

Trade route for E-commerce for farmers of rural areas of North 24 Parganas, West Bengal, India

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Abstract

In this research article, we have studied the E-commerce operating status in the rural area of North 24 Parganas. We have found the farmers are facing many challenges and limitations due to the pandemic situation of COVID-19 and we have developed the solution for each challenge and limitation. To find the challenges and limitations we have surveyed the rural area's farmers and farming business experts. The pandemic situation caused a total shutdown of all economic activities in the whole world. In this harsh situation, the import and export of agricultural products have stopped which causes the rise in the price of food products and the poor people are sleeping in hunger. In this situation of pandemic and food security, the globalization process has also been stopped. The government has still not taken any aggressive steps to realize the right to adequate food and reduce hunger and support the poor in this tough situation. We have concluded the implementation of E-commerce in the rural area for the development of farmers, trade, and globalization for the betterment of farmers as well as the development of healthy relations with other countries.

Keywords: Farmers, E-commerce, Globalization, Trade route, COVID-19.

1. Introduction

At the end of the year 2019, the corona virus started to spread. By March 2020 many governments have announced lockdown as and precautionary step to stop the spreading of the virus. In this process, millions of people have lost their jobs and many businesses are badly hit. This pandemic situation caused to total stoppage of the globalization process across the world. When the discussion comes to farmers' situation it seems that the developed country's farmers are in fair condition as they cannot have any access to physical market but in the alternative, they have attached with the E-commerce platform which is acting as a buying and selling platform. But in developing and under-developing countries the condition of farmers is worse because they rely on the nearest physical market and other state markets by importing and exporting the agricultural products by transportation. As we already know the government has imposed a lockdown and restriction on all transportation services which is a direct economic loss for farmers and wastage of all stock of agricultural products. In the situation of the pandemic, many people came into poverty which is causing them to fall into

malnutrition. The pandemic situation caused in shortage of supply of food products and an increase in prices the farmers have enough stock to feed the population but the stock is wasted and kept to rot because of a lack of proper storage facilities.

Previously the globalization process opened many opportunities like growing interdependency, the flow of investments, cross border transactions of goods and services. In this study, we have shown that food insecurity, high food product prices, malnutrition, and lack of access to food, combining all these factors will be a major source of conflict. Our major concern here is to demonstrate the shortest trading routes of North 24 Parganas to start the globalization process again for the betterment of farmers of rural areas of North 24 Parganas which will result in proper distribution of agricultural products across the border and making a healthy relationship with neighboring countries. Our major point is to connect the farmers of the rural areas with the neighboring countries which are operating and relying on the nearest physical market and making a trade practice of agricultural products which support globalization and peace, globalization and conflict, or neither hypothesis. Because of a lack of study on the connection of factors like food insecurity, high food product prices, malnutrition, lack of access to food, and the relationship is to be summarized to integrate an analytical frame structure. This literature review fills the gaps between the demand of the population and the supply of agricultural products and transforming the existing conflict literature into a healthy one and changing the historical trends.

The final perspective of our study is to consider the globalization process connecting the farmers of North 24 Parganas with the E-commerce platform to contribute to more peace and provide food security. We conclude with the solution and suggestion of how scrutiny of the rural market and urban market-level conditions of farmer's production and trade, and the wide concept of globalization process might be helpful to distribute the agricultural products and to formulate a more comprehensive process of agricultural activities for the research and policy.

2. The situation of North 24 Parganas.

Why North 24 Parganas important

North 24 Parganas is a district in southern West Bengal, India. The district extends from latitude 22°11'6" north to 23°15'2" north and from longitude 88°20' east to 89° east. The total area is 4094 square kilometers. Barasat is the district headquarters of North 24 Parganas and this district is West Bengal's most populous district. North 24 Pargana is the tenth-largest district in West Bengal by area and the second-most densely populated district in India, approximately 3,781/km² as of the 2007 census.

Tropical, North 24 Parganas is warm and humid most of the year around. However, the winter months, from November to February are cold, sunny, dry, and very pleasant. Monsoon hits in the starting week of June and lasts till the end of September. During this period, it rains regularly. The relative humidity is around 50%.

Summer:	24-40	degrees	C
Winter:	9-26	degrees	C
Monsoons:	June	to	September
Rainfall: 175 Cms			

As the climate is suitable for agriculture and the soil is considered to be the most fertile for crop production. The type of soil varies from sandy to clay sandy loam. The physiographic structure of the district of North 24 Parganas is mostly plain.

