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Implications of Philippine National Output, Population, and Business Establishments to Natural Resources Depletion

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***Abstract*: Natural resources depletion in the Philippines is a growing concern brought about by different economic indicators that resulted in its current status. This study aimed to identify the relationship between the different economic indicators namely GDP, Population, and Business Establishments to Natural Resources Depletion. The aforementioned variables were examined, and the theory of the Environmental Kuznets Curve was applied to further describe this relation. With reference to previous studies by Abdul Ghafoor Awan and Humaira Liaqat (2021) under similar backgrounds used in the study, the Augmented Dickey-Fuller Test, Engle-Granger Two-Step Method, and the Ordinary Least Squares (OLS) Regression were used. The results showed that GDP and Business Establishments have a significant negative effect on the depletion of natural resources, while Population has a significant positive effect. The concept of the Environmental Kuznets Curve supports the findings about the Philippines' GDP and Natural Resources Depletion. This study contributes to the policy-making sector as it can be used as the basis of environmental and industrial laws and recommendations to government agencies and officials, as well as provide suggestions to future researchers of studies related to the economic implications to natural resources depletion.**

***Keywords*: Business establishments, GDP, Natural resources depletion, Population, Environmental Kuznets curve.**

1. Introduction

Natural resources are naturally occurring resources found in the environment that are used and usable by man. Resources like minerals, farmland, timber, and marine and coastal resources are abundant in the Philippines. An estimated 19.3 billion metric tons (MT) of nonmetal mineral deposits and more than 21.5 billion MT of metal deposits can be found in the Philippines (AZO Mining, 2012). These natural resources contribute to the country's GDP growth. However, there are growing concerns about the sustainability of these resources since most of them are rapidly deteriorating (Herbst, 2020).

Consumption patterns for resources vary across developed and developing countries due to differences in wants, needs, and quality of life. Due to the modernization and innovation of new products, their life cycles get shorter, and more products are entering trade, which results in hyperproduction and consumption that cause high raw material and energy usage, particularly in developed countries (Martins & Castro, 2020). The negative state of our environment and depleting natural resources are the result of, among other things, a lack of environmental knowledge and policies, a sharp rise in population, unsustainable manufacturing and urbanization practices, trade and industrialization, and emerging countries' hasty attempts to catch up with rich nations (Byaro et al., 2021). With this, economic, social, and environmental expenses will rise, while productivity will fall, eventually leading to slower economic growth (Mittal & Gupta, 2015). The growing demand for social and economic development has led to drastic changes in production and consumption growth, resulting in the exploitation of natural resources and environmental degradation (Geng et al., 2022).

According to The World Bank, net forest, energy, and mineral depletion make up natural resource depletion. Implementing policies and programs for managing the environment and natural resources falls under the purview of the Environmental Management Bureau (EMB) in the Philippines. It aims to protect the environment by promoting economic viability, environmental integrity, and excellent public health. It oversees the National Greening Program, Cadastral Survey and Land Management, Geo-hazard Assessment and Mapping, Ecosystems Research, Forest Protection or Total Logging Ban, Protected Areas and Biodiversity Management, Mining Regulation, Geo-hazard Assessment and Mapping, and Good Governance (DENR, 2016). Republic Act No. 7942, also known as the Philippine Mining Act of 1995, was implemented, which instituted a new system of mineral resources exploration, development, utilization, and conservation. Many parts of the country are under a logging ban, and sustainable logging is only permitted in a few places to preserve its natural resources. However, there are still many places where illegal mining, fishing, and logging are done, and many corporations and businesses get away with these.

A country's GDP, population, and business establishments contribute to natural resources depletion. According to Magdoff (2013), for capitalist countries, growing populations are significant to stimulate economic profit. With that, economies rely on their natural resources to suffice their growing

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population and its needs. Capitalism fuel industrialization, urbanization, and modernization, causing the emergence of different ecological problems (Lynch et al., 2013). Economic growth from industrialization, urbanization, and modernization is related to better education and technological advancements, which can contribute to resolving ecological problems.

When there is more economic activity taking place, natural resources are depleted. Production and consumption patterns of different firms and individuals contribute to a country's depletion of natural resources. The amount of natural resources depletion reflects the country's different kinds of economic activity and economic outputs. In an economy, people's wants and needs are key factors that affect what natural resources are extracted and used. Creating a socioeconomic system that meets everyone's basic needs and wants plays a significant role in molding a modest society, with economic and political decisions resolved in respect of all creation (Magdoff, 2022).

In the view of households, natural resources are the source of livelihood and basic needs. Rural households rely on forest- and land-related activities such as logging and agriculture for livelihood (Tsai et al., 2019). Rural households have more direct access to natural resources than urban households. In cities, rapid and unplanned urbanization and migration cause environmental problems such as air and water pollution and changes in forest resources. Urban households have problems with safe drinking water and proper sanitation due to contaminated water from urban slums (Ray, 2011).

Individual behavior and culture contribute to environmental injustices. If the government does not commit to restraining resource consumption and individuals' consuming behavior is not regulated over instant gratification and satisfaction, it will result in excessive exploitation and overuse of exhaustible resources, endangering sustainable development (Wei & Kangping, 2013). The proliferation of natural resource depletion, as well as wrong societal views regarding natural resources, have a detrimental impact on a wide range of socioeconomic factors.

In the past years, almost 85% of the world's population has been facing excessive ecological problems, where resource consumption in the view of material footprint shows the rate of depletion in terms of gaze land and too much carbon emission from fossil fuels (Geng et al., 2022). Illness caused by environmental degradation and contamination of hazardous substances brings losses to the country due to reduction in labor productivity. Additionally, financing expenditures for social security increased due to the deterioration of the environment and the need for aid to such groups of the population (Koval, 2019).

This study focuses on the relationship between the economic output of the Philippines and the depletion of natural resources by analyzing key economic indicators such as Gross Domestic Product (GDP), population, and business establishments. The role of different economic actors in the depletion of natural resources speaks so much about a country's productive activity and capacity. The behavior of these economic actors altogether brings significant challenges related to natural resources, which is a frequent problem in developing countries. In this study, assessing the current situation of natural resources depletion in the Philippines presents a picture of the country's economic aspect as it highlights the occurring issues that need to be addressed. Through this study, the main objective is to measure how the country's economic production, population and, business establishments influence the depletion of natural resources and conclude what it suggests with the country's economic system.

From the perspective of sustainable development, ensuring an adequate economic and social demand for exhaustible resources is essential to prevent predatory exploitation avoiding resource depletion faced by the future generation caused by excessive exploitation (Wei & Kangping, 2012). Having responsibility for the environment should be not only a government responsibility but local people and leaders should also be encouraged to take steps to end environmental problems (Sarbapriya & Ray, 2011). Giving importance to providing information about environmentally conscious activities such as recycling and waste minimization in a culturally and emotionally suitable manner should be emphasized (Mansaray-Pearce, 2019). With several stakeholders in society accounting for an organized waste management system, harmful consequences due to increasing waste regard policy-making implications recognizing government waste management formulation indispensable.

