



## Research the prospects of applying green economy in Nghe An

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### Abstract

Developing green economy is an indispensable trend of countries in the world in general and Vietnam in particular in the context of climate change, environmental pollution, exhaustion of resources and energy. Green economy aims to improve the environment, ensure social justice and happiness of every citizen. Nghe An is the province with the leading area and the fourth largest population of Vietnam, with great potentials of natural resources and human resources, but the economy still grows slowly and is not really sustainable, the state of exploitation of natural resources is still unreasonable and lacks effective management. From that fact, the study and application of green economy in Nghe An will bring many development opportunities for this locality.

**Keyword:** green economy, green growth



## 1. Introduction

Vietnam has launched a "Green Growth Strategy" in 2012 to achieve the common goals of mankind on environmental protection, especially global warming issues. The Prime Minister also made a decision on the Green Growth Action Plan in 2014 to specify this strategy.

Nghe An is a province in the North Central region, with the second population in the region and the fourth in the country, in the construction planning of Nam Thanh - Bac Nghe, Nam Nghe - Bac Ha, these are the general economic regions with a role of development motivation for the North Central region with diverse industries, forming regional transport hubs, in the future, to be a diverse and dynamic economic development region, national and international importance [1]. In recent years, thanks to changes in development policies, Nghe An has attracted many investment projects for the development of agriculture, industry and services from domestic and foreign enterprises. The process of industrialization and modernization of the province has made many development steps. However, the actual socio-economic development of the province is still facing many difficulties, the economic situation is affected by inflation, recession, financial crisis of the whole country and the world, climate change and extreme events have greatly affected production results and people's lives. The risk of resource depletion is a sign that the development is not really sustainable. Therefore, the study of green economy based on available resources in Nghe An province to offer prospects for economic development towards greening is the most effective, most harmonious solution idea for the natural environment to be able to face the current economic, social and environmental challenges.

## 2. Rationale for applying green economy in Nghe An province

### 2.1. Related concepts

*Green economy:*

The concept of green economy appears in the context of global economy is facing major challenges of climate change, exhaustion of natural resources, environmental pollution, poverty and social inequality. The United Nations Environment Program (UNEP) defines the "green economy as a platform to improve human health and social justice, while significantly reducing environmental risks and ecological scarcity". It is low carbon, resource efficient and social equality. In a green economy, income and employment growth should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent loss of ecosystem services and biodiversity. "(UNEP, 2011). Put simply, a green economy is a low carbon economy, saving resources, creating jobs and social justice.



### *Green growth:*

According to the OECD, green growth is to promote economic growth and development, while ensuring that natural resources continue to provide essential environmental resources and services to our lives. Put simply, green growth is greening economic growth.

The concept of green growth is a component of green economy. The concept of green economy has richer and more diverse connotation than green growth. Green economy as well as sustainable development aims to put people at the center as the beneficiaries and have full access to achievements and development opportunities not only for one generation but for all generation in harmony with the natural environment.

For developing countries like Vietnam, promoting green economy will have the following benefits:

#### + Economic benefits:

- \* Increase in GDP - production of green goods and services
- \* Increase revenue from valuation ecosystem services
- \* Economic diversification, ie improving economic risk management and minimizing vulnerability

\* Innovating, approaching and absorbing green technology, ie improving market confidence

#### + Environmental benefits:

- \* Increase productivity and efficiency of using natural resources
- \* Natural capital is used within ecological limits
- \* Reduce adverse environmental impacts and improve risk / manage natural risks

#### + Social benefits:

- \* Increased livelihood opportunities, income and / or quality of life, notably the poor
- \* Good jobs that benefit the poor are created and maintained
- \* Strengthening social capital, people and knowledge
- \* Reduce inequality

The overarching goal of green growth is to establish incentives or organizations that help increase welfare by: improving resource management to increase productivity; encourage economic activity to take place where there is the best advantage for society in the long-term; find new ways to meet the above two goals, ie innovation; Recognize the full value of natural capital as a factor of production along with other goods and services.

