The Development Of Circular Economy In Some Countries And Valuable References For Vietnam

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ABSTRACT: Global economic growth has made great achievements, but with it the shortage of natural resources and increasing environmental pollution. To overcome these problems, countries in the world, including Vietnam, are moving towards a circular economic development in order to solve the challenge between economic growth and environmental protection. The circular economy is an economic model in which all activities from design, production to service delivery move towards reusing matter and eliminating negative environmental impacts. Vietnam is one of the countries with many efforts and achievements in the process of sustainable development. However, Vietnam is also facing an increasing amount of generated waste while the source of raw materials, fossil fuels is increasingly exhausted. In addition, most Vietnamese enterprises have outdated and outdated technology, small production scale and lack of resources to invest in recycling technology. Therefore, the selection of a circular economy is an indispensable requirement to overcome the limitations of the traditional growth model, associated with rapid, sustainable development, energy saving and environmental protection. However, the circular economy also requires strict conditions in terms of institutions and resources. Therefore, the study of the experiences of the previous countries, points out the difficulties and advantages, thereby shines into Vietnam, determines the conditions for the transition to a circular economy.

Keywords: circular economy, development experience, reference value, Vietnam.

1. DEFINITION OF CIRCULAR ECONOMY

To date, more than 100 definitions for circular economy have been mentioned in scientific papers and academic journals. Experts and researchers from different fields take different approaches to circular economy (Kirchherr, Reike & Hekkert, 2017). A philosopher will have a different perspective from a financial analyst when it comes to understanding circular economy. However, the common approach to circular economy often focuses on **using raw materials** or **systems change.**

In the first approach, the concept of circular economy is defined as a term for all the activities of the 3R approach

– *Reduce* (using less virgin material);
– *Reuse* (reuse product and its parts);
– *Recycle* (process high quality material).

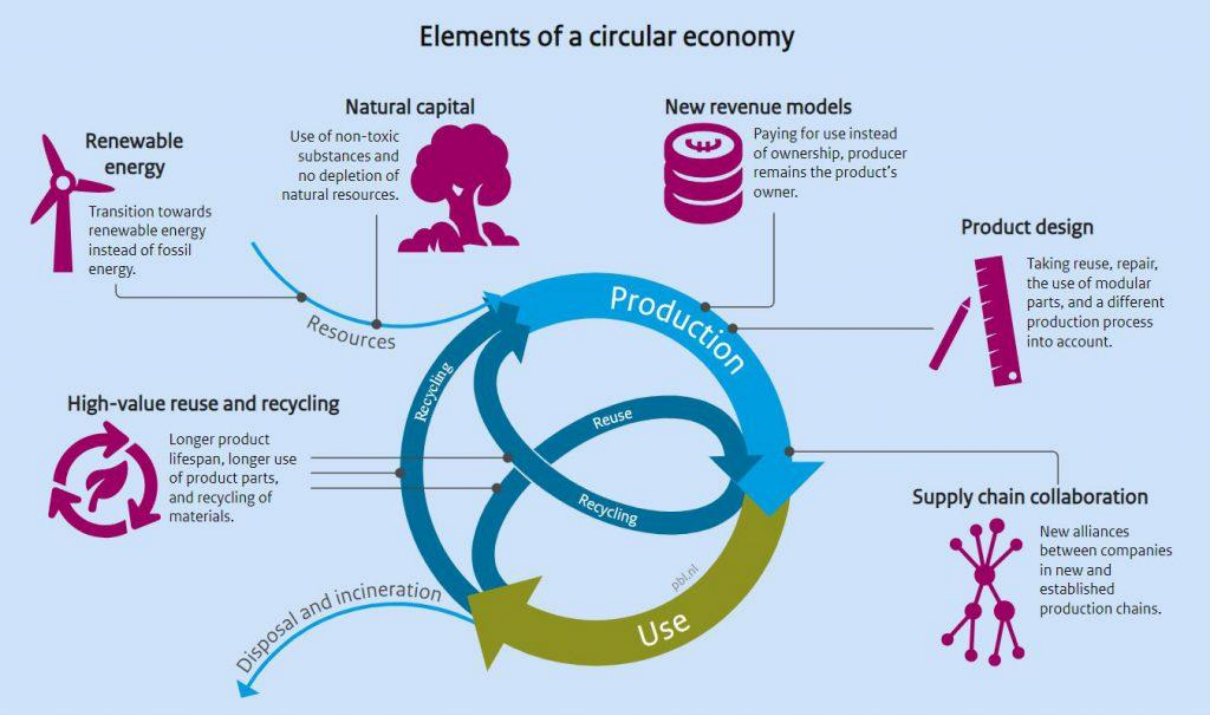
In terms of the first approach, circular economy is a systemic approach to economic development designed to benefit businesses, society and the environment. *A circular*

