

Minimization of Distribution Channels for Efficient Supply Chain

An agricultural & e-commerce perspective of Bangladesh

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Abstract

A typical agricultural supply chain is built around middlemen throughout the whole network - which is especially true for a developing country like Bangladesh. In both economic and agricultural perspective, the roles of middlemen can both directly and indirectly affect the market in terms of prices and product quality. Due to the frequent change of hands in the middlemen roster, it causes an offset in the appropriate pricing and quality of the products – which is equally valid for the e-commerce sector. In addition, the concept of e-commerce is relatively new in the economy of our country. All the more reason for a better setup of the e-commerce supply chain. As a developing country, Bangladesh faces a great deal of challenges when it comes to keeping the supply chains intact. A survey has been conducted on agricultural and e-commerce purchasing behaviour of consumers. The major problems identified in the survey were increasing price of agricultural products,

decreasing product quality, prolonged delivery time and unavailability of products. In order to address this problem, it is necessary to come up with ways to minimize the number of middlemen in the agricultural and e-commerce supply chains. Some possible potential methods such as co-operative model, contract farming, common buyer-seller platform, linking the distribution with technology can be introduced to effectively eliminate this problem. For e-commerce, skipping steps in circulation channel, market feedback, website-to-customer transportation are the potential solutions.

1. Introduction

Middlemen are intermediaries working independently in between any two stages of a supply chain. They usually work as an intercessor or agent between two parties specifically - a dealer, agent, or company intermediate between the producer of products and therefore the distributor or consumer. In particular, agricultural and e-commerce supply chains consist of a bulk of middlemen in between two stages of the distribution network. In the conventional agricultural supply chain of Bangladesh, middlemen play significant roles in ensuring that the product advances from the producer towards the consumer. However, in an upgraded global perception of supply chain management, a middleman can be deemed as redundant. The existence of a long chain of middlemen in the distribution network causes a hike in price of different agricultural commodities and most profits are lost in different layers of commissions. Additionally, there are higher rates of potentially damaged products as they move through multiple stages before finally ending up at the consumers' doorstep. In this paper, several potential solutions regarding the supply chain discrepancies in the agricultural and e-commerce sector of Bangladesh have been portrayed.

2. Literature Review

The existing studies conducted on the agricultural inconsistencies in the field of middlemen shows that the costs of products are relatively lower when multiple layers of distribution channels are reduced and different scenarios are evaluated. The exploitation of the producer community (farmers) was addressed and this initiated a huge impact on functionalities of food supply chains like grain, vegetables etc. Corresponding previous researches suggest at least five stages in

the distribution network can be condensed into one and thereby, eliminating the chain of middlemen. However, in the perspective of Bangladesh, some of these are not feasible and need customisations in accordance with existing market system and customer behaviour of the country. In terms of e-commerce, customers prefer to receive their desired products directly from the source – which eliminates or reduces the possibility of damage caused by the frequent change of hands. It is also observed, due to the unethical characteristics of the intermediaries the physical attributes of the ordered products are modified or changed. Middlemen in the e-commerce business also indicate that a simple buying process would be slowed down.

3. Problem description

3.1 Agriculture

Food grains are considered as the most reasonably priced edibles and great sources of energy and protein compared to other food items – which suggests its involvement in food and nutrition security for the low-income classes. This scenario is very much similar for most developing countries worldwide. And Bangladesh is no exception in this case. Even though Bangladesh is a small country, it is popularly known for its wide variety of soils and their high fertility status. In addition, the crops and grains grown here are exceptionally natural and diversified in category. Despite so many plus points, the supply chain network of the grain sector is not up to the mark. In fact, there are many opportunities of achieving a more efficient food grain supply chain. One of the core loopholes as noticed in most of the cases is – the middlemen. Middlemen or different distribution channels play a vital role in any supply chain, only if their functions are performed accordingly (without any discrepancies). In Bangladesh, the major challenge in agriculture is keeping the food supply chain intact. So, the more the number of distribution channels, the harder it is to maintain the supply chain network. However, it might not be possible to eliminate middlemen but the supply chain can be shortened through ‘Forward Integrated Cooperatives’. This is a process designed to help small farmers for higher income and sustainability.

