**Vietnam's transition to an ecological economic model in a new context**

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In Vietnam, the linear economic development model no longer fits the new context - one in which natural resources are depleting at an alarming rate and environmental quality is deteriorating. Eco-economic development, which promotes sustainable development while also protecting the environment, has become a pressing need and an unavoidable trend in the process of social development. The Communist Party of Vietnam's 13th Congress prioritizes sustainable economic development by resolving the conflict between economic growth and environmental protection in an amicable manner. Concretization and successful implementation of ecological economy applications are critical in the new context and are a top priority in national development policy.

**Vietnam's eco-economy**

With the current population boom – 66% of the world's population will live in cities by 2050 [1] – cities will face an increasing number of economic challenges – social and environmental. Additionally, overexploitation of natural resources, increased industrialization and urbanization, combined with modern, energy-intensive lifestyles, have resulted in an increase in greenhouse gas emissions in recent years, resulting in negative consequences for the environment and people. As a result, the transition to an ecological economy (2ECO) is a necessary condition for achieving more sustainable and inclusive development. Developing 2ECO contributes to economic development by extending product life cycles, reducing waste, limiting environmental pollution, recovering and regenerating natural resources, and assisting in the reduction of greenhouse gas emissions. This has aided the 2ECO model in gaining traction and being widely applied in a variety of fields throughout the world [2].



Phu Quoc City is moving toward high-quality ecotourism

According to the Ellen MacArthur Foundation, 2ECO is a proactive planning and design method that is regenerative and restorative. Essentially, 2ECO is an economic system established on the basis of closed-loop business models. Where the idea of end-of-life is supplanted by the concepts of reduction in use (reduce), reuse (reuse), recycling (recycle), and material recovery during the manufacturing, distribution, and consumption of products. As a result, the 2ECO platform will be used on a small scale (by manufacturers, businesses, and consumers); on a medium scale (by eco-industrial parks); and on a large scale (by municipalities) (city, region, country and transnational). The 2ECO platform is committed to sustainable development that promotes environmental stewardship, economic prosperity, and social justice. All in the interest of current and future generations [3].

Since the 1980s, a variety of economic models oriented around 2ECO have developed in Vietnam, including the garden-pond-barn (VAC) model. This is a sustainable agro-ecological economic model in which the system's components are inextricably linked. Although this model is imperfect and is mostly applicable to small scale families or cooperatives, it demonstrates the early economic efficiency of resource consumption and the minimization of environmental damage caused by natural resource degradation. livestock waste

Numerous efforts on sustainable corporate governance and promoting 2ECO to address climate change have been suggested and gradually adopted in recent years. Several noteworthy programs, including the professional group's (DN) and group of large firms' garbage collection and recycling programs; measures to avoid waste discharge into the environment; and eco-industrial parks in several significant cities. Certain outcomes of the 2ECO model have been successfully implemented in large enterprises such as Heineken Vietnam and Unilever Vietnam, small and medium enterprises such as pangasius farming and production supply chains, and projects. of the United Nations Industrial Development Organization (UNIDO) on Eco-Industrial Parks, has been implemented in six industrial parks in Ninh Binh provinces, Da Nang city, and Can Tho city. All of these activities and economic models are creating the groundwork for our country's shift from linear to two-economy development. However, success in transitioning the whole Vietnamese economy to the 2ECO model requires the participation and cooperation of the State, firms, industrial parks, and the community. At that time, the transition to the new 2ECO platform helps the entire society by resolving global difficulties caused by environmental pollution and climate change, as well as improving the home economy's competitiveness. worldwide, while limiting natural resource exploitation, maximizing the value of natural resources, and simultaneously providing new investment and job possibilities, lowering manufacturing costs, and expanding the supply chain.

It is sustainable economic growth that will resolve the two nations' relationship harmoniously in order to meet the economic development objectives for the period 2021- 2030 and a vision for 2050 set forth in the Resolution of the Party's 13th National Congress. Between economic growth and environmental preservation, it is critical to concretize and successfully execute 2ECO, which is why it is a priority in national development policy. Given that other nations have successfully developed the 2ECO model and reaped numerous benefits, Vietnam has the chance to learn from their experiences and adapt lessons learned to the home situation. Vietnam faces several potential and problems in developing 2ECO.

