

Introducing Natural Resource Economics: Basic Concepts and Relevance to Economic Development

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Article Information	Abstract
Article History: Received: 4 September 2025 Accepted: 5 September 2025 Published: 30 September 2025	<i>Natural resources are an element of the environment that has important value in meeting human needs. Natural resource economics is concerned with the management, use, and conservation of resources, including renewable and non-renewable resources. According to experts, natural resources can be classified according to their materials, habitat, and recreational capabilities. It includes biological and abiotic resources, soil and water, renewable and non-renewable resources. Sustainable economic development requires careful use of natural resources, as overexploitation can damage the environment and affect the wellbeing of future generations. Despite sustainable management efforts, Indonesia still faces major challenges such as environmental damage, climate change, and social conflicts. Policies that pay attention to environmental sustainability allow Indonesia to maximize the economic benefits of its natural resources while maintaining ecological balance and community welfare.</i>
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INTRODUCTION

Natural resources encompass all naturally occurring entities that can be utilized to satisfy human requirements. Natural resources can be categorized into renewable and non-renewable resources based on their characteristics. Renewable natural resources are natural assets that can persist indefinitely, provided their utilization is not unduly exploited. The market mechanism is defined as the inclination in a free market for price fluctuations to transpire until equilibrium is achieved, where the amount supplied equals the quantity requested. Standard economic theory posits that institutional factors, aside from the free market, can also lead to efficient and optimal allocation. In other words, the absence of a market will preclude effective and optimal resource allocation. In rare instances, the market system may not function adequately for specific natural resources. The distribution of commodities and services within a society can be executed through at least two mechanisms:

the market mechanism and the bureaucratic mechanism. The market mechanism, under certain requisite conditions, is regarded as a system that promotes the efficient allocation of resources.

Nonetheless, market failures may also arise in the distribution of specific goods and services. This may result from the presence of public goods and their associated externalities. These categories of goods and services (including mixed items) will be disseminated via bureaucratic channels. Economic development refers to the endeavor to enhance a nation's standard of living, as assessed by per capita income levels. The advancement of a nation is intricately linked to its available resources, encompassing both natural and human resources. Both resources are crucial in ascertaining the effectiveness of a nation's development. Several countries have attained prosperity through their effective utilization of available resources. Each country possesses distinct resources, which include assets that include soil fertility and natural richness, such as climatic conditions, forest products, and marine resources, all of which significantly impact a nation's economic development. Furthermore, if bolstered by an abundance of natural resources, it possesses significant potential to facilitate a nation's economic progress.

RESEARCH METHOD

Qualitative analysis is utilized to comprehend diverse ideas and models applied in natural resource economics and their influence on development policies. This study assesses the application of natural resource economics principles across different countries to determine the applicability of these concepts in a global context.

RESULT AND DISCUSSION

Equations should be centered and numbered as the following example. It is preferable to use 'equation editor' or 'Math Type' for the necessary equations, as it follows: Natural resources comprise two syllables: *sumber daya* and *alam*. Resources are described as sources of supply, encompassing both reserves and new sources. Resources serve as inputs in the production process from an economic perspective. Some understand resources as a human evaluation of the environmental elements required for sustenance. Chapman delineates various definitions pertaining to resources, specifically:

- a. Total inventory refers to the aggregate of all environmental components that may serve as resources if they were accessible. Total inventory encompasses the aggregate of all environmental components that may serve as resources if they are accessible.
- b. Resources constitute a segment of the overall inventory accessible to people.
- c. Reserves are the segment of resources that are definitively recognized as extractable.

Natural resources are defined as any materials discovered by humans in nature that are utilized for their sustenance. Katili asserted that natural resources encompass all components of the biophysical environmental system that can currently or possibly satisfy human requirements (Katili, 1986).

Other scholars assert that natural resources constitute elements of the natural environment that has value for fulfilling human needs. Natural resources are defined as the environmental conditions and raw materials utilized by humans to satisfy their needs and enhance their well-being. They encompass both physical and biological elements of the natural

environment essential for human welfare. Natural resources are important and helpful entities within their respective environments. Natural resources encompass all entities on Earth, both biotic and abiotic, that can be harnessed by people, are finite in availability, and whose extraction satisfies economic, social, technological, and environmental standards. Economics is the study of the management of material resources by individuals, society, and the state to enhance human wellbeing. Economics is the study of human behavior and behaviors aimed at fulfilling diverse and changing wants using available resources through decisions related to production, consumption, and distribution activities.

Economic development refers to the process of augmenting total and per capita income, considering population increase, while also facilitating significant alterations in a nation's economic structure and ensuring equitable income distribution among its populace.

