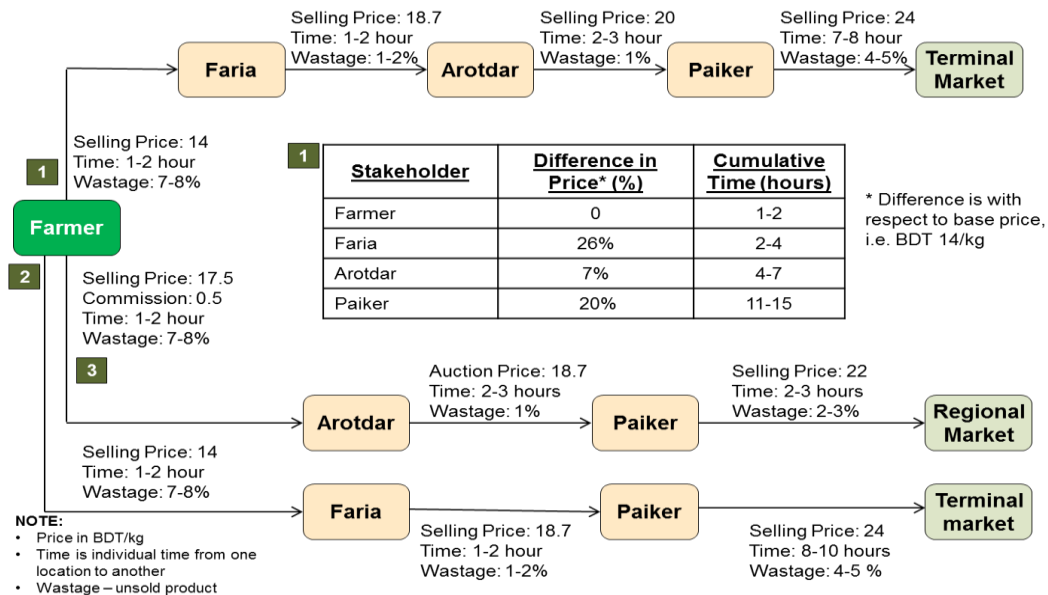
Similar to shrimp, arotdar earns 3-4% commission and paikers are the ones who make the most profit on the sale of fin fish. Paiker makes the most (23%) on fin fish. The processors get the fish in 7-10 hours of time which results in lower quality and hence, higher rejection at the processor level, thus results in further increase in cost for them.

Figure 21-2: Value chain of White Fish through GROWTH CENTER



21.2 Value chain for horticulture through Collection Center

Horticulture products such as cucumber, bottle gourd, bitter melon, brinjal etc. are generally collected at doorstep by farias who then aggregate and sell it to arotdar and earn commission. Farias earn high margins in horticulture (up to 25-26%). Paiker also earn huge margin and the whole process takes 11-15 hours before the product reach to end consumer. An illustration for value chain of cucumber is given below:



At Growth center/special bazar, farmers will find spoke at their vicinity, hence, it is expected that they themselves would travel and slowly their dependency on farias will reduce. If the farmers come directly to sell at Growth center/special bazar, they could earn a margin of BDT 2 per kg. Corporates would get the product at the same price but in reduced time and with traceability. The benefit by eliminating farias would directly benefit the farmers as shown below.

22 KEY PERFORMANCE INDICATORS (KPIs) FOR THE MARKET DEVELOPMENT INITIATIVES

The success of the GROWTH CENTER could be defined either in achievement of some levels of operational goal (e.g. 100% customer satisfaction, minimum wastage maximum environmental impact etc.) or in terms of making progress toward strategic goals (no of entrepreneurs developed etc). It is critical for the GROWTH CENTER to have a balanced scorecard in terms of defining the key performance indicators for its success. In addition, the KPIs should follow the SMART approach i.e. they should be:

- Specific – indicating a clear area or sector that has to be addressed
- Measurable – quantify an indicator of progress
- Assignable – specify who will be the key stakeholder to execute the task
- Realistic – the results should be realistically achieved, with the given resources
- Time-related –A time period should be specified when the result(s) could be achieved

The table below indicates some of the KPIs that are proposed for the Growth center/special bazar across four key categories Economic (financial indicator), Social Development (social goals), responsible sourcing (to ensure consistent supply), food security (to ensure good productivity) and environmental sustainability:

Parameter	Definition	How GROWTH CENTER will achieve the KPI
Economic	<ul style="list-style-type: none"> • Profitability of Growth center/special bazar should be more than the average yearly food inflation rate in Bangladesh 	<ul style="list-style-type: none"> • Percentage increase in income of Farmers & beneficiaries • Increase in volume of business transaction
Social Development	<ul style="list-style-type: none"> • Development of the farmers and their local community through net increase in income of farmer over the year • Number of women entrepreneurs developed in the year 	<ul style="list-style-type: none"> • Number of farmers linked for sustainable sourcing of inputs and outputs • Number of lead farmers converted to entrepreneurs • Number of women entrepreneurs included in the supply chain • Number of producer groups who have become part of commodity trade associations
Responsible Sourcing	<ul style="list-style-type: none"> • Sourcing ensuring traceability of product 	<ul style="list-style-type: none"> • Number of linkages developed between exporters, national supply chain actor, producer and farmer group
Food Security	<ul style="list-style-type: none"> • Lifting agricultural productivity to address volatility in food prices are under check 	<ul style="list-style-type: none"> • Measure the percentage improvement in production 'year over year' for the Market Development initiatives beneficiaries • Due to market facilitation the availability of food will increased.

Environmental Sustainability	<ul style="list-style-type: none"> • Minimising impact on environment 	<ul style="list-style-type: none"> • Percentage of energy utilised using renewable sources • Percentage of water discharged with treatment • Percentage of water collected through rainwater harvesting • Increase in treated waste disposal
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Source: *Solidaridad Analysis*

Achieving these KPIs year over year will be critical for the sustainability of the Growth center/special bazar. Some of the ways that these KPIs could be achieved and the key opportunities that could be developed by meeting these KPIs have been discussed briefly in the sections below.

a. Economic and Financial sustainability

Economic sustainability is most critical component for the Growth center/special bazar and any vagueness in its definition could lead to the failure of operations at the Growth center/special bazar. The Growth center/special bazar should ensure that its business volume is increasing and profitability maintained so that it can distribute the economic benefits to various stakeholders.

Various ways to measure key financial parameters in form of Management Information System (MIS) tools should be utilized by the management team of the Growth center/special bazar to continually monitor its financial performance. The MMC or the Board should meet at quarterly basis to review the financial performance of the Growth center/special bazar and corrective actions (including replacement of the management team if required) may be taken to bring Growth center/ special bazar economic performance back on track.

One of the ways to improve the volume of transactions (or traded volume) at the Growth center/special bazar is to continuously expand the suite of services that are provided to the buyers and the suppliers. Innovation in storage capacity and establishment of state-of-the-art cold storage units may be investigated after a first few years of successful operations of the Growth center/special bazar

To improve the existing traditional methods of cash transactions and payment clearing systems that may take several days to complete, proposal for establishing an evening bank or utilization of mobile money tools such as B-Kash could be investigated. These methods are expected to enhance the financial security at the Growth center compared to the other markets and make it more attractive for trading.

b. Social Development through promotion of local entrepreneurship

Social development in the rural areas has been linked to entrepreneurship. Entrepreneurship is seen as a strategic development intervention that could accelerate the rural development process and impact the livelihood of millions of people living in rural areas⁶. Entrepreneurship in rural communities in turn is increasingly linked to enterprise development in the rural areas. However the effectiveness of such interventions depends from where the promotion of entrepreneurship would come from and what are the incubation sources available for promoting it. Growth center/special bazar could play a key role in developing the entrepreneurship in the South-West region in Bangladesh and hence fulfil its social KPI in the process for a sustainable future. The Growth center/special bazar will note remove the intermediaries (for e.g. Arotdars) entirely from the supply chain, but will optimize their performance by connecting them through the Growth center/special for promoting entrepreneurship in the region.

