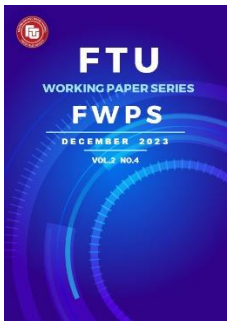


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# KINH TẾ TUẦN HOÀN HƯỚNG ĐẾN MỤC TIÊU PHÁT TRIỂN BỀN VỮNG (SDG) TẠI VIỆT NAM – CON ĐƯỜNG ĐẠT ĐẾN TIÊU THỤ VÀ SẢN XUẤT CÓ TRÁCH NHIỆM

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**Tóm tắt**

Trong nhiều năm vừa qua, kinh tế tuần hoàn (KTTH) đã nổi lên như một phương thức kinh tế tối ưu, vừa thúc đẩy hiệu quả kinh tế vừa hỗ trợ quá trình đạt được Mục tiêu Phát triển bền vững số 12 (SDG 12) về Tiêu thụ và Sản xuất có trách nhiệm. Bài viết này tập trung vào việc nghiên cứu khái niệm về KTTH và cách nền kinh tế này có thể đóng góp vào việc đạt được SDG 12 ở Việt Nam. Thông qua quá trình phân tích toàn diện, nghiên cứu xác định được một số cơ hội và thách thức trong việc đạt được Tiêu thụ và Sản xuất có trách nhiệm thông qua KTTH tại Việt Nam, trong đó tập trung vào các quy định và các yếu tố trong nước. Hơn nữa, bài viết cũng nhấn mạnh các biện pháp được thực hiện bởi chính phủ Việt Nam, cũng như các hoạt động sản xuất và tiêu dùng, để thúc đẩy việc áp dụng KTTH. Từ những phát hiện này, một số

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khuyến nghị cụ thể để sử dụng KTTH trong việc tiến tới đạt được SDG 12 cho các cơ quan, doanh nghiệp và cá nhân cũng được đưa ra.

**Từ khóa:** Kinh tế tuần hoàn, Tiêu thụ và Sản xuất có trách nhiệm, Việt Nam

# CIRCULAR ECONOMY TOWARD SUSTAINABLE DEVELOPMENT GOALS (SDGS) IN VIETNAM - A ROADMAP TO ACHIEVING RESPONSIBLE CONSUMPTION AND PRODUCTION

**Abstract**

For many years, the Circular Economy (CE) has emerged as an optimal economic method that can not only foster economic efficiency but also supports the attainment of Sustainable Development Goal 12 (SDG 12) on Responsible Consumption and Production (RCP). In this study, we will study the concept of CE and how it can contribute to the achievement of SDG 12 in Vietnam. Through comprehensive analysis, this research identifies several opportunities and challenges in achieving RCP through CE with a focus on regulations and the domestic factors. Moreover, this research highlights the proactive measures undertaken by Vietnam's government, as well as production and consumption practices, to advance the adoption of CE within the country. Drawing from the findings, some specific recommendations to utilize the CE in achieving SDG 12 for authorities, firms, and individuals are proposed.

**Keywords:** Circular Economy, Responsible Consumption and Production, Vietnam

## 1. Introduction

The concept of CE is currently promoted by several national governments as well as by several businesses around the world. CE appears to be a solution to sustainable socio-economic development of the country aligning with protecting the environment and the country’s natural resources. It offers an alternative economic model allowing recycling materials along with cutting down on wastes, saving natural resources and stimulating business potential. The relationship between CE and Sustainable Development Goal has long been an interesting topic to the general public, especially how CE contributes to the Goal of Sustainable Consumption and Production.

This study focuses on the adoption of CE in Vietnam and outlines a roadmap for achieving RCP in response to the country's unique settings. Through qualitative research methods, we gather information from reputable press sources and national and international scientific research.

Recognizing the profound influence of CE on Vietnam's sustainable development, particularly in relation to the achievement of SDG 12, our research group has undertaken a comprehensive study titled "Circular Economy Toward Sustainable Development Goals in Vietnam: A Roadmap To Achieving Responsible Consumption and Production." The primary objective of this research is to provide insights into the current state of progress in Vietnam and pinpoint areas that require further improvement. The structure of the research is as follows:

1. Literature Review on the concept of CE and its relationship with SDGs and SDG 12.

2. Methodology of the research.

3. Research Results on the adoption of CE Towards SDG 12 in Vietnam, with Opportunities & Challenges, and Recommendations for governments, enterprises and individuals for the development of CE Towards SDG 12 in Vietnam

## 2. Literature review

### *2.1. Theoretical framework*

#### *2.1.1. The concept of Circular Economy*

One of the currently most recognized definitions of the CE, provided by the Ellen MacArthur Foundation (2016), describes it as "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." Generally, by defining the CE, we are referring to a "closed-loop economy" that "does not generate excessive waste and whereby any waste becomes a resource" (Wysokinska, 2016, p.1). Another prominent definition stems from the EU Action Plan for the CE (European Commission, 2015): "In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimized, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value". However, there is ambiguity in these definitions regarding the treatment of waste. Is waste to be minimized or completely eliminated? Does the concept of "waste" differ from the common understanding, where it typically refers to discarded or treated residuals, whereas in a CE, waste may only exist in a form that can be reused? The call for waste limitation could, in this context, imply a need for greater efficiency.

The CE is often perceived as a new business model for achieving a sustainable economy and a healthy society. In such concepts, the CE encompasses aspects of sustainable development, including social and economic sustainability (Ghisellini et al., 2016). Moreover, it addresses both microprocesses within companies and the macro level of the overall economy . By adhering to its principles, the CE encourages all participants in an economy to contribute to a more environmentally friendly use of resources . The successful implementation of the CE is believed to require educated innovators, intermediaries, and explicit decision-making tools (Golinska, Kosacka, Mierzwiak, & Werner-Lewandowska, 2015).