In its practical sense, the contribution of this study to the government and authoritative bodies is for the development of efficient and sustainable natural resource management. The lack of related studies that focus on the significance of determining economic performance as the main input concluding the amount of natural resource depletion within specific areas in the country, initiates the necessity for understanding the role of human economic activity as a factor of natural resource depletion management. Therefore, results and findings generated through this study aspire to enrich related works in the academe in relation to economic analysis for the depletion of natural resources under economic factors.

The rest of the paper is outlined as follows: Section 2 includes the review of related literature, which presents the relationship between natural resource depletion among economic output indicators and hypothesis formulation. Illustrated in Section 3 is the research methodology. Section 4 analyzes the obtained results for discussion. Finally, Section 5 provides the summary, concludes, and discusses recommendations for natural resources policy implications according to the findings of the study.

2. Literature Review

A. Natural Resources Depletion and GDP

Economic growth is the increase in the inflation-adjusted market value of services and products produced in an economy over a specified period. It is referred to as the measurement of the total amount of increase in GDP or Real GDP. The function of the demand and supply of natural resources is their availability. An increasing demand trend occurs due to countries' efforts to acquire improved living standards and

higher economic growth. On the other hand, the predictability of supply depends on the scarcity of different natural resources that leads to risks at some point of no return in terms of environmental degradation. (Nawaz et al., 2019). In relation to this, according to Awan and Liaqat, 2021, A challenge currently faced by most countries today is to sustain economic growth rates while at the same time minimizing its impact on the environment.

Earth system sciences combined with economics is essential for understanding both the positive and negative impacts of involved trade-offs and alternatives. Applying principles in economics and empirical findings is necessary to meet plans for a good life for humanity and the earth's limited resources (Polasky et al., 2019). The inquiry on whether society can detangle the relationship between economic growth in terms of GDP from environmental impacts still needs to be settled. Extended to the general public is the divide over the coexistence of economic growth and environmental limitations under differing opinions on decoupling, dematerialization, and limits to growth (Ward et al., 2016).

The growing population impacts the demand and supply of consumer products and services and other ecosystems, allowing industries to integrate closely with production and consumption (Lakatos et al., 2018). According to studies reviewed by Othman and Jafari in 2012, the GDP indicator can effectively capture the benefits of resource extraction that are associated with the economy's products. Even so, the changes occurring in stocks of natural assets are clearly omitted from GDP. Human activities such as the production and consumption, and dissemination of different goods in society produce byproducts of solid waste (Balasubramanian, 2020). The surge in environmental pollution caused by the expeditious growth in production and consumption poses a challenge to reaching sustainable goals. Simultaneously, the increasing demand for social and economic development has led to the consumption of different natural resources above their capacity (Geng et al., 2022).

Some economic theories reviewed by Reikhof et al. (2016) claim that optimal resource use is related to interest rates. If interest rates become higher than the maximal reproduction rate of a resource, resource depletion becomes optimal. In the view of the general equilibrium perspective, interest rates are significantly correlated with GDP growth rates which, in turn, are related to trade. The relationship between GDP and natural resource depletion also exhibited their linkages in some studies reviewed by Raihan & Tuspekova (2022). Empirical findings indicate that economic growth depletes environmental quality. In congruence, other studies reviewed by (Gardiner & Hajek., 2020) showed recent findings suggesting that regional economic environments strikingly affect the interdependence between economic growth and environmental quality. In this example would be the increase in production factors such as employment and capital contributing to both production and consumption but as well as industrial pollution. On the other hand, according to a study by Lee et al., 2021, continued economic growth decreases resource depletion and is helpful in attaining a green developmental agenda.

Industrial development, resources, and the environment all interact with each other. Industrial labor requires capital, labor, and resource inputs, while energy resources are the driving force for processing and manufacturing. Excessive consumption of resources leads to environmental degradation, which gives rise to unsustainable production as waste generated from industrial production is released to nature, imposing a heavy environmental burden (Wang et al., 2022). Disregarding environmental depletion as an impact of economic growth on waste generation has been severely challenging since waste generation has adverse effects on health, the environment, socio-economic contributions, and climate change. The recent increase in population and development of cities and regions matched with spiraling consumption resulting in the large quantities of waste generated, heightened pressure on economic resources and the environment (Gardiner & Hajek, 2020).

Intensive use of natural resources to support the needs of the urban economy requires excessive energy resources (including firewood), quarry exploitation, extensive sand and gravel excavation, and overconsumption of water. All aforementioned bring harm to natural support systems and irreversible damage to ecosystem functions such as the water cycle, carbon cycle, and biodiversity, including a decrease in the number of available resources. As a result, other effects, such as pollution and harm to human health, may be experienced in the years to come (Awan & Liaqat, 2021). When the market fails to regulate the industry, benchmarking and monitoring the efficiency of decisions made by industrial decision-making units becomes critical (Ichinose et al., 2013).

Changes in consumer behavior, business operations, and societal education are necessary to reduce the manufacturing of goods related to greenhouse gas emissions (Lakatos et al., 2018). The new way of thinking about sustainable growth in developing countries is through the circular economy. Unlike the linear economy, where the concept is based on "take, make, consume and discard," the circular economy manages waste based on the 3R approach, "Reduce, Reuse and Recycle, which also considers improved product design and practices considering waste as an efficient resource material (Cheela et al., 2021).

One among the 17 UN SDGs mentions GDP but qualifies it as "inclusive and sustainable growth." It has been clear that GDP growth has been getting worse for most countries over the last decades. For sustainability to be attained under GDP growth, there must be a decoupling from energy and material use and environmental impacts (Ward et al., 2016). Earth's natural resources, the foundation of raw material manufacturing, should be handled sustainably so that the economic system can provide higher-value output with less input. Waste management initiatives focusing on resource efficiency and income from recycling could result in long-term business and career prospects (Bartolacci et al., 2019). In the commodity resource market, responsible production and consumption stand to improve industrial quality that absorbs the immense population growth in carrying out their demands at the domestic and international levels. Ecological sustainability standards should be applied to help take care of

natural ecosystems, and Pareto efficient situations can be achieved whenever the natural resources are efficiently managed (Lee et al., 2021).

Material consumption is boosted by soaring economic growth, and economic structural transformation alarms the achievement of environmental sustainability. The relationship between economic growth, urbanization, and industrialization also adds immense pressure to the demand for natural resources and gathering (Geng et al., 2022). The main issue with the market's participation in environmental challenges is its lack of morals. While millions of people are affected by the trash produced by this sector, and ecosystems are irreversibly destroyed, such practices persist because governments, corporations, and landowners earn significantly from them. Not only do these industrial players profit from the sale of their products, but much of their profit is directly related to the trash produced and the pollution caused by it (Van Dartel & Nitgen, 2018).