Growth center/special bazar could facilitate the development of local enterprise and local entrepreneurs through various measures in its ownership structure of the assets. For instance some of the key assets of the Growth center/special bazar that are required for its operations may be allocated to promising entrepreneurs in the region. The collection centres may be run by a lead farmer (under the Market Development initiatives initiative) who may have good knowledge of the local supply situation in the region and could be trained on other aspects of managing the spoke. Similarly the local milk collectors or gwalas may be incentivized to become a local entrepreneur by managing the refrigerated collection units for the dairy supply chain. Such initiatives by the Growth center/special bazar could ensure that local entrepreneurship is promoted in the area. With time and success of this model, Growth center/special bazar should then investigate promoting women Entrepreneurship in these rural areas.

c. Responsible Sourcing: ICT for ensuring traceability and safe food

Traceability in the supply to ensure safe food and quality control is another key area where ICT infrastructure could play a very important role. Outbreaks of foodborne diseases (especially for perishable food items that the Growth center/special bazar is targeting) in the past few years has raised awareness of the need to ensure food quality and safety. This need would drive the technological innovation to trace the origin of food supply on a consistent basis⁷.

The Agriculture landscape in South-West Bangladesh is highly fragmented with small land holdings and farmers. These small-scale farmers may not be aware or lack the resources to comply with food safety standards particularly traceability requirements. Given the role of traceability in protecting the end consumers by ensuring food safety, and managing the reputational risks for the Growth center/special bazar, it is critical to integrate the small-scale farmers (initially the farmer groups in the Market Development initiatives initiative) in the supply chain through ICTs.

It is proposed that the Growth center/special bazar would have adequate ICT facilities to ensure traceability in the products initially for the Market Development initiatives program covered farmers. Each of the Market Development initiatives farmers is given an identification number through which details of the farmer and his farming practices may be recorded. The collection center will be equipped with Bar Coding (or other similar equipment) to allocate a unique code to the produce brought at the center from the Market Development initiatives farmer. This information will be recorded and stored at a central server facility at the Hub to ensure traceability in the produce. The packaging of the traceable product will be done accordingly to distinguish it from other products. The farmers under the Market Development initiatives initiative will be given requisite training on the safe food from time to time and the benefits (such as premium pricing and higher profit margins) be explained to them. In the next 3-4 years, all the products coming to the Growth center/special bazar will be targeted for meeting the traceability requirements. Traceability facility could thus be a source of competitive advantage for the Growth center/special bazar in the long term.

d. Food Security

Food security coupled with price volatility could severely impact the low-income population and farmer groups in many regions of Bangladesh. One of the ways to ensure food security is to increase agricultural productivity that would spur market activity in the Growth center/special bazar by promoting increased trade and the better functioning to directly benefit the low-income population in the region. Growth center/special bazar could facilitate the improvement in productivity (measured as yield or volume of production per hectare of land) through promotion of investments in agricultural research for various food categories of aquaculture, horticulture and dairy. In addition, Growth center/special bazar would also assist the farmers to have better access to quality inputs such as high yield seeds, improved

fertilizers and pesticides. The proposed KPI for food security of the Growth center/special bazar is the improvement in production 'year over year' for the Market Development initiatives farmer groups to be carried out each year after a few years of operation of the growth center/special bazar.

It may be noted that though the food security KPIs will be relevant in the long run (after a few years of operation of the Growth center/special bazar), they are critical for long term sustainability of the Growth center/special bazar.

e. Environmental Sustainability

Environmental sustainability for businesses is typically about making responsible decisions that will reduce the business' negative impact on the environment. It is not simply about reducing the amount of waste the business would typically produce because of its operations or using less energy, but is concerned with developing processes and systems that will lead to businesses becoming completely sustainable in the future. The Growth center/special bazar is expected to produce considerable amount of waste given the high perishable nature of the products being traded and hence environmental sustainability is a key part of the KPIs measurement. Some of the key areas where the Growth center/special bazar could investigate a long-term environmental sustainability plan or strategy could be related to water management, sanitation and waste management and use of renewable sources of energy. All these parameters are very relevant in the local context of Bangladesh

Water treatment facility and treatment of the sewage could play a major role in improving the environmental impact of the Growth center/special bazar. Establishment of a Sewage Treatment Plant (STP) for treatment of all forms of liquid sewage could be utilized and the discharge utilized for developing the landscape in and around the Growth center/special bazar. For maintenance of hygiene and water and sanitation, 'waterless urinal technology' could be utilized which does not use any chemicals for treatment of sewage. It has a unique mechanism of operation where a ball valve operates to open and close the flow of urine, preventing the odour from escaping while not using any water. Additionally, as discussed in section 7.8, it has been proposed that the Growth center/special bazar should harnesses renewable sources such as sunlight / solar power and rainwater.