Classification of natural resources is conducted by experts according to their composition, environment, and potential for extraction, specifically:

One. Natural resources are classed according to their material.

- a. Natural resources (SDA) that are organic, include live organisms such as flora and fauna. Activities pertaining to organic resources encompass forestry, agriculture, animal husbandry, and fisheries.
- b. Non-biotic natural resources (inorganic) comprised of inanimate substances, including solids, liquids, and gasses. Inorganic natural resources (non-biological) comprised of inanimate substances including solids, liquids, and gasses. Activities pertaining to inorganic resources encompass the extraction of minerals, soil, rocks, oil, and natural gas, among others.

Two. It can be classed according on the type of habitat.

1. Land resources encompass the land utilized for diverse human activities and as raw materials for industries such as ceramics and tiles, together with all resources derived from the land.
2. Water resources encompass the sea, rivers, lakes, groundwater, and precipitation. Natural water resources encompass the sea, rivers, lakes, groundwater, and precipitation.

Three. It can be classed according to the likelihood of recovery.

- a. Renewable natural resources include land, water, forests, grasslands, and fish stocks.
- b. Non-renewable natural resources include oil, natural gas, coal, metal ores, gemstones, and sandstone. Non-renewable natural resources include oil, natural gas, coal, metal ores, precious stones, and sandstone.

c. Renewable resources that are inexhaustible, include solar energy, tidal energy, and air. Renewable resources that are inexhaustible, include solar energy, tidal energy, and air.

The correlation between natural resources and economic development pertains to the decision-making processes involved in the utilization of both renewable and non-renewable resources. The utilization of natural resources for the future necessitates the preservation of their availability for subsequent usage. Natural resources are defined as any materials found beneath or above the ground that have not yet been utilized in the production process. Natural resource goods are extracted natural resources utilized as elements of production. (Djula, 2013) Accelerated economic expansion necessitates substantial quantities of resource commodities, yet it may exhaust the Earth's natural resources. The economic theory pertaining to economic growth in relation to natural resources is the production function. Eight critical concerns of natural resources include the provision for human necessities, the

geographic distribution of resources, fluctuations in resource availability, utilization policies, the interplay between natural resources and the environment, quality, environmental degradation, and market dynamics. The extraction of natural resources for economic development must be conducted with due diligence to prevent harm to the human environmental order, employing comprehensive wisdom and considering the requirements of future generations.

The environment plays a crucial role in economic development, raising concerns that progress may stagnate due to the depletion of natural resources or their degradation, exacerbated by unchecked development and rapid population growth, which has resulted in the neglect of resource preservation. Environmentally conscious development aims to enhance the welfare of affluent societies while prioritizing the preservation of natural resources and the planet, ensuring the prevention of ecological degradation, soil depletion, and the exhaustion of non-renewable resources in the future. The challenge for developing nations, including Indonesia, is to enhance the provision of necessities for the impoverished through economic development initiatives while ensuring environmental sustainability is preserved. The policies governing the management, utilization, development, and preservation of natural resources for sustainable development, as articulated by Hadi Prayitno and Budi Santosa, must minimally conform to the following principles: honoring and sustaining the community of life, enhancing the quality of human existence, safeguarding the vitality and diversity of the planet, preventing the depletion of non-renewable resources, ensuring that consumption does not surpass the earth's carrying capacity, transforming individual attitudes and lifestyles, and fostering community ingenuity to sustain their environment (Khambali et al., 2023).

The Significance of Natural Resources in Economic Development Natural resources contribute to economic activities. Both domestic and business requirements are guaranteed to be sourced from nature, where enterprises will augment the economic value (Added-Values) of natural resources and the environment that are utilized in production. Two products will be formed from the production results: the first is the consumption product, and the second is the production residue. Ultimately, the byproducts of these economic activities revert to nature in solid, liquid, or gaseous states. The function of natural resources in economic growth can be articulated as follows:

- a. Functioning as a mechanism to satisfy human needs by augmenting the economic worth of natural resources through processing and output. Contributing to the satisfaction of human needs by enhancing the economic value of natural resources through processing and production.
- b. Functioning as raw materials in the production process, hence augmenting national income to stimulate economic growth. Functioning as raw materials in the production process, therefore augmenting national wealth to stimulate economic progress.
- c. Functioning as a source of raw materials for production processes to fulfill future human requirements, while also functioning as a stabilizing element for the ecological environment. Functioning as a source of raw materials for production processes to satisfy future human requirements, while serving as a stabilizing element for the ecological environment.
- d. Functioning as an inexhaustible resource, akin to air, and representing a distinctive asset that may be utilized and regulated in a nation's economic advancement.