H1: Increases in Philippines' GDP have no significant effect on Philippines' natural resources depletion.

B. Natural Resources Depletion and Population

According to Kumar (2016), urbanization has intensified in recent years, placing immense pressure on local governments to keep up with fast population growth, changing lifestyles, and demand for a standard of living. Natural growth and rural-urban migration account for most urban population growth, according to Atta-ur-Rahman et al. (2016) and March et al. (2016). People from rural areas frequently migrate to cities in search of a better quality of life and higher-paying jobs (Kumar, 2016). Rural-to-urban migration drives urban population growth in developed countries, but urban natural population growth has catapulted urban population growth in developing countries in recent years, according to Farrell (2017). Furthermore, he also stated that modern health procedures, substantial birth rates, and significant advances in health care owing to imported medicines and technology result in considerable declines in the death rate and significant growth in the birth rate.

However, based on the studies of Niva et al. (2019), Jiusto (2012), and Brueckner & Lall (2015), there is a growth in urban poor and informal settlements as people migrate from rural to urban areas. Furthermore, as Datta (2012) pointed out, rural-urban migrants were typically marginalized and could only afford informal and unauthorized housing due to their low-paying and informal jobs. According to Kuddus et al. (2020), most urban poor live in unregulated and overcrowded slums, near open sewers and in hazardous areas such as slopes, riverbanks, and water basins prone to landslides, flooding, or industrial hazards.

According to Bassi et al. (2021), as the population grows due to urbanization, there will be an increase in consumption, resulting in higher demand for goods and higher production. Unsustainable and irresponsible production and consumption wreak havoc on the environment's resources as elaborated by Lee et al. (2021). Gardiner & Hajek (2020), Bassi et al. (2021), Atta-ur-ahman et al. (2016), Barik (2019), and Lee et al. (2021) all stated that rapid population growth hampers economic activities contribute to a variety of environmental issues, including pollution, environmental deterioration, natural resources depletion, and climate change.

Arnould et al. (2017) stated that the national government must improve national resource governance to create and enforce necessary regulations and implement sustainable development processes to develop environmentally sustainable production that provides benefits to the population. Furthermore, the government should take steps to undertake population control programs, particularly in developing nations, to reduce the strain on already overburdened resources and to adopt better methods for economic and scarce resource allocation, as recommended by Komu & Ethelberg (2015). Furthermore, Awan & Liaqat (2021) elaborated that failure to control human growth and development due to a lack of urban planning and government legislation may result in a population explosion, environmental pollution and deterioration, rapid consumption of natural resources, high waste generation, and a variety of health problems.

Landfills and incinerators were used to dispose of waste created by households and firms (Gardiner & Hajek, 2020). Landfills are the most acceptable disposal method in the Philippines because incineration is already prohibited under RA 9003 due to the harmful pollutants created by facilities (Sapuay, 2016). However, according to Song et al. (2022), over-reliance on landfilling and improper waste disposal have long produced financial, environmental, and health problems. Population expansion is associated with increased waste creation, and with a lack of waste management knowledge, men may dispose of waste indiscriminately straight into bodies of water, causing water and soil contamination which may become unsuitable for consumption and utilization (Ochola, 2018).

Because of urbanization and population expansion, municipal solid waste generation has become a severe issue for society, the economy, and the environment (Rathore et al., 2020). And according to Khan et al. (2022), one of society's current and future concerns has been the steady growth in the volume and complexity of urban and industrial waste. According to Guerrero et al. (2013) and Hemidat et al. (2022), the private and public sectors must collaborate through public-private partnerships (PPP) to ensure the technical, financial, and social sustainability of the integrated solid waste management system. Furthermore, rural development is crucial to addressing the influx of migrants (Brueckner & Lall, 2015). According to Kuddus et al. (2020), if rural conditions do not improve, people will continue to migrate to urban areas; therefore, governments and development organizations should adapt to urbanization challenges while aiming to reduce unplanned urbanization.

Additionally, regulating birth rates is essential for population growth. Increased consumption may negatively affect the environment (Weber & Sciubba, 2018). Local governments can respond to the increase in natural growth by initiating and reinforcing family planning programs, introducing economic incentives or disincentives, providing quality sex education, and elevating and empowering women (Farrell, 2017).

There is a positive relationship between population and natural resource depletion. As the number of people who

migrate from rural to urban areas grows and the urban birth rate steadily increases, so does the quantity of natural resource depletion since there is greater demand for goods and services owing to increased consumption, which increases production. Overall, increased urbanization and population cause serious environmental problems due to high demand (Xu & Lin, 2016).

H2: Increases in the Philippines' population have no significant effect on the Philippines' natural resources depletion.

C. Natural Resources Depletion and Business Establishments

In recent years, as the population and urbanization have increased, so has household consumption (Pires et al., 2019). This factor pushes businesses to increase in order to profit from increased demand for goods and services. As mentioned by Shahab et al. (2022), environmental responsibility is an agency issue that extracts private gains, and the social responsibility of business is really to maximize profits. If the wealth and number of people living and working in cities continue to expand, and businesses remain ignorant of waste issues, the amount of garbage generated per person and the amount of waste produced by businesses will climb significantly (Sharma et al., 2021). As a result, several types of environmental stress have emerged, such as pollution, waste landfills, environmental degradation, and natural resource depletion (Koval, 2019).

In order to meet the demands of the growing population, more businesses are established, and companies across the globe take part in immense production which uses large amounts of natural resources (Shahab et al., 2022). Renewable resources are significant exports, especially in developing countries. However, the majority of the people are still not aware of the limit of trade to prevent it from contributing to resource depletion (Eisenbarth, 2022). All economic activities depend on natural energy and resources. Due to the rise of capitalism, urbanization, and industrialization, societies face sustainability issues such as climate change, biodiversity loss, and water scarcity, leading to resource depletion (Figge & Hahn, 2020). Economic growth is directly related to resource exploitation, and social development leads to excessive use of resources that exceeds the possibility for resource regeneration (Chen et al., 2022).

According to Rajadesingu et al. (2021), businesses' lack of initiative in combating the consequences of their operations on waste promotes the rising risk of tripping over a tipping point into irreversible pollution and climate change impacts. However, consumer behavior is a significant factor that is considered in all business decisions. According to Lakatos et al. (2018), consumer attitudes toward the environment, as well as the adoption of new behavior models and responsible consumption of businesses, have a significant, if not the most important, role.

