

The Literature Review of Potential Challenges Facing by Global Food Industry in the Era of IR4.0

Intan Cahya Ningrum¹, Bavaani Balakrishnan², Ciara Mae U. Agasino³, Kevin Pinondang Parulian Manurung¹, Raden Isma Anggraini^{1*}

¹ *School of Business IPB University*

² *School of Technology Management and Logistics Management, Universiti Utara Malaysia, Malaysia*

³ *College of Business, Economics and Accountancy, Mariano Marcos State University, 2906, Philippines*

*Corresponding author. Email: isma.anggraini@apps.ipb.ac.id

ABSTRACT

This paper contributes to the existing literature by reviewing the potential challenges facing the global food industry in the era of Industrial Revolution 4.0 (IR4.0). Even though many industries have been driving productivity and income growth through digitalization and automation, the development of the food industry cannot be ignored. The food industry is not the only an extension of agricultural production and fishing but also a series of industrial activities along the value chain such as food storage, processing, preserving, packaging, distribution, transportation, retailing, restaurants and many other services. Therefore, the food industry remains one of the global economic sectors as it provides high quality of food safety, export opportunities, creates new enterprise growth, and a significant share of employment in all countries. Thus, we conducted an extensive literature review by taking a closer look at the challenges faced by global food industry is the highly diversified the global market. The result of this review paper will be offered insights and will shed some light for our fellow farmers and industry players on the potential challenges that may affect the food industry in the era of IR4.0.

Keywords: *Food Industry, Food Safety, Industrial Revolution 4.0, Value Chain*

1. INTRODUCTION

The purpose of this paper is to review the potential challenges the food industry had to face to ensure continuous production in the era of Industrial Revolution (IR4.0). In many developing countries, the food industry is regarded as one of the economic sectors that accelerate economic growth that offers employability to millions of people around the world. With the rapid growth in the population, the demand and consumption of food increases resulted from massive production of raw materials. Since the food industry is considered a dynamic industry that constantly subjected to changes in customer demands, different countries have implemented different practices and initiatives to promote and improve the growth of food productivity [1]. According to [2], The United Arab Emirates (UAE) which is one of the destination countries for foreign tourists, heavily relies on imported products to support the needs of its tourists, such as rice from India and

Pakistan. Although the countries across the globe have allowed free movement of food products and other essential goods, [3] explained that there are still many companies that find it difficult to distribute their goods across the global market due to the existence of restrictions imposed by The World Health Organization (WHO) that causes supply chain processes are interrupted especially during global pandemic Covid-19. [4] stated many drivers who were the actors in the logistics chain, decided to stay at home or do other jobs to avoid the possibility of becoming the main reason for spreading the virus. As a result, the global logistics players facing difficulty in distributing goods to the market.

2. MATERIALS AND METHODS

This segment suggested a one-step method to compile the challenges faced by global food industry. In this one-step method, existing articles that available in

the database are gathered and analysed. These articles are treated as “primary material” in this paper. The literature review approach together with the combination of content analysis is an established approach that guiding a number of papers [5-6]. With the thirty one (31) literature support, identification of potential challenges in the food industry were summarized in the following topic.

3. RESULTS AND DISCUSSION

The overall results of the study described that the current challenges facing by the global food industry. In this section, the purpose of this study was to identify the key challenges faced by the global food industry through the existing literature. Table 1 shows the summary of literature review results.

Table 1. Summary of literature review results

Possible challenges on food industry	Comments	Source
Limited technological application	The IR4.0 is growing and with major enabling technologies, however reluctant to change, lack of technology savvy among farmers and huge financial investment limiting the penetration of technologies.	[7 -11]
Limited arable land	Rapid urbanization and industrialization have exploring and converting land into industrialized	[7- 8] ; [34-35]
Aging farmers	Unwillingness of most working age groups to be a farmer and draw people to cities to fulfil the demand of factory workers	[7- 9]
Scarcity of water resources	The water usage for other economic activities have increased as water availability for agricultural activities decreased in which the future agriculture activities may experience water scarcity or water stressed condition	[7] ; [31-33]
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Logistics	Due to the Covid-19 restrictions and Standard of Operations (SOP) many farmers and companies are unable to distribute goods to the market. Covid-19 tests are required for cargo drivers to carry out regularly to ensure they are free from the virus.	[4] ; [12 -13]
Harvesting of agricultural products	Harvesting the agricultural products is indeed a crucial activity in the agriculture sector. However, restriction policies have affected essential workers in which cases of agricultural products being left to rot. Moreover, due to Covid-19 where the borders have been closed, a limited harvested crop were distributed globally. Furthermore, reports stated farmers were left with no option as they were pushed to destroy their excessive supply of stock such as dairy and tea products because these products unable to reach the supply channels.	[14] ; [23] ; [39]
Price volatility	A new trend where farmers collect agricultural products and sell them in large quantities at once in which lead the price drop significantly.	[4] ; [15 -17]
Global Covid-19 pandemic	Due to the extreme isolation and quarantine restrictions issued by many governments, people have increased their consumption and stockpiling of	[21] ; [23] ; [26] ; [29-30]

	<p>food commodities.</p> <p>The outbreak of Covid-19 also resulted to the closure of food manufacturing and other distribution facilities all over the world. While other industries were able to continue operate with the option of work from home or remote working, the food industry is an exception because food industry need its workers to be physically available in which increases the vulnerability of workers.</p>	
Supply chain complexity due to multiple channels	The underlying supply chain is changing due to existing of different channel in ensuring the products reach the consumers.	[11] ; [18] ; [27]
Food safety & security	Due to Covid-19, the entire food supply chain is at risk for the dangers of contamination. Without a proper hygienic procedure, Covid-19 can be transmitted through animal tissues found in meat, poultry and fish product. Control requirements for entire food flow such as disinfection, sanitation of working environment, using personal protective equipments and managing worker's health are strictly implemented to restrain the impact of Covid-19.	[19] ; [21-22] ; [24-25] ; [27-29]
Environmental degradation	Due to natural calamities from all over the world, food crops can be destroyed. As a result, there are major shortage on food supplies and commodities.	[1] ; [7- 8] ; [26]

4. CONCLUSION

Based on literature review evidence, it can be suggested that the challenges facing by the global food industry is real and a lot of effects are needed to address the challenges. The global food industry that makes up of vast and diversified segments such as the fresh food industry, organic food industry, processed food industry and livestock food industry required a different set of supply chain strategies to succeed in the competitive market [20]. However, due to the recent global pandemic Covid-19, this industry also suffered substantial and financial losses due to disrupted supply chains and food business activities. Despite the disruption on the supply chain including transportation, distribution, preservation and shortage of manpower, food businesses have had to deal with increased demand for food consumption [39].

Furthermore, the rise of IR 4.0 has opened up few possibilities to address these challenges and able to restructure the strategies in the global food industry. The awareness of a technological shift in the agricultural sector is slowly shaping the food value chains. New technology and innovations are needed to strengthen the supply chain system so that high-value crops are able to meet new emerging market demands. Since, IR4.0 leverages the Internet of Things (IoT) which consists of: cloud computing, Artificial Intelligence (AI), big data analytics, simulation and other technologies help in digitizing the supply chain, thus can help to overcome challenges in the supply chain in the food industry [38]. The existence of IoT technology helps and facilitates the

supply chain process in the food industry such as planning, traceability, innovating, improving visibility, autonomous control and monitoring, and enhanced monitoring[36].

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