Besides, in many agricultural markets of the sub-continent, the middlemen exploit the efforts the farmers put in producing different grain crops. The main reason for such unethical business practice is that – these traders and multi-layered distributors mostly think of their profits and are indifferent regarding the economic prosperity of the country. In the case of vegetable supply chain two stages of distribution in the supply chain has numerous intermediaries between them. For the vegetable distribution system, a regular change of hands is rather a common phenomenon. Since fresh products such as vegetables are valued primarily for their quality, it is not suitable for them to go through such an enormous distribution channel. The larger the distribution channel, the greater the potential for vegetables to be harmed due to frequent changes of hands. It is also a problem as the prices of vegetables are likely to be higher with the increased number of intermediaries in the distribution channel. There has been a sharp rise in the number of middlemen challenging the purchase and transport of fishery products to the venture. At the same time, however, their actions put tremendous pressure on the raw material producers and build chaos, a problem for the management of the raw material supply system. For middlemen, farmers or producers are being manipulated by low-cost offers and higher interest rates. For this reason, they stay in the poverty trap because their income does not increase. Fishermen are aware of the exploitation but for some circumstances they are forced to rely on the middlemen.

3.2 E-commerce

The evolution of digital technologies accompanied by the boom of e-commerce means - brands will comparatively set up online stores and work with delivery partners if they don't have their own delivery fleet, or if they have to supplement it. As brands, corporations and makers become popular with marketing direct to customers, this trend can only grow. In Bangladesh, as the e-commerce trend is not yet fully utilized, the supply chains regulating the online businesses need restructuring for efficiency purposes. The core components of the supply chain and logistics processes of the online business industry include- inventory management, reverse logistics and optimized service level. Due to the increase of middlemen, these simple yet significant components are being difficult to keep in sync. Most problems faced in the supply chain of this industry include-

- Demand response time is lengthy

- Outdated in terms of feedback technologies and logistics
- Maintenance of third-party logistics is difficult.
- The processing time of products is time consuming
- More outbound shipping costs.

As the aforesaid issues are noticed, it is only clear that without the proper management of the e-commerce supply chain - it fails to fulfil the core purpose of the concept of e-commerce. Moreover

4. Methodology

4.1 Agriculture

Grain Supply Chain

In order to combat the challenges in the middlemen department of the supply chain, there is need for active policy actions to increase **farm productivity, post-harvest technology** and **better storage facilities**.

Economists suggest – a cooperative model may eliminate these middlemen dominated market setups. In a cooperative model, the following features are observed:

- Farmers get at least 70% of the market price of their produce.
- Most of the warehouses are near the cities, which is increasing post-harvest losses through rotting. Therefore, the warehouses should be made available near to the farmers' locations. Then the produce can be stored and search can be made for the better market price.

- Technology can be applied as an essential advantage in this model; the farmers should enroll with different start-ups – those that will provide a *common platform* for buyers and sellers (farmers). This will remove multi-layers (middlemen) and reduce it to one or two layers (suggesting a more efficient supply chain network).
- A very significant role of this model is - it removes “Information Asymmetry”. In Contract Theory and Economics, information asymmetry deals with the study of decisions in transactions, where one party has better information than the other. Since middlemen is reduced in this model, the flow of information between producers (farmers) and consumers (buyers) will be accurate.

The main objective of the “*Co-operative model*” is – to bring the **producers** as close as possible to the **consumers**.