economy is one that is restorative and regenerative by design and ensures the economy can grow while becoming less dependent on nonrenewable resources

With the second approach, according to Korhonen, Nuur, Feldmann & Birkie (2018), definitions that focus on system change often emphasize three elements including:

- Closed cycles
- Renewable energy
- Systems thinking

Figure 1: Elements of a circular economy



Source: [1] https://kenniskaarten.hetgroenebrein.nl/en/knowledge-map-circular-economy/what-is-the-definition-a-circular-economy/

a. Closed cycles

In a circular economy, material cycles are closed following the example of an ecosystem. There is no such thing as waste, because every residual stream can be used to make a new product. Toxic substances are eliminated and residual flows are separated into a biological and a technical cycle. Producers take back their products after use and repair them for a new useful life (Ellen MacArthur Foundation, 2015a). In this system, it is therefore not only important that materials are recycled properly, but also that products, components and raw materials remain of high quality in these cycles (Korhonen, Nuur, Feldmann & Birkie, 2018).

b. Renewable energy

Just like raw materials and products, energy also lasts as long as possible in a circular economy. The circular economic system is fed by renewable energy sources. Because it is not possible to recycle energy, there is no mention of energy cycles or energy cycles, but of 'cascade type energy flows' (Ellen MacArthur Foundation, 2015a).

c. Systems thinking

The circular economy does not only require closed material cycles and renewable energy, but also systems thinking. Every subject in the economy (company, person, organisation) is connected to other subjects. Together, they form a network in which the actions of one subject will influence other ones. To take this into consideration, the short and long term consequences must be taken into account in choices, as well as the impact of the entire value chain (Ellen MacArthur Foundation, 2015a).

Therefore, according to systems approach, *a circular economy is an economic system of closed loops in which raw materials, components and products lose their value as little as possible, renewable energy sources are used and systems thinking is the core*[1].
A circular economy is an approach to economic growth that benefits everyone within the limits of our planet. The method lies in every stage of a production process: from designing, manufacturing, consumption to discarded. In that process, the design stage plays the most important role as around 80% of environmental impacts are determined in this stage[2]. By *designing out waste and pollution, keeping products and materials in use, and regenerating natural systems*, we can "reinvent" everything[3]. That is the comprehension of circular economy.

2. CASE STUDY OF CIRCULAR ECONOMY DEVELOPMENT IN SOME COUNTRIES

2.1 Sweden

Sweden's economy is heavily dependent on biomass and food in which the food industry is the fourth largest industrial sector with more than 50,000 employees. Fishing is also one of the leading industries; particularly, Sweden exported approximately EUR 4 billion in fish and fish products every year. Besides, Sweden is a global leader in bioenergy. The main reason for the rapid growth of the bioenergy sector in the last decades in Sweden is generous political support. Sweden managed to bring back the percentage of oil as an energy source from 75% in 1970 to around 20% today, partially due to its bioenergy revolution.
Agricultural waste streams including those from food producing and animal manure are very efficient for producing bioenergy. Waste-to-energy plants play an important role for Sweden to achieve its goal of becoming fossil fuel-free by 2040. How were organic waste streams' infrastructure established? It comes from a big commitment of waste management companies, municipalities and local farmers to collaborate throughout the process although these are often arranged within regional scale. It is more difficult to organise a large-scale cooperation partly due to geographic spread of Sweden and lack of a clear national coordination. The next step would be to involve the entire value chain on a national level.
When focusing on a circular economy throughout the entire food chain instead of merely on bioenergy, Sweden still has a lot to do. Even though the government has set out a Swedish Food Strategy for the following years, with circular economy being part of it, there is not enough action. For circular economy to be applied in this sector, Sweden needs cooperation throughout the whole food chain.