As Ghisellini et al. (2016) point out, the CE is often misunderstood as merely "an approach to more appropriate waste management" (p. 2). This perception is reinforced by popular principles like the 3Rs (reduce, reuse, recycle), which are often used to summarize the core approach of the CE. However, the contribution of the 3Rs within the CE goes beyond waste treatment. It encompasses different product designs and improved consumption processes aimed at reducing waste generation. However, this waste-oriented view of the 3Rs is far too limited. Their contribution within a CE goes beyond the treatment of waste. It encompasses, for example, a different design of products or improved consumption processes in order to reduce the waste resulting from it.

The first R, "reduction," represents the pursuit of eco-efficiency in both production and consumption. Eco-efficiency is a business framework and goal that aims to create value while decreasing environmental impact. Therefore, CE is driven by two key motivations: economic and environmental improvements. However, while the social dimension is not explicitly mentioned within the goal of eco-efficiency, resource-efficient production still indirectly enhances social well-being by conserving resources for other purposes or future generations.

The second R, “reuse,” also implies a better design of products and business models for a cyclical “disassembly and reuse” sequence (Ghisellini et al., 2016, p. 6). There are further arguments that anything related to the principle of reuse, such as remanufacturing or repairing, should best be conducted regionally, thus reducing transportation and packaging. However, the reuse principle can be implemented successfully only if consumers are willing to buy reusable and remanufactured goods. This requires additional marketing from the companies, further education of people by public institutions, and a shared responsibility between producers and consumers to collect products after the first cycle of use (Lenzen, Murray, Sack, & Wiedmann, 2007).

The third R, “recycle,” refers to “any recovery operation by which waste materials are reprocessed into products, materials or substances, whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations” (European Parliament, 2008). The general CE definition also includes the requirement for renewable energy solutions.

In summary, scholars agree that the CE should be a regenerative system. However, much of the existing work primarily focuses on waste management, influenced by a narrow interpretation of the 3Rs principles, while these principles offer more extensive possibilities.

*2.1.2. The relationship between Circular Economy and Sustainable Development Goals*

The impact of the CE on achieving the Sustainable Development Goals (SDGs) has garnered considerable attention among researchers and policymakers. Several studies have investigated the connection between CE practices and the attainment of SDGs, considering various industries and business environments over different time periods. However, due to the diverse nature of these studies and the specific economic outlook and characteristics of Vietnam that are the scope of this paper, there is a need to analyze and evaluate the findings within the context of Vietnam's unique circumstances. The following section provides an overview and analysis of previous research on the relationship between CE practices and the SDGs.

The contribution of CE practices to reach sustainable development is studied on macro and micro level. The macro level studies focus on CE at global, national, city or regional level while the micro level studies concentrate on industry and products (Panchal, Singh, and Diwan, 2021).

Firstly, at the macro level, the study "The Relevance of Circular Economy Practices to the Sustainable Development Goals" by Schroeder, Anggraeni, and Weber (2018) concludes that CE practices can be applied as a versatile "toolbox" and specific implementation approaches for achieving a sizable number of

SDG targets. This underlines the importance of the CE transition for successfully achieving the SDGs. The research identifies the strongest relationships between CE practices and targets of SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 15 (Life on Land). These goals exhibit a close alignment with CE principles. However, the scope of this study is limited to developing countries and does not analyze opportunities between CE practices and SDG targets in specific country contexts.

In another research paper titled "From the Circular Economy to the Sustainable Development Goals in the European Union: An Empirical Comparison" (Rodriguez-Anton at al., 2021), the authors use a correlation analysis, an exploratory factor analysis, and a cluster analysis to show that there are significant links between the CE and SDGs, except for SDG 2 (Zero Hunger). However, it is important to note that this does not imply that there is no relationship between the CE and SDG 2, as this goal does not specifically aim to eliminate hunger in the European Union context. In addition, the author pointed out that the European Parliament should provide support measures for countries that are falling behind in the implementation of a CE model instead of letting all countries follow the general recommendations from the European Commission.

The third study, titled "Analysis of the Relations between Circular Economy and Sustainable Development Goals" (Rodriguez-Anton at al., 2019), explores the correlation between nine chosen indicators from four thematic areas (Production and consumption, Waste management, Secondary raw materials, Competitiveness and Innovation) defined in the monitoring framework of Eurostat and the 17 SDGs by using exploratory and cluster analysis. The findings reveal multiple correlations between these indicators and the SDGs, further underscoring the interconnectedness of CE practices and sustainable development. Moreover, the paper highlights that the EU can achieve the desired SDGs by applying initiatives toward a CE and help developing countries to fulfill at least some SDGs through development support measures.

However, it is important to note that the limitations of these two studies include the fact that both SDGs and CE are complex constructs comprising multiple components or factors, making their accurate measurement challenging. Additionally, the findings of these studies primarily apply to the European Union and may not be readily applicable to other regions due to the absence of a homogeneous global database.

At the micro level, although there are numerous studies about the impact of CE on sustainable development for companies and products, none of the researchers has agreed to a standard metric (Linder et al., 2017; Niero and Kalbar, 2019; Panchal, Singh, and Diwan, 2021). The main SDGs addressed by micro-level studies are responsible consumption and production (SDG 12) followed by affordable and clean energy (SDG7), industry, innovation and infrastructure (SDG9) (Panchal, Singh, and Diwan, 2021). There is only one paper which covers human health (SDG3) is “Human health and well-being in relation to circular and flexible infill design: assessment criteria on the operational level” (Geldermans, Tenpierik, and Luscuere, 2019).

In summary, these literature reviews emphasize the relevance of CE practices to the achievement of Sustainable Development Goals, particularly in areas such as clean water and sanitation, affordable and clean energy, decent work and economic growth, responsible consumption and production, and life on land. However, further research is required to explore the specific opportunities and challenges in different country contexts and to establish a comprehensive understanding of the relationship between CE practices and the SDGs.