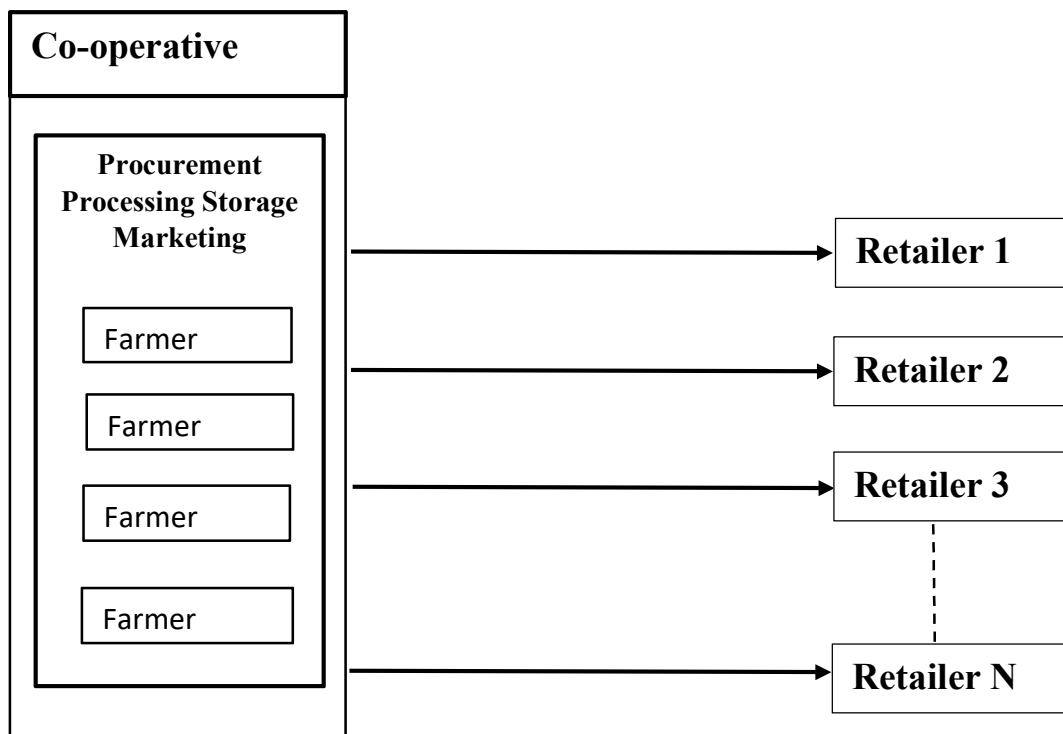


Fig: Co-operative supply chain model

The model eliminates the commission agent, mark-up and additional costs, wholesaler wastage and handling cost. Another viable approach would be “Contract Farming”.

In contract farming, farmers work under contracts by making it a system for the production and supply of grain with an industrial partner. The contract will include a commitment from the farmer to provide a specific agricultural commodity at a certain time, in a fixed quantity and of a specific quality. In this model, the buyer (industrial partners) agrees to provide certain essential inputs like seeds, fertilizers, technology and credit. This helps the farmers a great deal as they get access to the inputs and the market at a reasonable price. In addition, the processor gets an assured supply of raw materials – which enhances the efficiency of the supply chain. It also contributes in cutting down additional and handling costs.

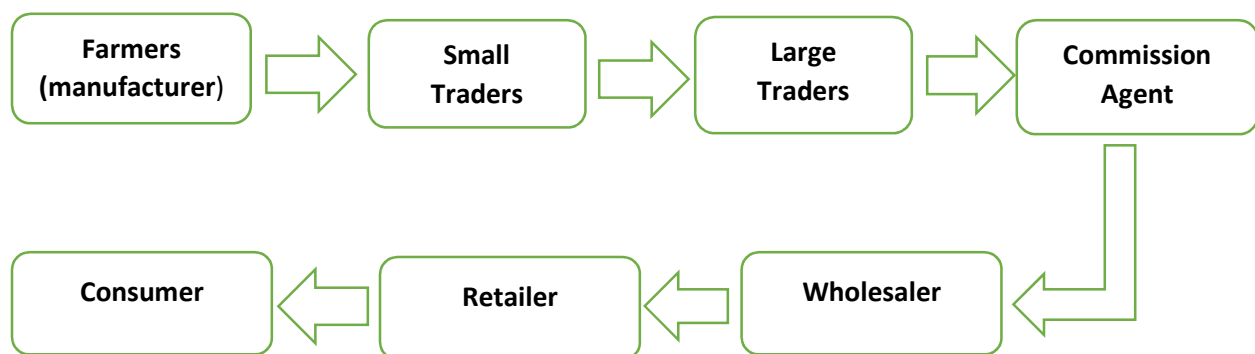


Fig: Contract Farming Supply Chain Model

Vegetable Supply Chain

The traditional vegetable distribution process in Bangladesh follows a long chain that begins with the manufactures and ends when the goods meet the customers it was intended for. But these two stages of distribution in the supply chain has numerous intermediaries between them. For the vegetable distribution system, a regular change of hands is rather a common phenomenon. Since fresh products such as vegetables are valued primarily for their quality, it is not suitable for them to go through such an enormous distribution channel. The larger the distribution channel, the greater the potential for vegetables to be harmed due to frequent changes of hands. It is also a concern as more the channels involved in the vegetable distribution network higher the prices of vegetables are likely to be. Even though middlemen in the distribution network play an important role in connecting farmers to traders and final markets, measures should be taken to minimize this distribution channel as much as possible. In fact, this is the case in developing countries such as Bangladesh, where consumer failure is ubiquitous and food chains are still made up of many measures, the minimization of the distribution channel is essential for an efficient supply chain.