Van Dartel & Nitgen (2018) mentioned that several economists, sociologists, and philosophers' targets to produce economic models that are sustainable than our existing capitalistic one. In a circular economy (CE), the private business and regulators bear the responsibilities, while in sustainability, although shared, obligations are not explicitly identified (Pires et al., 2019). According to Ghisellini et al. (2016), a CE makes efficient and environmentally friendly use of resources to create a greener economy with new business models and job opportunities. Despite being considered a new business model, there are many expectations of CE leading to a more sustainable development and a harmonious society. It provides a solid framework for fundamentally altering the current business model in order to promote preventive and regenerative eco-industrial development and greater welfare (Ghisellini et al., 2016). However, merely relying on the advantages of having a CE will not directly result in the concept of CE being widely accepted. It will require awareness and education campaigns for people to change their consumption habits. (Lakatos et.al., 2018).

Investing in sustainable business practices of companies depends on the structure and the administration of the board of directors on essential aspects such as the organization's capital (Shahab et al., 2022). In transitioning towards the concept of a circular economy, the use of innovative business models, product and organizational environmental footprints, and green public procurement must be established to boost demand for green goods and services (Gardiner & Hajek, 2020). To attain the upcycling concept, the industry must avoid using toxic materials and substances, recycle and upcycle to prolong the usage life of their manufactured products, use less energy and water, and provide their workers with a fair salary (Pires et al., 2019). Modern society necessitates a paradigm shift so societal and industry limitations can focus on significant transformation. Moreover, consumer practices, as identified by various approaches, play a major role in waste and resource management, which is why consumer responsibility in sustainability is crucial to prevent waste and resource depletion (Rajadesingu et al., 2021). Prakash et al. (2022) stated that people have become more aware of the situation of our natural resources, and industries have started to adopt green practices. Studies by Xu & Lin (2016) and Ali et al. (2021) also found that technological advancements and industrial structure optimization result in the gradual decrease of natural resources depletion.

H3: Increases in Philippines' number of business establishments have no significant effect on Philippines' natural resources depletion.

D. Synthesis

Significant changes in the economic variables discussed in related studies showed their implications on natural resource depletion. Increases in GDP, population, and business establishments affect natural resources depletion, conveying their relationship. Related studies mentioned the relationship between natural resources and population and observed that a growth in population leads to an increase in consumption and production, which significantly impacts environmental depletion. The study by Awan & Liaqat (2021) has investigated and found that a high population growth rate and urbanization affect the depletion of natural resources in Pakistan. They have also discovered that these two variables have resulted in the exhaustion of more than one-third of Pakistan's natural

resources. Byaro et al. (2021) also highlighted that industrialization, trade, and economic growth contribute to environmental degradation in sub-Saharan Africa.

Relationships between economic variables showed their role in economic development, but along with this is its contribution to natural resources depletion. Increases in economic productivity can cause environmental problems owing to the exploitation of natural resources and ineffective waste disposal and management systems. Changes in business establishments can alter the production and consumption patterns of individuals, households, corporations, and the government. If population growth continues, it has the potential to drastically expand the population level, creating a significant impact on the environment. As these variables rise, they contribute significantly to economic growth; however, not all growth portrays a positive effect. Corporations and governments benefit from higher economic growth, but it discourages policymakers from acting and enacting laws addressing the problem of depletion of natural resources. Authorities and the government play a big role in assessing these environmental issues resulting from economic activities. On the other hand, the positive effects of economic growth can also lead to the sustainability of natural resources using green technology and industrial innovations. With the growing concern, the different aspects of how economic actors affect natural resource depletion is a significant issue that needs to be addressed.

E. Theoretical Framework

GDP, Urbanization, and Employment are factors affecting the depletion of natural resources. In this study, researchers will use the Environmental Kuznets Curve (EKC) hypothesis. The EKC's original concept was developed by Grossman and Krueger in 1991, and this has been used to show the relationship between the economy and the environment (Chen et al., 2022). The hypothesis of the EKC expresses that environmental degradation increases with income during the early phases of economic growth but then declines with income after a certain threshold (Badeeb et al., 2020).

F. Simulacrum

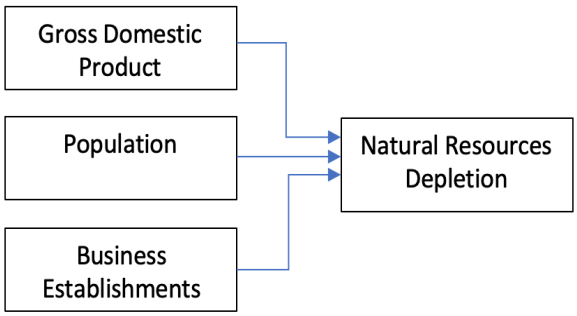

Fig. 1. Simulacrum

3. Research Method

This research aimed to determine if the Gross Domestic Product (GDP), Population, and Business Establishments in the Philippines, which will serve as a measurement of economic growth, have no significant effect on the country's natural resources depletion.

Both independent and dependent variables used in this study were all sourced from the world bank annually from 1990 to 2020. The first independent variable is the Real GDP, represented by the Philippine GDP (constant 2015 US$) data. The second independent variable, Population, is represented by the total Philippine Population data, while the third independent variable, Business Establishments, represents the list of domestic companies in the Philippine data. The dependent variable, Natural Resource Degradation, is represented by the data for adjusted savings: natural resources depletion (% of GNI), which is the sum of net forest depletion, energy depletion, and mineral depletion. In this study, the researchers chose to examine the Philippines due to data availability and relevance to the country's current situation.

In studying the relationship between economic actors and natural resource depletion, the study employed the Augmented Dickey-Fuller Test to test the stationarity of the variables. This was followed by the Engle-Granger Two-Step Method to test the cointegration of variables. Finally, in proving the Environmental Kuznets Curve (EKC) application in the study, Ordinary Least Squares (OLS) Regression was used to estimate the coefficients of linear regression equations to analyze the relationship between the time-series data of the dependent variable and the three independent variables. In reference to the previous related study of Ghazi Alajmi (2016), the model for measuring the effects of economic growth variables on Natural Resources Depletion was derived from the functions below:

$$NRDt = f(GDP) \quad (1)$$
$$NRDt = f(POP) \quad (2)$$
$$NRDt = f(BE) \quad (3)$$
$$NRDt = f(GDP, POP, BE) \quad (4)$$

The functional forms of the Unit Root Test:

$$NRDt = \alpha + \beta 1\ GDPt + \varepsilon t \quad (5)$$
$$NRDt = \alpha + \beta 1\ POPt + \varepsilon t \quad (6)$$
$$NRDt = \alpha + \beta 1\ BEt + \varepsilon t \quad (7)$$
$$NRDt = \alpha + \beta 1\ GDPt + \beta 2\ POPt + \beta 3\ BEt + \varepsilon t \quad (8)$$

where:

NRD	= Natural Resources Depletion (Dependent)
GDP	= Gross Domestic Product (Independent)
POP	= Population (Independent)
BE	= Business Establishments (Independent)
α	= Intercept
$\beta 1 \& \beta 2 \& \beta 3$	= Elasticity Coefficients
ε	= Error Term
t	= Time