### *2.2. Overview of Circular Economy in achieving Responsible Consumption and Production*

#### *2.2.1. Responsible Consumption and Production*

Responsible Consumption and Production is the 12th Goal in 17 Sustainable Development Goals (SDGs) in The 2030c adopted by all United Nations Member States in 2015.

According to the United Nations Development Programme (UNDP), Responsible Consumption and Production (RCP) serves as a prerequisite for economic growth and sustainable development. The UN explains “Sustainable consumption and production (SCP) is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all.” SCP has the potential to facilitate the transition towards a low-carbon, environmentally sustainable economy and yield an improved standard of living and increased employment prospects, thus supporting poverty reduction efforts.

The achievement of Goal 12 necessitates the establishment of a robust domestic framework pertaining to sustainable consumption and production. Therefore, the UN has defined 11 Targets to accomplish the 12th SDG. To sum up, the 11 targets of the 12th SDG focus on energy efficiency, sustainable infrastructure as well as improving the living standard and securing employment through resource management, sustainable manufacturing and circular supply chains (Küfeoğlu, 2022).

From the perspective of sustainable production, the major goal is to effectively manage limited resources in light of socio-cultural production aspects (Wang et al., 2013; Pallaro et al., 2015). From the perspective of sustainable consumption, the major goal is to raise consumer knowledge of the benefits of adopting sustainable purchasing practices (Liu et al., 2016).

SCP systems incorporate "bottom-up" initiatives from businesses as well as "top-down" sustainable efforts by legislators (Akenji and Bengtsson, 2014; Tseng et al., 2013). The "bottom-up" approaches integrate enterprises' SCP commitment into their business operations, whereas the "top-down" approaches lead to economic intervention by the authorities (Wang et al., 2018). The focus on RCP practices can differ based on the stage of national economic growth. In developing countries, the ability of the government to care for their own citizens and natural surroundings is hampered by poverty and a lack of infrastructure (Clark, 2007). Therefore, government policies in these economies typically focus on developing the economy rather than taking environmental concern and sustainability into account (Fang et al., 2007). While there have been numerous efforts implemented through "bottom-up" initiatives by corporations (Corral, 2003; Wong et al., 2016), lawmakers tend to disregard "top-down" initiatives. On the other hand, developed

nations take part in both "top-down" and "bottom-up" initiatives and possess a portfolio of supply-side and demand-side interventions (Ghadimi et al., 2018).

*2.2.2. Circular Economy in achieving Responsible Consumption and Production*

CE and sustainable development are closely related concepts (Pla-Julián, 2018). Goals on sustainable consumption and production (SDG12) are also closely intertwined with CE approaches, such as 12.2 (achieving the sustainable management and efficient use of natural resources); 12.3 and 12.5 (substantially reduce waste generation through prevention, reduction, recycling and reuse) (S. U. M. Khan, 2020; Schroeder, Anggraeni, and Weber, 2018). Schroeder, Anggraeni, and Weber also find that CE indirectly contributes to target 12.1 (Global Action for Sustainable Consumption), 12.3 (Cut Food Waste, Improve Efficiency), and 12.6 (Promote Sustainable Business Practices) (2018).

Despite not having a definite concept in literature, the effectiveness of CE in achieving SCP is undeniable (Aguilar-Hernandez et al., 2021; Pieroni et al., 2021). SCP associated with CE seeks to perform more efficiently with fewer resources. It strives for economic progress while also ensuring environmental and societal harmony. It aims to reduce consumption of resources and waste production (Tseng et al., 2020; Witjes & Lozano, 2016). Progress in production and consumption under CE is also supervised in the scope of: supply of critical raw materials, voluntary environmental tools, waste generation, and food waste (Boorová, 2020). This is perfectly in line with the vision of SDG 12.

In the previous linear economy model, which is based on the “take - make - dispose” principle (Sariatli, 2017), resource shortage is bound to happen. This is because the linear economy creates short-lasting products that require extensive resources but have little to no recycling use after they reach the end of their product life. On the other hand, the CE does not have this problem as its objective is to preserve the value of resources and products to reduce excessive production and overconsumption (Camacho-Otero et al., 2018). After reaching the end of their use, the product is reintroduced to the production stage to become raw materials for new products, which means waste is reduced significantly and even partially or completely terminated, making the model a closed flow of labor and capital, which is similar to the natural biosphere. (Korhonen, J., Honkasalo, A. and Seppälä, J., 2017). To sum up, it is notable that the concept of CE is highly compatible with the cyclical flow of the ecosystem, making it a practical tool for the nation to achieve SCP.

There are several factors that determine the success or failure of achieving RCP using CE (Goyal, Garg, and Luthra, 2021). One crucial factor is the government who is responsible for developing and executing policies for the adoption of SCP associated with CE (Yadav et al., 2020). Finance is also important in the promotion of SCP linked with CE because most operations such as technology upgrade and infrastructure development fail due to a lack of budget (Bhandari et al., 2019). Lastly, Wong et al. (2009) proposed that there must be sufficient communication between departments and organizations and that information flow be bidirectional. These factors are analyzed and discussed throughout this paper to support the analysis of CE towards SCP in Vietnam.

*2.2.3. Circular Economy practices in achieving Responsible Consumption and Production in Asia*

Several research has aimed to explore the relationship between CE actions and the achievement of Goal 12 of the SDGs: Responsible Consumption and Production. By examining various academic sources, this review seeks to shed light on the different approaches used to determine the application of CE towards sustainable consumption and production, especially in Asia.

