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## Attaining Aquaculture Contract Farming Business Performance in Malaysia: The Call for Supply Chain Integration and Technological Innovation Materialization

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### Abstract

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Attaining aquaculture contract farming business performance continued relevance remain demanding in the eleventh Malaysia Plan. Anchored on the supply chain management philosophy, this paper highlights on the technological innovation and the three interrelated elements of supply chain integration, namely: external integration with suppliers, external integration with customers and supply chain risks; and the composite relation amongst these variables that could perhaps produce the possible outcome of promising business performance. Hence, in order to attain for the betterment of the aquaculture contract farming business performance, this paper provides a foresight to the prospective aquaculture contract farmers to conceptualise, visualise and materialise the outcome of supply chain integration and technological innovation engagement.

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**Keywords:** Supply Chain Integration, Aquaculture Contract Farming, Technological Innovation, Business Performance, Supply Chain Risk.

### 1. Introduction

Since independence, the development of agricultural economics activities in Malaysia, have long gained focus. Premised on believed that robust agricultural growth and productivity increases are crucial to sustain its economic development, Malaysia gives due emphasis on how agriculture could best contribute to overall economic growth and modernization. Given the widely recognized role of economic development by agricultural sector, Siamwalla, (1996) and Harron et. al (2001) assert that, in



developing nations, stakeholders in this sector, among others like policy makers, policy analysts, academics, donors communities to have lost interest in this sector as its roles seems to lose sight from the engine of growth to sunset significance, or perhaps the continuing relevance and importance are in question (Abdul Rahman, 1992). Conversely, the interest in this sector come to its regain after nearly two decades of relatively neglected. It gains its significance over again as has been manifested in the eleventh Malaysia Plan, where it is well noted as it positioning itself as the third engine of national growth .

Malaysia government has fast made a reviewed on its agricultural policy subsequently after the incidence of 1997 world financial crisis, as one of its strategy to ensure the nation to regain its competitiveness through agricultural food production. In 1998 the third National Agricultural Policy (NAP3) was formulated and endorsed. NAP3, among others, highlighted the potential and importance of fisheries as food security commodity and potential foreign exchange earnings as well as given a significant role to balance out food import bill which long time was shown a deficit. Currently the aquaculture sector is underutilised, thus the increase in production and contribution is set forth and it ought to be from this sector. The production area is still available and new improved technology will be introduced in light of facilitating to hike up the productivity and concurrently without neglecting the eco-friendly aquaculture farming practices.

Government set target by and beyond 2010 at a total of 787,000 mt to be achieved for by the main commodity singled out from aquaculture food production, namely: marine shrimp (180,000 mt), marine fish (122,000 mt), fresh water fish (230,000 mt), cockle (130,000 mt) and sea weed (125,000 mt). Hence, the government introduced best aquaculture practices management and food safety programs, in light of getting closer to the production as well to boost up the image as a producer of aquaculture products. Further, the issues at hand such as production sustainability, employment of new improved technology, eco-friendly aquaculture farming practices, food safety regulations and the likes are continuously being addressed, though are still facing the industries. Despite the related issues are being continuously addressed by the government, however at the management level of the aquaculture eco-system, among the crucial elements that somewhat receiving less attention that ought to be given due consideration, include the state affairs of supply chain integration, namely: external integration with suppliers, external integration with customers; supply chain risks, and technological innovation towards attaining significant business performance. All these collectively may avail in the agriculture sector, perhaps also incidence in the aquaculture contract farming eco-system.

Given the above new development, this paper aims to unveil some possible state of affairs that could lead to this rejuvenation of interest in agricultural economic activities, with specific focus on contract farming in aquaculture. Hence, this paper will address the above mentioned subject matters from the preceding paragraph, namely: supply chain risks, external integration, and technological innovation toward business performance, in the context of aquaculture contract farming landscape. The rest of the paper addresses on the background of contract farming in aquaculture, follows by the SCM philosophy and supply chain integration, and finally this paper ends up with concluding remarks on the subject matter of discussion.

## **2. Contract farming in Aquaculture**

Like many industries in the world, there is great competition in the agricultural sector. Demand for agricultural products, particularly those relating to food production, is high. In order to meet the demand various techniques, technologies and chemicals have been introduced to increase productivity. In Malaysia, within the Five year term Malaysian Plan, agriculture has been placed as the third-highest income generator for the country. The government has undertaken various strategies and measures to further increase food production. The strategies include the opening of new agriculture lands, and introduction of modern agricultural production techniques and other initiatives the like. Further, the agriculture ecosystem is flourished by the presence of the practice of contract farming in poultry, so as its presence in the aquaculture environment.

Contract farming is not a new industry in Malaysia, having been established since the early 1980s. The scheme was originally designed for poultry-based broiler farms, and was then broadened to other types of farming, including aquaculture. Contract farming can be defined as agricultural production based on an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products. Commonly, the farmer agrees to produce their products according to the quality and quantity determined by the purchaser. In turn, the buyer commits to buy the product and, in some cases, to support production through, for example, the supply of farm inputs, land preparation and the provision of technical advice. Hence, it is obvious that there exist the relationships based on collaboration between business partners, namely: the farmers and buyers. The said relationship based on such collaboration becomes a fundamental subject matter in the supply chain management (SCM) phenomenon. The following section provides the highlight of SCM philosophy, supply chain integration related concepts in relation with business performance of aquaculture.