4. Results & Discussion

In this study, the researchers aim to determine the relationship between economic indicators and natural resource depletion by measuring the influence of three economic variables. Independent variables, Real GDP, represented by the

Philippine GDP (constant 2015 US$) data, Population, represented by the total Philippine Population data, and Business Establishments, represented by the list of domestic companies in the Philippines data, were measured against the dependent variable, Natural Resources Depletion, which is represented by the data for adjusted savings: natural resources depletion (% of GNI). In coming up with results, researchers used time series data from 1990 to 2020, all sourced from the World Bank open data. The researchers employed the Unit Root Test using the Augmented Dickey-Fuller Test, followed by the Engle-Granger Two-Step Method to test cointegration among variables. The researchers used the Vector Error Correction Model (VECM) and the Ordinary Least Squares (OLS) Regression method to prove the relationship further. Moreover, to demonstrate the relation of the study's theoretical foundation, the Environmental Kuznets Curve (EKC), researchers also plotted a curve with data from natural resource depletion and Real GDP.

A. Results

1) Summary statistics

Table 1 shows the descriptive data on the summary statistics of variables reflected by Gretl data analysis software. It shows that Natural Resource Depletion has a mean of 0.47 and a median of 0.35, with a standard deviation of 0.51 and a coefficient of variation of 1.09, which means 50% or less of the observations lie below 0.35 that the standard deviation is equal to the mean.

The average number of GDP is 2.0490e+1 and 50% of the sample size has a GDP of 1.7937e+11 and below, while the remaining half has a GDP of 1.7937e+11 and above. The minimum GDP of the data is 1.0664e+11 and the maximum GDP is 3.9622e+11. The standard deviation of GDP is 8.9355e+10 and has a coefficient of variation of 0.43608, indicating that the observation is widely dispersed.

The population has a mean of 8.5985e+07 and a median of 8.6326e+07, indicating that 50% or less of the observations fall below 8.6326e+07. Furthermore, Population has a minimum observation of 6.1895e+07 and a maximum observation of 1.0958e+08. The population's standard deviation is 1.4577e+0, and the coefficient of variation is 0.16952, suggesting that the observations are widely spread.

The average number of Business Establishments is 230.81 and 50% of the sample size has Business Establishments of 235.00 and below, while the remaining half has Business Establishments of 235.00 and above. The minimum Business Establishments of the data is 153.00 and the maximum Business Establishments is 268.00. The standard deviation of Business Establishments is 31.817 and has a coefficient of variation of 0.14, indicating that the observation is widely dispersed.

All the data has less variability and has platykurtic kurtosis. On the other hand, in terms of skewness, Natural Resources Depletion and the Gross Domestic Product are positively skewed, while Population and Business Establishments are negatively skewed.

2) Correlation between variables

H_O = There is no significant linear relationship between the two variables.

H_A = There is a significant linear relationship between the two variables.

Table 2
Correlation between NRD & GDP, POP and BE

Variable	Correlation Coefficient	P-value
NRD & GDP	0.2995	0.1017
NRD & POP	0.4133	0.0208
NRD & BE	0.3736	0.0384

The correlation coefficient between NRD & GDP is at 0.2995, which is higher than its P-value of 0.1017, showing the variable's goodness of fit. In this case, the null hypothesis is rejected and there is a linear relationship between NRD & GDP. In table 2, the NRD & POP computed correlation coefficient resulted in 0.4133, which is higher than its P-value of 0.0208. This relationship among variables shows a significant fit for the model, confirming the need to reject the null hypothesis. On the other hand, the resulting correlation coefficient between NRD & BE is at 0.3736 higher than its P-value at 0.0384. Researchers reject the null hypothesis and conclude a possibility of a linear relationship between variables.

Table 1
Summary Statistics of Variables

	NRD	GDP	POP	BE
Mean	0.46912	2.0490e+1	8.5985e+07	230.81
Median	0.34505	1.7937e+11	8.6326e+07	235.00
Standard Deviation	0.50937	8.9355e+10	1.4577e+0	31.817
Coefficient of Variation	1.0858	0.43608	0.16952	0.13785
Minimum	0.038789	1.0664e+11	6.1895e+07	153.00
Maximum	2.0709	3.9622e+11	1.0958e+08	268.00
Skewness	1.7674	0.72006	-0.025057	-1.0455
E. Kurtosis	2.7427	-0.72791	-1.2152	0.21283
5% Perc	0.042246	1.0691e+11	6.2831e+07	157.80
95% Perc	1.9517	3.8252e+11	1.0870e+08	266.20
IQ range	0.52464	1.3858e+11	2.5841e+07	33.000

Table 3
Augmented Dickey-Fuller Test

Variable	P-value	First differences C	First differences C+T	Second differences W/O C
NRD	0.105	3.235e-09*	5.025e-08*	1.507e-13*
GDP	0.9971	0.1858	0.693	0.007251*
POP	9.856e-05*	0.9957	0.03512*	0.08559
BE	1.026e-06*	0.2059	0.2533	2.747e-06*

Table 4
Engle Granger Test

Null Hypothesis	Probability	Decision
Increases in the Philippines' GDP has no significant effect on the Philippines' natural resources depletion.	2.882e-08	**Reject null Hypothesis**
Increases in the Philippines' population has no significant effect on the Philippines' natural resources depletion.	1.443e-08	**Reject null Hypothesis**
Increases in the Philippines' number of business establishments has no significant effect on Philippines' natural resources depletion.	2.216e-08	**Reject null Hypothesis**
Increases in the Philippines' GDP, population, and number of business establishments have no significant effect on Philippines' natural resources depletion.	3.513e-07	**Reject null Hypothesis**

Table 5
OLS Regression Estimates

Variables	Estimate	Standard Error	T-value	P-value
NRD	−3.45604	1.03344	−3.344	0.0024
GDP	−1.28937e-11	3.97781e-12	−3.241	0.0032
POP	1.33197e-07	3.85117e-08	3.459	0.0018
BE	−0.0211682	0.00897281	−2.359	0.0258

Table 6
OLS Regression Fit Statistics

Mean dependent var	0.469122	**S.D. dependent var**	0.509369
Sum squared resid	4.640136	**S.E. of regression**	0.414556
R-squared	0.403866	**Adjusted R-squared**	0.337629
F(3, 27)	6.097285	**P-value(F)**	0.002632
Log-likelihood	−14.54882	**Akaike criterion**	37.09764
Schwarz criterion	42.83359	**Hannan-Quinn**	38.96741
rho	0.257227	**Durbin-Watson**	1.445236

All three independent variables are higher than their p-value which is why the null hypothesis that there is no correlation against natural resource depletion is rejected, concluding the acceptance of the alternative hypothesis that there is correlation between variables.