The SWITCH-Asia Magazine (Winter 2016/17) presents a detailed look at Asian countries' early adoption of a CE towards SCP in terms of policy and regulation. According to this magazine, China took the lead as an early adopter by implementing regulations for a CE in 2009. The Circular Economy Law (Article 9) of China focuses on practical changes to production and consumption processes through resource recovery and resource efficiency. According to the authors of "Circular economy is happening in Asia!", people in Asia have long been reusing, repairing, sharing and upscaling products in what is now seen as advanced models of CE. These resource-efficient traditions and philosophies underpin many national development strategies. Thailand, for example, has adopted a national sufficiency economy philosophy in its development plans since 1997. The authors also highlight that Indonesia has a law in place to minimize waste through CE policies (Act 18/2008, PP 81/2012), promoting concepts such as 3R, and EPR at national and sub-national levels.

Several studies have explored the implementation of CE models in certain Asian countries. Su et al. (2013) described China's CE structure as comprising three layers: micro (involving consumers and companies), meso (involving eco-industrial parks), and macro (involving provinces, regions, and cities). The production progression entails a transition from cleaner production practices, including resource reuse and by-product recycling, to the establishment of eco-industrial parks that integrate the 3R principles into existing parks (Shi et al., 2014). Ultimately, it culminates in the development of eco-cities. On the consumption side, the journey begins with green purchasing and environmentally friendly consumption, progresses to environmentally friendly parks, and concludes with rental services.

Regarding ASEAN countries, Chapter 3 on "Evolutionary Acts and Global Economic Transition: Progress of the Circular Economy in ASEAN" of the ERIA Book (2018) presented two notable CE models adopted by Singapore and Thailand, which are circular input model and resource recovery, respectively. It is important to note that the circular input model applied in Singapore, where limited resources are replaced by fully renewable, recyclable, and biodegradable resources, and the resource recovery model applied in Thailand show high relevance towards the target 12.2 and 12.5 of the 12th SDG.

While Vietnam has been mentioned in conjunction with other Asian countries, there appears to be a notable research gap when it comes to providing comprehensive insights into the implementation of the CE specifically in relation to Goal 12 of the SDGs in the country. Existing research from Vietnam primarily focuses on either isolated indicators of CE in Vietnam or assessments of the current state of SCP in the country without incorporating up-to-date information. Consequently, our study aims to address this gap by conducting an in-depth exploration on the adoption of CE in Vietnam to achieve the goal of Responsible Consumption and Production.

## 3. Methodology

In this study, a qualitative research approach was employed to investigate the current application of CE principles in Vietnam and identify the opportunities and challenges for achieving Responsible Consumption and Production through CE. The research relied on secondary data sources to ensure the quality and reliability of the findings. Various data sets were collected from diverse sources, including the annual enterprise survey database of the General Statistics Office, as well as databases from reputable international organizations such as the World Bank, OECD, and others. Additionally, information from reports and research assessing the CE application in Vietnam, sourced from both international and domestic papers, was utilized.

Having obtained a comprehensive collection of data and information, our research team conducted a meticulous analysis to examine the current state of CE implementation in Vietnam, particularly in relation to RCP objectives. Furthermore, based on the existing circumstances, recommendations were formulated for different entities involved, with the aim of bringing them closer to the realization of the set goals.

## 4. Research Results

### *4.1. The adoption of Circular Economy in Vietnam to achieve Responsible Consumption and Production*

#### *4.1.1. Overview of Vietnam's current economic and environmental situation*

Vietnam is a developing country with a fast-growing economy and a rapidly expanding population. According to the World Bank, Vietnam's GDP grew at an average annual rate of 6.8% between 2016 and 2019, making it one of the fastest-growing economies in the world. However, the COVID-19 pandemic has had a significant impact on Vietnam's economy, with GDP growth slowing to 2.9% in 2020. The World Bank forecasts that Vietnam's economy will recover and grow by 6.5% in 2021 (Figure 1).

However, this growth has been accompanied by increasing environmental pressures, including air and water pollution, deforestation, and biodiversity loss. Vietnam is also highly vulnerable to climate change, with rising sea levels, more frequent natural disasters, and changing weather patterns.According to the World Health Organization (WHO), air pollution in Vietnam is among the worst in Southeast Asia, with high levels of particulate matter and other pollutants. Water pollution is also a major problem, with many rivers and waterways contaminated by industrial and agricultural waste.