Generally, a typical vegetable distribution channel works as below:



Even though these middlemen have significant roles in the vegetable distribution channel, a large number of intermediate middlemen is redundant. And their practices may often be perceived as unsolicited, unwanted and thus they may be

considered as detrimental to the food chain by farmers and consumers. For example, middlemen have been severally accused of adulterating agri-foods at different levels, decreasing consumer benefits and rising agribusiness profits. And it is also noticed that a longer network increases the price of the vegetables for the final consumer as the vegetables have to go through numerous stages till it reaches them, where the middlemen run their chores to increase the profit for themselves but from where the farmers get no benefit from. And as the vegetables change a lot of hands during this distribution process, their tendency to get damaged increases rapidly.

As seen in the common vegetable distribution network, the vegetables have to go through at least 5 stages till it reaches the customer. With proper measures those 5 stages can be condensed in to one. Which will result in a better price for both the customer and the farmers. It will also mean that the freshness and quality of the vegetables will be effectively stored, and the potential threats of the vegetables getting damaged will be reduced to minimum. To cut the middlemen out, the farmers can also form a co-operative market where they themselves play the role as the bridge between manufacturers and customers. Vegetable producers may create cooperatives to obtain better prices. Where they sell the vegetables they grow, such as the good ones, via auction. For example, CDP market for sale in Khulna. To reduce the role of intermediaries, the government or local authority may promote the establishment of a community marketing place and collection centers. Technology is also a great way to reduce middlemen in the distribution channel for the farmers to get the right price. As many startups are gathering pace in this era, the farmers can easily involve themselves and collaborate with startups related to agriculture to get the right price, cut middlemen in the channel and to ensure superior product quality. For example, FARMNATION a startup in India that has a farm to kitchen policy, where they are able to reduce the huge cluster of middlemen in the distribution network and solve all the problems that arise in between. A common platform can be introduced for the buyers and sellers that removes the multi-layers of the distribution channel or reduces it to one or two.

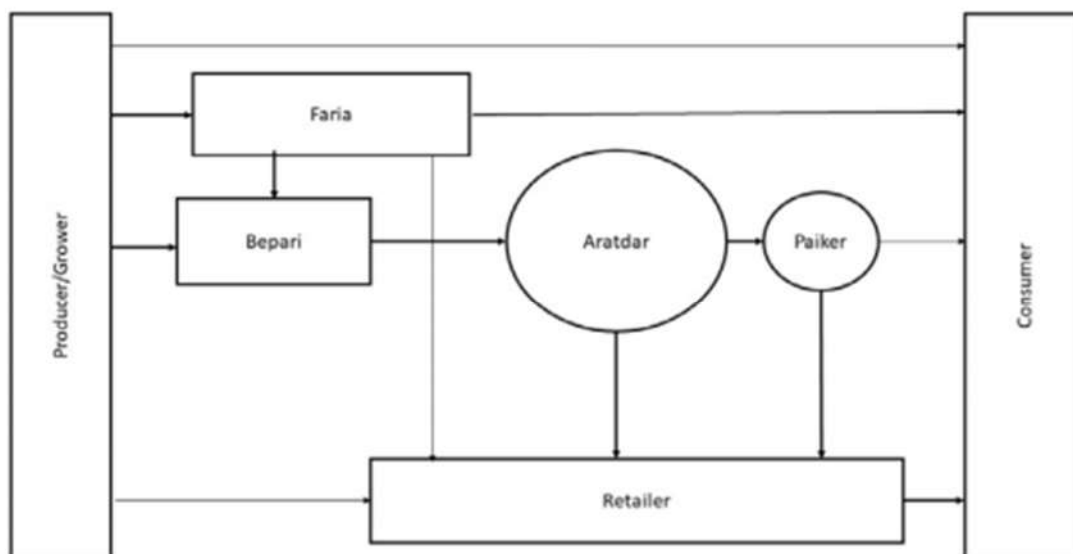


Figure: a common downstream vegetable supply chain

Introducing a common platform for buyers and sellers that will condense all the intermediaries such as bepari, atradar, paiker etc in to a single channel will reduce the cluster of middlemen in the distribution network and not only ensure fair prices for both parties but also ensure product quality.