(source http://north24parganas.gov.in/about_district/geography). (Bengal, 2020)

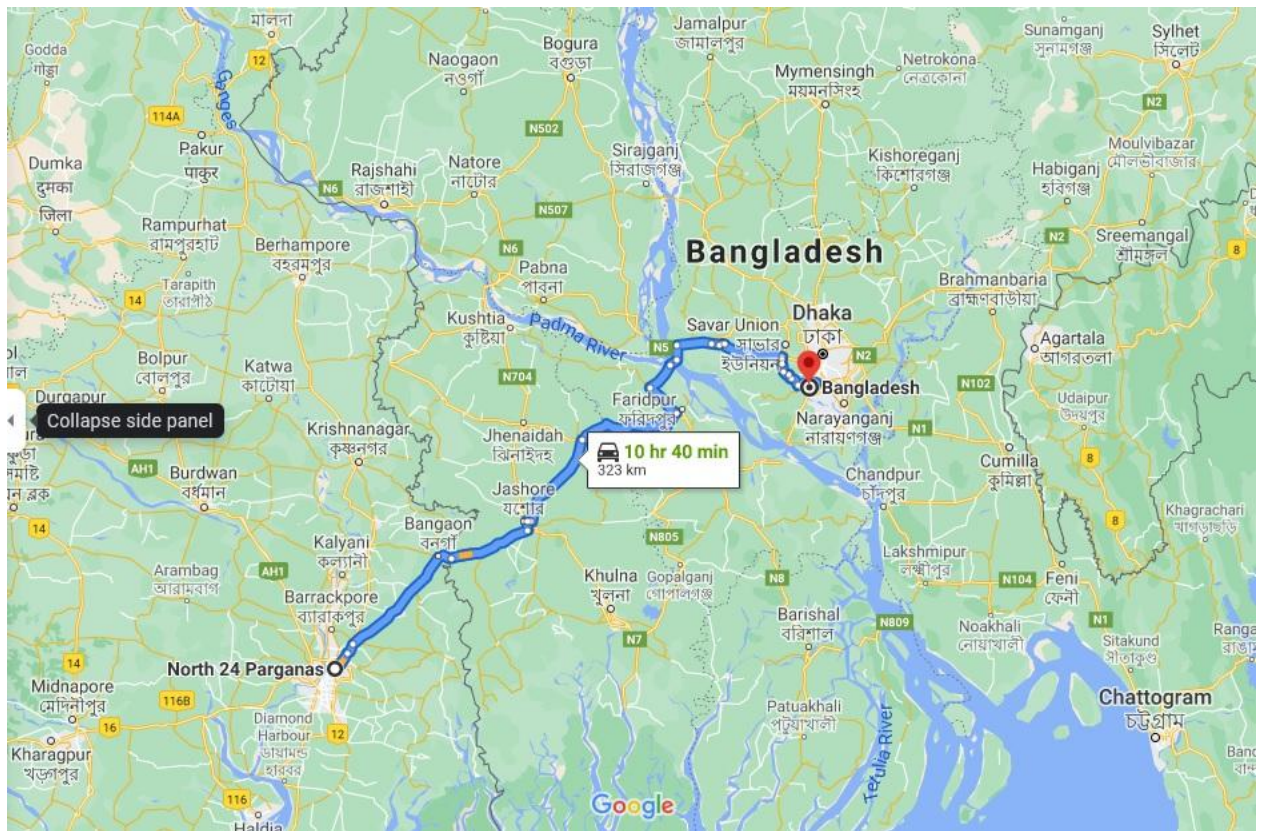
Figure 1: Bengal 2020



(Source: source- source http://north24parganas.gov.in/about_district/geography)

We also have to consider the connectivity of the rural area to National Highways, state highways, Airport, Ports, and the district North 24 Parganas is also connected to the international border of Bangladesh. The connectivity with the border is fruitful when we will consider the E-commerce platform for import and export.

Figure 2: Road connectivity from North 24 Parganas to Bangladesh



In this figure 1. The trade route will help the E-commerce platform to export agricultural products from India to Bangladesh. This will help to make the future more reliable and less conflict country and the agricultural product will be distributed when in need, like in this COVID-19 pandemic situation.

Figure no 2. shows that the district has all these connectivity services which the E-commerce companies will require for their operations. This connectivity also helps the farmers to export their agricultural products to different places at a low cost. But due to the pandemic situation, the movement of farmers is not possible so, in this case, the E-commerce companies can take advantage and start operating with the farmers. The proper distribution of agricultural products will help the farmer to sell their stock and in the area where the demand is high, the e-commerce platform will deliver the product. This will benefit the three parties which are farmers, consumers, and the E-commerce platform companies.

The roadways will help to connect the nearby counties and the airport will help to deliver the agricultural product to distant places in less time. The airways consume less time to deliver which will be helpful to deliver perishable agricultural products like fruits. This transaction with other countries will help to keep the relationship healthy and proper supply of agricultural products where the people required more. This proper distribution will help the market to keep the prices stable so, that the maximum people can afford them. This pandemic situation is not the time to earn a profit, it is the time when every country will stand together to survive the situation. In this way, we can survive the situation as well as we can also be prepared for future pandemics and disastrous situations.