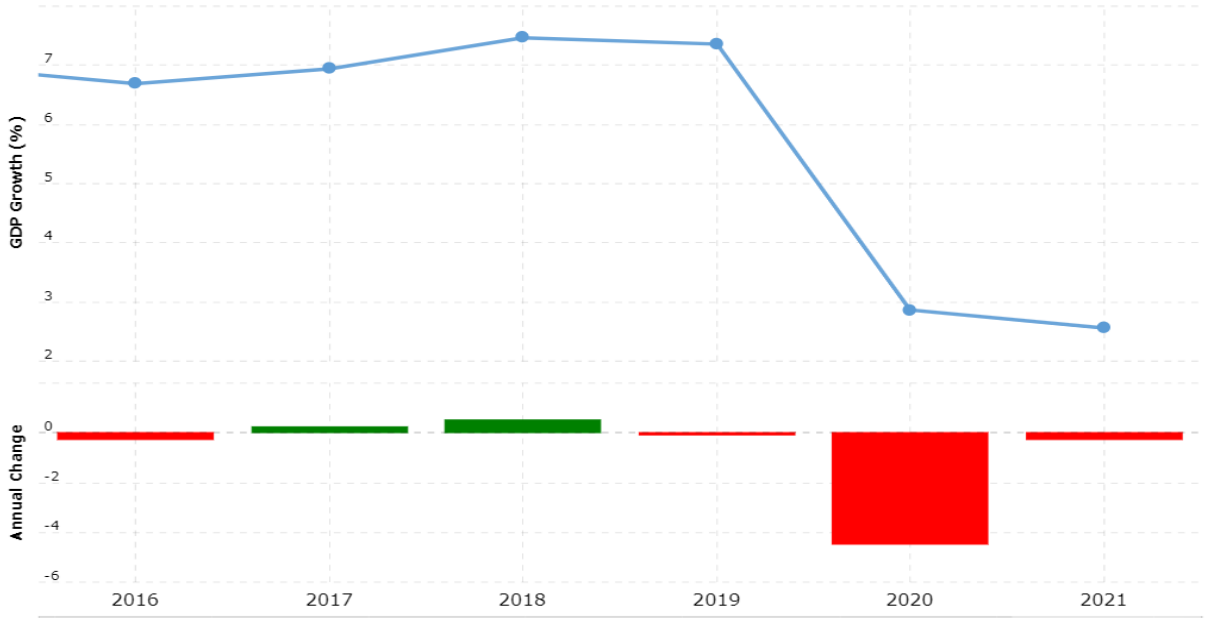


**Figure 1:** Vietnam GDP annual rate

***Source:*** *World Bank Website*

Additionally, Vietnam is facing significant challenges in managing its waste, particularly in urban areas. According to the Ministry of Natural Resources and Environment, Vietnam generated over 41 million tons of waste in 2021, of which only 24% was treated in accordance with environmental standards. The rest was either dumped in landfills or discharged into the environment, leading to environmental pollution and health risks. The government has set targets for reducing waste generation and improving waste management, but progress has been slow. According to Vietnam Chamber of Commerce and Industry (VCCI), "Vietnamese plastic waste per capita is the third highest in Southeast Asia after increasing more than 10-fold in the last three decades" (2019) (Figure 2).

Research also predicts that the situation will worsen as urbanization, rapid population growth, and strong economic development lead to an increasingly rapid increase in household waste, causing devastating consequences to the economic and social development in the long term. To tackle these pressing issues, Vietnam must urgently prioritize the adoption of a CE approach. This approach aligns with the 12th SDG out of the 17 SDGs outlined in the 2030 Agenda for Sustainable Development. By striving to achieve these goals, Vietnam can proactively address the environmental concerns it faces and contribute to the broader global sustainability agenda.

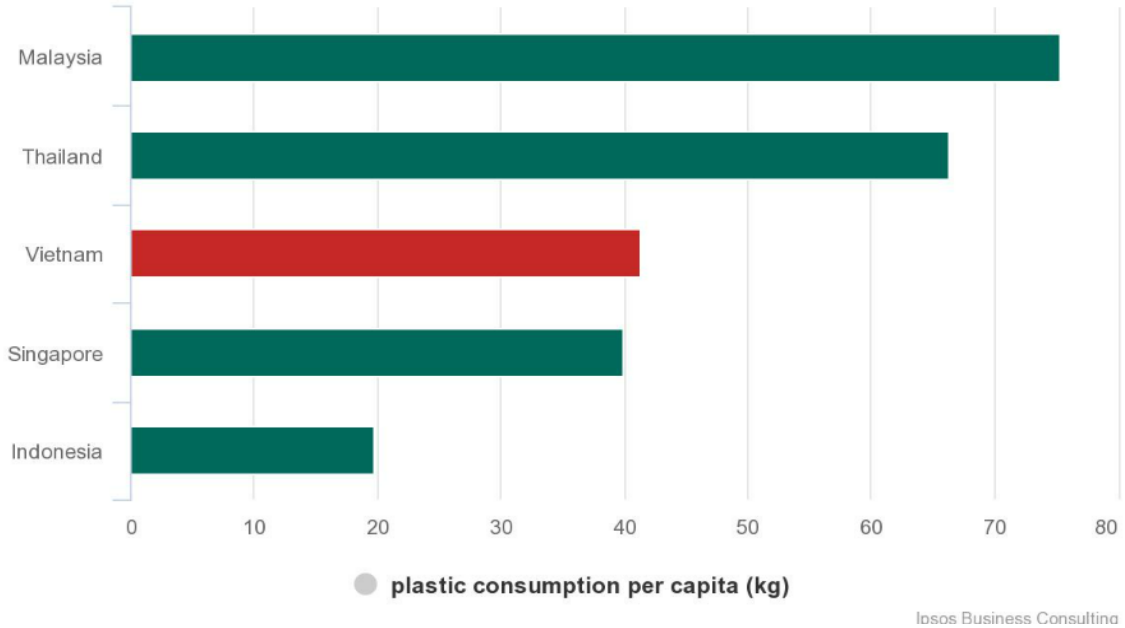


**Figure 2:** Top 5 Plastic consumption countries in ASEAN

***Source:*** *VCCI (2018)*

*4.1.2. Current adoption of CE in Vietnam to achieve RCP*

Achieving RCP requires a transformation in different parts of the overall socio-economic system: from government policies to production practices, and consumption habits. The ability of decision-makers, such as policymakers, farmers, entrepreneurs, or consumers, to think and act in a circular manner is a crucial factor contributing to the success of this goal. According to numerous reports and research, the adoption of CE in Vietnam is particularly noticeable in achieving Target 12.1, 12.2, 12.4, 12.5 and 12.6 of the 12$^{th}$ SDG Goal.

• ***Target 12.1: Implement the 10-year framework of programmes on sustainable consumption and production***

Vietnam has undertaken the implementation of several key strategies aimed at achieving cleaner production and sustainable consumption. The Strategy for Cleaner Production in Industry until 2020 (Decision No. 1419/QD-TTg dated September 7, 2009) and the National Action Plan on Production and Consumption for sustainable use until 2020, with a vision extending to 2030 (Decision No. 76/QD-TTg dated January 11, 2016), were established to guide these efforts.

Over the past decade, the country has been actively engaged in projects promoting cleaner production within public enterprises, facilitated by government initiatives and supported by development partners. This endeavor has led to the establishment of 47 industrial promotion and energy-saving centers nationwide, over 20 technical guidelines on cleaner production have been created and issued (Le, V., 2020). However, clean technology adoption mainly occurs in production and smaller initiatives. A recent Ministry of Industry and

Trade survey in 11 regions shows only 15% to 40% of enterprises integrate cleaner production solutions (National Report 2020 on 5-year progress of Sustainable Development Goals Implementation).

