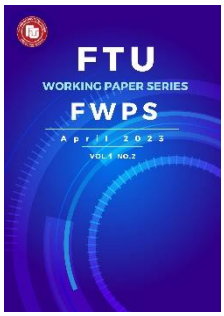

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ỨNG DỤNG CHUỖI CUNG ỨNG TUẦN HOÀN: KINH NGHIỆM QUỐC TẾ VÀ ĐỀ XUẤT CHO VIỆT NAM

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Vấn đề chuyển dịch từ nền kinh tế tuyến tính truyền thống sang kinh tế tuần hoàn đang được quan tâm và mở rộng trên phạm vi toàn thế giới. Tuy nhiên mỗi quốc gia sẽ có những kế hoạch thực hiện và những mục tiêu khác nhau. Mục đích của nghiên cứu này là tìm hiểu về những khái niệm và quan điểm liên quan đến kinh tế tuần hoàn và nghiên cứu một số nghiên cứu ứng dụng kinh tế tuần hoàn trong chuỗi cung ứng của các nước Đức và Trung Quốc. Kết quả chỉ ra rằng, nền kinh tế tuần hoàn không phải là một mô hình duy nhất, thống nhất cho toàn bộ nền kinh tế, mà là một tập hợp của nhiều mô hình dựa trên cùng một triết lý - tái tạo và khôi phục. Từ đó đưa ra một số đề xuất đối với vấn đề áp dụng chuỗi cung ứng tuần hoàn tại Việt Nam.

Từ khóa: chuỗi cung ứng, kinh tế tuần hoàn, Việt Nam, đề xuất

IMPLEMENTING CIRCULAR SUPPLY CHAIN: INTERNATIONAL REVIEW AND SUGGESTION FOR VIETNAM

Abstract

The transition from the traditional linear economy to the circular economy has gained popularity recently on a worldwide scale. Each nation may, however, have a different execution plan with different objectives. The purpose of this paper is to investigate the circular economy and some foreign examples of how it can be applied. As a result, the Circular Economy is not a single, uniform model for the entire economy, but rather a collection of numerous models that are based on the same philosophy—that of renewal and repair. Some policy implications for Vietnam are addressed in light of foreign experience.

Keyword: supply chain, circular economy, Vietnam, suggestion

1. Introduction

Vietnam is a developing country, which has been facing serious problems in the use of natural resources and management of environmental pollution.

Although it has been approached quite widely from the perspective of individuals or households, we can see that circular economy is still a new term in Vietnam, appearing for the first time in legal documents in Vietnam. Clause 1, Article 142 of the Law on Environmental Protection 2020 officially takes effect as well as the newly approved Vietnam Circular Economy Development Scheme in 2022.

The most important issue for Vietnam today is building the foundation for a circular economy. This foundation should be based on the development of a unified policy that can integrate different efforts on socio-economic development, environmental protection, and natural resource conservation into one mission.

The development of a circular economy is the current shifting trend of many businesses both at home and abroad. This new economic model contributes to promoting economic restructuring in association with renovating the growth model towards modernity, improving competitiveness, and improving the ability to proactively adapt and withstand shocks from the global economy

while realizing the National Strategy on Green Growth for the period of 2021-2030. However, in order to successfully transform the circular economy, businesses need to have a vision of the immediate difficulties in order to make appropriate changes, aiming to maximize the results when applying the new economic model.

The circular economy model is a new issue for businesses, especially applied specifically to each type of business. There is a lack of specific policies to support enterprises to participate in the development and application of circular business models, such as finance, credit, technology and training. Due to the old shortcomings from the design of the model, businesses are forced to redesign their production and business activities from the input of raw materials, instead of discharging to the environment as before. New investment enterprises under the circular economy model will also face many difficulties in the initial design stage, requiring good experts with deep expertise and appropriate design. Additionally, it is necessary to redesign, invest to innovate technology and production processes to improve quality, prolong product life cycle, recover waste, etc., and to retrain existing human resources and add suitable new human resources.