### ***2.2. The strengths and obstacles of Nghe An when applying green economy***

Like other provinces in the Central region, Nghe An goes up from a very low starting point and is affected by severe natural disasters. In recent years, the face of the province's economy has changed a lot on the basis of promoting internal resources, continuing to comprehensively



promote the renovation and rational exploitation of strengths on conditions of the area's natural resources and labor.

Nghe An is located in the North Central region, has a close relationship with the Red River Delta and is located in the affected area of the Northern Key Economic Area, nearly 300 km from Hanoi capital, 400 km from Hue city. There are national highways 1A, Ho Chi Minh road, North-South railway running through, Vinh airport, Cua Lo seaport, which are the major traffic hubs of the region; Highway 7 in the east-west direction linking Laos and Northeastern Thailand with the East Sea. Nghe An has Vinh City as a first-class city, an economic, cultural and social center of the North Central region. Nghe An has 21 urban districts, with some main features of nature, environment and socio-economy as follows:

- Regarding natural conditions:

+ The province's natural land area is more than 1.6 million hectares, of which the currently used land is 1,378.3 thousand hectares, accounting for 83.6%, of which agricultural land accounts for 75.6% (including land for agricultural production is 16.7%, forestry land is 58.4% and other land groups are 0.5%), non-agricultural land accounts for 7.8% and unused land makes up 16.4%. Thus, in Nghe An province, the proportion of agricultural land is less than the natural land and land for agriculture. Forest land with forest accounts for the largest proportion (58.4%). The province still has 270.7 thousand ha of unused land, in the future it is possible to exploit this land fund for agricultural production (development of industrial crops, fruit trees, livestock ...) to improve people's life.

+ Located in the tropical monsoon climate zone, under the direct impact of the dry and hot West-South monsoon (from April to August) and the cold, wet Northeast monsoon (from November to March next year). The average annual temperature is 23 - 24.2oC. The total rainfall for the year is 1,200 - 2,000 mm. The annual average humidity is 80-90%. The total number of sunny hours in the year is about 1,460 hours.

In general, Nghe An has a relatively harsh climate, frequent natural disasters, which are unfavorable conditions for production activities in general and industrial production in particular.

- Regarding resources:

+ Minerals:

Nghe An mineral resources are quite diverse, with types from rare minerals such as gold, gemstones to other types. In particular, there are some minerals with large reserves such as tin widely distributed in Quy Hop, Quy Chau, Que Phong, Tan Ky ... including original and placer ores, estimated reserves of over 82,000 tons. refined tin; White stone is a material used in industries such as paint, paper, cosmetics, additives ... concentrated in Quy Hop, Tan Ky and Quy Chau with reserves of nearly 310 million tons. At present, only exploration and evaluation of reserves and quality in three areas in Quy Hop district with reserves of over 200 million tons; Limestone:



abundant in Hoang Mai, Do Luong, Anh Son and Tan Ky with reserves estimated at over 4 billion tons; iron ore has up to 22 mines, with a total reserve of 6.2 million tons, distributed in many districts, mainly brown iron ore, magnesite iron, some prospective ore points. industrial, but most are small scale; Coal has 5 mines with over 4 million tons, of which Khe Bo has 2.23 million tons. There are also a number of other types such as bauxite, phosphorus, and minerals used as construction materials such as building stones, sand and gravel ... among which there are many types of significance within the region. and the whole country like tin, limestone, building stone. This is a great advantage of the province in developing industries such as mining, cement production, construction materials ...

+ Water resources:

- Surface water: The system of rivers and streams is dense, the river network density is from 0.6 to 0.7 km / km<sup>2</sup>. Ca river is the largest river in the province, 375 km long with a basin area of 17,730 km<sup>2</sup>, accounting for 80% of the provincial water surface. Due to the steep terrain, rivers and streams are capable of constructing large and small hydroelectric projects, meeting local energy demand for upland people and joining the national electricity grid. Total calculated hydroelectric capacity can be up to 950-1000 MW.