2.2. Netherlands

The Netherlands agriculture and food industry is strong and well developed as it is the country's largest industry, with over 140.000 employees. The export of agricultural goods was estimated at 91.7 billion euros in 2017, which is 19.4 percent of the country's total exports. The industry's added value is about 48 billion euros per year. The industry's ecosystem in the Netherlands owns around 5,300 companies, including global leaders with major production or R&D sites. Also, due to the presence of world-class research institutes, universities and numerous public-private partnerships, the Netherlands has the second highest private R&D investment in agrifood in Europe. The sector is beneficially positioned to create a switch towards circular economy, throughout its innovation ecosystem *(Figure 2).*

[1] https://kenniskaarten.hetgroenebrein.nl/en/knowledge-map-circular-economy/what-is-the-definition-a-circular-economy/
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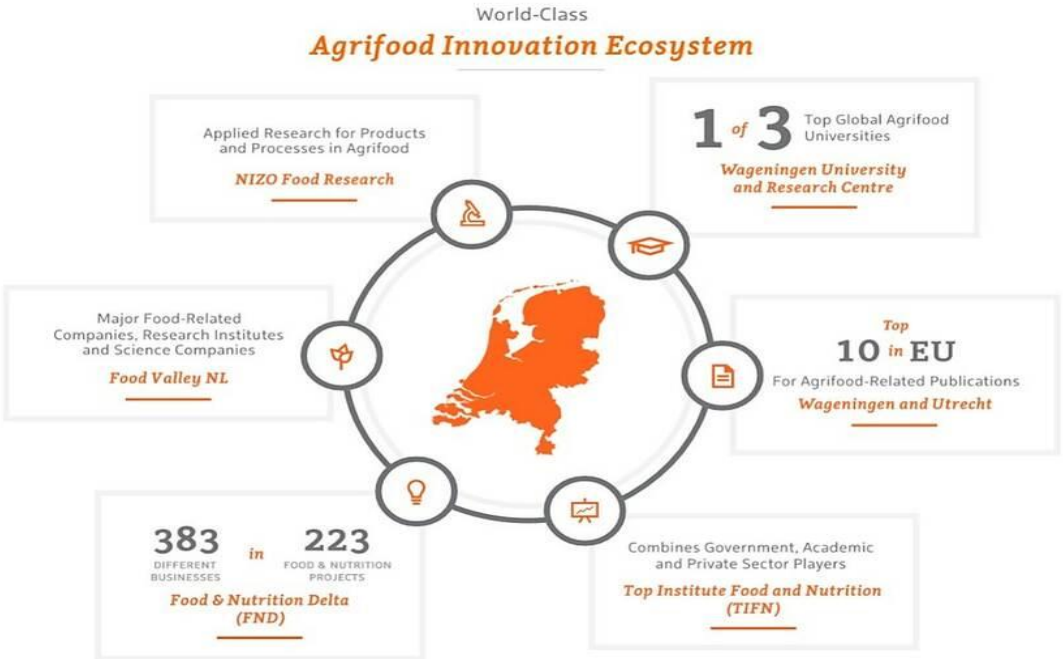
Figure 2: Agrifood Innovation Ecosystem of Netherlands



Source: https://www.netherlandsandyou.nl/your-country-and-the-netherlands/sweden/doing-business/circular-economy-opportunities-and-cooperation/ce-biomass-food-opportunities-se-nl

The ecosystem's favorable position for the circular economy-transition, is mainly driven by three forces:

Agglomeration of knowledge: The academic knowledge and innovative sector insights are excellent due to the many research institutes and universities that are specialized in this area. For example, Wageningen University is considered to be the best university in the world in both agriculture and food science. Moreover, with one in every six employees working in this sector, the Netherlands has a large, highly skilled and multilingual agrifood workforce.

