

# Hutanomics: Digital Economy Innovation for Strengthening Forestry Economic Resource Management

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## ABSTRACT

This research trying to explains the management of the nation's economic development based on preserving the environment, which is the forest. This is because economic development has always been identified with environmental damage, including deforestation. As one of the countries with the largest tropical rainforest globally, Indonesia is automatically one of the focuses on its economic development is utilizing existing forestry resources. This causes a massive deforestation process, so the international community pressures Indonesia by accusing Indonesia of being one of the world's countries that cause climate change. Therefore, currently, the Government of Indonesia has established a Green Economy Development Program to overcome the problem of climate change caused by economic activities. The idea of Green Economic Development is essential to discuss because of the nation's priority for strong economic growth and sustainable development. One form of green economic development is to introduce the hutanomics concept, a concept of economic development management that is harmonized and based on the interests of forests and nature, which the author has adopted as the theme of this research. With a qualitative approach, the descriptive method, the researcher explains the management of the nation's economic development based on preserving the environment, which is the forest. Research findings show that economic development does not always have to come at the expense of the environment like deforestation. One of the concepts introduced is Hutanomics (Forest Economic), a management concept of economic development by aligning economic interests with the interests of forests and nature. Environmental impact analysis is critical to Hutanomics because it involves the claims of nature and the necessity of a collaboration between the government, the corporate world, and the community, each with their own functions.

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## I. Introduction

During the last 15 years, Before the COVID-19 pandemic, Indonesia's economic growth was 6%. Economic growth indicates an increase in a country's output, affecting the fulfillment of people's needs for goods and services(Nurtiyas, 2016). The Indonesian economy is expected to continue to improve with continued economic growth. The development of economic growth is inseparable from the role of industrialization. The industrial sector is a significant contributor to Indonesia's economic growth (Udemba et al., 2019). The Central Bureau of Statistics shows that the percentage of the industrial sector's contribution to Indonesia's economic growth is 20.7%. According to the United Nations Statistics Division, Indonesia is ranked fourth in the world out of 15 countries, with the manufacturing industry's contribution to GDP of more than 10 percent in 2019 (Sangka et al., 2019)

Indonesia, which is at the heart of the world economy today, namely the Asian region, wants to take advantage of the existing global economic growth (Rochwulaningsih et al., 2019). One of the significant programs carried out by the Indonesian government to achieve this goal is to attract investment into the country. The improvement in the investment climate above is believed to make Indonesia a developed country in 2035 (Vu, 2020). The government places a per capita income of approximately USD 14,250-USD 15,500 as a benchmark of achievement as a developed country. To achieve these indicators in developed countries, the government needs to expand investment on a large scale (Markandya et al., (2015); Kerstens et al., (2016)).

However, behind efforts to increase investment achievement in improving economic growth, negative externalities occur. These negative externalities occur in Indonesia's natural environment (Rany et al., 2020). Seeing Indonesia's geographical condition, which is rich in Natural Resources, makes Indonesia dependent on natural resources as a factor of production in producing output. In addition, the use of non-renewable natural resources to facilitate productivity (such as oil and coal) also hurts environmental conditions such as causing a reduction in air and soil quality (Cheval et al., 2020). Environmental degradation also occurs in forest conditions in Indonesia, causing deforestation. The condition of forest destruction in Indonesia is evidenced by data from the Ministry of Environment and Forestry (MOEF), where the MOEF handled forest fire cases involving more than 200 companies (consisting of oil palm plantations, rubber, etc.) in 2019 (Ab Ghani, 2019).

Deforestation itself occurs because many parties believe that carrying out development will inevitably lead to deforestation. In fact, with minimal or even no deforestation, development can continue and economic performance can grow with passion (Oljirra, 2019). In the context of a green economy, the smaller the deforestation, the greater the quality of economic growth that can be achieved. The reason is that development along with deforestation has long-term effects which are certainly very worrying. This makes it quite important to implement the forestomic principle in development (Nambiar, 2019).

Indonesia is one of the countries with the largest tropical forest in the world. According to Malau & Darhyati, (2021), Indonesia's forests have an essential role in maintaining climate stability for the country and the world. In addition, according to Alisjahbana & Busch, (2017), around 60 million Indonesians depend on forest resources for their livelihoods. The utilization of forest resources is done by collecting forest products for daily needs or working in the wood processing industry (Hastari & Yulianti, 2018). Thus, this utilization caused the wood industry in 2017 to become the highest production in large and medium manufacturing industries, which increased by 8.71 percent (Harris & McCall, 2019). In addition, it is projected that in 2030 the wood processing industry will increase by 10 percent to 15 percent.