- Mineral water: Currently, there have been only eight hot spots, notably two in Khang (Quy Hop) and Giang Son (Do Luong) villages, recently three more new mineral water spots have been discovered in Nam Giot (Tan Ky), Bac Thanh (Yen Thanh), Kim Da (Tuong Duong).

+ Marine resources:

Nghe An has 82 km of coastline and 6 creeks, capable of developing shipping and fishing. Including Cua Lo and Cua Hoi very convenient for the development of seaports. Cua Lo has been identified by the Government as an important international seaport of the North Central region, as a transport gateway for Laos and Northeastern Thailand. Marine economic development is an important strategic direction and has a significant impact on the industrial development of the province.

The internal waters and waters of Nghe An are 4,230 square nautical miles. From a depth of 40 m or more, there is a relatively flat bottom, the outer area has many reefs, sand dunes, obstacles; The outer area is also the fishing grounds with large reserves. Currently, the ability to fish offshore is limited. The continental shelf has a plethora of plankton which is a good food source for the fish to live and thrive, the fish's reproductive potential is very strong, most of which are non-migrating species.

- About human resources

Nghe An is a province with potentials for people and labor. According to the 2018 Statistical Yearbook of Nghe An Statistical Office, the population of Nghe An province has 3,157,128 people, an increase of 25,836 people, equivalent to an increase of 0.83% compared to



2017. The natural increase rate of the province in at more than 13% per year, this is a great source of labor in the future so that the province can well fulfill its socio-economic development goals.

Nghe An has an abundant labor source, according to the province's statistics in 2018, the labor force aged 15 and over of Nghe An province was 1,890,274 people, accounting for 59.87% of the provincial population, annually supplemented. adding about 40 thousand people to the labor force. This is a great potential of labor to serve the economic development of the province.

Nghe An's labor force is mainly young, characterized by hard work, studiousness, intelligence, seriousness in labor and education, as a result of previous education and training tradition; create conditions for forming a contingent of workers and managers, technicians in developing economic sectors of the province. However, the quality and professional qualifications of workers are generally low, and the percentage of workers with high professional qualifications remains low. This is a significant challenge for Nghe An on the path of development and integration, especially in changing the perceptions of workers towards harmony with nature and environmental protection.

- Economic:

The province's gross output (at current prices) increased continuously, from VND 19.9 trillion in 2006 to VND 42.17 trillion in 2010, contributing 27.5% to the GDP of the North Central Coast (after Thanh Hoa) and 2.1% of the national GDP, ranking 11 out of 63 provinces and cities nationwide. By 2018, the province's total output will reach 115.67 trillion dong (estimated), 5.81 times in 2006 and 2.74 times in 2010 [5]. The growth in GDP scale has contributed to improving GDP per capita from VND 3 million in 2000 to VND 14.2 million in 2010 and to VND 38 million in 2018 (an increase of 12.67 times compared to 2000).

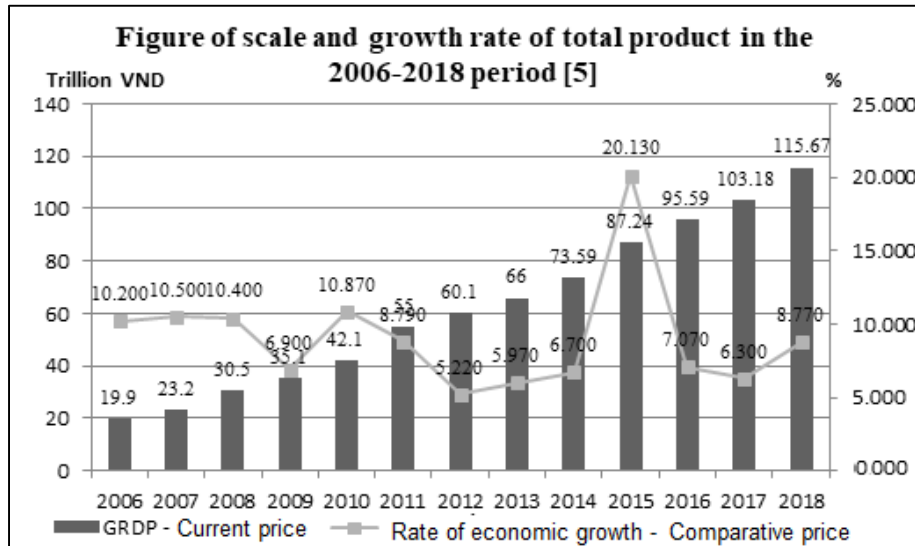
The average annual GDP growth rate in the same period of the province is higher than the national average with nearly 9.34% / year, of which, the period of 2006-2010 reaches 9.77% / year; in the period of 2011 - 2018 reached 8.9% (in 2018 reached 8.77%), but this period also recorded a sudden growth milestone of the economy with a value reaching 20.13% in 2015, marking efforts in the province's economic development strategy.

