LANCAH JURNAL INOVASI DAN TREN
Vol. 2, No. 2, 2024, pp. 346~354
e-ISSN: 3025-8189 ; p-ISSN: 3025-8197
DOI: https://doi.org/10.35870/ljit.v2i2.2724

Advancing Green Economy: Case Studies from Indonesia, Ghana, and Strategies for Governance and Eco-Management

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Article Info

Article history:

Received 06 23, 2024
Revised 06 24, 2024
Accepted 06 25, 2024

Keywords:

Economic Development;
Sustainable Development;
Green EconomyDiscriminant;
Analysis, SWOT Analysis;
Eco-Management;
Renewable Energy;
Clean Energy, Stock Prices;
Nonlinear ARDL.

ABSTRACT

This paper underscores the imperative of acknowledging the adverse impacts of economic development to foster sustainable economic growth. It advocates for the adoption of the green economic concept as a viable solution, emphasizing natural resource conservation. Employing discriminant analysis, the study assesses green economic development across income-classified countries, revealing the significance of environmental factors such as emissions and forest area. While the principles of a green economy gain traction globally, concerns linger among some nations about potential hindrances to development. Consequently, a clear methodology for green economy implementation is crucial, particularly in the context of governance. The research discusses prerequisites, basic principles, and modeling techniques for green economy implementation, employing the IDEF0 methodology. Using Ghana as a case study, SWOT analysis evaluates its green economy transformation efforts, highlighting strengths like geographical advantages and weaknesses such as weak institutions. Opportunities include international support, while threats encompass inadequate technology development and corruption. The study underscores the necessity for policymakers to leverage strengths and opportunities while addressing weaknesses and threats, emphasizing science and technology education to support green economy development. Furthermore, the paper explores the significance of eco-management in fostering a green economy, advocating for new scientific approaches to managerial decision-making. It delineates management technologies for eco-management, focusing on resource-oriented production and competitive strategy. The study underscores the importance of resource efficiency in economic and environmental aspects, offering practical recommendations for industrial waste reuse. Lastly, employing the nonlinear ARDL approach, the paper analyzes the asymmetric impact of renewable energy generation and clean energy prices on green economy stock prices. Results indicate significant negative impacts of renewable energy generation, with clean energy prices exhibiting both positive and negative effects. The study concludes by highlighting the dominance of negative shocks and the intricate relationship between renewable energy generation, clean energy prices, and green economy stock prices.

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How to Cite:

Ardhi, F., Aditya, F., & Hwihanus. (2024). Advancing Green Economy: Case Studies from Indonesia, Ghana, and Strategies for Governance and Eco-Management. *LANCAH: Jurnal Inovasi Dan Tren*, *2*(2), 346~354. https://doi.org/10.35870/ljit.v2i2.2724

1. INTRODUCTION

The global pursuit of sustainable development has prompted a paradigm shift towards green economy frameworks, emphasizing environmental preservation alongside economic growth. This article delves into various facets of green economy implementation, examining case studies from Indonesia and Ghana to glean insights into effective strategies for governance and eco-management. By analyzing the eco-management of organizations within the green economy system and exploring the asymmetric effects of renewable and clean energy on green economy stock prices, this article aims to provide a comprehensive overview of the challenges and opportunities inherent in transitioning towards a greener economic model.

In recent years, Indonesia has grappled with the need to reposition its economic structure in alignment with environmental imperatives. As a country endowed with rich natural resources, Indonesia stands at a critical juncture where sustainable development hinges upon embracing green economy principles. By leveraging its abundant natural capital while mitigating environmental degradation, Indonesia seeks to forge a path towards inclusive and resilient economic growth.

Meanwhile, Ghana's endeavors in green economy implementation serve as a roadmap for other nations striving towards sustainable development. Through a thorough review of Ghana's green economy policies and strategies, this article sheds light on the successes, challenges, and lessons learned in fostering a sustainable development drive. From harnessing renewable energy sources to addressing institutional weaknesses, Ghana's experiences offer valuable insights for policymakers and practitioners alike.

Furthermore, the eco-management of organizations within the green economy system plays a pivotal role in ensuring the effective implementation of green policies and practices. By adopting eco-friendly technologies, optimizing resource utilization, and integrating environmental considerations into decision-making processes, organizations can contribute to the overarching goal of environmental sustainability while enhancing their own competitiveness in the marketplace.