Utilization of the STP, rainwater harvesting and solar power at the Growth center/special bazar is expected to create a positive environmental impact compared to the other traditional agriculture markets in Bangladesh.

23 RISKS AND RISK MITIGATION STRATEGY FOR THE GROWTH CENTER

Every organization in its incubation phasefaces various risk elements while doing the business. These risks may lead to internal business risks such as uncertainty in the operations, lower profits or danger of loss and external business risks that may impact the complete industry sectors as a whole. This section attempts to identify the key risks and mitigation strategies for the growth center/special bazar in context of Bangladesh; internal risks that impact the business operations of the Growth center/special bazar and external risks that impact the overall business environment and eco-system in which the Growth center/special bazar operates.

a. Internal risks and mitigation strategies

The internal risks for the the Growth center/special bazar can be identified utilizing the Corporation, Customer and Competition (CCC's) framework⁸. Focus on these three key factors could lead to the successful operations of the the Growth center/special bazar and hence the risks associated with each factor identified and suitable mitigation measures adopted by the the Growth center/special bazar.

The most likely internal risks factors that impact the operations of the the Growth center/special bazar have been captured along-with the appropriate mitigation measures in the table below.

Table 23-1: Internal risks and mitigation strategies for the the Growth center/special bazar

	Risk factor	Mitigation strategy
Corporation	High cost of land for construction of the the Growth center/special bazar or non-availability of land in an accessible location	<ul style="list-style-type: none"> • Work with local community to lease land or offer ownership stake in the the Growth center/special bazar
	Low availability of Produce specially for seasonal products could impact the trade volumes of the the Growth center/special bazar	<ul style="list-style-type: none"> • Improve the productivity of the farmer groups associated with the the Growth center/special bazar through supply of quality inputs (such as hybrid seeds, fertilizers etc.) from the Growth center/special bazar • Training on improving productivity, customizing the crop mix as per the soil quality and maintaining safe food farming practices
	Supply risks from famers in case of absence of facilities such as credit transactions	<ul style="list-style-type: none"> • Sustained communication with Market Development initiatives farmers to explain the benefits of income security and how association with the Growth center/special bazar would ensure a steady income to help them mitigate inflation risks and over supply shocks of the market. • Existing relationships with Arotdars and customers such as exporters would be leveraged to ensure consistent demand matching with supply.
	Lack of funding in case some key financiers such as EKN drop off in the subsequent phases of the program	<ul style="list-style-type: none"> • A contingency plan to be prepared by Solidaridad during the the Growth center/special bazar construction phase. Association with civil societies, NGOs and other donor agencies to be investigated for ensuring fund availability for the the Growth center/special bazar. It is expected that the the Growth center/special bazar will break-even after 4-5 years and would be self-sustainable beyond it
	Construction delays due to delay in approval, delay in mobilization of funds and external environmental conditions	<ul style="list-style-type: none"> • Ensure that the construction contracts and consultancy are executed by professional reputed firms with proven track record to minimize risks. A contingency plan and creation of a corpus fund for managing the delays (refer section 12.6 for more details)

Risk factor		Mitigation strategy
Customers	Lack of buyers willing to pay a premium price for the the Growth center/special bazar would impact the profitability of the the Growth center/special bazar	<ul style="list-style-type: none"> • Create partnerships with corporates and the private sector such as key agro-input and output buyers and processors/exporters willing to pay a premium price for quality products • Work with key intermediaries like 'Aarotdar' to leverage their networks
	Less acceptance of the product presentation (packaging etc) and quality measures	<ul style="list-style-type: none"> • Marketing and branding of the products for quality preservation efficient packaging • Quality measures adopted and traceability of the product could be printed on the packages as per customer requirements
Competition	High competition from local markets and informal markets in the region	<ul style="list-style-type: none"> • Constantly compare the Growth center/special bazar products & services, prices, channels and promotional efforts with the local markets. The marketing team of the the Growth center/special bazar to undertake this analysis on a periodic basis • Collaboration with other markets for development of market linkages and synergies for mutual benefits • Better payment and transparency in pricing to attract producers and buyers to the the Growth center/special bazar
	Competition arising in future as a result of change in business environment	<ul style="list-style-type: none"> • Identify areas of competitive advantage of the the Growth center/special bazar such as relationships with farmer groups in Market Development initiatives that are difficult to replicate by others • Ensure ongoing investment in improving farm productivity (food security) and product quality so that customers and farmer groups remain associated with the the Growth center/special bazar,