Nurtiyas, (2016) state that forests hold four functions: ecological, economic, social, and aesthetic procedures. Ecologically, the forest is an ecosystem unit that plays a critical role in maintaining environmental arrangements such as regulating water systems and soil and air fertility. Economically, forests have direct use values, such as the value of land as a producer of wood commodities that can be sold and a source of livelihood. For the local community, the forest plays an essential role in their social life and is considered a shared property that must be protected. Forests can also be used as tourist attractions because of their aesthetic function, and finally, forests are also a source of environmental resilience.

However, due to the international push for economic growth, the issue of environmental resilience is often forgotten. In fact, according to Nurrochmat et al., (2016), the discussion on the importance of environmental stability has become a particular concern of the Indonesian government, even during the end of the New Order. The problem of deforestation is a primary focus to be addressed. The average rate of forest loss of 1.1 million hectares of forest per year in the 1990s was one of the triggers for environmental

issues to begin to rise in Indonesia. This deforestation was largely due to the expansion of oil palm plantations which grew in area from 100 000 hectares in the late 1960s to 2.5 million hectares by 1997 (Hansen et al., 2009). Deforestation and forest degradation are seen as one of the leading causes of increased anthropogenic greenhouse gas (GHG) concentrations in the lower atmosphere (troposphere) caused by human activities. This will prevent more heat radiation from escaping from the atmosphere than usual and thus be responsible for some kind of heat accumulation. This development is due to industrialization and related burning of fossil energy sources such as coal, oil and natural gas, as well as large-scale land use, such as clearing of tropical rainforests. Scientists estimate that the global average temperature has increased by 0.30 to 0.60C over the past 100 years, and it is estimated that by 2100 the average temperature could increase between 10C and 3.5 °C (Almazroui, 2020), which in turn will lead to changes global climate. This climate change is thought to affect the supply of food, change the planting season, increase the incidence of pests and plant diseases, decrease water supply, forcing humans to adapt and mitigate the impacts of climate change (Skendžić et al., 2021).

In recent years, the decline in deforestation has been an excellent first step for Indonesia to develop the Indonesian economy without destroying forests and the environment (Alisjahbana & Busch, 2017). Indonesia should be able to maintain a reduction in deforestation in the future so that it becomes a reference for the success of other tropical forest-owning countries. Therefore, the government must ensure that all the latest development policies, starting from the National Economic Recovery (NEP), National Strategic Projects (NSP) to the Food and Energy Security Program - are in line and coherent with efforts to achieve climate commitments (Setyowati, 2020)

Therefore, it is necessary to develop a management concept for sustainable national economic development, which can mainly prevent deforestation. At the same time, the government must also be able to formulate policies that have the potential to increase the rate of deforestation in the next few years. Without developing a management concept for sustainable national economic development, it is feared that these various development programs could derail the achievement of Indonesia's climate and low carbon development commitments and increase conflicts with local communities.

Hutanomics (Forest Economics) can be a practical solution to direct conservation policies toward better decision-making. It is possible to reduce deforestation and promote conservation while increasing productivity by financially evaluating the benefits of biodiversity and the costs of species loss and ecosystem degradation. Placing an economic value on ecosystem services and biodiversity can help stakeholders weigh their decisions and assist in arguments for pursuing conservation and sustainable development. Hutanomics aims to develop these ideas, build on existing knowledge and build networks with government, private sector, and academia to conduct scientific and economic research to support the development of financing solutions for forest and biodiversity conservation.

## II. Method

The research conducted by the author is a descriptive qualitative research, namely research that is intended to describe what it is about a variable that is in the field (Tutelman & Webster, 2020). Qualitative research is based on the philosophy of postpositivism, which is used to examine the condition of natural objects (Skarbek, 2020). Qualitative research is carried out under natural conditions and is inventive in nature. In qualitative research, the researcher is the key instrument. Therefore, authors must have broad theoretical and insightful knowledge so they can ask questions, analyze and construct the object under study to be clearer. Data collection tools usually use direct observation, interviews, document studies. While the validity and reliability of the data used triangulation using the inductive method, the results of qualitative research put more emphasis on meaning than generalization.