In a recent development, the Prime Minister has introduced the National Action Program for production and sustainable consumption throughout the 2021-2030 period (Decision 889/QD-TTg dated June 24, 2020). Notably, CE stands out as an essential and inevitable trend highlighted within this context. CE aligns with the prerequisites for executing the Sustainable Development Goals, as stipulated in the National Strategy on Green Growth for the 2021-2030 period, envisioning progress until 2050, and the implementation of Sustainable Development Goals (Decision No. 687/QD-TTg).

Following this Decision, the Ministry of Planning and Investment, Ministry of Natural Resources and Environment, and Ministry of Industry and Trade, are entrusted with advancing research and comprehension of the CE (Nguyen, H., 2023). The objective is to embed the CE mindset into pertinent policy making endeavors, thereby maximizing the value of input materials and minimizing waste through alterations in product design, manufacturing, and usage practices.

- ***Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources.***

The 13th National Party Congress Resolution has outlined constructing a Circular Economy (CE) as a pivotal developmental direction for Vietnam from 2021 to 2030, as well as a strong foundation for effectively managing resources, environmental preservation, climate change responsiveness, and sustainable socio-economic progress until 2030, with a vision to 2045 (Tran, H.H., 2023).

Several CE models have been applied in Vietnam with an aim to achieve an efficient management of resources. In the northern region of Vietnam, there exists a renowned domestic agricultural approach known as the garden-pond-barn model, abbreviated as VAC in Vietnamese. This model efficiently combines orchard cultivation, fish breeding, and animal husbandry within a cyclical framework. The dissemination of the VAC model commenced in the early 1980s. It is implemented at the household level to maximize the utilization of land, water, and solar energy, resulting in notable economic gains with minimal initial investment( Nguyen,V.M, 2008).

- ***Target 12.4: By 2022, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle.***

According to a recent report by Mordor Intelligence, the waste management market in Vietnam has shown remarkable growth, with an estimated value of USD 5.12 billion in 2023. The market is projected to further expand, reaching USD 7.54 billion by 2028, demonstrating a notable Compound Annual Growth Rate (CAGR) of 8.04%.

As of 2018, around 75% of hazardous waste (HW) was collected and treated as per regulations; medical solid waste treatment was at 99%. Capacity for hazardous waste treatment improved, with 118 facilities by 2018, processing an added 500,000 tons/year compared to 2017. Besides collecting and self-treating hazardous wastes in the country, Vietnam has initially exported hazardous waste to foreign countries,

contributing to reducing the pressure on waste treatment in the country (National Report 2020 on 5-year progress of Sustainable Development Goals Implementation).

In recent years, hazardous industrial waste generation is around 874,589 tons per year, with agricultural damage adding 10,000 tons (from toxic packages and bottles) (Report on Environmental Protection, 2018) and daily medical waste at 47-50 tons (Ministry of Natural Resources and Environment, 2020). Hazardous waste collection and treatment capacity has grown significantly, increasing from 83 enterprises processing 1,300 tons/year in 2015 (Ministry of Natural Resources and Environment, 2015) to 118 facilities in 2018, handling 1.8 million tons/year collectively. This includes 7 new facilities processing 500,000 tons/year each compared to 2017 (National Report 2020 on 5-year progress of Sustainable Development Goals Implementation). Compliance for hazardous waste collection and treatment reached approximately 75%, while medical solid waste achieved an impressive 99.1% treatment rate (Mot The Giơi, 2020). However, by 2018, only 34% of solid waste landfills met sanitary standards (Ministry of Construction, 2018).

Despite Vietnam's progress falling short of the 2020 and 2025 targets outlined for hazardous waste treatment, numerous waste management models applying CE embraced by businesses have gained popularity and disseminated across the community. Numerous companies have adopted diverse strategies to integrate CE principles into their production processes. This involves repurposing waste generated during production into raw materials, thereby contributing to the advancement of a CE model.

A standout example is Heineken, a company that constitutes roughly 0.9% of Vietnam's GDP (Nguyen, D., 2022). This company has implemented a range of measures to effectively handle wastewater, stemming from both its manufacturing operations and the community. All wastewater emanating from Heineken Vietnam's factories is meticulously treated to exceed environmental standards, ensuring its safe return to the ecosystem. Moreover, HVN has taken a pioneering role in implementing a program focused on supporting people in Lai Chau Province 's access to clean water, providing waste collection equipment, and training the local community on proper waste management practices. This project includes training sessions to guide local residents in the proper use of plant protection products, along with constructing waste collection pits for these products to prevent harmful substances from infiltrating the soil and water (Heineken Vietnam, 2020).

- ***Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.***

In recent years, both the government and enterprises have directed their efforts towards recycling, particularly focusing on high-quality scrap that serves as raw material for production. Notably, the plastic collection and recycling sector in Vietnam have witnessed impressive growth, driven by the pressing issue of plastic waste, which constitutes a significant proportion of the country's annual waste generation. According to Expert Market Research, in 2022, the Vietnam recycled plastics market recorded a volume of approximately 236,472.3 tons. Notably, Southern Vietnam stands as the dominant market due to its robust plastic waste collection rates, which outpace those of other regions in the country.

Concurrently, legislation is underway to promote and regulate plastic recycling activities, particularly in Southern Vietnam. For instance, the Ministry of Natural Resources and Environment of Vietnam has introduced measures to facilitate the recycling of plastics. To support companies operating within the plastic recycling sector, accessible and favorable financing options are being made available, including low-interest loans ranging from 2.6% to 3.6% per annum. These loans are further bolstered by a maximum lending rate of approximately 70% of the total investment in projects affiliated with the Environment Protection Fund.