Consequences of the pandemic situation in North 24 Parganas.

During the COVID-19 pandemic, many farmers now faced challenges in terms of their livelihood. Due to the implementation of new rules, regulations by the government, and lockdown in the country to stop the spreading of the coronavirus, laborers from other villages had stopped visiting to help with the harvesting. Earlier the unseasonal rainfall ruined many crops. And in addition, due to a lack of labor, the harvesting process became a long and exhausting process, since they cannot seek help anywhere. The restriction on movement hampered the uninterrupted flow of agricultural activities. The perishable products have been affected badly. According to the report of the Food Corporation of India (FCI) tons of food grains were wasted since May 2020.

The lockdown and curfew in many places in North 24 Parganas made many markets stay close which result in the agro product remaining unsold and the perishable products getting rotten which became a direct loss to the farmers as well resellers. After the investment and self labor, time spent, usage of fertilizers and pesticides, the endowment of freshwater for about six months, and after that, if the agro products remain unsold or rotten then the consequences hits the economic condition of the farmers directly and it is also very demotivating. The market closure increases the demand for the agro product and due to no supply in the market and the existing stock price will rise, which means many people cannot afford the high price to purchase the products and have to remain empty stomach.

There are few procurement centers in North 24 Parganas which has been closed in this pandemic situation which also affects the income of farmers as they have to sell at a fluctuating price to others. The main objective of the procurement centers is to ensure that the farmers get the right prices for their products. Due to the closure of the procurement center, the farmers have only two options with them which are (a) To sell the stock at any price which the middlemen are giving and (2) To keep the stock with the farmers and try to sell by themselves which is not possible because the farmers produce in huge quantity to sell in procurement center. This 2nd option lead the farmers to sell in the local market physically in which the farmer can only sell a small amount of product because of low demand in that area and the risk of coronavirus infection is also there which is highly risky.

E-commerce scenario of North 24 Parganas.

We have collected some information from the e-commerce platform people about the rural area coverage by the E-commerce companies. The information we find is that the E-commerce platform companies have started to deliver their goods and services in the rural area of North 24 Parganas. In this pandemic situation, the demand from the urban as well as rural areas of this district has risen.

We have conducted a self-monitored survey in which we have done a face-to-face interviews with experienced farmers and agricultural business experts in rural areas of North 24 Parganas. In which they have mentioned their challenges and limitation.

Our research has attempted the first-time survey in this rural area regarding Ecommerce, which shows that the area remained untouched by the E-commerce platform for farmers. The farmers have mentioned that they know a few of the benefits of E-commerce but they don't have any access or information regarding any functional E-commerce platform which is operational in this rural area for the farmers or agricultural products.

3. Implementation of E-commerce

To successfully implement the E-commerce platform in the rural area of North 24 Parganas, the following activities will help;

- Advertisement of E-commerce platforms.
- Free Demo.
- Marketing activities.
- Develop the E-commerce platform in the local language.
- The toll-free number for information.
- Support and helping hand of local governing bodies.
- Seminar conduction and clarification of doubts.

All these activities will be for one time when the farmers start using the E-commerce platform the advertisement will be done by them through the mouth because in the rural areas the farmer is well connected with other farmers.

To support the industries government have given some special area where the industries or company can be established so, that they can get benefits. These details are as follows;

- Total Operational SEZs (Including prior to SEZs Act + under the SEZs Act, 2005) in West Bengal is 7 (As of 27.09.2021).
- The Government of India introduced the concept of the Special Economic Zone (SEZ) in the year 2000, by way of revision in the Export-Import Policy, 1997-2000.
- SEZs are specifically delineated duty-free enclaves treated as foreign territory for industrial services and trade operations with exemption from customs duty and a more liberal regime in respect of other levies, foreign investment, and other transactions. Domestic regulations, restrictions, and infrastructure inadequacies are sought to be eliminated in the SEZs for creating an internationally competitive environment.

The SEZs can be developed in the public, private or joint sector or by the State Government following guidelines issued from time to time by the Government of India. Exploiting the full potential of the concept of SEZ would bring large benefits to the State in terms of economic and industrial development, generation of employment opportunities, and contribute to the growth of export earnings. In effect, SEZs are expected to be engines of economic growth.

(Source: source- <http://sezindia.nic.in/upload/uploadfiles/files/9west%20bengal%20policy.pdf>)

4. Shortest trading route

Nowadays we can use Google Maps for directions and more information about the locality. But in our study, we are giving the trade route importance because these high-lightened routes and connectivity will encourage the E-commerce platform companies to get more information regarding the locality and facilities in the rural area of North 24 Parganas so that the E-commerce platform companies will get motivated to start operations.