Source: Solidaridad Analysis

b. External risks and mitigation strategies

External risks are the risks that are not directly under control of the the Growth center/special bazar management team and impact the complete market eco-system in general in Bangladesh. These risks usually differ from country to country. The external risks for the the Growth center/special bazar can be identified using the PESTLE framework⁹ as shown in the table below with appropriate risk mitigation strategies.

Table 23-2: External risks and mitigation strategies for the the Growth center/special bazar

Risks		Mitigation strategy
Political	<ul style="list-style-type: none"> • Competitive Regulations (On the number of markets within a selected area) 	<ul style="list-style-type: none"> • Work with the regulatory authorities to select and approve the location of the marketplace

	Risks	Mitigation strategy
	<ul style="list-style-type: none"> Government rules and regulations (Ease of doing and establishing a business) Law and Order risks: Hartals and blockades from time to time may impact the functioning of the the Growth center/special bazar High level of political and internal corruption may impact the operations of the Growth center/special bazar 	<ul style="list-style-type: none"> Compliance check on government regulations to be a part of the roles and responsibilities of MMC Ensure that the Growth center/special bazar is politically neutral and aligned to development policies Develop alternative collection and sourcing mechanisms as appropriate for the commodities. As such for aquaculture, the harvesting and sourcing could be done on the weekend.
Economic	<ul style="list-style-type: none"> High fluctuation in prices leading to extreme demand supply mismatch Inflation leading to lower consumer confidence on spending may impact the price of produce 	<ul style="list-style-type: none"> Adequate storage of high seasonality products in the the Growth center/special bazar facilitated storage infrastructure
Social	<ul style="list-style-type: none"> Cultural behavior: Difficult to change attitude of people towards work (such as milking of cows) Understanding of the demand of safe food by the consumers and the premium price producer could charge for it Conflict of interest may arise in some situations as farmers may be involved in multiple interests (financial, emotional, or otherwise), one of which could possibly lower their motivation to supply to the the Growth center/special bazar 	<ul style="list-style-type: none"> Training programs for farmers on benefits through the Growth center/special bazar (e.g., self-milking and disease prevention) Training programs for farmers on correct usage of pesticides and probiotics. Premium price for safe food category products to the farmers Motivation of famers to supply to the the Growth center/special bazar could be improved through regular communication and explaining various benefits (financial and non-financial) on regular intervals
Technology	Lack of knowledge on the use of modern technology devices may lead to low productivity	<ul style="list-style-type: none"> Training on usage of modern technology devices with efficient energy usage
Legal	Unclear regulatory and taxation policies may impact the long-term economic sustainability of the the Growth center/special bazar	<ul style="list-style-type: none"> Compliance check with the taxation policies as a part of the roles and responsibility of the MMC
Environmental	<ul style="list-style-type: none"> Climatic changes (such as severe floods, drought) may impact the production and impact supply to the the Growth center/special bazar High amount of waste produced by the the Growth center/special bazar (unsold product/inferior quality product) could impact the environment 	<ul style="list-style-type: none"> Adequate storage of high seasonality products in the the Growth center/special bazar facilitated storage infrastructure. ICT infrastructure to predict weather patterns and take suitable steps for storage Waste management system and effective drainage system at the the Growth center/special bazar. Provision for Sewage Treatment Plant installation