Various recycling models have emerged, involving the exchange of scrap between groups of enterprises for production purposes. The possibly most successful approaches that have been put into action and yield notable outcomes are CE models. Some cases in point include the Eco-industrial park models in Ninh Binh, Da Nang, and Can Tho; Nha Trang University's innovation in processing aquatic by-products (such as shrimp shells and heads) to generate valuable biological, medical, and agricultural products; the Vietnam Chamber of Commerce and Industry's initiative to prevent waste release into nature; and the inventive recycling of Tiger beer caps into iron for constructing a bridge in Tien Giang (Nguyen, M., 2021).

Another evident model of CE is the model of waste recycling craft villages in Vietnam. There are more than 90 recycling villages around the country, which is a sign that waste recycling is becoming a potential sector along with the growth of industries and increasing production. A few notable villages can be named such as Trung Van plastic recycling village in Hanoi which collects plastic waste to recycle into raw materials; Binh Yen craft village in Nam Dinh which has around 300 households recycling wasted aluminum. The growing number of waste recycling villages in Vietnam is a positive sign of the country stepping in the right path to reduce waste generation. However, the outdated recycling process of these craft villages still needs much improvement to optimize the use of energy and minimize wasted materials. Nonetheless, it is believed that the waste recycling craft villages still have a lot of potential if the government officials manage to spread awareness of this growing environmental concern of waste reduction and the proper methods of waste treatment (Nguyen, T.D. et al, 2022).

- ***Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.***

After a decade of dedicated policy implementation aimed at fostering cleaner production, numerous Vietnamese businesses have gained access to cleaner production technologies and methodologies. A considerable number of these enterprises have effectively adopted CE models, leading to transformative changes in their product cycles.

For example, Nestle Vietnam, which is a part of Nestle, one of the largest transnational companies in the world, has applied the circular model to make their adobe brick made from waste of coffee production. The coffee waste is used to make biomass as a burning gas, which reduces the consumption of CNG combustible gas and reduces the CO2 emission; and the wasted sand from the boiler is used to make adobe brick for construction purposes. Not only that, Nestle is committed to reusing and recycling 100% of the product packaging globally and cooperated with the government to conduct numerous environmental campaigns to collect, sort waste from the source and prevent improper waste treatment. (Nguyen, T. , 2022)

Vinamilk, a large Vietnamese company with branches in multiple countries in the world is a case in point with highly utilized sustainable practices in its operation. Vinamilk owns a biogas processing system that makes use of the waste to support the farms' activities, such as sterilizing milk, heating water, drying grass… The waste is also processed to make fertilizers and improve the soil quality. The company has saved a large amount of costs for electricity, fertilizers this way to further the development of their farms and waste treatment. In addition, not only the cycle happens within Vinamilk's farms, it is also linked to farmers outside the company. Vinamilk and farmers work together to provide each other with needed resources and knowledge of ethical environmental practices, thus further strengthening the bond inside the cycle to protect the ecosystem (Vinamilk, 2022).

To further encourage enterprises to adopt sustainable practices, especially CE into their production, by the close of 2019, the Prime Minister ratified the Sustainable Development Plan for Private Sector Enterprises until 2025, envisioning 2030 (Decision No. 1362/QD-TTg). This focuses on fostering resilient private sector growth, balancing economic success with social responsibility and environmental preservation, and prioritizing support for small and medium-sized enterprises. Furthermore, operated by VCCI's Vietnam Business Council for Sustainable Development (VBCSD), the Corporate Sustainability Index (CSI) is born to aid companies in enhancing sustainability reports, practiced since 2016. CSI is a highly esteemed index utilized by domestic and international enterprises, enhancing corporate governance. Collaborating with relevant ministries and labor organizations, VCCI encourages Vietnamese businesses to employ the CSI Index to annually evaluate and rank its sustainable practices (National Report 2020 on 5-year progress of Sustainable Development Goals Implementation).

### *4.2. Opportunities and challenges for Vietnam in achieving Responsible Consumption and Production through Circular Economy*

#### *4.2.1. Opportunities*

Vietnam has several opportunities to achieve responsible consumption and production through the CE.

Firstly, Vietnam's government has recognized the significance of CE and has taken proactive measures to capitalize on this opportunity. The issuance of directives, such as Decision 687 on CE development and the revised Law on Environmental Protection, signifies the government's commitment to shifting Vietnam's economy from a linear model to a circular model. These directives not only pave the way for research and development of CE technologies but also contribute to raising public awareness (Nguyen, T. and Nguyen, C., 2022). Moreover, the National Action Plan on Sustainable Consumption and Production (2021-2030) serves as a comprehensive framework for promoting CE in Vietnam. Within this plan, the government has the chance to create a conducive environment for CE development by incentivizing enterprises to adopt sustainable manufacturing processes through favorable green financing and funds. Furthermore, the plan encourages citizens to embrace sustainable lifestyles, fostering a reduction in waste generation and promoting more responsible consumption habits (Ministry of Industry and Trade et al., 2020).

Additionally, the advent of the Fourth Industrial Revolution has had a significant impact on various aspects of society, research, and technological innovation. The transition to the digital sphere presents a

remarkable opportunity for enhancing economic development and efficiency compared to traditional methods. Vietnam has been actively leveraging numerous advantages offered by the Fourth Industrial Revolution to establish a knowledge-based economy intertwined with advanced technological platforms. This would be fundamental to the country's implementation of CE (Pham and Nguyen, 2021).

Finally, and probably the most advantageous aspect of Vietnam conditions, is the young population, which is highly susceptible to adaptation and improvements. The median age of Vietnam population is 32 y.o, and statistically, this is the most 'productive' age range where adults may pivot to their current socio-economic surroundings most effectively. Now might be the best timing for our country to innovate the entire economic system into a sustainable model in account of the adaptability of our population (Netherlands Enterprise Agency, 2020).

*4.2.2. Challenges*

With opportunities, come challenges. Vietnam's pursuit of an effective economy, aligned with the achievement of SDG 12, is accompanied by a set of challenges that must be addressed.