Practical implementation

Due to this kind of benefits in this area of North 24 Parganas, Flipkart has an investment of Rupees 1000 crores for the integrated logistics hub setup. This new setup has created new employment of 18000 people which includes trucking, clearing and forwarding services, food catering, supporting logistics activities, etc. It will effectively improve the supply chain and reduction of costs through the deployment of mechanized warehouses and transport system intelligence.

As far as now the hub of Flipkart is running with 50% employees due to COVID-19 rules and regulations. Flipkart is not dealing with any kind of agricultural product. In near future, the existing setup will help to start the transaction of agriculture products when the E-commerce company wants any kind of diversity in near future.

Table 1: Export data of commodity from 2014 to 2021 (Values in US \$ Million)

S.No.	Commodity	2020- 2021	2019- 2020	2018- 2019	2017- 2018	2016- 2017	2015- 2016	2014- 2015
1	LIVE ANIMALS.	8.54	33.63	42.94	63.85	78.75	70.75	12.72
2	MEAT AND EDIBLE MEAT OFFAL.	3,223.27	3,300.69	3,722.51	4,174.64	4,037.61	4,209.98	4,929.27
3	FISH AND CRUSTACEANS, MOLLUSCS AND OTHER AQUATIC INVERTEBRATES.	5,235.38	6,159.23	6,256.88	6,850.91	5,501.05	4,486.29	5,249.51
4	DAIRY PRODUCE; BIRDS' EGGS; NATURAL HONEY; EDIBLE PROD. OF ANIMAL ORIGIN, NOT ELSEWHERE SPEC. OR INCLUDED.	351.85	353.63	538.65	366.6	292.93	328.49	379.03
5	PRODUCTS OF ANIMAL ORIGIN, NOT ELSEWHERE SPECIFIED OR INCLUDED.	96.74	93.7	132.07	121.5	79.76	91.64	99.94

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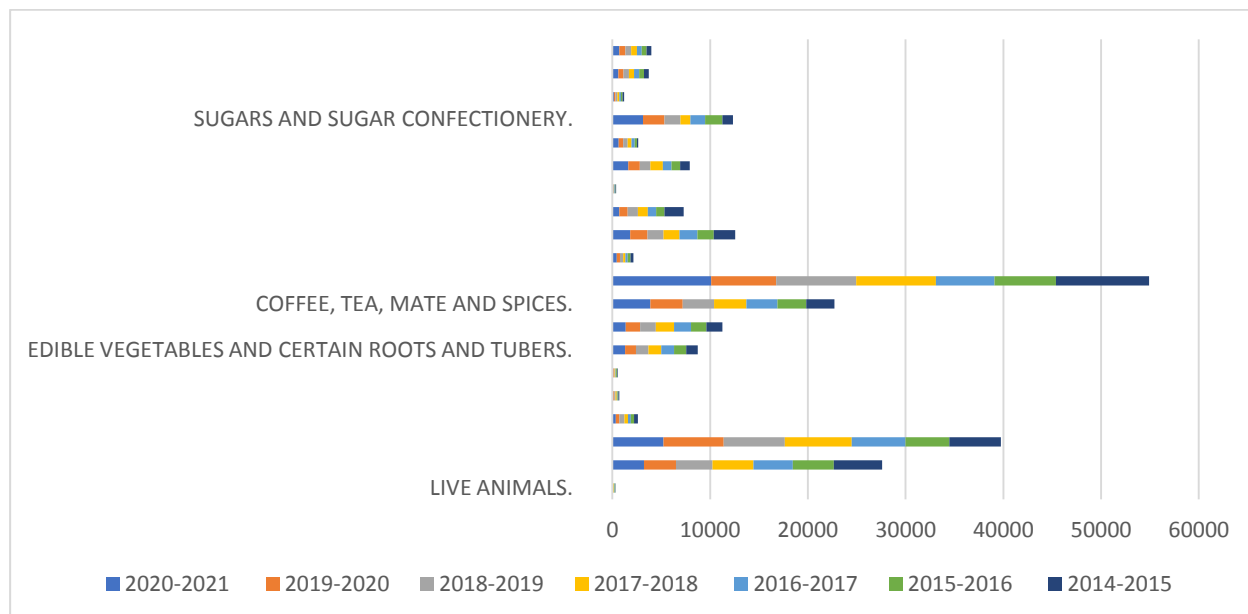
6	LIVE TREES AND OTHER PLANTS; BULBS; ROOTS AND THE LIKE; CUT FLOWERS AND ORNAMENTAL FOLIAGE.	77.84	76.52	81.78	78.73	81.55	73.8	75.39
7	EDIBLE VEGETABLES AND CERTAIN ROOTS AND TUBERS.	1,304.46	1,095.62	1,301.72	1,305.55	1,294.72	1,261.38	1,180.80
8	EDIBLE FRUIT AND NUTS; PEEL OR CITRUS FRUIT OR MELONS.	1,352.89	1,490.75	1,617.42	1,857.05	1,731.21	1,584.68	1,610.71
9	COFFEE, TEA, MATE AND SPICES.	3,901.69	3,299.27	3,199.62	3,310.34	3,185.20	2,954.87	2,871.86
10	CEREALS.	10,103.51	6,672.38	8,160.17	8,151.56	6,012.95	6,272.02	9,550.98
11	PRODUCTS OF THE MILLING INDUSTRY; MALT; STARCHES; INULIN; WHEAT GLUTEN.	434.48	334.68	321.31	247.39	217.97	299.47	305.55
12	OIL SEEDS AND OLEA. FRUITS; MISC. GRAINS, SEEDS AND FRUIT; INDUSTRIAL OR MEDICINAL PLANTS; STRAW AND FODDER.	1,821.04	1,773.09	1,640.47	1,647.14	1,809.02	1,673.53	2,213.94
13	LAC; GUMS, RESINS AND OTHER VEGETABLE SAPS AND EXTRACTS.	727.34	822.93	1,056.91	1,019.00	844.41	868.92	1,947.54
14	VEGETABLE PLAINTING MATERIALS; VEGETABLE	44.15	47.39	54.22	53.28	67.78	66.06	59.87