In the present era of information technology growth, the use of circular economy in supply chain management with the objective of shifting to a circular supply chain is vitally essential, assisting us in coming up with solutions. reaction to the problem of depletion of natural resources, limitation of input materials as well as one of the answers to safeguard the environment. The need to improve market speed and tailor services to suit client expectations is another reason why our manufacturing and supply chains must be quicker, more flexible, and responsive. Replace the linear model with a circular model.

2. Theoretical Background

2.1. Circular Economy Concept

The circular economy concept has rapidly expanded over the last decade, from a simple recycling-related theory to an autonomous economic structure with enormous potential. Stahel (2019) describes the process of balancing economic, environmental, and social needs. A glance at the sheer amount of scholarly papers demonstrates its importance in academic research: The search phrase "circular economy" generated only roughly 150-170 entries in the Web of Science (WoS) database from 2010 to 2014, a rather consistent trend. Yet, there was a large increase in publications during the next five years. Each year, the number of articles climbed significantly, reaching a peak (at least so far) in 2020 with over 3,300 publications. In just ten years (according to WoS estimates), the research field has grown by more than 2,000%.

The lack of transparency and agreement about the current understanding of the circular economy concept, which impedes its further progress, particularly the successful transition from linearity to circularity, is a significant issue arising from this rapid development (Kirchherr et al., 2017; Prieto-Sandoval et al., 2018). The scientific community agrees that the circular economy is superior to the old, linear economy with its "take-make-waste" strategy (Homrich et al., 2018).

Yet, there is substantial disagreement regarding which tactics, behaviors, and, most crucially, goals constitute the basic parts of the circular economy.

To date, the most widely used definition of the circular economy was presented by the Ellen MacArthur Foundation "A circular economy is one that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. This new economic model seeks to ultimately decouple global economic development from finite resource consumption" (Ellen MacArthur Foundation, 2013). Within restorative cycles, the goal is that discarded technical (non-organic) products and materials become technical nutrients through the application of R-activities, within regenerative cycles, discarded organic products become biological nutrients as natural capital (Ellen MacArthur Foundation, 2017). In both cycles products and materials can flow in open- or closed-loops, either flowing reverse within one supply chain or cascading forward toward other supply chains (Batista et al., 2018).

Circular Economy, in other definition, is a closed-looped industrial economic model that aims to minimize waste while keeping materials, product value, and resources within the economy as much as possible via restoration and reuse, renewable energy, elimination of toxic chemicals usage, sustainable design (Spring and Araujo 2017; Cheng and Chou 2018). In this context of this study, Circular value may be produced and supplied by engaging in important circular activities such as R-process implementation, cycling, and cascading (Ellen MacArthur Foundation, 2013). Circular value capture refers to the reduction of economic, environmental, and social costs as well as the establishment of new income streams as a result of value creation (Geissdoerfer et al., 2020). These could be savings from reduced costs due to the input of recycled material, increased margins due to reusing products or additional revenues from residual values (Bocken et al., 2016).

The phrase circular economy first appeared in Vietnamese legislative papers in Clause 1, Article 142 of the Law on Environmental Protection 2020, which formally took effect in 2022, as well as the newly authorized Vietnam Circular Economy Development Programme. "A circular economy is an economic model in which design, manufacturing, consumption, and service activities attempt to reduce the exploitation of raw materials and materials, lengthen the product life cycle, limit waste formation, and minimize negative environmental consequences." The circular economy is defined in this Article as a concept that explicitly focuses on the environmental factor while simultaneously promoting positive improvements at the economic and social levels.

The creation of a circular economy is a moving trend among many firms, both domestic and international. For the four primary reasons listed below, the circular economy model is being proposed as a solution, an alternative approach to the linear economic model, in the contemporary context:

(1) Increased demand for raw materials, despite the fact that these resources are becoming increasingly depleted, particularly non-renewable mineral resources;

(2) Dependence on other countries, particularly those that rely on other countries for raw material supply. This reliance contributes to global political instability.

(3) Environmental impact, accelerating the process of climate change (emissions of greenhouse gases, especially CO2). The shift to a circular economy with the objective of utilizing sustainable energy and decreasing waste output will reduce climate change and remove negative environmental consequences.