Lastly, the article explores the intricate relationship between renewable energy generation, clean energy prices, and green economy stock prices. Through a nonlinear autoregressive distributed lag (NARDL) approach, the asymmetric effects of renewable and clean energy on green economy stock prices are analyzed, providing valuable insights for investors, policymakers, and researchers interested in the intersection of environmental sustainability and financial markets.

Overall, this article serves as a comprehensive exploration of the multifaceted challenges and opportunities in advancing green economy agendas. By drawing upon case studies, empirical analysis, and theoretical frameworks, it aims to contribute to the ongoing discourse on sustainable development and environmental stewardship in the 21st century.

2. METHOD

For the specification and visual modeling of ways to improve green economy in the context of government in the field of ensuring green economy and environmental safety, we have chosen a functional modeling methodology and a graphical description of the processes (IDEF0). The reason for choosing this model among others was that during its construction, the emphasis is on the phasing and characteristics of subcontracting elements of the model. In our opinion, this type of modeling itself will allow us to fully depict the sequence and conceptualism of ways to improve green economy in the context of government.Brock and Taylor (2010) discuss the influence of technology adoption to pollutants value, in their publications Green economy. The globalization of capital leads to some negative effects such as a loss of habitat and species. The bad consequences were caused by the high level of exploitation of natural resources.Environmental Kuznets Curve (EKC) is widely used in various studies of the relationship between the economy and the environment. EKC is adopted from the Kuznets curve inverted U-shape to explain the relationship between environment and income. The EKC term was popularized in the World Bank Development Report 1992 (Stern, 2004).

3. RESULTS AND DISCUSSION

	Wilks' Lambda	F	df1	df2	Sig.
Emission	.915	5.004	1	54	.029
Population	.992	.458	1	54	.502
FDI	.937	3.610	1	54	.063
Forest	.896	6.285	1	54	.015
Unemployment	.961	2.200	1	54	.144

	Function
	1
Emition	.002
Population	.000
FDI	-.001
Forest	.038
Unemployment	.123
(Constant)	-2.036
Unstandardized coefficients	

Table 3: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1	.758	14.297	5	.014

Table 4. Eigen values

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	.320[a]	100.0	100.0	.492

a. First 1 canonical discriminant functions were used in the analysis.

Table 5. Classification Results b,c

		Predicted Group Membership			
		Negara	high income	low income	Total
Original	Count	high income	20	8	28
		low income	6	22	28
	%	high income	71.4	28.6	100.0
		low income	21.4	78.6	100.0
Cross-validated[a]	Count	high income	19	9	28
		low income	6	22	28
	%	high income	67.9	32.1	100.0
		low income	21.4	78.6	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

b. 75,0% of original grouped cases correctly classified.

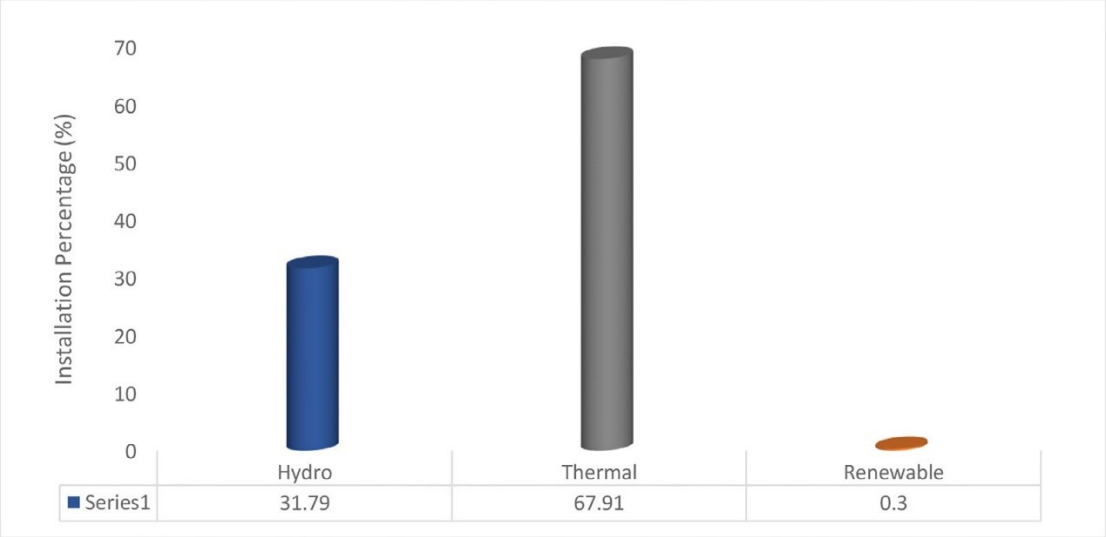
c. 73,2% of cross-validated grouped cases correctly classified

