Minimizing the Effect of Covid-19 Pandemic as One of the Supply Chain Disruption in a Timber Trade Sector

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Abstract

This paper aims to minimize the effect of COVID-19 pandemic as one of the supply chain disruption in timber trade sector. In order to investigate how COVID-19 created problem, how the pandemic disrupted the operations, and how the company minimized the problem, survey questionnaire was distributed online. The questionnaire was distributed to 20 respondents from timber trade sector, from where 20 responses were gathered. The timber trade sector suffered greatly during the pandemic as there are many new implemented policies and regulations about how the timber sector will trade to the people. In addition to this, the timber sector have experienced rapid change due to the effect of supply chain disruption and companies especially small companies had a hard time in adapting. However, the pandemic shouldn't be a barrier in having a successful trade, the use of technology should be utilized by creating online strategy in timber trading as the solution to the effect of the pandemic as one of the supply chain disruptions and also keep the sustainability of supply chain to timber sector. The timber trade sector must have digital transformation in order to compete properly, this strategy will change offline store to online purchases for the safety and convenience of both the public and the company. The use of digital transformation will greatly help in the situation the timber trade is facing. Digital transformation is not just about the use of technology, it also about how businesses can compete more because it can minimize cost in many ways.

Keywords

Supply Chain Disruption, Timber Trade Sector, COVID-19, Digital Transformation, Online Strategy

1. Introduction

According to (Michael H. Ramage, 2017) one of the numerous forest products used around the world is timber. It is the reason why timber is considered to be the main supply for production and trading's of wood products, goods and services. Timber has many benefits, it includes economic benefit for many used, as modern timber is largely factory prepared and brought to site for rapid assembly. Timber sector exist in both domestic and international markets that is why each might be important in evaluating the benefit of utilizing timber at a large scope. The environmental benefits have been demonstrated. Timber, which is to say wood in raw or semi-processed form, is a bulky, heavy product that is very costly to transport. Commonly, more than one-half of the price of timber at the destination market was made up by the cost of transport (Timber, 2021). Timber was also one of the earliest goods to be large-scale traded globally.

(International Labour Organization, 2020) Stated that as in many other industries, disruptions in timber related supply chains have resulted in a severe decline in exports and imports of timber trade throughout the world. Demand for wood

internationally, including tropical timber has decreased significantly. (International Labour Organization, 2020) Also reported that orders for both timber and processed products have been postponed or cancelled caused by the pandemic disruption, timber-related industries have not been able to continue operating at full capacity. These difficulties have been increased by the delayed performance of the negatively affected sectors connected to timber trade industry, like transportation, recreation that is based on forest, and departments that use wood as a raw material which includes construction and manufacturing. This combination of decaying production, reduced demand, shortages of raw materials, lack of working capital, shipping rate increases and, in some cases, labor shortages to monitor the wood products in warehouse, has forced many operations and enterprises to pause their activities, some permanently. According to (Mohsin Shafi, 2020) reported that the situation is particularly challenging for many micro, small and medium-sized enterprises in developing countries, which make up the large majority of enterprises in the timber sector and are highly exposed to economic downturns. (Riddle, 2020) said that during the past years, the production and trade of timber products have gone through rapid change due to the effect of Supply Chain Disruptions during this period of Covid-19 pandemic and addition of implementation of several new policies and regulations about how the timber will trade to the public.

With the COVID-19 pandemic crisis still emerges up until now, there are many changes and risk in the timber trade sector that needs to be addressed. Some company didn't make it because they can't adapt to the changes made by the pandemic. Companies need to respond quickly to scheme and carry out a plan that will safeguard the supply chain.

1.1 Problem Statement

The COVID-19 pandemic is affecting public health and causing unprecedented disruptions to economies and labor markets, including for workers and enterprises in the timber sector (Bertulfo, 2020). The sector provides work to at least million women and men worldwide, many in the informal economy. Timber trading is one of the central to mitigating impacts of pandemic and around billion people, many of whom are dependent on timber trading for foods, income, and jobs.

Despite the potential of the sector to promote growth and employment, the persistent decent work shortages have been worsened by the pandemic. Globally, many jobs have been lost and many more are still at risk, as companies around the world have faced challenges in retaining their workforce and meeting payroll commitments, leaving workers furloughed or unemployed especially in the timber trading industry. With the COVID-19 crisis, fundamental changes in consumer behavior, supply chains, and routes to market are hitting companies off balance. The spread of the new coronavirus, COVID-19, is being felt globally across operations in ways that are difficult to model and assess.