The growth rate of industry - construction has always been at double digits from 2006 to present: average 17.6% / year, services: 9.9%, agriculture: 4.5%.

The economic structure of the industry has shifted in the right direction based on promoting comparative advantages, gradually reducing the proportion of agriculture, forestry and fishery (from 33.1% in 2006 to 27% in 2011 and 20.5% in 2018 ), gradually increasing the proportion of industry - construction (from 30.3% in 2006 to 34.9% in 2011, and 34.25% in 2018. The service sector has a positive growth rate, so the proportion of This sector in the economic structure tends to increase rapidly in the same period (from 36.6% in 2006 to 38.1% in 2011 and



45.25% in 2018). This is a result showing the development path. The economy is in the right direction of the province.



Specifically:

+ Regarding agriculture, forestry and fishery:

Regarding production value (value of production) of agriculture, forestry and fishery products (current price) of VND 25.4 trillion in 2018 (estimated), accounting for 22% of the total value of production value of the province, ranked third after industry and construction. and service. With the scale of such production value, Nghe An is ranked 2/6 provinces in the northern region (after Thanh Hoa) and 15/63 provinces and cities. In the structure of production value of agriculture, forestry, fisheries, agriculture predominates with 80.6%, attracting jobs and generating income for 88.0% of rural labor [5].

Nghe An's strong products, providing domestic and international markets, bringing income to agricultural and rural households are: rice (186.0 thousand ha, accounting for 26.6% of the area. Rice in the BTB region, ranked 2/6 in the province and 12/63 provinces and cities in the country, with a yield of 982.5 thousand tons, accounting for 27.8% of the rice output in the BTB region, the 2nd/6/6 in the BTB region and the 15/63 provinces and cities, sweet potatoes (6.1 thousand ha and 41.0 thousand tons, 2nd of June provinces in the northern region, after Thanh Hoa province and 4/63 provinces and cities after Vinh Long, Thanh Hoa and Dak Nong), peanuts (16.2 thousand hectares and 37.3 thousand tons, leading the country), oranges (3.5 thousand hectares, ranked 6th out of 63 provinces and cities), buffalo herd (over 296.0 thousand head of the whole



country), herd of cows (428.8 thousand heads, head of the whole country); forest area (902.2 thousand ha) and natural forest (735.4 thousand ha), leading the whole country).

+ About industry Industrial production value in 2018 reached 20.3 trillion VND (estimated), accounting for 25.0% of industrial production value of the BTB region, 2nd of June provinces (after Thanh Hoa), attracting over 22.0 thousand workers. It has a good income compared to agricultural production. The province's prominent industrial products are cement, food processing, beverages (frozen seafood, sugar cane, beer), textiles, footwear, ready-made garments, etc. Dai has come into operation such as TH milk factory, Ton Hoa Sen factory, Royal Foods canned fish factory, Masan food processing factory (in Nam Cam), Song Lam 2 cement factory (in the UK). Son), MDF wood factory (in Nghia Dan)... have contributed to creating jobs and stable incomes for workers.