Minimization of middlemen in the distribution channel can be very fruitful for the market and for the overall economy. From a study it is derived that, in Ethiopia Gross profit for farmers without intermediation was 225% higher. This may be explained by the fact that these farmers have access to better quality inputs, better contract requirements and higher prices for their goods. So, it is quite evident that the minimization of distribution channel for efficient supply chain is not only potentially fruitful for Bangladesh but also for the other countries of the world. For contrast a Gross profit analysis of potato farmers of Ethiopia selling through middlemen versus directly to wholesalers is shown below (Per 100kg):

Cost and Profit:	Farmers selling through middlemen (in Ethiopian birr)	Farmers selling directly to wholesalers

Total cost	9678	10585
Total Revenue	11985	18085
Gross Profit	2307	7500
Profit Percentage	19%	41%

This is the scenario portrayed only through one vegetable (potato) which is also true for other vegetables too. And the similar scenario also exists in Bangladesh where a cluster of middlemen in the distribution channel causes the prices of vegetables to increase. Which is only one of the backlashes we face for a large number of middlemen in the vegetable distribution channel. Minimization of this distribution channel can be very helpful in making the vegetable supply chain more efficient.

Fisheries Supply Chain

Bangladesh, with its prosperous inland waters and river system, has enormous fishery and aquaculture potential. The fisheries sector plays a vital role in the national income of our country. Approximately, 17 million people (1.4 million women) depends on fisheries sector for their livelihoods through fishing, farming, fish handling etc. Agriculture sector has experienced huge growth over the last decades, with the fisheries sector. According to the fishery industry estimates, fish production will reach about 5.02million metric ton within 2020-21. Currently there are 14.7 million fish farmers and 902 fish hatcheries in our country.

The fisheries sector in Bangladesh has been earning a remarkable amount of foreign exchange. The highest export earnings in the last 10 years was BDT 4,776.92 by exporting 77.33 thousand MT of fish and fisheries product. Though the country is endowed with huge fishery assets which are indispensable to the livelihood of millions of people and countrywide food and diet security, the sector is dealing with major problems. One of the few problems which this industry is facing over the past years is in the supply chain industry. There has been a sharp increase in the number of middlemen challenge the purchasing, transporting of fisheries products to a venture. But their activities concurrently put huge pressure on raw material producers and create disorder, problem for managing the raw material supply system. Re-arrangement of middlemen force should be identified

as a pinnacle priority in the development strategy of the fisheries processing enterprise in Bangladesh. Though middlemen are the connectors, the windows to a faraway market, local and overseas. Middlemen can be eliminated but not their functions. For a fact, middlemen perform the marketing functions for the farmers, buying product from the farmers and distributing through the channels. The relation between the farmers and middlemen is consensual but not always a win-win situation. It can be said that it is an asymmetrical relationship between these two types of people.

- For the middlemen, the farmers or the producers are being exploited through low-cost offerings and a higher rate of interests.
- For this they remain in the poverty trap because their income does not get improved.
- They proportionally give low returns to the producers

Fishermen are aware of the exploitation but for some circumstances they are forced to rely on the middlemen. There have been many cases that the fishermen are unable to repay the loans from the middlemen and thus they are forced to sell their harvest to repay loans, sometimes for life. The fishermen work hard day and night to harvest fish, but middlemen here play an evil role. Mostly fishermen are not that much educated, and they are misled with innumerable market information.

There can be possible solutions for this. Such as,

- The fishermen can be middlemen themselves by selling directly to retailers and customers.
- They can form farmer co-operatives.
- The co-ops can take benefit of the development of information and communication technology (ICT) to achieve access to the market records and increase their enterprise beyond the common spheres of the nearby market.