Functioning as an inexhaustible resource akin to air, it represents a distinctive form of wealth that may be harnessed and administered in a nation's economic development.

A deterioration in environmental quality and natural resources is attributable to two factors: escalating economic demands and ineffective governmental measures. Consequently, due to the escalating demand, extensive exploitation is conducted only to satisfy the requirements, particularly the insatiable market demand. (Komarulzaman & Alisjahbana, 2006). The escalating and boundless demand frequently exerts significant strain on the environment and available resources. The demand for wood compels us to unnecessarily deforest and participate in illicit logging activities. The demand for transportation to facilitate mobility and economic development frequently results in environmental degradation, including air pollution and maritime events where economic pressures compel fishermen to overfish.

Consequently, the acceleration of economic development must be complemented with the availability of sustainable resources and a healthy environment. (Bakar, 2020). The historical progression and evolution of natural resources from prehistoric times to the colonial period indicate that Indonesian culture has relied on these resources for survival since ancient times. The discovery of lithic implements indicates that prehistoric humans utilized natural resources, including stone and wood. In the kingdom era, the administration of natural resources became structured, marked by the advancement of agricultural systems and the extraction of mineral resources. The Dutch colonial period had a swift escalation in the exploitation of natural resources. The Dutch established an extensive plantation system that exploited Indonesia's lush terrain for commodities such as coffee, tea, and spices. Furthermore, the extraction of minerals, including tin and gold, was conducted aggressively. This policy enriched the colonizers while simultaneously inflicting considerable environmental harm. Post-Independence Development of Natural Resources Following independence in 1945, the administration of natural resources in Indonesia experienced substantial transformations. The state constitution stipulates that the land, water, and their resources are governed by the state for the maximum benefit of the populace. Nonetheless, considerable obstacles have arisen due to rampant exploitation and ecological degradation. During the reform era in the late 1990s, recognition of the significance of sustainable management began to rise.

The government commenced the implementation of more eco-friendly policies and prioritized the welfare of local populations. Forest conservation initiatives and the safeguarding of endangered species have been implemented to preserve biodiversity. Natural resource management in Indonesia faces significant challenges despite the country's ample natural resource potential. These challenges include overexploitation, resulting in environmental degradation from illegal logging and mining; climate change, which disrupts weather patterns and water availability, adversely affecting agriculture and other resources; and social conflicts, where tensions frequently emerge between local communities and large corporations over land rights and resource access.

The Economic Significance of Natural Resources for Economic Development. The economy of natural resources is significantly pertinent to economic development, particularly for resource-abundant nations. Natural resource economics (NRE) is crucial for economic development since it fosters economic growth, primarily because natural resources serve as the fundamental input in the production process. The mining, oil, and forestry sectors can augment national income via exports and taxation, so bolstering employment, as

the natural resource industry employs a substantial workforce, particularly in emerging nations. Industries such as fisheries, agriculture, and forestry generate numerous employment opportunities and serve as significant sources of government income through taxes and royalties derived from natural resource exploitation. These revenues are crucial for financing infrastructure, education, and health initiatives, while also promoting environmental sustainability, as emphasized by ESDA's focus on preserving natural resource viability. Effective management can mitigate environmental detriments, exemplified by sustainable agricultural practices and the utilization of renewable energy. Additionally, equitable and transparent governance of natural resources can avert social conflicts that frequently stem from competition or overexploitation.

The primary challenges in ESDA encompass: first, economic dependence on natural resources, rendering countries reliant on this sector susceptible to global market price volatility; second, overexploitation and environmental degradation, where heightened demand leads to excessive resource extraction detrimental to the environment; third, the necessity for technology and innovation, as advancements in resource management are essential for enhancing efficiency and mitigating adverse environmental effects; and finally, social inequality, wherein the advantages derived from natural resource exploitation are frequently inequitably distributed, leaving local communities without equitable benefits.

CONCLUSION

Natural resources are important and helpful entities within their respective environments. Eight critical issues of natural resources include the provision for human requirements, the geographical distribution of resources, fluctuations in resource availability, usage regulations, the interplay between natural resources and the environment, quality, ecological degradation, and market dynamics. The interplay between economics and natural resources, as well as the environment, pertains to decision-making about the utilization of both renewable and non-renewable resources. Natural resources contribute to economic activities. The stock of natural resources refers to the quantity of known natural resources that can be profitably harvested. Natural Resource Economics elucidates the management of natural resources in a sustainable and responsible manner to facilitate economic development. By emphasizing sustainability principles and addressing environmental, social, and economic dimensions, Natural Resource Economics (NRE) serves as a crucial foundation for developing sustainable policies.

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