+ About the service

Transport, trade and tourism activities flourished, both creating jobs and meeting consumers' needs. Total retail sales of consumer goods and services increased rapidly from VND 9 trillion in 2005 to VND 17.43 trillion in 2010 and VND 50.84 trillion in 2018 (estimated). The structure of total retail sales is increasingly diverse, including commerce, retail, tourism, hotels, restaurants and other service activities. The retail system is abundant and growing, including retail stores, markets (popular in rural areas), supermarkets, shopping centers ... These networks not only enhance production development, exchanging goods but also creating jobs, income for a part of the population, affecting the improvement of the living standards of the population.

The value of import and export goods in the area is increasing both in terms of exports and imports, from 191.7 million USD in 2005 (import accounted for 54.8%) to 386.5 million USD (imports accounted for 53 , 5%) in 2010 and US \$ 1,010 million in 2018 (imports accounted for 48.8%) [8, 9]. From trade deficit in the period 2005 - 2012, from 2013 to now, Nghe An province has a trade surplus. Foreign trade activities are an important factor to promote production and consumption, thereby increasing the income for the whole province in general and for every individual in particular.

- Regarding economic and technical infrastructure:

The infrastructure system of Nghe An province was formed very early and is gradually improving, building new to meet the development needs of the entire socio-economy.

+ Transport network

• Road:

National highway 1 is 91 km long, of which the next phase will invest in the construction of Hanoi - Vinh expressway and Ho Chi Minh highway running parallel with national highway 1 of 132 km long and national highway 15 in the west, 149 long. km running through the province; national highway 7 is 225 km long, national highway 46 is 90 km long, national highway 48 is 162





km long (of which only 40 km has been completed to connect with Thong Thu border gate), which is the route connecting the east and west of the province, with border gates of Laos. The transport system ensures Vinh City is the center of the region and ensures trade with Laos and Northeast Thailand.

- Seaports:

Cua Lo port, the current channel depth -5.5 meters, the volume of cargo volume of 1.3 million tons, ships of 1.0 thousand tons in and out. The ability to upgrade to a capacity of 6-8 million tons by 2020, ships with a capacity of 3-4 thousand tons, is a great potential for the shipping industry and import and export of Nghe An, North Central region. It is also the gateway to the sea for Laos and Northeast Thailand. Located between the two deep-water ports of Nghi Son and Vung Ang, if they work well with these ports in transporting goods, the role of Cua Lo port of Nghe An in increasing cargo capacity will be promoted. With the above location and conditions, Nghe An plays a role as a gateway for socio-economic exchanges between the North Central region and the Northern and Southern regions. In the near future, Dong Hoi port will be invested to build a cargo port for the development of thermal power, cement and steel. Construction capacity to accommodate vessels of 1-3 thousand tons in and out.

- Rail:

The North - South railway is 94 km long and the Cau Giat - Nghia Dan railway is 30 km long, with 7 stations, of which Vinh Station is the center with a large volume of passengers and cargo.

+ Urban and urban infrastructure systems, electrical systems, water supply and drainage, telecommunication and telecommunication systems, hotel service systems, restaurants, banks, insurance, post and telecommunications... is gradually developing and upgrading to meet the needs of the province.

- Capital: The capital invested in socio-economic development of the province has been increasing over time. In 2005, the total investment capital was only VND 8,407,070 million, but by 2018 this figure reached VND 62,205 billion (estimated), up 7.4 times. This proves that the policy of attracting investment capital of the province has been achieving certain effects.

- Regarding policy directions:

The policy line and the system of legal documents are important factors, contributing to creating a legal corridor for economic development, and at the same time orienting the socio-economic development process of Nghe An province in line with the common goal of the region and the whole country. Over the past years, Nghe An has actively invested in open, attractive and attractive investment policies to attract capital from domestic and foreign investors, creating a great motivation for economic development. Socio-economic province. This is an important premise for the province's economy to apply a green economy model to increase sustainability and efficiency.