### III. Result and Discussion

#### A. Deforestation in Indonesia

Indonesia has a land area of 1919 million hectares. About 60 percent of it is natural forest. Indonesia's forests are essential to the world. It is estimated that Indonesia has nearly 60 percent of all tropical forests in Asia, and perhaps about 90 percent of it is still virgin. In terms of commercial production, Indonesia also has the wealthiest woods globally. Natural forest is estimated to have reserve value, namely the economic rent obtained if the forest is used for timber (Schwerhoff et al., 2020)

As a result of rapid development, especially in the last two decades, this wealth is rapidly diminishing. In early 2010, FAO estimated the rate of deforestation in Indonesia at around 900,000 ha/year; in the 2010-2016 period, this deforestation rate jumped to 2.7 million ha/year. Poor logging practices account for only a tiny part of deforestation. The forest lost due to logging activities is only 80.00 ha/year, or about 10 percent of all deforestation. One of the main factors in development projects is forest conversion for plantations and government-sponsored transmigration (Gatto et al., 2015)

The main drivers of this deforestation are shifting cultivation and conversion to small-scale agriculture outside of development projects. Shifting cultivation is a rational adaptation to less fertile land. In this system, vegetation is cut down and burned to release the source of fertility into the soil. When soil fertility decreases, the ground is left behind so that the brush grows back. Since farmers generally prefer to clear secondary forests than primary forests, they return to the same land after 10-20 years (Adrianto et al., 2019)

Various studies show that almost 2 million families are involved in this shifting cultivation practice, and about 2.8 million hectares of land outside Java are used for this kind of production system. If this land is estimated to increase by about 2 percent per year, deforestation due to small-scale forest conversion outside Java will be around 500,000 ha/year (Ferraro & Simorangkir, 2020).

Deforestation due to factors related to agriculture is a common phenomenon in Indonesia. Due to population pressure and limited energy absorption in the economic sector in Java, the agricultural industry outside Java has increased (Wilsonyudho, 2017). In the early 1980s, the Indonesian economy continued to experience a shift from the farm sector to other sectors. With about 70 percent of the population living in rural areas and depending, directly and indirectly, on subsystem agriculture, the change is beneficial. However, due to the decline in oil revenues during the 1990s, growth rates and employment in other sectors were forced to decline (Firman, 2017).

In the period 1990-2017, deforestation efforts had a downward trend, peaking at the end of President Soeharto's administration, reaching a high of 2.83 which can be seen in the following figure:

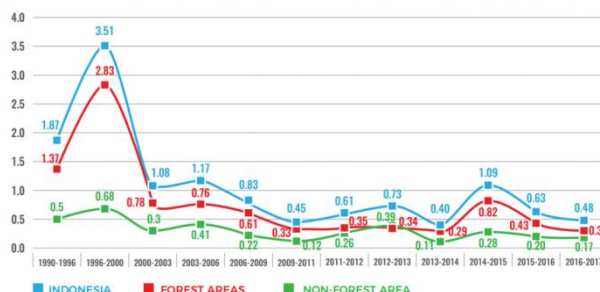


Figure 1. Graph of government deforestation for the period 1990-2017

In Java, the capacity of the agricultural sector to absorb labor is still limited. By the early 2000s, 75 percent of Java's land surface had been cultivated, and about 87 percent was used productively (Firman, 2017). Landless agricultural workers in Java who want jobs in the farming sector must move outside Java. Conditions outside Java resulted in similar pressures on land. Although 40

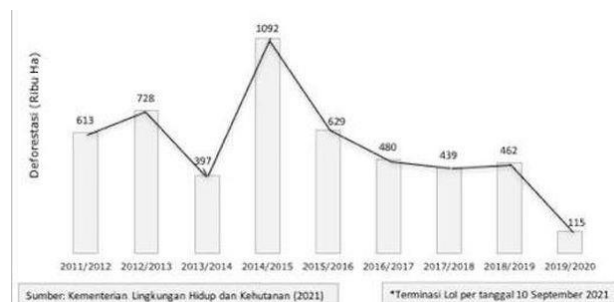
percent of the population lives outside Java, only 20 percent of all medium and large industries are there. This indicates that new workers will seek employment in the agricultural sector. Although Java has a population that depends on agriculture more than outside Java, from 2010 to 2015, the farm sector in Java only absorbed 12 percent of new workers, while the agricultural industry outside Java absorbed 30 percent (Shirleyana et al., 2018). This suggests that population growth combined with limited employment opportunities in Java has increased demand for land outside Java, contributing to deforestation rates.