In addition, the effects of Covid-19 disruptions in supply chain as the ff;

- Sales decreases occur due to failure to meet end-customer demand as a result of product unavailability, partially fulfilled orders in terms of quantity and late deliveries. These lead to customer complaints, damaged image and brand reputation and loss of customers. The financial consequences then follow with lower sales, loss of revenues and reduced market share.
- Higher costs may occur
    A. Due to the use of alternative transportation means for product deliveries, and higher administrative costs for dealing with backorders.
    B. Due to premium supplier contacts for ensuring delivery of the limited resources from alternative areas and firms,
    C. Due to production rescheduling as a consequence of stock outs of certain resources, or worse
    D. Due to production shutdowns and lower assets and capacity operation

Overall the decreasing sales and increasing costs ultimately lead to loss of profitability and a decrease in the company's value.

1.2 Objectives of the Study

To incorporate a wide range of observational, experimental and special modelling studies that addresses the key aspects on how to minimize the effect of the Covid-19 pandemic as one of the supply chain disruption on timber sector.

1.2.1 Specific Objectives

- To identify the effect of Covid-19 as supply chain disruption causes for timber trading sector.
- To identify supplier-relationship-specific moderation strategies to avoid and resist such disruptions.
- To identify and discuss possible responses that help lessen impacts on people and timber trading and help address the situation in the short term while at the same time contributing to building a more unaffected and sustainable future.
- To propose follow-up steps, that better enables the timber sector to help rebuild sustainable and strong societies against pandemic disruption.
- To combine knowledge on supply chain disruptions which creates an important and timely as the frequency and impact of disruptions increase.
- To review also observes the most popular modeling approaches on the topic with suggestive examples and the possible tools that enhance resilience and reduce disruption effect.

1.3 Scope and Limitations

1.3.1 Scope

Market disruptions are unplanned and unanticipated events, which may further influence the flow of goods and materials within a supply chain (Li B. S., 2016). In view of the increasing significance of market disruptions in timber industries, in this study, it focusses on how Covid-19 affects as disruptions in the supply chain. It was classified in some aspects, namely:

- Demand disruption
- Supply disruption
- Supply chain disruption risk.
- Strong presentation and analyzation of data using the name of the tool that will use.
- To provide up-to-date information to researchers to better identify, manage, and control market disruptions.

1.3.2 Limitations

- Supply Chain management and Strategies.
- The researchers only focused on a specific sector which is the timber trade sector.
- In this study, the researchers focused on the effects of pandemic to the supply chain in the timber trade sector of the industry.

2. Methodology

2.1 Conceptual Framework

The outbreak of Covid-19 pandemic in various parts of the world gives a major impact on health and economy in terms of trade, the implementation of social distancing makes people very careful by limiting activities outside their home so that it impacts on various business, including timber trading sector. All this time, the role of timber sector is believed to be able to drive the economy of a country (Li A. L., 2014). However, since covid-19 pandemic, Timber trading's are considered as one of the vulnerable affected. It is because this type of business is very dependent on the velocity of money from supply chain from wood supplier's and merchandise sales, so that the decreased demand disturbs the company's cash flow.

Government policy imposes social distancing and physical distancing limits travel and consumption. Thus it impacts on transactions in the market. As the result, people in several regions have changed their supply and trading patterns. The business people who rely on physical space like this timber trading, suffer losses. It is in contrast to online

markets. In a situation like covid-19, the researchers came up the idea of the use of technology by creating online strategy in trading woods and as the solution to minimize the effect of Covid-19 as one of the supply chain disruptions and also keep the sustainability of supply chain to timber sector. The crisis due to the covid-19 pandemic has become the right moment for this type of business to improve the quality of their products or services and to develop various strategies for offering goods or services based on business' concern. Covid-19 should not be a barrier for timber trading's to increase supply and sales, because the timber trading sectors can promote business through digital marketing.

The digital approach will work well if timber trading sectors have digital transformation so that they can compete intensively. The strategy is changing their offline store to online purchases for the sake of safety and convenience (Winarsih, 2021). During this pandemic condition, timber trading companies can strengthen promotions through online applications both for sales and logistics. Since it can be part of digital economic ecosystem, transformation and innovation in digital skills is needed so that business sustainability can take place now and in the future.