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	PRODUCTS NOT ELSEWHERE SPECIFIED OR INCLUDED.							
15	ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVAGE PRODUCTS; PRE-EDIBLE FATS; ANIMAL OR VEGETABLE WAXEX.	1,633.16	1,165.69	1,097.57	1,263.88	892.62	877.26	973.29
16	PREPARATIONS OF MEAT, OF FISH OR OF CRUSTACEANS, MOLLUSCS OR OTHER AQUATIC INVERTEBRATES	637.94	480.11	432.55	422.28	317.31	211.97	155.39
17	SUGARS AND SUGAR CONFECTIONERY.	3,149.66	2,192.14	1,629.21	1,018.73	1,508.52	1,763.61	1,075.16
18	COCOA AND COCOA PREPARATIONS.	149.77	180.1	192.69	177.47	162.18	193.31	138.87
19	PREPARATIONS OF CEREALS, FLOUR, STARCH OR MILK; PASTRYCOOKS PRODUCTS.	617.13	531.21	535.04	538.38	519.11	506.24	489.85
20	PREPARATIONS OF VEGETABLES, FRUIT, NUTS OR OTHER PARTS OF PLANTS.	702.67	623.64	588.5	584.89	493.77	488.27	504.71

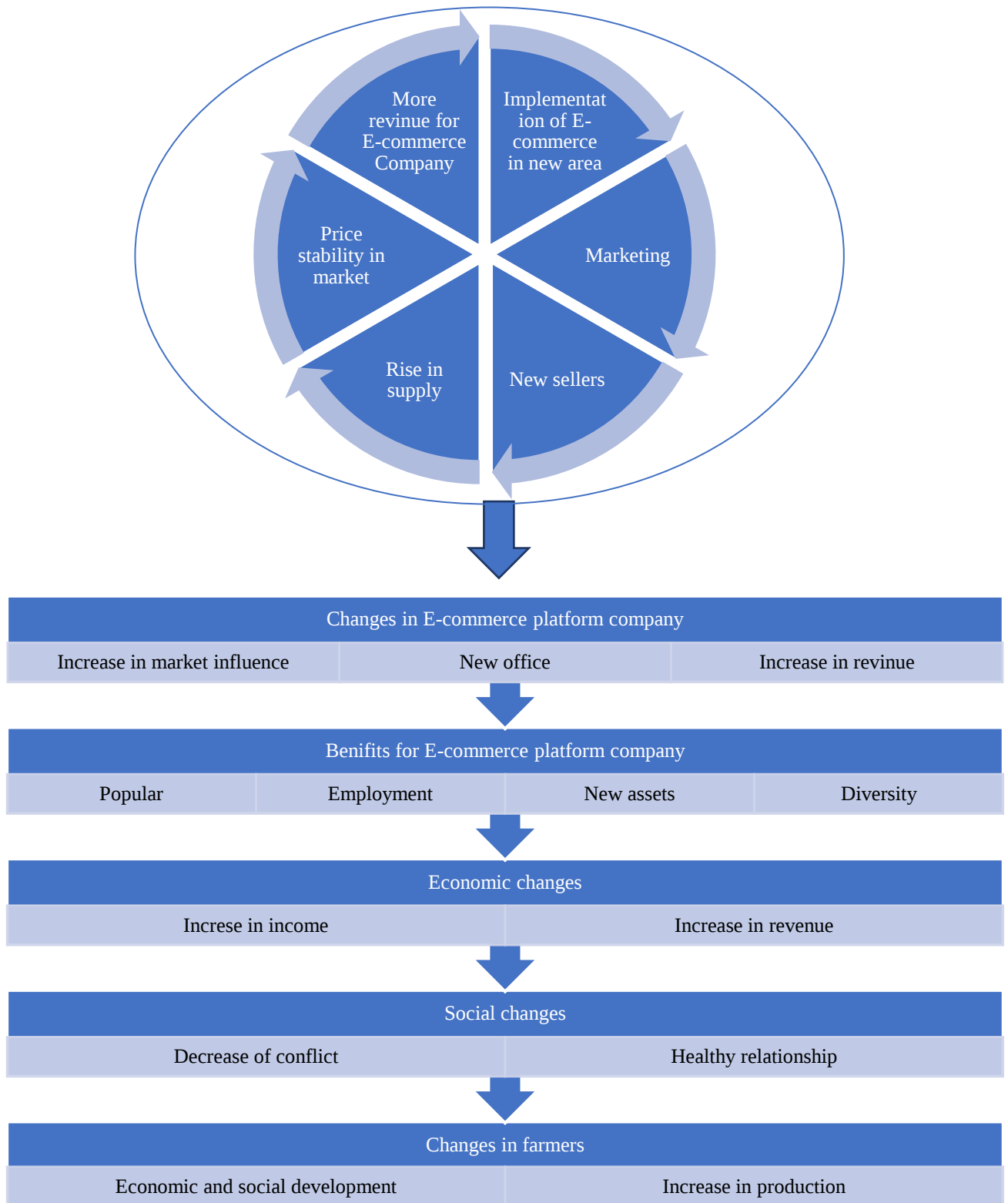
(Source- <https://commerce.gov.in/trade-statistics/>)