24 RECOMMENDATION

INFRASTRUCTURE FACILITIES DEVELOPMENT

- Market structures need to take into consideration of proper shedding, ventilation, light and heat absorption to maintain product quality and shelf life.
- The design of the market should be customized based on geography, local ecosystem, nature of products and local demand.
- Design of the markets should consider cluster/block wise trading zone (grocery, input, fish, Fruits, Veg. etc.)
- Design should also consider facilities for product landing, washing, sorting, grading, packaging to facilitate transit to local, regional, national and export market.
- The growth center should have provision for Arot of (wholesale/auction) for expansion to meet the future demand.
- The suggested markets design should feature a separate transportation stand and circular transport path to avoid traffic congestion and to reduce trading lead time.
- Product loading –unloading should be more efficient to reduce physical damage.
- quality and shelf life.
- The design of the market should be customized based on geography, local ecosystem, nature of products and local demand.
- Design of the markets should consider cluster/block wise trading zone (grocery, input, fish, Fruits, Veg. etc.)
- Design should also consider facilities for product landing, washing, sorting, grading, packaging to facilitate transit to local, regional, national and export market.
- The growth center should have provision for Arot of (wholesale/auction) for expansion to meet the future demand.
- The suggested markets design should feature a separate transportation stand and circular transport path to avoid traffic congestion and to reduce trading lead time.
- Product loading –unloading should be more efficient to reduce physical damage.
- Market should have enough space for 'Open Trading' (OTC) specially in the growth center to encourage smallholders to take part in trading
- The special collection center (vegetable, fish and fruits) should have the following facilities to supply products to national and export markets:
 - -Modern packaging infrastructure
 - -Transitional cold storage
 - - Robust transport facility
- Market has to be established as one-stop service point for backward and forward linkages, including advisory services
 - -Facilities for input shop, modern storage facilities
 - -Information centers formed and managed by DAE
 - -Dedicated transport facilities for the farmers managed by MMC
- Social facilities need to be built/improved
 - -Toilets (outsourced to well-maintain the facility)
 - - Resting place
 - - Café/restaurant

OPERATION AND MANAGEMENT

- Improve better functionality of the MMC members thorough knowledge transfer and capacity building for managing day-to-day operation and market management

Draft Report

Project Name: Consultancy Services for Carrying Out Feasibility Study and Review Study on Rural Growth Centre/Hat Bazar under My Village My Town Project (MVMT)

- Capacity development of market actors on trade facilitation and entrepreneurship development, product knowledge and food safety management etc.
- Ensure legal requirements (license/Registration/certification etc.), monitoring of processing and value addition activities, farmers & traders' payment etc.
- Deployment of sufficient worker/labor/cleaner in the market for day to day activities
- Develop communication technologies like SMS / WhatsApp/voice facility giving an indication on pricing and demand for a particular product category to multiple stakeholders
- Develop market-based e commerce for integrating specialized products to urban buyers
- Develop facilities for women led business, young entrepreneurs and trade specific skilled labor

GOVERNANCE

- Improvement of transparency and governance for land acquisition, shop allocation, trading process, tender of the market etc.
- Improvement in process and procedures in annual tendering and revenue collection
- Review and update existing guideline /SOP for MCC on their role and responsibility, market management, utilities uses, uses of market development budget, market maintenance etc.
- MMC needs to work in coordination with the government authority (local administration and other relevant Dept.) to introduce ethical trading practices (Auction, weight, price etc.) for betterment of the farmers and traders.
- MMC needs to take steps to prevent adulteration and to promote grading and standardization of notified agricultural commodities.
- MCC meeting should be held regularly tracking implementation of meetings decisions.

COORDINATION AND HARMONIZATION

- DAE, DoF, DLSs, DAM, LGED, Ministry of agriculture, ministry of commerce, ministry of fisheries and livestock, and others line department coordination and harmonization is important for market centric agricultural value chain development.
- DAE and DoF could help for geography/ecology wise clusters development, including enhancing capacities of the farmers on production, and post-harvest management as per GAP standards.
- DAE and DoF could Govern and control the production and post-harvest management in particular use of pesticides and chemicals, residue limits, as well as hygiene requirements for post-harvest handling, and traceability
- Co-creation with private sector for exploring PPP investment in post-harvest management such warehouses, cold rooms, packing units, storage buildings, refrigerated trucks, and proper transportation facilities (Specially for seasonal and industrial fruits, vegetables, fish etc.)
- Exploring the provision of market and value chain based (Crop, seasons based) financial product development in coordination with different formal/informal banks, MFIs.
- Develop branding and marketing strategy for special region-based horticulture/Aquaculture/handicraft products in the national and international market

INNOVATION

- Consideration for Renewable Energy Use like Solar
- Develop bio-gas plant for efficient waste management and organic fertilizers production and improving the economic value and reducing the environmental footprint.

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- Fuel/Electric recharge considering future demand
- Poultry and cattle slaughtering facilities