(4) Encouraging businesses to innovate and improve science and technology in order to provide economic possibilities

The Government of Vietnam has made significant efforts in environmental protection in order to develop a circular economy, primarily through numerous major legislative instruments, policies, and orientations, most notably the Law on Environmental Protection. 2014 school year National green growth plan for the period 2021- 2030, with a vision to 2050; Vietnam's renewable energy development strategy to 2030, with a vision to 2050; National integrated solid waste management strategy to 2025, with a vision to 2050. …

2.2. Circular Supply Chain

The circular supply chain (CSC) is defined as an industrial concept that, by its unique design, allows the flow of materials, energy, human, and information to be in a closed cycle so that economic development and environmental protection are balanced with each other (Murray et al. 2017). SCM operations play a vital role in moving toward circular components at all stages of the supply chain. As previously stated, there are several challenges and roadblocks to implementing the CSC model in enterprises. As a result, in order to employ flexible materials that can be recycled and re-produced along the chain, a systematic method that may boost economic growth and company performance while considering environmental challenges is required. Yet, due to the benefits of the circular model, numerous studies have been undertaken in many fields such as building, manufacturing, supply chain, and services (Tukker 2015).

The term "circular supply chain" has been used in several research to connect Circular Economy and Supply Chain Management. The following are some of these definitions: Closed loops are used in coordinated supply chains to market by-products and utilities and to employ valuable trash to produce value, which promotes the economic, social, and environmental sustainability of businesses (Batista et al. 2018). Incorporating circular economics into SCM minimizes the requirement for raw materials by recycling materials (which can increase the number of resources in supply chain systems) and leads to the development of the limits of sustainable and green supply chain management (Genovese et al. 2017). The integration of circular thinking into SCM and the surrounding industrial and natural ecosystems is referred to as CSCM. This systematic approach restores materials and resources, as well as biological materials, through extensive innovation in business models and supply chain functions (from product design to end of product life), as well as waste management, and it involves all stakeholders in the production

and delivery of products or services. Manufacturers, distributors, and end users are the primary participants in the product life cycle (Nasir et al. 2017).

To restructure supply chains in order to accomplish Circular Economy or to adopt Circular Supply Chain, the supply chain structure and configuration must be modified from linear or sequential to circular (MacArthur 2013). The circular supply chain will create small loops, bringing end products, waste or surplus materials back into inputs in the production process, helping to lower energy consumption, reduce lower emissions and greater efficiency for the business.

The stakeholders in textile CSC are based on the classification of European Commission (2017); Wicher et al. (2018); Boiten, Li-Chou Han, and Tyler (2017); Fontell & Heikkilä (2017).

"Suppliers, as the first layer of the supply chain network, pose a great impact on environmental pollution" (Govindan, K. et al. 2020). A supplier in a circular supply chain is an entity responsible for delivering the products, services, or components required to complete the end product while also getting the product or service in return. Service for reusing, recycling, or maintaining. Suppliers in the circular supply chain must maintain a consistent method for recovering spent or expired items or services from the end consumer. This product or service must subsequently be disposed of in a safe and ecologically responsible manner, such as reuse, recycling, or sale to professional recycling organizations. This helps to decrease waste and produce value for some old items or services, while also boosting supply chain management efficiency. As a result, suppliers are critical to sustaining and improving the sustainability of production and economic operations in the circular supply chain. As a result, selecting the proper supplier is critical to ensuring reduced material handling costs and less environmental effect, as well as lowering the number of distribution centers and transportation vehicles utilized. The selection process can be completed with further supplier development to increase the performance of the existing provider. (Masoumi, S.M., Kazemi, N. and Abdul-Rashid, S.H. 2019).

Designers' involvement in this process is to develop goods that minimize waste in production, reuse waste in garment design with little loss of quality, and encourage the use of recyclable local resources (Wilson 2015; Ozdamar Ertekin and Atik 2020). This procedure is offered to save energy, utilize fewer raw materials, and lessen environmental effects (Snoek 2017).