2.1.1 Digital Transformation

Digital transformation is an effort to accelerate business by using technology tools and looking at opportunities that can help business processes, that the target market is wider (Winarsih, 2021). D. When businesses are forced to change because of a pandemic, the advantage is that they can intensify promotions through online applications. As the result, they can solve problems in sales and logistics channels.

Digital transformation is a radical and comprehensive shift in the use of technology with the aim of improving company performance. Digital transformation is very useful when businesses are forced to shift, suppose that online applications can solve two problems at once, namely:

A. Sales and logistics.

B. Supply chain can start relying on online platforms that can connect business people with raw supply producers.

There are three things related to digital adoption;

- Urgency of digital transformation is not just about technology, but more about how businesses can compete more intensively because it can reduce costs in many aspects.
- Improving digital knowledge and skills related to business. The fact is that not all businesses need a website, some only need to promote through the appropriate channels. Lack of understanding often makes digital transformation decision taken is less appropriate to the needs of the business itself.
- Using E-wallet services.

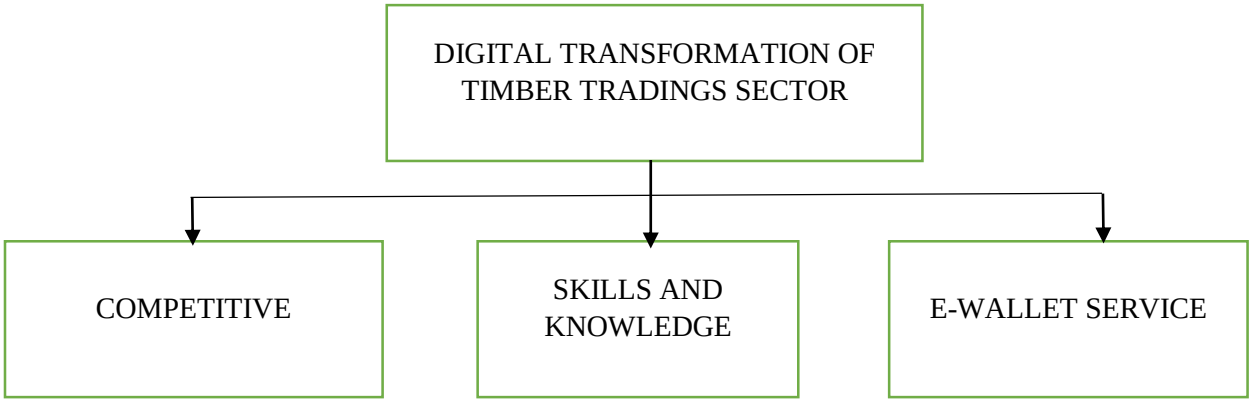

Figure 1. Digital Transformation

2.1.2 Sustainability in Timber Trading Sector

In dealing with the impact of Covid-19, the steps taken to result sustainability in timber trading's, they are:

- Using social media to promote wood products. It can be started by actively displaying products or businesses and giving promotions. Companies promote their brands more effectively through digital media, so they can build online communities in new ways in order to build customer loyalty. Digital marketing provides new tools for getting to know customers effectively, on a large scale and proactively developing and enhancing customer experiences.
- Cash flow must be maintained in order to manage cash optimally. The current situation causes late in billing and payment to business partners. Therefore, using online software can help in making billing and payment documents easily.
- Re-budgeting-by sorting out which budget items are the priorities and adjusting the budget to the current conditions.
- Monitoring business transactions
- Inventory