### **3. Some solutions for applying green economy to Nghe An province**

The proposed innovations are based on the benefits, goals and framework of the green economy combined with the strengths and challenges of the province's economy itself, including acquiring the country's development orientation and taking advantage of investment cooperation opportunities, as well as spreading community contributions and practical implementation of ongoing economic models in the province, can apply green economy to Nghe An province according to the following groups of solutions:

- Firstly, gradually replace traditional energy sources and raw materials with clean energy sources and materials.

Green energy is a type of energy obtained from nature, which does not pollute the environment, is sustainable and renewable ... Green energy types, including: Solar energy, wind energy, hydroelectricity, geothermal energy, tidal energy, bioenergy, hydrogen energy... Nghe An is a province with potential for hydroelectricity, the total capacity of hydroelectricity calculation can be up to 950-1000 MW, Can meet local energy needs by building hydroelectric plants in the province. However, considering the impact of hydroelectricity on the reservoir bed to the ecosystem and livelihoods of people in the reservoir area, the development of hydropower projects should be limited to certain projects. At the same time, it is necessary to build other green energy projects that Nghe An has advantages such as: solar energy, wind energy, tidal energy, bioenergy ...

Increasing use of organic raw materials instead of inorganic materials to create products with organic origin that are safe for users and contributing to environmental protection such as packaging of organic origin, using raw materials produced by organic farming and farming methods for the processing industry ...

- Secondly, building green economic models: building green economic models based on the local socio-economic natural characteristics is an increasingly developing trend. Nghe An with its natural characteristics and diverse natural resources, with many local specialties creates good conditions for building green economic models such as:

+ Green farm economic models with highlights such as: using renewable energy through solar battery systems; semi-natural poultry raising activities in the farm area; making use of animal wastes from fertilizing plants, chickens eating insects and insects; Organic packaging is used for packaging post-harvest agricultural products, linking product consumption from farm to supermarket and incorporating sightseeing, student learning and weekend relaxation on the farm. This farm model is very suitable for midland mountainous areas such as Nghia Dan, Thanh Chuong, Anh Son, Quy Chau...

+ Ecological village models in the area of coastal ecosystems, ecological village models of hilly ecosystems and ecological village models of wetland ecosystems. These models are



suitable for various conditions of Nghe An terrain. The essence of the eco-village model is the harmonious combination of natural conditions, indigenous knowledge combined with science and technology to create a better living space. The model of an eco-village needs to be the center of people, emphasizing that in order to develop agro-forestry economy, it is necessary to improve the ecological environment, livelihood orientation or production activities in accordance with the climatic conditions [6].

- Thirdly, innovating green technologies and techniques: energy-saving technologies (LED lamps); technologies using renewable energy (solar energy, mini hydro...); pollution reduction technology (livestock waste treatment; organic agricultural techniques...)

- Fourthly, change consumption habits towards greening by educating and disseminating green lifestyles currently being applied in Vietnam and many countries such as implementing 3R (reduction, recycling, reuse); energy saving, smart transportation participation; reduce the consumption of plastic bags; building green living environment (green office - green classroom, green neighborhood ...); Smart consumption (using organic food, buying from the best sources, buying enough to use, knowledgeable about the product...) [7].

#### **4. Conclusion**

Green economy development is an indispensable trend in the context of global change in nature as well as socio-economic in order to improve the quality of sustainable living of people and ensure harmony with the natural capital resources and adapt to climate change. Nghe An is a province with the largest area and population of the country with a lot of potentials in nature and manpower and open and flexible innovation policies to develop green economy effectively and sustainably. Based on the strengths and limitations of the province, green economy can be applied in the following groups of ideas: innovation of raw materials and energy towards green, clean; building a green economy model towards sustainable livelihoods, contributing to the recovery of natural capital, minimizing environmental and ecological issues for people; technological innovation, green technology; educating, propagating and popularize the green consumption lifestyle and habits to every people in the province.

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