3) Cointegration test

H_O = There is no significant linear relationship between the two variables.

H_A = There is a significant linear relationship between the two variables.

Note: * denotes rejection at 5%. C: represents test with constant, C+T: represents test with constant and trend, W/O C: represents test without constant. NRD is Natural Resource Depletion, GDP is Gross Domestic Product, POP is Population Growth, and BE is Business Establishments.

In proving cointegration between variables and Natural resource depletion, Unit root test using the Augmented Dickey-Fuller test was applied by the researchers. Stationarity in data of the time series variables indicates that the characteristics of the variables are not changing over time which is an important condition in cointegrating variables. The Augmented Dickey-Fuller test was chosen in testing for the unit root to help determine the stationarity of the data. Table 3 shows that POP and BE's null hypothesis are rejected because the p-value is less than 0.05 alpha indicating that their data is stationary. NRD's null hypothesis is rejected at a 5% significance level using the first differences with constant, while the GDP's null hypothesis is rejected using the second differences without constant. Among the variables both Population and Business Establishments showed stationarity in their level which indicates that the variables are well fit for cointegration. Meanwhile NRD and GDP showed stationarity at their differences which determined their capacity for cointegration, overall, all variables have no unit root and are stationary.

4) Engle Granger test

H_O = There is no cointegration among variables.

H_A = There is cointegration among variables.

The Engle Granger test for cointegration was used to set up residuals for any presence of a unit root. If there is a unit root, then there is no cointegration among variables. This test was used under stationary data confirmed through the Augmented Dickey Fuller test. Table 4 reports that all variables, GDP, Population, and Business Establishments, have a p-value less than 0.05 alpha, thus rejecting the null hypothesis and accepting the alternative that there is cointegration among variables. Results imply that since the variables are cointegrated and they confirm that the variables used are stationarity.

5) Ordinary Least Squares

Gretl was used in modeling the Ordinary Least Squares for the data in order to describe the relationship between the Independent Variable GDP, Population and Business Establishments with the dependent variable, Natural Resource Depletion.

H_O = There is no significant relationship between an independent variable and Natural Resources Depletion.

H_A = There is a significant relationship between an independent variable and Natural Resources Depletion.

Durbin-Watson statistic = 1.44524
p-value = 0.0132133

In table 5, the coefficient estimates indicate that if all other things equal, an increase in GDP will reduce the NRD by -1.28937e-11, an increase in Population will increase the NRD by 1.33197e-07, and an increase in Business Establishments would lower the NRD by -0.0211682. NRD, Population, and GDP are statistically significant at 0.01 alpha, while Business Establishments is statistically significant at 0.05 alpha. All

variables are deemed to be significant, as a result, the researchers reject the null hypothesis that there is no significant relationship between variables and Natural Resource Depletion and accept the alternative. The R-squared of the model at 0.4039, representing the goodness of fit of the model, tells that 40% of the variance in natural resource depletion is determined by the independent variables. A Durbin Watson of 1.44524 in the OLS regression indicates that there is no autocorrelation among the variables. The following model is fitted for this set:

$$NRDt = -3.45604 - 1.28937e\text{-}11\ GDPt + 1.33197e\text{-}07\ POPt - 0.0211682\ BEt + \varepsilon t$$

Durbin-Watson statistic = 1.22647
p-value = 0.00177567

Table 7 shows that the coefficient estimates indicate that if all other things equal, an increase in GDP will reduce the l_NRD by −2.61970e-11, an increase in Population will increase the l_NRD by 3.25553e-07, and an increase in Business Establishments would lower the l_NRD by −0.0611212. All the variables are statistically significant at 0.01 alpha, which indicates that they are significant, as a result, the researchers reject the null hypothesis and accept the alternative. The R-squared of the model is also at 0.606442, which means that 60.64% of the variability in the log of Natural Resources Depletion is explained by the independent variables. Furthermore, the table indicates that the data has no autocorrelation because the Durbin-Watson is 1.226466, which is still acceptable. The following model was obtained:

$$NRDt = -9.83683 - 2.61970e\text{-}11\ GDPt + 3.25553e\text{-}07\ POPt - 0.0611212 + \varepsilon t$$

Table 9
Jarque-Bera Test for Normality

Variable	Jarque-Bera Test	P-Value
NRD	25.8553	2.42988e-06
GDP	3.36321	0.186075
POP	5.70562	0.384659
BE	5.70562	0.0576821

H_0: The residuals are normally distributed.
H_a: The residuals are not normally distributed.

The p-value for GDP, POP, and BE are 0.186075, 0.384659, 0.0576821 respectively, which are greater than 0.05 alpha. Thus, the researchers reject the null hypothesis for the three variables and accept the alternative that the residuals are normally distributed. However, the p-value for NRD is 2.42988e-06, which is less than 0.05 alpha. Therefore, the null hypothesis is accepted. Further transformation is required for NRD.

Table 10
Jarque-Bera Test for Normality Transformation Estimates

Variable	Jarque-Bera Test	P-Value
l_NRD	1.38592	0.500094

H_0: The residuals are normally distributed.
H_a: The residuals are not normally distributed.

The p-value for l_NRD is 0.500094 which is greater than 0.05 alpha. Thus, the researchers reject the null hypothesis for the variable and accept the alternative that the residuals are normally distributed.

Chow test for structural difference with respect to Philippine Native Plants Conservation Society (Dummy variable)

F(4, 23) = 6.125 with p-value 0.0017
H_0: There is no structural breakpoint in the dataset.
H_a: There is a structural breakpoint in the dataset.

The Chow Breakpoint test has a p-value of 0.0017, which is

Table 7
OLS Regression Transformation Estimates

Variables	Estimate	Standard Error	T-value	P-value
l_NRD	−9.83683	1.87455	−5.248	<0.0001
GDP	−2.61970e-11	7.21535e-12	−3.631	0.0012
POP	3.25553e-07	6.98564e-08	4.660	<0.0001
BE	−0.0611212	0.0162758	−3.755	0.0008

Table 8
OLS Regression Fit Statistics Transformation Estimates

Mean dependent var	−1.319325	**S.D. dependent var**	1.137140
Sum squared resid	15.26715	**S.E. of regression**	0.751964
R-squared	0.606442	**Adjusted R-squared**	0.562714
F(3, 27)	13.86831	**P-value(F)**	0.000012
Log-likelihood	−33.00869	**Akaike criterion**	74.01738
Schwarz criterion	79.75333	**Hannan-Quinn**	75.88716
rho	0.338459	**Durbin-Watson**	1.226466

Table 11
Chow Breakpoint

Variables	Coefficient	Standard Error	T-value	P-value
NRD	2.73975	2.28457	1.199	0.2426
GDP	3.47857e-11	2.06393e-11	1.685	0.1054
POP	−9.55903e-08	8.88052e-08	−1.076	0.2929
BE	−0.000820777	0.00966025	−0.08496	0.9330

less than 0.05 alpha. Therefore, the researchers reject the null hypothesis. It further proves that there is a structural breakpoint. No further transformation is required.