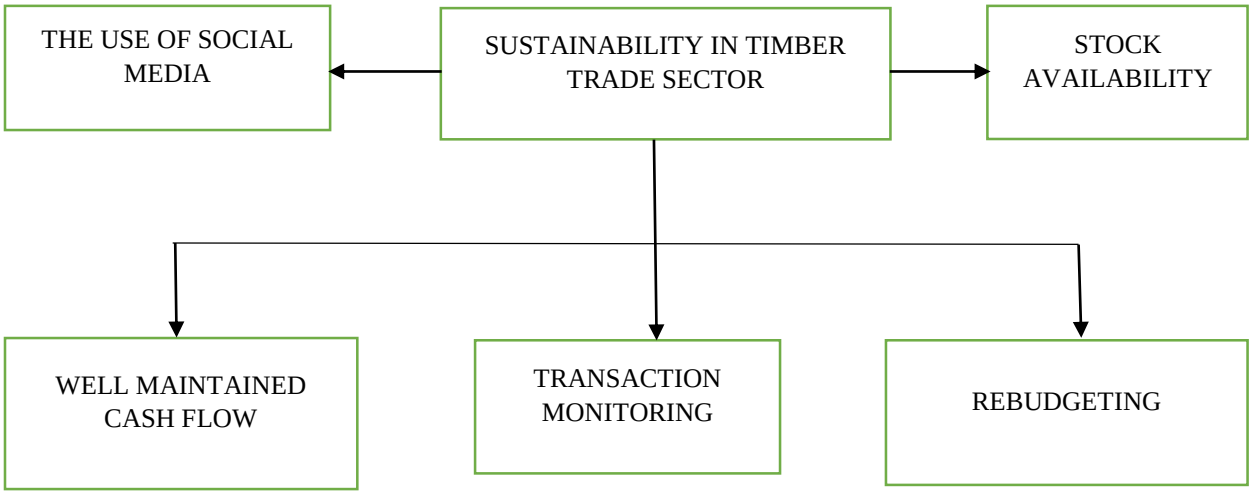

Figure 2. Sustainability in Timber Trading Sector

2.1.3 Sustainable Supply Chain Management

A Supply Chain is determined and characterized by structures that the infrastructure and organization within the Supply Chain provide, as well as processes linked to physical, financial, and information flows across the Supply Chain. Based on these foundations and related efforts to build a concept in Sustainable Supply Chain Management as follows;

2.1.3.1 Supply Chain Area

The Supply Chain is conceptualized through an end-to-end approach ranging from suppliers via manufacturers and distributors to retailers that serve ultimate consumers of finished goods (Marcus Brandenburg, 2019). Its foundations are grouped into structures and processes. Structures represent the network's physical and organizational fundaments. The organizations connected within and related to the Supply Chain comprise not only producers and consumers, but also governmental authorities and other stakeholders linked through pressures and incentives that raise network sustainability. The infrastructure comprises property, plant, and equipment, i.e., physical assets such as production sites, warehouses, terminals, vehicles, and other facilities needed to operate the Supply Chain.

The SC structures are connected through processes consist of physical, financial, and information flows within the network. Physical flows include goods and inventory generated through operational SC activities forwarded from suppliers to consumers. Furthermore, physical flows include natural resources consumed and waste and emissions

released through transportation, and storage processes. Physical flows represent the main interface between structures and processes because products and infrastructure have physical properties, and both are related to the consumption of natural resources and the release of waste and emissions. Financial money flows, usually directed upward from consumer markets to suppliers.

2.1.3.2 The Bottom Line Area

The Bottom Line comprises;

- Profit dimension, which is measured through price and cost;
- Planet dimension, which is affected by consumption of non-renewable input and disposal of unwanted output.
- Social dimension, which comprises producers and consumers linked in the supply network.

2.1.3.3 Decision Area

Sustainable Supply Chain Management decisions are complex tasks to design the supply network and plan, execute, and control operations therein. Decisions on structures and processes are made when establishing a new Supply Chain.

2.1.3.3 Impacts Area

SSCM decisions about processes and structures result in performance and risk impacts along the TBL of sustainability. These SSCM impacts fall into four categories:

- Value,
- Vitality
- Variability
- Vagueness

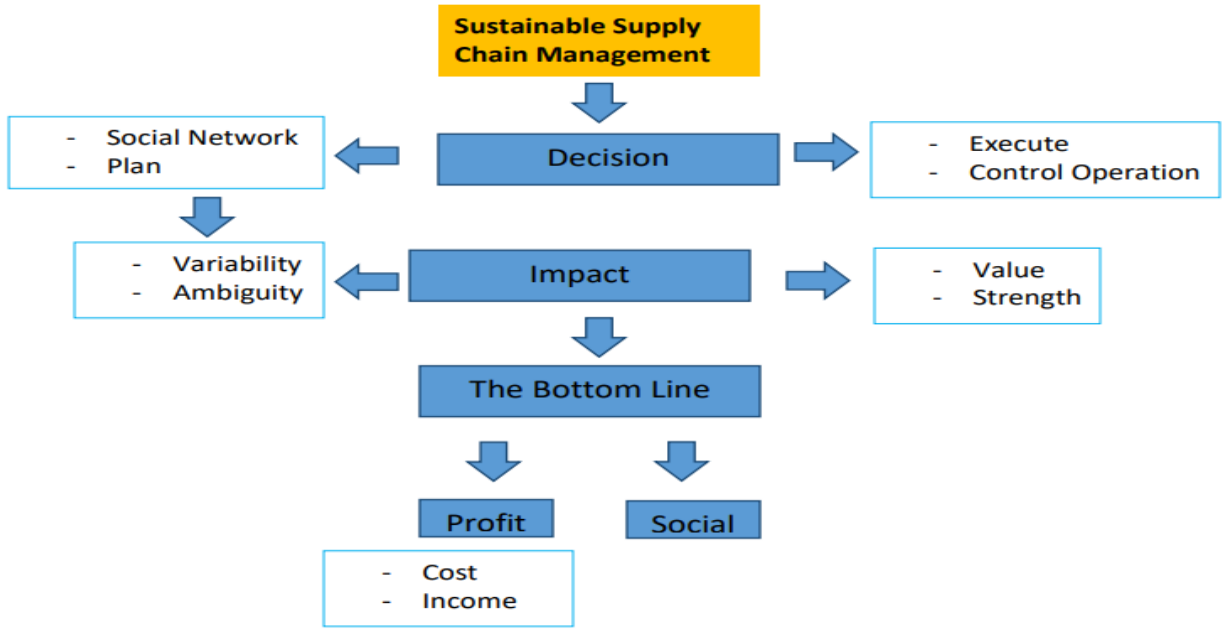

Figure 3. Sustainable Supply Chain Management

2.2 Case Study

In this study, the researchers have used a few models to measure the performance or effect of COVID-19 disruption in supply chain in the operation a trading company of woods, which is the Philippine and Scandinavian design, Filtra Incorporated. This model has also helped the researchers to identify the other factors that are affecting the supply chain efficiency and find out the probable solution to minimize the effect of these inefficiency factors. The researchers selected Philippine and Scandinavian design, Filtra Incorporated as their case company and its trading operation in their warehouse at San Mateo, Rizal as the area of their case study because the materials they could collect from the company were necessary and suitable to solve their research questions.

3. Result

The analyzed responses obtained from the 20 respondents suggest that the timber sector companies are currently undertaking or have already taken a dedicated enterprise-wide effort in implementing and strengthening contingency plans for a potential second wave of COVID-19 or other future disruptions. Companies are still concerned in ensuring safety and preventing outbreaks, they are also concerned in the continuation of shortage of critical parts. Because of this concern, the companies are implementing supply chain risk mitigation strategies by multi-sourcing products, strengthening relationships and transparency, and relying on suppliers from multiple geographies utilizing the online marketplace.

4. Conclusion

The researchers gave out the questionnaires to 20 respondents workers of operations in their trading. After all the proper analysis and data assessment and evaluation, the researchers were able to conclude that Covid-19 pandemic really created a problem as disruption for the operations.

The questionnaires helped the researchers identify how the operations lessen the risk, handle the new normal and deal with the new changes when it comes to supply and demand by how the company is minimizing the disruption due to COVID-19.

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References

Bertulfo, D. J. (2020, November 27). *VOCEDplus.* Retrieved from COVID-19 labour market impact in the Philippines: assessment and national policy responses: https://www.voced.edu.au/content/ngv%3A89581

International Labour Organization. (2020, June 10). Retrieved from Impact of COVID-19 on the forest sector: https://www.ilo.org/sector/Resources/publications/WCMS_749497/lang--en/index.htm

Li, A. L. (2014). Contribution of the Forestry Sector to National Economies.

Li, B. S. (2016). Market disruptions in supply chains:A review of operational models. *International Transactions in Operational Research*, 24.10.111/itor.12333.

Marcus Brandenburg, T. G. (2019). Sustainable Supply Chain Management—A Conceptual Framework and Future Research Perspectives. *Sustainability*, 11.

Michael H. Ramage, H. B.-W.-T. (2017). The wood from the trees: The use of timber in construction. *Renewable and Sustainable Energy Reviews, Volume 68, Part 1*, Pages 333-359.

Mohsin Shafi, J. L. (2020). Impact of COVID-19 pandemic on micro, small, and medium-sized Enterprises operating in Pakistan. *Research in Globalization, Volume 2*, 100018.

Riddle, A. A. (2020, December 10). *EveryCRSReport.com.* Retrieved from COVID-19 and the US Timber Industry: https://www.everycrsreport.com/reports/R46636.html

Timber. (2021, April 15). Retrieved from Encyclopedia.com: https://www.encyclopedia.com/history/news-wires-white-papers-and-books/timber

Winarsih, M. I. (2021). Impact of Covid-19 on Digital Transformation and Sustainability in Small and Medium Enterprises (SMEs): A Conceptual Framework.

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