Farmer co-operatives are fantastic solution for the small farmers. Under the fine shelter of co-operatives, the farmers can have a bargain power with the big-time dealers. The co-operatives furnish more benefits such as entrepreneurship, education, and neighborhood spirit. The co-operatives can evoke the sharing of production, processing, and marketing processes between the farmers. The farmers will get better access to market and suppliers, there will be risk mitigation and there will be a great democratic management system. Additionally, incentives must be provided to the co-operatives to start their business and help the small farmers in their day to day life. It must be supported with innovations that are necessary

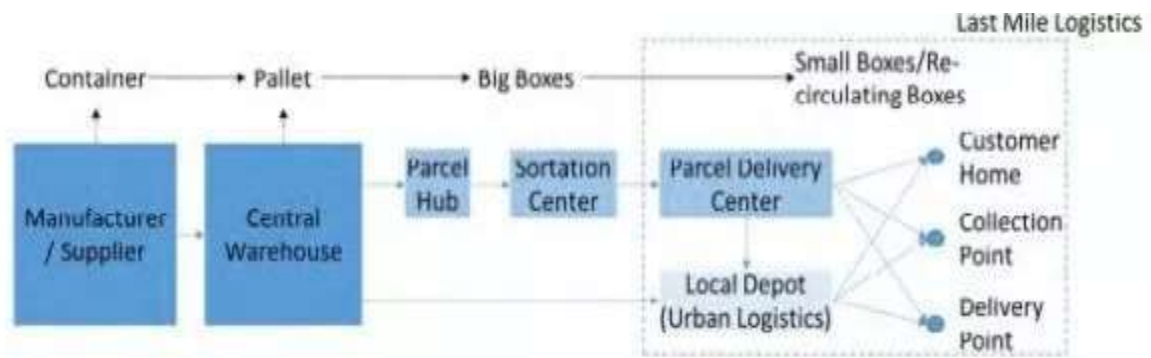
and suitable for the small farmers such as internet applications and ICT things for business, small gadgets, and machines.

4.2 E-commerce supply chain

The rapid evolution of technology along with business processes has led the current global trading system to shift towards online platforms. Everyday new businesses are entering the online market rather than the previously used traditional platforms. To cope up with this trend, the traditional supply chain systems are also evolving. E-business does not require the active line-up of middlemen if they perfectly set up their websites. The strategies for removing additional middlemen from the e-commerce supply chain include –

- Developing internal fulfillment of services related to logistics. This will eliminate the need for using third party logistics- removing additional layers of middlemen.
- The core components of an ecommerce supply chain involve: **“Optimized Inventory Management”, “Reverse Logistics”, “Product availability and Service level”**. To properly execute these steps, the internal labor management is more important than appointing external groups. So, training should be provided to the internal team as they would take over the roles that were previously performed by outside parties. This will not only keep the supply chain smoothly functioning but also reduce additional costs related to logistics and other factors.
- The use of different supply chain software and implementation of new information systems will give an accurate guideline for using only those distribution channels which are obligatory. This will result in the filtering of needless layers of distribution channels. The examples of these software include: E2open, SAP SCM, Logility, Perfect Commerce, Oracle SCM, Infor SCM, Watson Supply Chain etc.
- Online based “Apps” or such applications are gradually becoming more and more available in Bangladesh which is helping the ecommerce industry run more efficiently. However, these applications should be upgraded so that different activities like customer reviews, customer suggestions etc. can be executed more efficiently. This will lessen the need for employing different service companies that perform these activities as third parties.

A diagram showing how the e-commerce supply chain runs:



Incorporating the above-mentioned structure with more effective inbound activities, increasing capacity of existing warehouses, increasing the number of picked orders per day – it will be possible to turn around the functioning pattern of the e-business supply chain. It will also reduce the unnecessary layers of middlemen.

5. Findings & Analysis

After conducting the questionnaires survey, the main issues concerning the distribution channels of agricultural products and e-commerce supply chain are high prices of grain and vegetable products, improper distribution, preferences of freshness regarding fish products etc. From the survey, it is observed that consumers prefer purchasing agricultural products for a weekly stock, in which case freshness of the food grains and vegetables is integral for their purchasing decisions.