Big and innovative business sector: Agriculture and food industry attracts global agrifood enterprises, while also forming a center for successful small and medium-sized enterprises and innovative start- and scaleups. The geographic location combined with an excellent infrastructure is also a contributing factor, as it is relatively easy to reach Europe's 500 million consumers from here.

*Ambitious government***:** The Dutch government has set a clear goal to become fully circular by 2050, and has identified five crucial sectors to focus on in order to succeed. The biomass & food sector is one of that with a transition agenda has been launched. The proactive approach form the government is reassuring for businesses who want to make long-term investments to develope circular economy.

Both Sweden and the Netherlands are global leaders in transitioning their biomass & food sectors towards circularity. However, they do so in different areas, which presents mutually beneficial opportunities for further collaboration. In this way, both countries will be way ahead of the pack and could then benefit from their lead, causing a threatened industry to become a certainty for sustainable economic growth.

2.3. China: Circular economy in textile industry

China is the world's leader in the production and export of textiles. Textile industry of this country is in the phase of reconstruction and transformation. In a period where economic growth and urbanisation occur rapidly, along with a growing middle class, the domestic

demand for textiles has increased three times and is expected to triple in the next decades. Fast fashion is favored by the middle class living in urban areas, while those who have higher income seek for high-end fashion brands. These trends have negative impacts on water reserves, water and air quality and public health. Every year, China's textile industry generates around 20 to 26 million tons of waste that could not be fully decomposed or recycled while many landfills in big cities are running out of space. This unprecedented growth, combined with the traditional, linear *"Exploit – Produce – Dispose"* approach could be reduced by applying circular principles. Opportunities that are captured by Chinese textile industry have been identified including: *(i) pursuing business models that increase utilisation of durable textiles; (ii) Scaling up recycling; (iii) Applying resource efficiency measures.* The implementation of such circular practices in the textile industry could bring about a total cost of access (TCA) of CNY 0.5 trillion (USD 80 billion) by 2030 and CNY 1.2 trillion (USD 0.2 trillion) by 2040, when compared with the current development path.

Pursue business models that increase utilisation of durable textiles

Textiles that have been designed for quality and can withstand multiple multiple and prolonged use can be circulated in repeated use cycles. Business models such as sharing, renting and leasing provide customers with a service offering access to products rather than ownership. The advantage of these models is that the average numbers of times textiles are used (or worn) increase, customers gain more convenient and affordable access to textile products, while businesses benefit from customer loyalty and more consistent revenue streams.

Increasing the utilisation for textiles requires the set-up of reverse logistic systems that allow for fast delivery and re-collection, online shopping sites to provide more convenient and affordable access to clothing, and services to maximise customer satisfaction. The benefits include not only cost saving in fibre production, but also during manufacturing process and in avoiding externalities.

Companies such as Ms Paris and Liangyuhui have set up business models based on the only renting and trading of second-hand luxury items. Others such as Ycloset have even set up clothing subscription services whereby customers pay a monthly fee to gain access to trendy clothing, which they can rent and swap at any time. Ycloset offers access to mid-range and high-end clothing for a monthly subscription fee of CNY 499 (USD 80). The company has observed that trendy durable clothé could be rented up to 40 different people, as opposed to only three to four for lower-quality products. Such companies clearly demonstrate the vibrant future potential of the product-as-a-service approach to clothing in China. In the future, such business models could become especially relevant in lower-tier cities where there is a rise in the middle class, more only shoppers, and where physical retail stores have not yet fully established.