Graph 1: Graphical representation of commodity from 2014 to 2021.



India is a developing country and the main occupation of West Bengal, North 24 Parganas is farming and the export data we have found from the year 2014 to 2021. These are the main farming products, which are exported to other countries. The other commodities are also exported directly to other countries as well as the E-commerce company does the export and import operations. With the help of the E-commerce company, the agricultural products export quantity will also increase. Our data analysis shows that there is an average increase in the export of agricultural products from the year 2014 to 2019. After the global pandemic situation, all the economic activities have been stopped. That's why there is a decrease in the rate of export of agricultural products. This leads to a sudden increase in the price of food products and a shortage of supplies in the market. But there is enough stock with the farmers and due to all restrictions and rules of the pandemic situation, they cannot export so, the stock of agricultural products rot and waste. The three-year 2019, 2020, and 2021 values in the table show the decrease in export.

Figure 3: The basic model of implementation and its result.



From this basic model, we can clearly understand the what are benefits for the E-commerce company whenever they want to implement in a new area. Previously we have discussed the actual benefits of the district of North 24 Parganas, which has numerous facilities which an E-commerce company required for an operation smoothly. So, whenever the E-commerce company will start its operation in a new area this benefit from the model will be received by the companies. In the first part of the

model, we can see that it's a repetition process to develop, learn and earn, and survive in this tough competition of the market. At first, the E-commerce company has to start operation in a new area. For successful capture of the area, they have to do marketing activities that will lead to new sellers and consumer generation. This seller generation will supply the agricultural product which will result in the rise of supply in the market. Whenever there is a rise in supply in the market then the price of the product will become cheaper and stable which is extremely required in this time of pandemic period. All this will help the company to increase revenue generation.

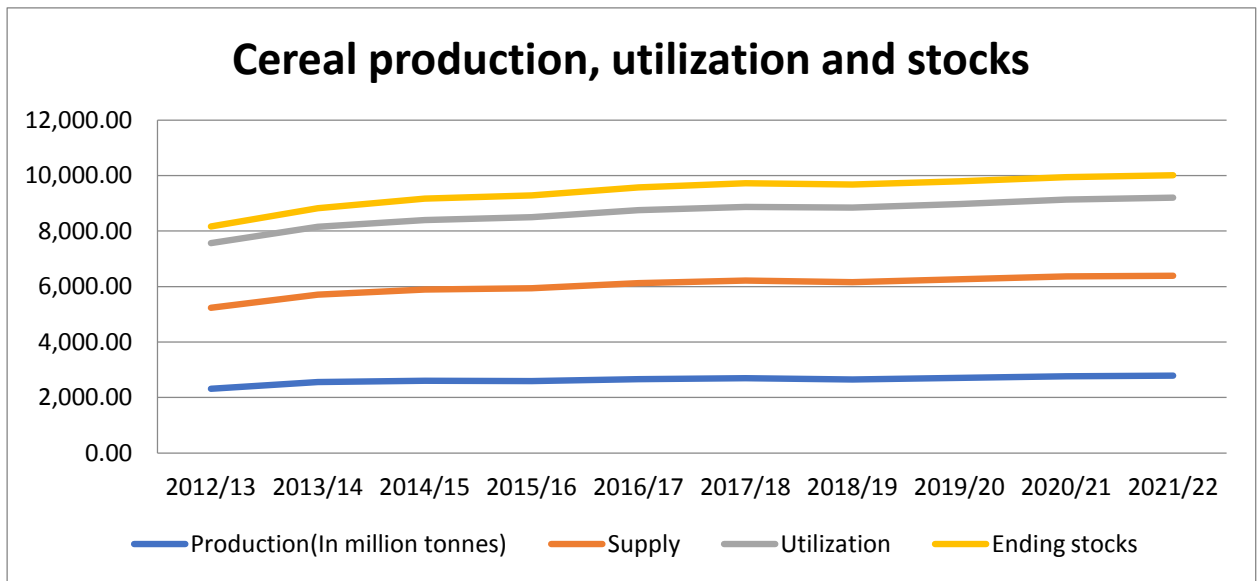
Along with this cycle of the model, some more benefits and facilities will be received such as changes in the E-commerce platform company, benefits of the E-commerce company, economic changes, social changes, and changes in farmers.