### B. Deforestation and Economic Growth Challenge

Indonesia is under international pressure to reduce its very high rate of deforestation. This is based on the assumption that deforestation in Indonesia is so high that this country is placed as the second country (after Brazil) that has contributed to global economic growth. Like other developing countries with tropical forests, Indonesia maintains that western countries are to blame for cutting down most of the woods, both its forest and developing country forests, during their development process (Arshad et al., 2020). For example, in 1963, deforestation in the United States was the same as the rate of deforestation in Indonesia today (Hussain et al., 2022). It is also stated that if tropical forests become a world resource and are very important for the world's climate in the future, then rich countries must be willing to provide compensation—the opportunity cost of protecting this resource. In the case of Indonesia, Apostolopoulou, (2020) proposed the idea of debt for nature swap as a compensation arrangement.

On the other hand, economists tend to reject the notion that a multilateral approach is the only way to solve the problem of deforestation in most developing countries (Maxton-Lee, 2018). The issue of increasing the earth's temperature, like other environmental damage, stems from the problem of deforestation waste at the national level; Therefore, national action is considered more effective to address this problem. Environmental damage is generally a by-product of various economic activities where the resulting social costs are not included in market accounting. Externalities both on the consumption and production side stimulate the market mechanism to ignore these costs (the argument for market failure). If these costs can be internalized, private consumption and production decisions will change, environmental damage will be reduced, and government intervention is essential. In the case of deforestation, the internalization of these costs can be done through the imposition of tree-cutting taxes and licensing fees (Groot, 2020).

Based on the data, the deforestation rate tends to decrease in the era of Joko Widodo's administration, this is due to the many regulations that Joko Widodo has successfully implemented, and the increase in human resources in this sector has also helped. The data can be seen in the following figure:



**Figure 2.** The rate of deforestation in the era of President Joko Widodo

Unfortunately, some economic policies exacerbate deforestation (policy failure argument). Steckel et al., (2017) notes that the governments of some developing countries have sold timber too cheaply, sacrificing government revenues and profits outside of HTI. The provisions of forest concession agreements and income systems have encouraged wasteful and resource-draining exploitation of forests. In addition, policies outside the forestry sector often support increased deforestation. The distribution of large land areas is directly proportional to the amount of forest cleared for farmers to plant certain crops. Moreover, in some countries, modifications to existing policies have increased forest depletion in reaction to deforestation. Efforts to reduce the rate of deforestation cannot be made just like that, for example, by limiting the import of logs.

Determination of policies that pay attention to economic instruments will lead to achieving a concept called "sustainable development." Sustainable development is based on the recognition that resources are limited; Thus, economic growth must be achieved without ignoring this fact. Economists would argue that government intervention is needed to ensure that externalities in forest use (i.e., environmental degradation due to deforestation) are appropriately addressed. Based on the optimal control model (as discussed briefly later), economists believe that if the government takes an active role in dealing with externalities, the private sector will use forest land efficiently. For an indefinite period, market mechanisms will provide adequate signals for economic sectors, including forestry and agriculture, to adapt to environmental degradation. This degradation will be reflected in a decrease in productivity in the agricultural industry. This will turn into a price signal and will affect the decision-making process regarding the use of forest land.

However, it should be borne in mind that economic approaches to sustainable use of forest land have not been satisfactorily explained in terms of sustainability in most of the countries experiencing deforestation. It is caused by population pressure. These factors exogenously cause an increase in demand for agricultural land and cause deforestation problems. It is a significant factor causing deforestation in many developing countries, but economic models for optimal forest land use rarely consider this.

### C. Management of Forestry Concept Economic Development (*Hutanomics*)

According to Benedek & Fertő, (2020), Development Management is an effort or series of planned growth and change efforts made by a nation, state, and government consciously towards modernity in the context of nation-building. While the notion of development management, according to (Liebowitz & Beckman, 2020), is the process of government control over business (administration) to realize planned growth towards a situation that is considered better and more advanced in various aspects of national life.

The concept of development management is a perspective and another term for the idea of administration of development because it sees the administration's role in realizing development (Magid et al., 2020). Therefore, it can be said that the problem of development administration is also a problem of development management. Zimon et al., (2020) emphasizes that the success of national development goals will be achieved optimally following what has been aspired if there is a reasonably good development plan in various aspects of life. National development is the accumulation of regional development, which is essentially a place for the proliferation of development programs. Regional development will be carried out well, synergistically, and directed if it begins with careful and professional planning coordination and pays attention to aspects of continuity.