A distributor is an intermediary between the producer and the ultimate client in a circular supply chain. Distributors often buy products from manufacturers or other suppliers and resell them to end users or other distribution channels. The distributor's responsibility is to guarantee that commodities are delivered at the correct location and at the correct time, while saving money on transportation and storage. Furthermore, the distributor is responsible for the handling of product waste as well as maintaining food safety and players cleanliness for clients. Moreover, distributors play a crucial role in assisting manufacturers in completing their circular supply chains. They can supply information and feedback from customers, assisting producers in understanding market demands and optimizing their operations.

Customers are the final link in the supply chain in the linear economy, performing a passive role. Customers, like other supply chains, are expected to participate actively in product recovery and waste material recycling in the circular economy (Borrello, M. et al. 2017). Because the consumer becomes a crucial player in the circular economy's strategic network, it is critical to foster loyalty and satisfaction in order to establish a longer-term connection. "Firms have been increasingly affected by their consumers' ethical beliefs and ecological thinking, compelling them to address environmental management practices" (Masoumi, S.M., Kazemi, N. and Abdul-Rashid, S.H. 2019). Businesses that use circular economy ideas in their supply chain should share shared goals and collaborate with consumers to drive green purchasing habits (Kazancoglu, Y., Kazancoglu, I. and Sagnak, M. 2018). These improvements can be achieved by the adoption of sustainable awareness campaigns and education (Farooque, M. *et al.* 2019). "Supply chains may become more sustainable and enhance their economic and socio-environmental performance by encouraging customers to adopt greener consumption habits, which in turn encourage manufacturers and suppliers to adjust their operations" (Taghikhah, F., Voinov, A. and Shukla, N. 2019). Consumers' behavior has a direct impact on market capacity.

3. Discussion

Agri-food products face many challenges for transitioning to a CE in China. Generally, China's food recycling system is limited due to inadequate collection infrastructure and treatment facilities. Unsorted food waste is mostly disposed of in landfills. Only in major cities like Shanghai and Beijing is a tiny amount of food waste segregated at the source and processed using biochemical techniques. Farooque et al. (2019b) highlighted the primary challenges to circular food supply chains in China as "poor environmental legislation and enforcement," "lack of market preference/pressure," and "lack of collaboration/support from supply chain participants."

Government organizations such as the National Development Reform Commission (NDRC) and the Ministry of Environmental Protection have pushed for CE adoption in China (Mathews and Tan, 2016; Geng et al., 2014). Unfortunately, due to the presence of several impediments, China's progress in CE adoption has been minimal (Mathews and Tan, 2016; Pesce et al., 2020). Su et al. (2013) also investigated CE implementation barriers such as a lack of incentive schemes for CE projects, a lack of high-end technology for CE practices, complex institutional structures and issues of local administration coordination, fewer financing options, a lack of transparency, and the absence of a region-specific customized performance monitoring system. Ranta et al. (2017) noted constraints such as a lack of a holistic perspective, an overemphasis on recycling, and an underutilization of reuse and reduction approaches. Nonetheless, there are particular cases of increased enforcement. For example, in Shanghai City, the new "Regulations on the Management of Household Trash" went into effect on July 1, 2019. At this time, other legal requirements include the Environmental Protection Law, recently enhanced to make punishments stricter. However, they only concentrate on the most polluting businesses rather than food loss or waste. Despite the fact that the Circular Economy Promotion Law was revised in 2018, there are no laws addressing food loss or waste.

From an institutional standpoint, Liu and Bai (2014) identified a gap between awareness of CE practices and their implementation as a result of structural, contextual, and cultural challenges. These problems are specific to organizations and locations. According to Yuan (2017), an insufficient regulatory framework, various stakeholder engagements, a lack of fundamental data, and a lack of attention to waste management all contributed to considerable delays in CE projects. This looks to be a significant concern at both the manufacturing and consumption stages. Zhang et al. (2019) revealed in a recent study that the main challenges to smart waste management for a CE in China were a lack of regulatory constraints and a lack of environmental education and culture of environmental preservation.