Table 2: Cereal production utilization and stock of the world

Year	Production(In million tons)	Supply	Utilization	Trade	Ending stocks	World stock-to-use ratio(In percent)	Major exporters' stock-to-disappearance ratio
2012/13	2,318.60	2,915.80	2,333.10	318	593.40	24.3	17.4
2013/14	2,556.20	3,150.60	2,449.10	363.6	672.30	26.9	18.7
2014/15	2,607.90	3,280.20	2,507.50	377.5	768.7	30.2	19.5
2015/16	2,586.80	3,355.40	2,552.90	394.3	792.8	30.2	17.1
2016/17	2,664.50	3,457.30	2,628.90	408	826.2	31.1	17.8
2017/18	2,693.20	3,519.50	2,655.20	424.1	859.80	32	18.2
2018/19	2,647.20	3,507.10	2,688.50	412.1	834.70	30.8	18.8
2019/20	2,710.70	3,545.30	2,712.50	440	822.10	29.7	18.1
2020/21	2,769.20	3,591.30	2,768.60	472.1	815.60	29	17.3
2021/22	2,787.90	3,603.50	2,808.80	465.8	808.6	28.1	16.9

(Source- <http://www.fao.org/worldfoodsituation/csdb/en/>)

To prove the originality of the study we have taken the cereal which is an agricultural product to study further by focusing only on one item. So, in the above table, we have taken the data from the year 2012 to 2021. From the table, we can see the production, supply, utilization of cereal, trade, and ending stock. The table shows that the annual utilization of cereal is more than the production. This means without the supply of cereal the prices and demand will increase and the poor people will be badly affected.

Graph 2: Graphical representation of cereal data from 2012 to 2021.

We have discussed in table no. 1 the export of 20 types of agricultural products and in graph no 2 we can clearly understand that the utilization of agricultural products is more than the production. To maintain the equilibrium of demand and supply in the market the countries have to depend on supply from other countries. But due to this pandemic situation, there are many types of limitations on export and import operations which result in a decrease in supply and the utilization is the same so, the ending stock at the end of the year is critically low. From the year 2012 to 2021 we can clearly understand that the products haven't increased much but the utilization of agricultural products has increased drastically due to the increase in population. Production cannot increase because we have limited natural resources and limited agricultural land. The only way to increase production is by using hybrid agriculture such as more usage of fertilizer, hybrid seeds, pesticides, etc. these techniques will lead to the generation of new viruses and diseases and will decrease the life span of humankind. To maintain the supply in the market the only way is the proper distribution of agricultural products to keep steady the market. This will only happen in this pandemic situation through the implementation of an E-commerce operation.

5. Conclusion

From this study, we suggest some points for the E-commerce companies and their policymakers to consider while developing and expanding the company this "Peace, globalization and food security business". During this tough time of the pandemic situation of COVID-19 maximum countries have to maintain peace and healthy relation to achieve more and more food secure aspects and take in the potential benefit and facilities of globalization. Acceptance and development assistance, including literacy about E-commerce and aid to agriculture and farmer's development, which can easily discourage the conflicts between countries and together, will construct and develop a social circumstance that can promote fair play.

It is very much important to monitor the market prices and provide more supply temporarily until the country can again stand on its feet. This will help the country to adjust and diversify the source of income so, that the market becomes stable again. In this pandemic situation, we have to compromise

on some of the important factors like exchange rate, monetary policy, import and export duty, and taxes, all these factors have to compromise a little to survive this tough situation and maintain the humanitarian.

In our study, the basic model offers the positive possible path which will help to approach conflict deterrence at an international level. But these models have to be linked more precisely and effectively to political and program of economic at the international level. A small level local government can pressurize the farmers of rural for acceptance and provide them with the necessary required information. To encourage and motivate the government can provide some basic facilities and relaxation on taxes and some schemes through which the government can invest in agricultural activities and the digitalization process. If we examine throughout history maximum war and conflicts had happened to gain control over the natural resources like land, water facilities, and food storage of others. We can easily say that “Hunger and Conflict” are interrelated and are the basic root of the trigger of conflicts/wars.