In terms of opportunities, the participation of the entire Vietnamese political system in resolving domestic issues and Vietnam's commitment to the international community in achieving the Millennium Development Goals and sustainable development goals is an opportunity for promoting 2ECO development in Vietnam. Vietnam is on the verge of the Fourth Industrial Revolution, and the research and promotion of technical innovation, as well as the transition from the physical to the digital world, will provide an excellent chance to execute 2ECO development effectively. Results in more growth than in the preceding growth mode. Conversion to 2ECO contributes to the achievement of the Prime Minister's Decision No. 622/QD-TTg, dated May 10, 2017, "On the publication of the National Action Plan to Implement the Agenda 2030 for Sustainable Development," as well as the Document of the 13th National Party Congress. The action plan displays the Government of Vietnam's efforts and commitment to achieving the country's Sustainable Development Goals (SDGs). 2ECO development has the potential to alleviate resource scarcity, preserve the environment, mitigate climate change, and increase economic efficiency, all of which contribute to the achievement of several goals, targets, and criteria outlined in the objectives. objectives for sustainable development. This provides an excellent reason to further the development of this economic paradigm. Encourage the growth of supporting sectors, employ modern technology for trash recycling and reuse, and expand job possibilities in new domains.

Concerning obstacles, at the moment, no explicit and well-defined policy framework for developing the 2ECO model exists. Our nation already has a number of operational 2ECO models and eco-industrial parks, but there is no legal pathway for their growth. In the following years, it will be essential to establish conclusions and fully functional synchronous development institutions that are compatible with this economic model. Additionally, because economic activities have historically been dominated by a linear economic approach, the transition to 2ECO requires a clear roadmap; additionally, it is necessary to emphasize innovation in thinking and awareness, as well as the encouragement of initiatives in the production and supply chain, to aid enterprises in their transition to 2ECO. The correct views of 2ECO must be formed at all phases, from input materials through design, consumption, deployment, reuse, recycling, and disposal, for each industry and area, and must be harmonized from leaders and management levels down to each firm and individual. Additionally, infrastructure, industrial park development, and connection in the direction of 2ECO remain restricted. Numerous independent plans as a result of linear economic development thinking and a lack of connectivity; planning is unrelated to the capacity to manage resources and utilize them inefficiently. Additionally, recycling technologies, supporting industries, and resources for transitioning to 2ECO development remain underdeveloped. Eco-economy must be linked to scientific innovation, access to modern technology, and environmental and human health protection. In terms of resources, developing 2ECO requires a team of competent professionals in science, technology, and practical knowledge capable of resolving issues across the enterprise's and enterprise's whole production process. the capacity to connect enterprises.

**In Vietnam, an orientation toward sustainable economic growth based on the ecological economic model**

With the goal of sustainable development inextricably linked to environmental protection, Vietnam must continue to invest heavily in improving the quality of human resources, perfecting institutions and policies, and increasing public awareness about the application of 2ECO. in everyday life, digital technology, waste treatment and recycling technology, and industrial park and ecological agriculture infrastructure. Concentrate on the following:

**To begin, vigorously revitalize one's ideas and consciousness**

Renewing thinking and knowledge about the critical nature of 2ECO is critical for setting the road and creating room for sustainable development in an era of globalization and international integration. The 13th Party Congress stressed the importance of continuing to reinvent thinking in conformity with the realities of contemporary socioeconomic growth. Faced with pressing practical issues such as population pressure, encroachment and destruction of the ecological environment, exhaustion of natural resources, and particularly the problem of waste, reinvigorating thinking and awareness about 2ECO requires not only the State or business, but also the cooperation of the entire community. For instance, shifting consumer mindsets toward "green" consumption and using the ecologically beneficial 3R (reduce - reuse - recycle) strategy will benefit the market and business. Development of a "green" economy, laying the groundwork for enterprises to transition to "green" production and generating a ripple effect for sustainable development throughout the country. Raise awareness among individuals and businesses (from micro to big) about waste responsibility and the value of waste when proper technology is used to convert trash to electricity. or the addition of new materials in the 2ECO model. For instance, classifying household waste in the community (which includes organic waste, plastic waste, and other rubbish), organic waste being a significant source of raw materials for the generation of electric energy from biogas and biogas. organic fertilizers; properly sorted plastic trash may be recycled into a variety of products, avoiding its disposal in the environment, which would have long-term implications... Or, to address the issue of e-waste, businesses must establish policies that encourage consumers to collect and recycle electronic products in accordance with the process, thereby generating significant commercial value from this waste (precious metals, rare in electronic components) and contributing to a green, clean environment. Rethinking the concept of establishing a legal corridor for 2ECO implementation requires a development orientation that is necessary but complemented by support for enterprises to rethink their approach to 2ECO development. For example, high taxes on fossil fuels, the shift to bioenergy, and the expansion of renewable energy sources such as solar power have all been rising at a rapid pace for some time now. a brief period during which a support policy is in place. State support for policies will encourage firms to develop bioenergy production, progressively lowering reliance on oil exploitation and usage.