One major challenge lies in the absence of a well-defined legal framework for CE development, compounded by the lack of mechanisms and policies to promote its implementation. This is not due to the lack of effort, yet, it is the process of trial and error when embarking on such a momentous task, underscoring the need for a consistent and expert-driven approach. Unfortunately, Vietnam currently faces a shortage of such expertise, posing an obstacle to CE advancement (Dang, H. V. et al., 2021).

Another challenge stems from the modest budget allocation by the Vietnamese government for CE implementation. Prioritizing more urgent concerns like poverty reduction and territorial protection, the government hesitates to invest significant capital to drive noticeable improvements in CE. Consequently, we are suffering from major loss of material value of recyclable plastics, equivalent to US$2.2 to 2.9 billion every year, due to inadequate waste management, which was suggested by Thu and Cece (2022).

Furthermore, the lack of foreign assistance compounds the challenges faced in building a CE. Given Vietnam's economic trajectory, self-reliance in this endeavor proves difficult due to limited resources. That is why we always try to attract Greenfield FDI to help us on this endeavor. And although we are seeing some green investment (Lego factory in Binh Duong,..), it might not be enough because total foreign capital in Vietnam in 2022 reached 27.72 billion USD, down 11% over the same period in 2021 (Pham, B., and Vu, H., 2023). This level of foreign investment is still not substantial enough to develop any significant change in Vietnam's economic system as of 2023.

### *4.3. Recommendation for developing Circular Economy toward achieving Responsible Consumption and Production in Vietnam*

In order to develop a circular economy (CE) towards sustainable development toward achieving Responsible Consumption and Production in Vietnam, there are several recommendations for the government and other national management authorities as well as for enterprises, organizations, and individuals.

*4.3.1. For the government and other national management authorities*

First, a comprehensive study should be conducted to improve the CE model by learning from successful methods applied in developed countries with a global approach. According to Tran et al. (2022), countries around the world have successfully adopted CE towards Responsible Consumption and Production, such as:

• The UK and its 25-year Environment plan and a new Waste and Resource Management Strategy (2018) with the objective of maximizing the value of using resources, minimizing the generation of waste, and emissions, and towards a cleaner, greener and healthier planet.

• China's eco-design program to reduce negative environmental impacts throughout the product's life cycle and to promote a zero-waste city (Meng et al., 2021).

• The Eco-Label Program in Korea with an incentive for manufacturers to develop sustainable products; this Program develops consumption patterns, increases the marketability of products, and encourages consumers to choose environmentally friendly products (Policy Handbook for Sustainable Consumption and Production of Korea, 2014).

Based on this foundation, specific approaches can be chosen and applied to Vietnam's practical conditions, and knowledge can be disseminated to businesses, individuals, and managers.

Second, legal frameworks and regulations related to CE should be completed by referring to transparent laws and regulations from all countries implementing CE. Vietnam can then develop a roadmap and formulate a law for CE development. Policies should be established for the development of clean technologies, reusing and recycling waste, and increasing taxes on non-recyclable resources and carbon emissions to reduce environmental pollution.

Third, a healthy and extensive business environment promoting CE should be created. Policies should encourage businesses, organizations, individuals, and especially the private sector to participate in CE sectors. For Vietnam, the first priority is plastic bags and waste, which must be included in the next 5-year plan to thoroughly solve and minimize the amount of waste dumped into the environment as a fundamental step in developing the CE (Nguyen, T.C., 2020). Establishing funds to support the development of CE is one way to enhance the transition from a traditional production model to a sustainable production model within businesses. The roles of each individual, organization, and business in CE development must be clearly defined.

Fourth, build an economy based on high technology (Pham, N.P. and Nguyen, T.A.N., 2021). This is one of the prerequisites for building a knowledge-based economy because only modern technology can bring about zero emissions and sustainable development for future generations. Therefore, it is necessary to have supportive policies for businesses and individuals to innovate and create in production with environmentally friendly products with high reusability. Additionally, Vietnam needs to build a database on the knowledge economy associated with digital economic transformation and the Fourth Industrial Revolution. Promote cooperation and linkage between economic sectors and social organizations in the

development of the knowledge economy in Vietnam, in which the Government plays a leading and creating role (Nguyen, 2022).

Fifth, related ministries and authorities should actively implement communication and information strategies to enhance awareness among manufacturers and the public about the CE.

*4.3.2. For enterprises, organizations, and individuals*

For enterprises, organizations, and individuals, participating in the production process requires awareness of the importance of promoting CE and committing to CSR responsibilities in handling packaging and waste products after production or use by applying modern waste treatment technologies or renewing production processes.

Enterprises should also use capital effectively from CE promotion funds to transform from a traditional production model to a sustainable, environmentally-friendly production model. It is also necessary to connect with other businesses in the same fields or sectors to create a closed loop for the production process, turning waste output from one industry into input resources for another, or recycling within the enterprise itself (Pham, N.P. and Nguyen, T.A.N., 2021).

For individuals, it is essential to adopt a sustainable lifestyle that practices thrift and avoids waste in daily life and consumption while spreading an environmentally-friendly lifestyle to those around them. Sorting waste at the source and then collecting, cleaning, and transporting garbage into reuse and recycling is also important. Sorting waste at the source should become mandatory and be made a standard of civilized behavior among citizens.

## Conclusion

In conclusion, the Circular Economy has emerged as a global trend in response to the increasing depletion of natural resources and the accumulation of waste. Many countries have embraced this model as a means of achieving sustainable development, and Vietnam is no exception. As the country aims to achieve its Sustainable Development Goals, achieving Responsible Consumption and Production has become a crucial part of its strategy and must be pursued with urgency and determination. This research illustrates how the Vietnamese government adopts CE to achieve Responsible Consumption and Production along with the current opportunities and challenges. Our research team also suggests further recommendations for developing CE in Vietnam, focusing on Responsible Consumption and Production. Future studies could focus on implementing targeted incentives and regulations, exploring innovative business models and technologies, fostering stakeholder engagement, and evaluating the environmental and socio-economic impacts of CE implementation.

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