Chow test for structural difference with respect to Philippine Native Plants Conservation Society (Dummy Variable)

F(4, 23) = 14.2072 with p-value 0.0000

H_0: There is no structural breakpoint in the dataset.
H_a: There is a structural breakpoint in the dataset.

The Chow Breakpoint test has a p-value of 0.0000, which is less than 0.05 alpha. Therefore, the researchers reject the null hypothesis. It further proves that there is a structural breakpoint. No further transformation is required.

Table 13
Ramsey Test

RESET Specification Test	Test Statistic	P-Value
Squares and Cubes	1.586876	0.224
Squares Only	3.278548	0.0818
Cubes Only	3.211694	0.0848

H_0: There is no specification error among the variables
H_a: There is a specification error among the variables

The p-values of the Ramsey Reset are 0.224, 0.0818, and 0.0848, and all are greater than 0.05 alpha. Therefore, the researchers accept the null hypothesis that there is no specification error among the variables.

Table 14
Ramsey Test Transformation Estimates

RESET Specification Test	Test Statistic	P-Value
Squares and Cubes	5.949371	0.0077
Squares Only	1.679747	0.206
Cubes Only	3.420228	0.0758

H_0: There is no specification error among the variables
H_a: There is a specification error among the variables

Table 14 shows that the p-values of the Ramsey test transformation estimates are 0.0077, 0.206, and 0.0758. The p-values in the squares only and cubes only test are greater than 0.05 alpha, however, the p-value of squares and cubes is lower than 0.05 alpha. Therefore, the researchers accept the null hypothesis that there is no specification error among the variables.

Test statistic: LM = 9.622007, with p-value = P(Chi-square (3) > 9.622007) = 0.022068

H_0: The variances are constant.
H_a: The variances are not constant.

Yielding a p-value of 0.022068 which is less than 0.05 alpha. The researchers reject the null hypothesis that the variances are constant. Therefore, at a 5% level of significance, the error terms are heteroskedastic. Since there is heteroskedasticity in the model, there is a need to transform the dependent variable, NRD.

Test statistic: LM = 0.942346, with p-value = P (Chi-square (3) > 0.942346) = 0.815199

H_0: The variances are constant.
H_a: The variances are not constant.

It yields a p-value of 0.815199, which is greater than 0.05 alpha. The researchers accept the null hypothesis that the variances are constant. Therefore, at a 5% level of significance, the error terms are homoscedastic.

6) Environmental Kuznets's Curve

In confirming the Environmental Kuznets Curve (EKC) Theory employed in the study, the researchers plotted the variables with the Level of Philippine Natural Resources

Table 12
Chow Breakpoint Transformation Estimates

Variables	Coefficient	Standard Error	T-value	P-value
l_NRD	8.92190	3.19658	2.791	0.0104
GDP	1.42427e-10	2.88786e-11	4.932	5.52e-05
POP	−3.92209e-07	1.24257e-07	−3.156	0.0044
BE	−0.00572538	0.0135167	−0.4236	0.6758

Table 15
Breusch-Pagan Test for Heteroskedasticity

Variables	Coefficient	Standard Error	T-value	P-value
NRD	−9.83168	5.73355	−1.715	0.0978
GDP	−3.71801e-11	2.20690e-11	−1.685	0.1036
POP	3.17628e-07	2.13665e-07	1.487	0.1487
BE	−0.0383917	0.0497816	−0.7712	0.4473

Table 16
Breusch-Pagan Test for Heteroskedasticity Transformation Estimates

Variables	Coefficient	Standard Error	T-value	P-value
l_NRD	0.753494	3.23205	0.2331	0.8174
GDP	−5.60577e-12	1.24405e-11	0.4506	0.6559
POP	2.36422e-08	1.20445e-07	0.1963	0.8459
BE	−0.00276297	0.0280623	−0.09846	0.9223

Depletion (% of GNI) on the vertical axis and the GDP (constant 2015 US$) from 1990 to 2020 on the horizontal axis. Figure 1 shows an inverted U-shape, indicating that the growth in GDP causes increases in Natural Resources Depletion in the beginning, but when GDP reaches a certain level, the level of Natural Resources Depletion starts to decrease as the economy develops continually. However, Figure 2 highlights that the relationship between Natural Resources Depletion and GDP is more complex, which is presented in an N-shape. This shows that Natural Resources Depletion will start to increase again at a certain level of economic activity, but it will decrease again due to economic growth, which was shown by the smaller inverted U-shape curve. Upon this, the researchers were able to prove this relationship between variables in congruence with the theory of the EKC.

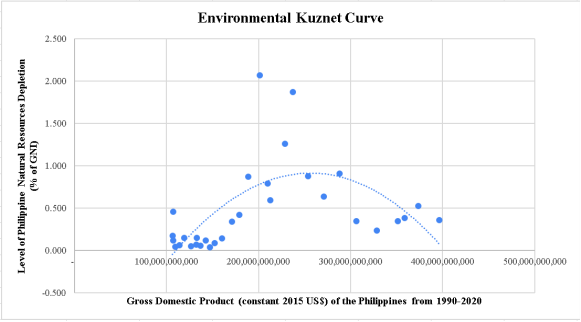

Fig. 1. Environmental Kuznets Curve at Second-Order Polynomial

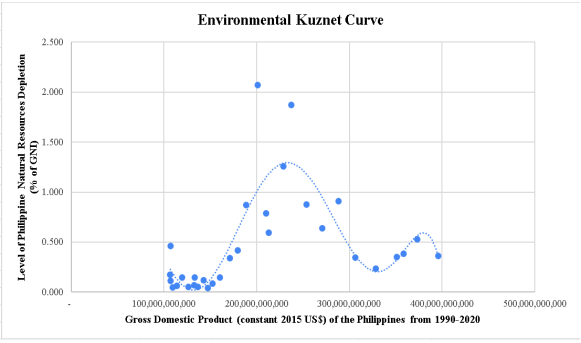

Fig. 2. Environmental Kuznets Curve at Sixth-Order Polynomial

B. *Discussions*

After arriving at statistical results, researchers were able to define the relationship between variables.

1) *Natural Resources Depletion and GDP*

Results from the estimation showed that a significant relationship exists between Gross Domestic Product (GDP) and natural resource depletion. As confirmed by the cointegration tests presented through the Augmented Dickey-Fuller unit root test and Engel Granger test, Economic growth plays a factor in natural resource depletion. Interestingly, the relationship is inversely related, as reflected by the ordinary least squares (OLS) output. The OLS output shows that Increases in gross domestic product decrease the depletion of natural resources. This result implies that the Philippines' economic growth has become a helpful factor in preserving its natural resources. With the application of the theory of the Environmental Kuznets Curve, the relationship between GDP and Natural Resources Depletion obtained through the estimation and plotting of the curve shows relevance. The inverted U-shaped EKC shows that during the initial stage of economic growth, environmental depletion significantly increases but after passing a certain point, the impact of economic growth on environmental degradation decreases.