Assuring the fair and proper distribution of agricultural products will reduce wastage and provide food to the hungry stomach which will give a humanitarian way approach. This proper distribution will decrease the tremendous pressure on the natural resource for the high demand for agricultural products in the market. Throughout our study, we remain convinced that the implementation of E-commerce in the rural area of North 24 Parganas or in any other area which offers these positive impacts and factors for the operation of E-commerce can maintain the demand in the market in this pandemic situation. The globalization factor is offering positive norms and a guide for a non-conflict and increase in connectivity worldwide. However, our study required mass investment from an E-commerce company, support from the government, social justice, rules, and regulation to make this a positive and non-conflict way of approaching other countries.

References

- Abebe, G.K., Bijman, J., Kemp R., Omta O., & Tsegaye, A. (2013). Contract farming configuration: smallholders' preferences for contract design attributes. *Food Policy* 35, 14-24.
- Adhikari, J., Timsina, J., Khadka, S. R., Ghale, Y., & Ojha, H. (2021). COVID-19 impacts on agriculture and food systems in Nepal: Implications for SDGs. *Agricultural Systems*, 186, 102990.
- Alexander, P., Brown, C., Arneth, A., Finnigan, J., Moran, D., & Rounsevell, M. D. (2017). Losses, inefficiencies and waste in the global food system. *Agricultural systems*, 153, 190-200.
- Chakraborty, S., & Sarmah, S. P. (2019). India 2025: the public distribution system and national food security act 2013. *Development in Practice*, 29(2), 230-249.
- COVID, W. (19). will double number of people facing food crises unless swift action is taken. 2020.
- Dutta, P., Mishra, A., Khandelwal, S., & Katthawala, I. (2020). A multiobjective optimization model for sustainable reverse logistics in Indian E-commerce market. *Journal of Cleaner Production*, 249, 119348.
- Feder, G., Just, R.E., Zilberman, D., 1985. Adoption of agricultural innovations in developing countries: a survey. *Econ. Dev. Cult. Chang.* 33 (2), 255–298.
- Gerard, F., Imbert, C., Orkin, K., (2020). Social protection response to the COVID-19 crisis: options for developing countries. *Oxf. Rev. Econ. Policy* 36 (Supplement_1), S281–S296.

- Kumar, A., Arabinda, K.P., Shalander, K., 2020. How Indian agriculture should change after COVID-19. *Food Security* 12, 837–840.
- Kumar, P., Singh, S. S., Pandey, A. K., Singh, R. K., Srivastava, P. K., Kumar, M., ... & Drews, M. (2021). Multi-level impacts of the COVID-19 lockdown on agricultural systems in India: The case of Uttar Pradesh. *Agricultural Systems*, 187, 103027.
- Leroux, N., Wortman Jr, M. S., & Mathias, E. D. (2001). Dominant factors impacting the development of business-to-business (B2B) e-commerce in agriculture. *The International Food and Agribusiness Management Review*, 4(2), 205-218.
- Li, X., Guo, H., Jin, S., Ma, W., & Zeng, Y. (2021). Do farmers gain internet dividends from E-commerce adoption? Evidence from China. *Food Policy*, 101, 102024.
- Nakicenovic, N., & Swart, R. (2000). Emissions scenarios-special report of the Intergovernmental Panel on Climate Change.
- Nguyen, K. (2020). State of Food Security and Nutrition in the World Report. *Rising Hunger and COVID-19 Present Formidable Challenges*.
- Paudel, G.P., K, C.D.B., Rahut, D.B., Justice, S.E., McDonald, A.J., 2019. Scale-appropriate mechanization impacts on productivity among smallholders: evidence from rice systems in the mid-hills of Nepal. *Land Use Policy* 85, 104–113.
- Smith, E., Thorpe R., & Lowe, A., (2010). Management research: an Introduction. Sage Publications, London, UK.
- Strzębicki, D. (2015). The development of electronic commerce in agribusiness—The polish example. *Procedia economics and finance*, 23, 1314-1320.
- Varshney, D., Kumar, A., Mishra, A. K., Rashid, S., & Joshi, P. K. (2021). India's COVID-19 social assistance package and its impact on the agriculture sector. *Agricultural Systems*, 189, 103049.
- Varshney, D., Roy, D., Meenakshi, J.V., 2020b. Impact of COVID-19 on agricultural markets: assessing the roles of commodity characteristics, disease caseload and market reforms. *Indian Econ. Rev.* 55 (83–103), 1–21.
- Zenga, Y., Jiab, F., Wanc, L., & Guo, H., (2017). E-commerce in agri-food sector: A systematic literature review. *International Food and Agribusiness Management Review*, 20(4).DOI: 10.22434/IFAMR2016.0156