**Second, sustainable development is a scientific and technology-driven endeavor**

2ECO's development plan contributes to the attainment of all three criteria for sustainable development (economic, environmental and social). For example, by lowering raw material consumption, waste creation and emissions, and waste management costs, the 2ECO model creates several new markets and job possibilities. Unlike a linear economy, which demands an increase in resource extraction and consumption of resources, energy, water, and raw materials, the 2ECO platform is aimed on generating less waste and ensuring that goods and commodities retain their economic worth for as long as feasible. Thus, science and technology provide the means and information necessary to make development policy decisions at many levels in both the public and private sectors.

Numerous research are being conducted in the European Union (EU) to develop decarbonization technologies for converting CO2 and other wastes into building materials. In Europe and China, a number of eco-industrial parks have been established to repurpose the factory's waste, pollutants, and gases as raw materials for other manufacturers. In companies, the strategy of utilizing biodegradable, non-toxic materials at all stages of the manufacturing process in order to minimize waste formation and preserve a high product value after use is also a 2ECO model approach.

In agriculture, science and technology have had a significant influence on reorganizing production, enhancing the quality of growth, and increasing the economy's productivity. Numerous agricultural methods use advanced technology, such as smart fertilizers, autonomous irrigation systems, drones, organic farming, and clean agriculture, as well as the use of information technology to track the origin of products. Product origin and weather predictions have aided in the improvement of productivity and product quality, hence decreasing human risk. Digital transformation successes also assist in connecting individuals to the market and enterprises by connecting production and consumption, production throughout the value chain, e-commerce, and connecting market information, among other things.

Eco-economy may contribute and provide several advantages at all phases of the agricultural production process, including the optimization and usage of waste byproducts from production operations, input materials, and output materials (eg, water ecology in aquaculture, composting of rice straw and shrimp shells as bio-fertilizer,...). Alternatively, diversifying or linking agricultural types in order to capitalize on the resource flows associated with diverse forms of agriculture, such as crop-aquaculture hybrid models (shrimp-rice, gardens— pond - barn, shrimp - forest, ...). Additionally, by enhancing post-harvest processing and preservation technologies, integrating production-consumption chains, and using waste byproducts such as rice straw, animal manure, and so on, production efficiency and environmental quality are increased.

**Thirdly, technological innovation and change**

To make the shift from a linear economy to a two-ecosystem economy, enterprises must be pioneers in "innovating" business models that result in a more ecological value chain. Gligoric et al. (4)'s research on 2ECO demonstrates that the advancement of digital technology is contributing to this transition. Additionally, the process of digital transformation in industrial firms is occurring concurrently with the introduction of the notion of a 2ECO business model. Digital technology is viewed as a component of the Fourth Industrial Revolution, also known as Industry 4.0, which is concerned with industrial transformation, in which the collecting and storage of data has transformed goods into high-value systems. On the basis of their functions, digital technologies are grouped into three categories: data collecting, data integration, and data analysis. Sensors (e.g., radio frequency identification – RFID) and devices that link items and consumers to the internet (e.g., internet of things – IoT) are data collecting technologies. Data integration technologies store and format data, allowing for the use of data analysis technologies in the production and development of information.

The interaction between digital technology and business model innovation in the direction of 2ECO demonstrates how digital technology has the potential to delay, decrease, or completely eliminate resource flows. Specifically, IoT can prolong product life cycles and allow supply chain recalls by improving monitoring, analysis, and management of product data. Additionally, the real-virtual cyber system aids in the optimization of production and maintenance by giving data for real-time decision-making.

Apart from facilitating resource allocation processes, digital technology also contributes to value generation. Specifically, digital technology aids in increasing competitiveness through innovative services; improving finance through enhanced value creation and cost reduction; improving equipment efficiency through machine optimization and new business models (e.g., product-service solutions and pay-per-use); and optimizing resource efficiency. Thus, the use of 2ECO principles in "innovating" a business model is the primary engine of value generation from Fourth Industrial Revolution technology.

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