Scaling up recycling

- Mechanical recycling

Mechanical recycling involves cutting and re-sewing (fabric recycling), unravelling (yarn recycling), shredding and reprocessing, or melting and re-spinning (polymer recycling) of discarded textiles. The disadvantage of fabric recycling is that it can lead to downcycling, producing lower grade single-use products such as wipes. Fibre recycling also often results in downcycling. Although it is quite widespread, the shredding process reduces the quality of fibres and the output materials are often used for lower-use purposes such as insulation and fillings.

- *Chemical recycling*

Chemical recycling is refered to using two different levels of value preservation, including depolymerisation and polymer recycling. The process of depolymerisation and repolymerisation of plastic-based materials has been applied. The process involves changing the materials by breaking down before or after used fibres back to their basic chemical components – monomers. This process is theoretically able to produce endlessly recyclable fibres using pure sources or cleaning the recyclate of contaminants.

Applying resource efficiency measures

Resource efficiency measures help limit the waste of materials, hazardous chemicals, water and energy consumption across the textiles value chain which help to reduce production cost as well as costs related to human health and the environment.

3. RECOMMENDATIONS FOR VIETNAM

Circular economy is a key element for a country's growth and sustainable development. Many countries have implemented circular principles in economic growth and achieved significant records. Being a follower in this field, Vietnam should do researches and learn from other countries on how to establish a circular economy model that is consistent with the current situation and growth rate of the country. Through the Sweden, the Netherlands and China case studies analysis, there are some aspects that Vietnam can learn from:

Firstly, the development of circular economy requires a cooperation of all stakeholders from governments, businesses and citizens. Within this ecosystem, government orients and creates an environment so as to develop circurlar economy through strategies and plans for each industry and fields; conducts and enacts laws related to circular economy. Businesses will directly propose and bring the idea of circular economy model to life. While citizens play an important role in determine the model's success or failure. Therefore, raising awarness and changing people habits can have great impact on impulsing circular economy.

Secondly, establishing and developing research institutes dedicated for in-depth study purposes. These institutes will be responsible for training experts with profound knowledge of circular economy and more importantly, have the ability to communicate, spread and apply their knowledge into practice in order to set the foundation of circular economy in Vietnam. These institutes will be the place to conduct in-depth research of entire closed loops of the circular economy from designing to manufacturing, compsuming, reusing, recycling and discarding.

Thirdly, from the case studies of Sweden and Netherlands – the world leaders of food and bioenergy industries, it can be seen that Vietnam must identify crucial sectors to focus on developing. The selection should be based on the country's potential and strength; or sectors that have huge impacts on the environment. Besides, the cooperation of economies for specific activities such as conducting projects, organising workshops and/or conferences about circular economy should also be brought into consideration. Through cooperation, countries can learn and share experiences.

Lastly, Vietnam should consider pursuing business models that increase utilisation of durable textiles (ex: renting clothes), scaling up recycling, applying resource efficiency measures in order to increase sustainable values of the textile industry. Since it is one of the many industries which has huge contribution to Vietnam economy in many aspects such as market value, export, jobs creation as well as contribute to the country budget...

4. CONCLUSION

Vietnam, for a long time has been depending on the available resources and cheap labor force, has recorded great achievements in economic and social development. However, we also have to face different challenges, namely resource scarcity, pollution and climate change. The concept of circular economy slowly becomes more well-known, but it is still difficult to bring this model into practice, especially for small and medium-sized enterprises. Vietnam's economy still takes the traditional approach which is linear economy. This is the primary reason that leads to the state of resource scarcity and serious pollution. In order to grow fast and sustainably as well as develop the economy without "sacrificing" the environment, the circular economy model should be conducted. However, this transformation should be able to grab the opportunities and overcome challenges. Based on other countries' experience, Vietnam needs to develop circular economy with the cooperation of every stakeholders (government, businesses and citizens) as well as establish research institutes, identify crucial sectors to develop and consider pursuing business models that increase utilisation of durable textiles.

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