Consumer opinion on agricultural and e-commerce sector in the supply chain perspective:

Buying behaviour	Percentage (%)
Frequency in the purchase of agricultural products (weekly basis)	55.7

Dissatisfaction with vegetable prices	57.4
Preference in buying grain products in large volumes	60.7
Too many distributors as the reason for price hike in rice market	39.3
Lack of freshness in the fish market	32.8
Freshness as the main criterion for buying fish	85.2

From the above table, it is observed – 55.7 % of the surveyed population prefer to buy agricultural products for a weekly stock. This clearly depicts freshness and non-damaged products are the main concerns for these consumers. Additionally, 57.4% of the lot- are not satisfied with the market price of vegetables. 60.7% people who were surveyed, choose to buy grain products in bulk. Moving ahead, 39.3% of the respondents identify a long chain of middlemen as the core reason for price hike in the rice market. Lastly, the remaining two categories depict that freshness should always lead the buying decisions when it comes to fisheries; 85.2% people chose freshness over other criteria – accompanied by 32.8% affirming the dearth of fresh produce in the existing fish market.

As the previously mentioned issues are also prevalent in the study conducted here – the data obtained further justifies the facts that middlemen are indeed triggering an offset in the efficiency of the aforementioned supply chains.

Purchasing Behaviour	Percentage (%)
More efficiency in e-commerce industry	41
Need to increase product quality	42.6
Purchase of food grains and vegetables online	41.6

From the above data, it is justified to say- a good number of consumers are not satisfied with the functioning approach of the current e-commerce industry in Bangladesh. It might not occur to everyone the ways in which product quality gets reduced due to the change in hands through so many distribution pathways. However, 42.6% of the surveyed respondents shows that it's not an uncommon phenomenon. In every case, there prevails a possibility that the desired product might incur unexpected damages or deviations in quality as the product moves

through a variety of middlemen before finally reaching the end consumer. Nowadays, consumers even buy agricultural produces in online platforms. A good percentage of participants comply to that fact; 41.6%. It is observed that almost everyone prefers freshness over other purchase factors – when it comes to agricultural food products. If there are too many middlemen in between, then it not only delays the delivery time but also causes difficulty in retaining the freshness of the products.

6. Recommendation

After conducting a thorough study on the aforementioned issues, it is recommended:

- There should be more warehouses available to the farmers' areas. It would aid in storing the produces, retaining the freshness. This will reduce the need for additional middlemen for transporting the produces to different city warehouses.
- Farmers should get acquainted with different start-ups that help them sell directly to consumers or at least through less distribution channels in between. It would help in obtaining a fair market price, resulting in a win-win situation for both producer and consumer.
- E-commerce companies should utilize existing warehouse spaces more efficiently. A need for additional storage places solves both money and time.
- The use of third-party logistics should be avoided and internal fulfilment should be ensured.

7. Conclusion

There is always more room for updates and improvements in different supply chain processes. Especially, the proper functioning of agriculture and e-commerce industries is correlated to the economic welfare of Bangladesh. As a developing country, it is important to always look for better opportunities in these sectors.

More often than not, a smooth flow between the different stages of a supply chain plays a vital role in accomplishing the desired success in a business. Regardless of the importance of middlemen in different supply chain structures, unnecessary or excess layers will result in more impediments rather than enhancements.

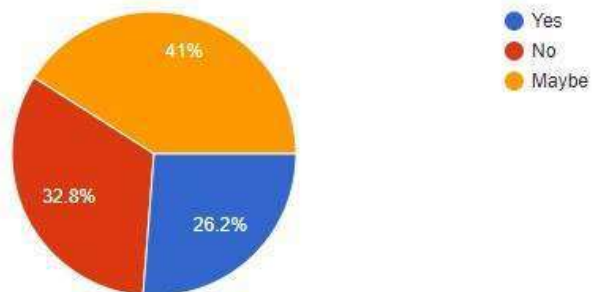
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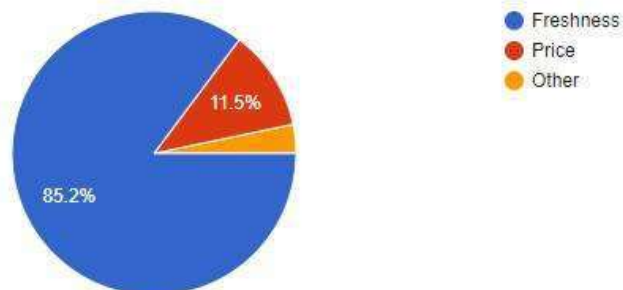
Appendix

Survey Questionnaire:

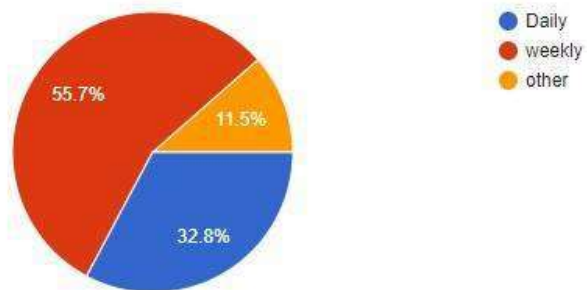
Do you think the fish market is in alignment with customer choices? (considering freshness and price)



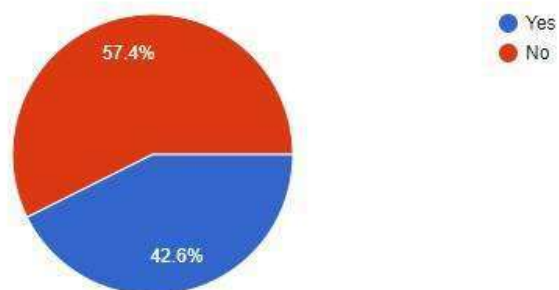
What is your main concern while purchasing fish?



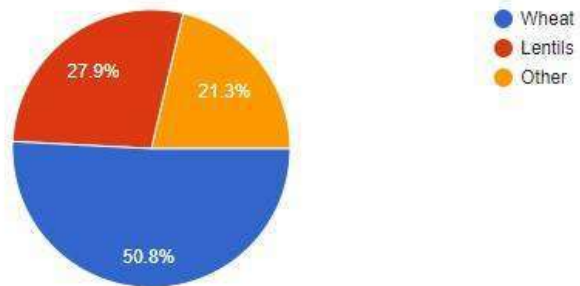
How often do you purchase agricultural products ?(food grains, vegetables, fish etc.)



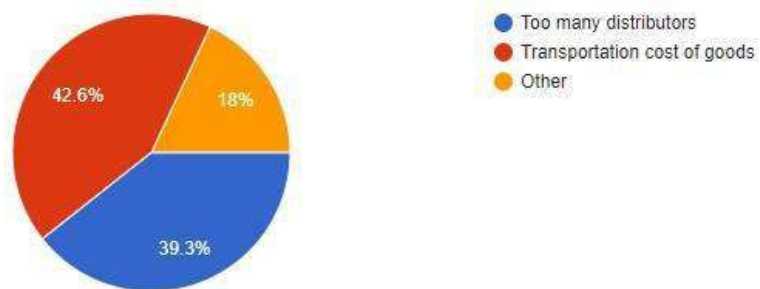
Are you satisfied with the market price of vegetables?



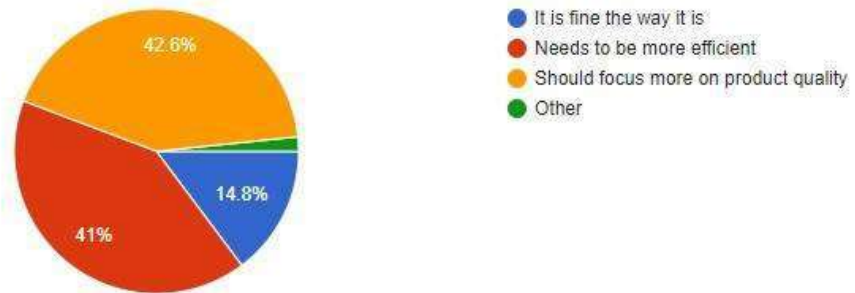
Which grain product do you buy more often? (except rice)



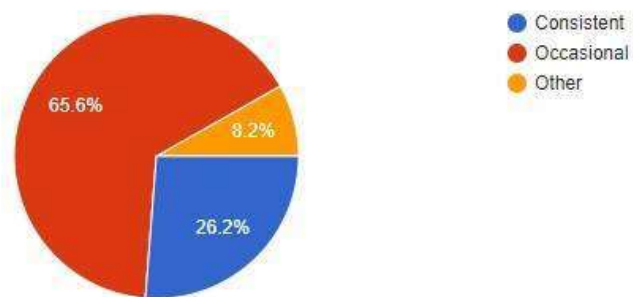
What do you think causes the increase in price in the rice market?



According to you what is the current condition of the e-commerce industry in Bangladesh?



How is your online shopping activity?



How does the pandemic (Covid-19) affect online shopping for you?



Which of the following agricultural products do you buy more often online?