## **3. The SCM Philosophy and Supply Chain Integration**

To some people, SCM is a management philosophy, while to others it is a management process, and some view it as an integrated system. However, succinctly expressed, in operational term, that SCM involves the movement of materials and products (Tyndall et al., 1998); while Jüttner et al., (2003) defined that supply chain as a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer. Thus, the supply chain can be described as the connecting process across supplier-user relationship, starting from the raw materials (such as agriculture inputs) and ending with the consumption of the finished products, in aquaculture environment are the fishes, shrimps, cockles and the like.

Generally, the supply chain comprises of all the internal and external functions of an industry which enable the value chain to produce items and supply services to ultimate customer or end user of an industry and in this context is the agriculture sector. Hence, the SCM essentially combines supply and demand management within and across business entities. This management philosophy concentrates on how businesses make use of their supply processes, technology, information, and skills to improve their business performance through the coordination of production, materials,

logistics, and distribution and transportation functions within an organization SCM as an integrative strategic initiative to manage the overall movement of a distribution route from supplier to the end user. Having stated so, the subsequent sections provide specific highlight on the three related variables of supply chain integration, vis-a-vis, external integration with suppliers, external integration with customers, and supply chain risk. All these variables are anticipated having bearing on business performance. The innovation in agriculture in relation with business performance is discussed then.

### *3.1. External integration with Supplier and Business Performance*

Organization's integration with suppliers refers to that entity working closely with suppliers and viewing the latter as an important component of supply chain (Swink et al., 2007). In this article, this variable also encompasses the degree of involvement and influence suppliers have in the company's decision. It also measures how closely suppliers work with company to seal a deal (Narasimhan, R et al., 2002). The level of strategic partnership with suppliers has been used to refer to closer, longer-term relationships with suppliers (Rajagopal, 2002).

Several previous studies have also examined the effects of supplier involvement effort on performance (Petersen et al., 2005). One of the earliest studies on the effect of supplier involvement effort is reported by Wheelwright et al., (1992). The authors found positive impacts on shorter project lead-time and fewer engineering hours from strong inter-firm communications, intensive joint engineering problem solving, and early involvement, while, operationalized the buyer-supplier interface as timing of supplier involvement, and supplier's responsibility for policy (Hartley et al., 1997). Overall, this body of research tends to emphasize the positive side of supplier involvement in business performance. Perhaps this scenario is anticipated to exist in the context of aquaculture contract farming landscape.

### *3.2. External integration with Customers and Business Performance*

Company's integration with customers refers to company working closely with customers and viewing the latter as an important component of supply chain (Swink et al., 2007). In this article, this variable also encompasses the degree of involvement and influence customers have in the company's decision. It also measures how closely customers work with company to seal a deal (Narasimhan et al., 2002). On the demand side of a supply chain, through customer integration, firms will penetrate deep into the customer organization to understand its products, culture, market and requirements. With increased visibility, customer integration will further enable collaboration in demand planning (Fisher, 2003). Otherwise, due to the lack of information sharing from one end of the supply chain to the other, there will be tremendous inefficiencies in customer service (Lee et al., 1997), consequently affected business performance on the whole.

### *3.3. Supply Chain Management Risk and Business Performance*

A supply chain is a network that includes vendors of raw materials, plants that transform those materials into useful products, and distribution centres to get those products to customers. Known also

as the value chain, it is the sequence, which involves producing and delivering of a product or service. The simultaneous integration of customer requirements, internal processes and upstream supplier performance, however, is not commonly free from risk, vis-a-vis, supply chain management risk. Perhaps, the potential occurrence of possible or anything that may disrupt or impede the information, material or product flows from original suppliers to ultimate user, may affect the business performance.

#### *3.4. Innovation in Agriculture Sector*

Currently, more than ever before, global food and agricultural systems are undergoing a process of rapid change. Growing consumer demand and changing consumer preferences have emerged as key drivers of agricultural prices, technology, and trade. Global integration of agricultural markets, and supply chains have created new opportunities for sharing of goods, services, and ideas among suppliers, consumers, producers, researchers, and entrepreneurs. These changes have been accompanied by new technology and other fields that have the potential to change the quantity and quality of food and agriculture produced and consumed worldwide. These rapid changes and emerging conflicts strongly suggest that developing countries will need to develop more responsive, dynamic, and competitive agricultural sectors in the short to medium term to benefit from the changing global system. Agricultural innovation will be the order of the day, and developing countries will need innovative policies, programs, and investments just to keep up.

#### **4. Concluding Remarks**

In this paper, three variables of supply chain integration, namely: external integration with suppliers, external integration with customers, and supply chain risk; as they may have different effects on business performance. It is also possible that the effects technological innovation on each of these three elements of supply chain integration differ from one to another. These concepts are discussed above in turn. In the scope of this paper, external integration in the supply chain perspective involves the processes of collaboration with suppliers and customers to achieve mutually acceptable results. Linkage with suppliers and with customers helps to reduce lead-time which undoubtedly reduce the adverse effects, such as bullwhip effects, and contribute to enhanced business performance. Perhaps the outcome of supplier integration could act as a competitive competence, meriting management consideration and resources. Hence, when companies are integrated and acted as a single entity, performance is shared throughout the chain. Similarly, collaborations and combined experience of both parties can help reduce errors, defects or flaws in routine, which leads to improved operational performance. This scenario perhaps could emerge in the context of aquaculture contract farming in Malaysia. Hence, this milieu ought to be observed, giving due recognition and consideration by the prospective aquaculture contract farming intervenants in light of reaping the fruitful engagement for business performance.

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