

## **INTEGRATING AGILITY, VOLATILITY AND SUSTAINABILITY PERSPECTIVES: A CASE STUDY FOR AN EFFECTIVE SUPPLY CHAIN MODEL UNDER COVID-19**

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### **ABSTRACT**

A useful supply chain model is required for a sustainable business to maintain optimum production, profitability, market shares under the COVID-19, or any pandemic situation. Entrepreneurs are trying hard to integrating agility, smooth dealing with a volatile market, and practicing good/best sustainability indices to ensure maximum benefits in all aspects. A large case farm is chosen to identify the current processes and build a simulation model accordingly. This model will add all the relevant variables on agility, volatility, and sustainability. Later, the simulation model will be experimented with several inputs and desired outputs to determine optimality in profit, productions, market share, and the likes. Finally, the result will be disseminated to the case industry for further extensions and amendments to implement their existing operation to achieve sustainable outputs.

### **1 INTRODUCTION**

Recently, a volatile environment like COVID-19 strikes hard so many businesses. Sustainable supply chain practices are the emergent concern for every realistic and modern industry in the world. Academician exasperated to develop some workable model to make this justified to the business world. At the same time, industry people are also feeling the same for the future and consistent performance. More or less, all the business world stakeholders know and understand the indispensable matters of connections among the environment, society and economy to gain maximum benefits in a sensible, decent, and justified method. Livestock is one of the fundamental areas where all should look at for the present and future. Livestock within agriculture has equal importance. But the problem is to familiarize, transfer, and extending the latest technology to the remote farmers to accommodate the beneficial tools. There are several reasons behind it. For this, giant conglomerates came to the livestock business and doing much better than traditional farmers. Theory and practice also proved that some farmers convert their operations into bigger ones to sustain and accommodate the technologies. When something grows significant, operational activities should be organized and methodological. This research will try to determine the problems the newly expanded farming businesses face, whether they are following sustainability concepts. It is mentioned that sustainability concepts can be used for securing the future of the concerned farm rather than dealing with the things for the customers' only actions. A case large poultry farm from Bangladesh will be chosen to identify the usage intentions of research results, ongoing technology, new ideas, and strategies and implement them accordingly. A country like Bangladesh becomes a low-middle income country from the least developing country status in July 2015. This country is mainly doing great in many sectors like garments, livestock, agriculture, and industrial explorations. They are now self-sufficient in food, garments,

and other essential things. But they need to practice more sustainability than before as they are growing day by day.

This research attempts to find the actual sustainability practices in the specific large farms and its supply chain operations through system dynamic modeling. According to USDA, Bangladesh will require 17 billion eggs, 2 million tons of poultry meat, 85.8 million-day-old chicks, and 7.9 million MT of feed to meet the demand by 2021. The growth of this industry is about 15% a year. USDA estimates that one million entrepreneurs and eight million people involved in Bangladesh's poultry sector commercially produce 10.22 billion eggs and 1.46 million tons of poultry meat annually. Therefore, this industry needs to practice the sustainability index before it goes to the international market.

## **2 MATERIALS AND METHODS**

This research focuses on the current situation in the Covid19 pandemic situation. It is hard to maintain sustainable growth in this sector now. This research will also attempt to find out the indicators of agility, volatility, and sustainability with maximum utilization of resources. Later the study will put recommendations on how the supply chain process will be more sustainable in light of economic, social, and environmental aspects. A noteworthy research gap exists in the above matters to maintain optimum outputs. This research proposes a supply chain model where all the above variables will be considered while developing a simulation model. The model will add the primary variable of economic gain and environmental impacts through waste management. System Dynamic methodology will apply to establish a supply chain process model. This research aims to determine optimum productions level based on demand volatility, considering environmental impact, social contributions, and economic gains. The reverse logistic concept will be used to recycling and reusing the poultry wastes to develop further by-products of fertilizers, energy (biogas), and other valuable items. Vensim simulation tool will be used to create the model and simulate a wide range of variables like policies, the impact of natural disasters, disease outbreak, inconsistent market price, and other required variables. Such a model could be a ready weapon for the particular industry to simulate now and then update the latest or imaginary dataset to visualize the scenarios. This is how the whole industry could know the forecasted results to determine their sustainability goals and outcomes.

## **3 RESULTS AND DISCUSSIONS**

The results will analyze from the simulation model outputs in this study. The results will test the reliability and validity of the simulation model to justify the proposed changes. The relevant discussions will be made from the simulation results align with the research objectives and questions. In support of this connection, additional tables and figures will be presented to defend the research objectives. This section includes a discussion on possible contributions gained through the real-life study, which will answer volatility, agility, and sustainability.

## **4 CONCLUSION**

The knowledge gained from conducting this research relating to sustainability, supply chain, simulation, and the case industry can further expand to address various prospects.