Development management is a process towards improving people's living standards and is dynamic. In developing the concept of development contains four meanings (Esman, 1991), namely: (1) development is a process, in the sense of an activity that is continuously implemented and sustainable, (2) development is an effort that is consciously carried out, because it is considered as a necessity, (3) development is carried out in a planned manner oriented to growth and change, and (4) development is related to the dimension of modernization, in the sense of a way of life that is better than before.

Management of sustainable development in the forestry sector means paying attention to and using the biodiversity of forest products as efficiently as possible and taking into account the sustainable supply/reserves of forests for future generations. Sustainable development management in the forestry sector in the Sustainable Development Goals (SDGs) includes the 12th goal of responsible consumption and production, the 13th to tackle climate change, and the 15th to protect terrestrial ecosystems. This can be realized through efforts to minimize new land clearing and selective logging (Hazarika & Jandl, 2019).

Planning and management Forestry-based development management cannot be separated from the role of the government at the central and regional levels. The government in the forestry sector is a policymaker in the regulatory system for guidelines in forest management, both in the form of plans and protection in forestry management (Linsler & Lier, 2020). The central government, which in this case is represented by the MOEF, must carry out this function so that it can be carried out in the regions. However, local governments must also support policies from the center according to

existing conditions and characteristics. An integrated forestry development planning system can reduce the problem of inconsistent forestry planning. Forestry planning is arranged in stages from the national, regional (provincial and district) levels to even the smallest management unit. Thus, the consistency of forestry macro policies from the central and regional levels can be maintained.

Many people think that development without deforestation is impossible. The belief that deforestation is a necessity in growth makes the development carried out often override the interests of the environment, especially the forest itself. In fact, with minimal or even no deforestation, development can continue, and economic performance can grow with passion. Deforestation itself is a process of removing natural forests employing logging for many purposes, starting from the interest of taking wood products or converting forest land to non-forest (Baumgartner, 2019).

However, the step toward zero deforestation as desired is still a long way. In terms of building infrastructure, many think, even justify, that clearing forests to build connectivity such as roads, bridges, and other physical buildings is commonplace. This makes many people understand that even if it has to be at the expense of protected forests, development is still prioritized and even has to be accelerated.

In the context of a green economy, the smaller the deforestation, the greater the quality of economic growth that can be achieved. The reason is that development and deforestation have long-term effects that are indeed very worrying. Eliminating natural forests can also mean that we are impoverishing ourselves. Quality economic growth also means that the strength of the domestic economy will be more muscular. Of course, this will be one solution to the vulnerability of Indonesia's economic growth to the threat of global economic turmoil.

The amount of deforestation is undoubtedly one of the triggers for forest and land fires. In this case, not a few people have become victims and have felt the effects of the forest and land fires along with the haze disaster that continues to this day. The smog disaster occurred in 2015 and had a very bitter impact on the surrounding community.

Business expansion, as well as the development of increasingly massive connectivity at this time, in my opinion, must be based on the environment. Therefore, implementing sustainable economic development management has the concept of preventing forest destruction; Author call it hutanomics.

Hutanomics itself is a view, perception, and how development works towards economic growth based on the interests of forests and nature. Based on this concept, Authorbelieve that development in Indonesia will be healthier and of higher quality. To put it simply, protected forests or primary forests are a natural wealth that has a high value. This is because forests and their contents that have existed for years, even decades, do not grow back quickly when they become victims of deforestation. Clearing primary forests to carry out development without accurate considerations will undoubtedly become a ticking time bomb.

Hutanomics is an effort to utilize forest functions by creating activities that can affect ongoing processes or create new techniques so that forests can make a maximum contribution to influencing and improving community welfare without deforestation. This definition includes three keywords: forest function, influencing/creating the process, and social welfare. This means that the forest is part of a more extensive system so that its contribution is to fulfill and improve the community's welfare.

It is common knowledge that currently, countries categorized as developed are starting to think about the environment because they are starting to feel the impact of environmental destruction due to such massive development without in-depth environmental analysis. Therefore, it is entirely rational if they support many developing countries to protect their environment. Because in addition to maintaining and even improving the quality of the world's climate, they also provide a signal and a lesson that many developed countries are starting to regret that they have carried out development without in-depth environmental analysis.

