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# Supply Chain Risk Management in Shrimp Industry Before and During Mud Volcano Disaster: An Initial Concept

**Achmad Room Fitrianto[1], Suryadi Hadi[2]**
[1]IAIN Sunan Ampel, Jl. A. Yani 117,60237, Surabaya, Indonesia
[2]Universitas Tadulako, Jl. Sekarno Hatta, 94118, Palu-Central Sulawesi, Indonesia

**Abstract**

The aim of this paper is to analyse the function of supply chain risk management in supporting shrimp industry before and during mud volcano disaster in Sidoarjo (Indonesia). Articles related to supply chain risk management are identified and analysed. Theories and concepts are outlined in order to develop a supply chain risk management. Future research may explore the model with a qualitative research to identify and analyse the application of supply chain risk management in shrimp industry. Supply chain risk management can help this sector to sustain their business. There has been little investigation in shrimp industry so that further study in this sector is needed. This study can be used by academicians and professionals who wish to address supply chain risk management practice in shrimp supply chain. Investigating the role of supply chain risk management in shrimp sector will enable the farmer, small traders, manager in depots and processing plants to prevent risks to their business. This paper recognizes that supply chain risk management requires further study in different method and sectors to enrich the understanding of key constructs.



*Keywords*: shrimp industry; supply chain risk management; mud volcano disaster

## 1. Introduction

Shrimp is a highly valued commodity traded worldwide (FAO, 2010). Indonesia is one of shrimp exporters and the main destination market includes Japan, USA, and EU for specific type of shrimp. The shrimp industry also provides vacancy for local people such as, fry collectors, hatchery operators, shrimp farmers, traders, and processors. In other words, the shrimp industry has positive impact on social and economic. For example, there were approximately 13,978 workers involved in the shrimp industry in Sidoarjo, East Java (DKP Sidoarjo, 2010; Marines and fisheries in figures 2011). However, this industry could only produce shrimp which valued for roughly US$ 4,877,870 in 2010 since the natural disaster occurred in 2006. In fact, the production of shrimp in 2008 dropped 18.6% (DKP Sidoarjo, 2009). According to Antara (2009), there were 200 farmers had been affected by the dumping of mud volcano to


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the river in Porong (district of Sidoarjo). In fact, the dumping can affect the vegetation and aquaculture because the mud contain several hazardous materials, such as, Hydrocarbon Sulphide, Mercury, Cadmium, Chromium, Arsenic, and Phenol (Antara, 2006;Mawardi, 2006;Herawati, 2007;Pohl, 2007;McMichael, 2009). In addition to this, the ICBB claimed that the mud volcano in Porong contains dangerous bacteria, such as, *coliform*, *salmonella*, and *staphylococcus aureus* (Antara, 2006). In short, the mud volcano has significant impact on the shrimp production in Sidoarjo since the Mud Volcano disaster occurred.

As the shrimp industry has been existed, this sector needs to be aware of any potential risks, such as, supply risk, demand risk, and environmental risk which could impact their sustainability. Some studies found that if supply chain risk is managed correctly, the profit of the organization will be significantly affected (Cousins et al., 2004; Hendricks and Singhal, 2005). In other words, the shrimp industry should properly manage their supply chain in order to improve their performance, even though their supply chain processes are more complex. Therefore, this objective might not be achieved if shrimp industry has not implemented proper supply chain risk management.

Johnson (2001) argues that supply and demand risks are the source of risks in supply chain. The present researcher argues that supply risks include limited capacity, currency fluctuation and supply disruption. Meanwhile, demand risks include seasonal imbalance, volatility of fads and new products. However, Juttner et al.(2003) contend that risk can be categorized into three classifications, such as, external, internal and network related. The present researchers posit that the source of risks from external of supply chain could be affected by political, natural disaster, social and market. Furthermore, the source of internal risk might come from strikes, machine failure and IT uncertainties (Juttner et al., 2003). Then, the present researchers claim that the network related risk could be occurred when the interaction between organization within supply chain become failure. For example, the relationship between buyer and supplier can be disrupted by false information flow from the buyer side and poor quality product and service from supplier side. In short, the point of view of researchers regarding to risk in supply chain are varying so that the categorization of risk might also be different in other sectors.

Most of researchers are focusing their research on supply chain risk management in certain sectors, for instance, electronic, manufacturing, and automotive. In fact, the research in supply chain risk management in shrimp industry has been rare. For this reason, research in shrimp industry may add to the existing knowledge on how the applications of supply chain risk management before and during the natural disaster. In addition to this, this research intends to fill the gap in literature with the aim to provide guidelines for managers in shrimp industry in different regions or countries on how to deal with risk. This conceptual research propose to investigate in how natural disaster impact the application of supply chain risk management in shrimp industry and what type approaches they applied before and during natural disaster.

This research will focus investigations on Indonesia's shrimp industry in Sidoarjo for several reasons. First, Sidoarjo District play significant role in fishery export. There are eight sub districts provide land for fishery ponds as it can be seen on the table 1. Second, the Mud Volcano disaster is occurring in Sidoarjo and this disaster has been demolished infrastructures, houses, and industries. Also, there are approximately 600 hectares of land and housing has been buried by the Mud Volcano. Third, the shrimp industry in Sidoarjo has been employed more local people so that the sustainability of this industry has huge significances to the local people economy. Fourth, the shrimp industry in Sidoarjo is significantly contributed to the Indonesian fishery export.