The Philippines, as a developing country, continuously faces challenges in protecting its natural resources due to many other economic, social, environmental, and policy issues at hand. Despite those mentioned above, there are still prospects for countries like the Philippines to increase economically without harming the environment. Related studies by Xu & Lin (2016) in China showed results on the optimization of economic growth, including the rise of industrial products as reasons for the decline in the magnitude of environmental damage.

Different actors in the GDP gearing towards sustainable development can cause the generated result. The emergence of alternative resources to avoid draining available resources started as people searched for new sources by developing efficient technologies that can help produce renewable resources and calibrate production and consumption processes (Wei & Kangping, 2012). Economic growth through industrial technology development improves living standards and awareness in terms of environmental protection systems, as technological progress allows green production in industries to reduce pressure on the environment (Wang et al., 2021).

2) *Natural Resources Depletion and Population*

Population results from the OLS coefficient estimates, Augmented Dickey-Fuller unit root test and Engel Granger test indicate that the variable significantly affects Natural Resources Depletion. In contrast to the null hypothesis, the Population is seen as a positive variable influencing the increase in the level of Natural Resource Depletion. This backed up the results of the Xu & Lin (2016) study, which found that population growth follows a positive U-shaped pattern since demand differs at different stages of population growth. The Philippines is a developing country with fast-growing and high population densities causing increased demand for the production and consumption of goods and services. This generates demand for workers, new employment opportunities, and infrastructure, all of which contribute to the expansion of the Philippine economy. However, uncontrolled, and excessive population growth in the country would not suggest good overall welfare for the country's natural resources. This supported the findings of Lee et al. (2021) cross-sectional study of 138 countries that rapid population growth influences the pace of economic growth, leading to natural resource degradation and exploitation to meet demand.

With that, controlling population growth is essential in minimizing the demand for finite resources, particularly in developing nations. According to Komu & Ethelberg (2015), family planning and population control initiatives are critical for educating the public about the economic and natural resource costs of unrestrained population growth. Furthermore, Arnould et al. (2017) observed that reaching a sustainable balance is difficult when the population is fast rising, and environmental and sustainable initiatives should be more

integrated with efforts on high-priority matters. Suppose the Philippines government does not intervene and regulate the high continuous rate of population growth and continues to overlook environmental and sustainable development concerns. In that case, the population will continue to positively affect natural resource depletion, which may lead to economic and ecological problems.

3) Natural Resources Depletion and Business Establishments

The results show that Business Establishments have a significant relationship with Natural Resources Depletion as tested using the Augmented Dickey-Fuller unit root test, Engel Granger test, and Ordinary Least Squares. Based on the OLS output, Business Establishments have a negative effect on the depletion of natural resources. Therefore, an increase in business establishments leads to a decrease in the depletion of natural resources.

Awan & Liaqat (2015) stated that the emergence of different industries results in high levels of pollution and carbon emissions. Xu & Lin (2016) also indicated that increased carbon emissions are due to the early stages of industrialization. Still, technological advancements and industrial structure optimization lead to the gradual decrease of emissions of industries. A study by Figge & Hahn (2020) found that business-related comparative advantages and the return on natural resources can be positively correlated. It stated that more financially successful businesses could quickly achieve higher returns on natural resources. However, other firms can also attain this through green technology or green utilization advantages. According to Prakash et al. (2022), people have become more aware of the situation of our natural resources, and industries have started to adopt green practices. Moreover, Ali et al. (2021) found that tourism, renewable energy, urbanization, and cultural globalization led to decreased natural resource depletion.

5. Conclusion and Policy Implications

A. Conclusion

The Philippines, an archipelagic country rich in natural resources from its seventeen regions, has been a key producer of raw materials in different industries to supply the demands of a variety of goods both domestically and internationally. Through the years, economic activities have constantly been using natural resources to sustain the needs of society, bringing threats to the quality, number, and future of natural resources. In this study, researchers examined the significance and impact of three economic indicators, namely Gross Domestic Product (GDP), Population, and Business Establishments, on the level of Natural Resources Depletion in the Philippines from 1990 to 2020. All secondary data was sourced from the World Bank Open Database. The Augmented Dickey-Fuller Unit Root Test was used to test the stationarity of the variables. This was followed by the Engle-Granger Two-Step Method to check the cointegration among variables. And the Ordinary Least Squares (OLS) Regression was employed to identify the relationship and significance of the variables. Diagnostic checking among the variables was done using the Jarque-Bera test for normality, Chow Breakpoint, Ramsey Test, and the Breusch-Pagan test for heteroskedasticity. Furthermore, the theory of the Environmental Kuznets Curve (EKC) was employed to see the relationship between GDP and Natural Resources Depletion in the country. The results showed that there is an inverse relationship between GDP and Natural Resources Depletion, which means an increase in GDP decreases the level of Natural Resources Depletion. Therefore, the researchers rejected the null hypothesis, and these findings about the Philippines' GDP and Natural Resources Depletion supports the concept of the Environmental Kuznets Curve. Meanwhile, the results of the study for Population show that the variable also rejects the null hypothesis. However, unlike GDP, it positively impacts the level of Natural Resources Depletion. Similar to GDP, the study also found that Business Establishments and Natural Resources Depletion has a negative relationship, which rejects the null hypothesis.

B. Policy Implications

Based on the findings and results of this study, the researchers recommend that the level of Natural Resource Depletion be considered and prioritized in policymaking. Policymakers should draft legislation to promote and create green technologies and practices and strengthen existing environmental and sustainability regulations. To conserve natural resources, the Philippines enacted several national environmental laws to preserve resources, educate the public, and control exploration and exploitation. However, the general public still needs to be made aware of the goal and significance of these laws for the country and its people. Proper information dissemination about the protection of natural resources is necessary to help society function economically while caring for the environment. This may be accomplished by incorporating the country's laws and goals into the educational system. Educating people on the necessity of preserving natural resources can help them make sound economic and personal decisions.

Furthermore, economic, and personal activities must be regulated and monitored, such as defining family planning and sex education rules to control unplanned, rapid population growth and production and consumption habits to favor limited and exhaustible resources. A high population creates a high demand for natural resources for production and consumption to fulfill needs and wants. Excessive resource utilization leads to depletion; alternative resources must be employed, and sustainable practices and systems must be incorporated to provide time for renewal or recovery before being used in various production processes. Moreover, as part of their corporate social responsibility, corporations must be urged to practice sustainability. Imposing taxes and regulatory fines on businesses that do not pursue ethical and sustainable practices can help to enforce policy more strictly.

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