Another example of adopting circular economy is the German polyethylene terephthalate (PET) markets. The issue for implementing a circular plastics economy transition is policy. Plastics never become garbage in an ideal, closed-loop circular economy; instead, they re-enter the system as valuable raw materials (Ellen MacArthur Foundation, 2020). Despite Germany's long heritage of waste laws, neither Germany nor the European Union has a comprehensive legal framework for a circular economy. However, components of the Circular Economy are often addressed under waste prevention and management regulations, which are directed more toward garbage disposal than resource-productive material management. Furthermore, the essential features are dispersed throughout many departments of the law. At the same time, existing policy tools are not yet geared toward supporting a circular, resource-productive economy; for example, ecodesign regulation is still heavily focused on individual product energy efficiency.

Despite advanced German waste management infrastructure, the German recycling PET market lacks the ability to scale up. The opportunities provided by digitization are far from exhausted, ranging from digital technical support for circular product management strategies to essentially digital, dematerialized company models. Germany presently ranks 12th in Europe in terms of digital competitiveness. So, special emphasis should be placed on encouraging the adoption of appropriate digital technologies in business practice, thereby enhancing the data and information interchange required for a Circular Economy.

4. Suggestions for Vietnam

From the above studies, it can be seen that businesses from developed countries are focusing on implementing circular supply chains through economic policies, data systems as well as enhancing waste reduction and efficiently managing raw material revolving in the supply chain.

Based on the above experiences, situations, and lessons learned from Germany and China, the research team makes some recommendations for businesses in Vietnam as follows.

Vietnam will need thorough and systematic policies, though, in order to adopt a circular supply chain in line with the global trend. Because, in accordance with the above-mentioned international experience, the circular supply chain has advanced and must now be thoroughly taken into account in four stages: (1) production (including design and production execution); (2) consumption; (3) waste management; and (4) turning waste into resources. This paper suggests

some policy recommendations to encourage CE implementation in Vietnam based on the study of foreign experience presented above.

The first step is to institutionalize the circular supply chain and integrate it into all operations. The state plays a tectonic part in the circular supply chain, and business is the primary driving factor. International experience indicates that institutionalizing CE is the answer selected by many countries, most notably Germany, to support that central dynamic. To begin with, clear laws and policies will aid in the methodical and coordinated execution of circular supply chain, as will incentives (incentives in administrative processes and procedures, finance, and access to resources) and clear and open penalties.

The second step is to promote material recovery and limit waste that is difficult to recycle. There are three main groups of solutions to promote this: segregation of waste at the source, expanding producer responsibility (EPR), and promoting new markets. Green public procurement often has a great impact, and limiting the use of difficult-to-recycle materials is also important to promote the eco-economy. This is why most countries in Europe consider the restriction of single-use plastic products an important consideration when implementing eco-friendly policies.

The third step is to create a CE database system.

The circular economy data is more than just a compilation of information on excellent circular instances or projects to evaluate and scale up; it also contains critical data to help monitor how circular the economy is. (such as solid waste recycling rate, waste reuse rate, resource recycling efficiency, etc.). These are critical statistics for managing and regulating circular supply chain deployment.

The truth is that all of the world's top circular economy nations have a very effective database system, whereas Vietnam lacks fundamental data such as solid waste recycling rates over time.

5. Conclusion and Limitations

The study has systematized theories and perspectives related to the circular supply chain and its application. At the same time, this study also points out and analyzes the role of stakeholders in the chain, and analyzes the application cases of circular economy and circular supply chains in a number of countries such as Germany and China.

From the above analysis, the research team has made some recommendations related to the application of circular supply chains in Vietnam.

However, it can be seen that the research still has some limitations when it is not possible to point out all the challenges and limitations that still exist in the application of the circular supply chain in general worldwide and, in particular within Vietnam.

The studies used are based on the theoretical basis of the review method and need to provide some applied and quantified models in more detail. In addition, it is also necessary to study the circular supply chain model for each business field due to the specificity of each product type

because it is very important to study a selected context. In the future, there will need to be other in-depth studies into the details of each industry and each stakeholder involved in the chain.

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