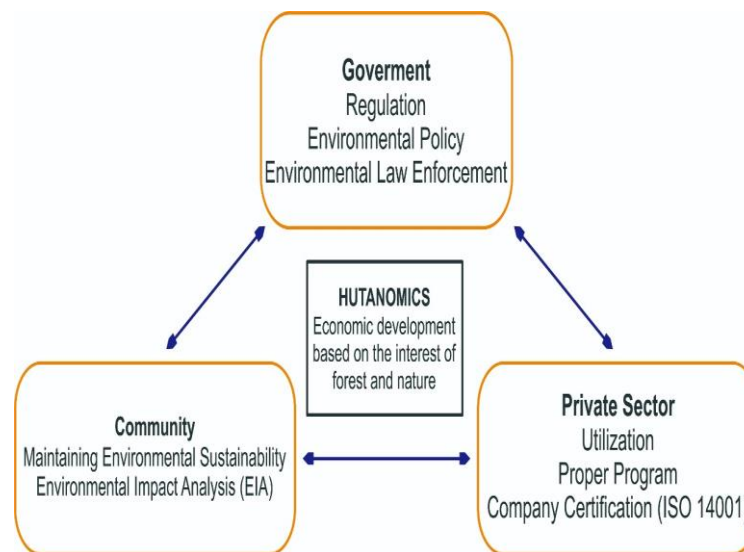
In this case, many developing countries are misguided and think that the support efforts from many developed countries related to forest and nature conservation are selfish. Support for prohibiting deforestation is interpreted as an effort to hinder the economic development of developing countries that are said to be lagging.

The zero-deforestation efforts voiced so far do not mean that there is no development in it. Instead, build by keeping in mind and even considering the impact that will occur later. Therefore, environmental impact analysis (EIA) in development projects is the most critical part because it involves the interests of nature itself, which means it also concerns the livelihoods of many people.

The use of environmental damage control devices and tools is a must in its implementation. A few mechanisms exist to hold those responsible for environmental damage, according to (Jiménez-Parra et al., 2018). It is the instrument:

- a) creation of EIA (Environmental Impact Analyses) documents, Environmental Management Efforts and Environmental Monitoring Efforts Documents, and spatial planning;
- b) the establishment of preventative measures such as environmental quality standards inspections and an evaluation program for companies (Proper Program);
- c) Preventive measures are taken. For example, a self-initiated environmental assessment and ISO 14001 certification.

Additionally, in order to realize the notion of hutonomics, a partnership triangle between the government, business, and civil society is required that operates on an equal footing and respects the laws of economics, nature-ecology, and civilization. The government is primarily concerned with enforcing environmental rules. After legislation, standard-setting, permit issuance, and implementation, environmental law enforcement is the final process in the environmental policy planning regulatory cycle. The enforcement of environmental law in question is the imposition of sanctions on the developer or implementer of development who violates the building's conditions—both administrative, civil, and criminal penalties as specified in the legislation.



**Figure 3.** HUTANOMICS Partnership Triangle

Additionally, in addition to some of the major points and the government's involvement outlined above, the community plays a part in environmentally sound sustainable development. The community is invited to submit suggestions or viewpoints on the EIA paper. Additionally, the community is required to take an active role in environmental sustainability. In keeping with this, community natural resources will be better conserved if the entire community understands and manages them.

Finally, Hutonomics as a management strategy for sustainable economic development is a pattern of development management that aims to maintain the ecosystem's balance, namely development that is oriented around the management of forestry resources while also making efforts to protect and develop them. Environmental management is founded on the principle of preserving a harmonious and balanced environment capable of sustaining development and enhancing human wellbeing.



## I. Conclusion

The demands of globalization require Indonesia to increase its economic growth constantly. However, it is not uncommon for economic growth to cause environmental damage, primarily since Indonesia, which is rich in natural resources, depends on the use of these resources. The notion of sustainable economic development management refers to economic development that is carried out in such a way that it improves the quality of life for current and future generations while also taking environmental resilience into account. However, many people think that economic development without compromising the environment is necessary. Development can continue without compromising environmental impacts, including deforestation. Hutannomic is a management concept of economic development based on a forest economy where the forestomach is to utilize the functionality of the forest as one of the pillars of economic development that can provide community welfare without destroying the forest. In Hutannomic environmental impact, analysis plays an essential role in every development project. So in the concept of hutannomics, it is a development management pattern that aims not to disturb the balance of the ecosystem, namely development that is oriented to the management of forestry resources while at the same time making efforts to protect and develop them.

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