groups	Km value	Group Name	Number of companies surveyed by industry and size,%			
			industrial construction companies		food engineering companies	
			large	medium-sized	large	medium-sized
I	Km ≥ 0-0,51	waste	22	18	18	29
II	Km ≥ 0,81 - 0,9	low-waste	64	71	73	64
III	Km > 0,9	waste-free	14	11	9	7

Table 2: Results of unit root tests

Variable	ADF	1st Diff.	PP	1st Diff.	KPSS	1st Diff.
	Level		Level		Level	
Asia						
REG	−10.356	−10.356***	−2.2572	−10.352***	0.2054***	0.0613
CEP	−2.7066	−9.1221***	−2.4215	−9.1221***	0.0751***	0.0794
GEC	−2.4525	−9.5668***	−2.2424	−9.4807***	0.1530***	0.0853
Europe						
REG	−10.356	−10.356***	−2.2572	−10.352***	0.2054***	0.0613
CEP	−1.8835	−10.424***	−1.8835	−10.404***	0.1192***	0.0495
GEC	−2.1169	−10.707**	−2.1853	−10.777***	0.0974***	0.0649
US						
REG	−10.356	−10.356***	−2.2572	−10.352***	0.2054***	0.0613
CEP	−2.6499	−12.416***	−2.4769	−12.716***	0.2014***	0.0557
GEC	−1.4217	−11.960***	−1.3633	−12.063***	0.2054***	0.0613

***, **, *Indicate 1%, 5% and 10% significance level, respectively. ADF, PP and KPSS are the empirical statistics of the Augmented Dickey–Fuller (1979), and the Phillips–Perron (1988) unit root tests, and the Kwiatkowski et al. (1992) stationarity test, respectively. The critical values of the KPSS unit root tests at 5% significance level are 0.463 and 0.146, respectively



Discussion

The implementation of a green economy, while theoretically beneficial, presents numerous practical challenges and opportunities, as highlighted in the case studies of Indonesia and Ghana. The transition to a green economy necessitates a multifaceted approach, involving environmental, economic, and social dimensions. In this discussion, we delve into the critical aspects that facilitate and hinder the adoption of green economy principles, using the insights derived from our research and analysis. Effective governance is paramount to the successful implementation of green economy initiatives. Both Indonesia and Ghana have made strides in establishing policies that promote sustainable development.

However, the effectiveness of these policies hinges on robust institutional frameworks and the political will to enforce them. In Indonesia, the alignment of economic goals with environmental preservation requires comprehensive policy reforms and strict enforcement mechanisms to mitigate environmental degradation. Similarly, Ghana's progress in green economy policies underscores the need for strong institutions capable of overseeing and implementing these initiatives.

Addressing institutional weaknesses, such as corruption and lack of technical expertise, is crucial for both countries to achieve their green economy objectives. The results of this meta-analysis show that the transition to a green economy often involves a trade-off between economic growth and environmental sustainability. For instance, while renewable energy projects in Ghana present significant opportunities for sustainable development, they also require substantial investments and technological advancements. The SWOT analysis revealed that Ghana's geographical advantages could be leveraged to harness renewable energy sources, yet the country faces threats from inadequate technological development and corruption. Similarly, Indonesia's rich natural resources present both an opportunity and a challenge; the exploitation of these resources must be balanced with conservation efforts to ensure long-term sustainability. Technological innovation plays a critical role in advancing green economy agendas.

The adoption of eco-friendly technologies and efficient resource management practices can significantly reduce environmental impacts. In both Indonesia and Ghana, promoting science and technology education is essential to build a workforce capable of driving technological advancements in sustainable practices. Furthermore, eco-management strategies that optimize resource utilization and incorporate environmental considerations into business decisions are vital for organizations aiming to enhance their competitiveness while contributing to environmental sustainability.

The relationship between renewable energy generation, clean energy prices, and green economy stock prices is complex and multifaceted. Our analysis using the nonlinear ARDL approach indicates that renewable energy generation has a significant negative impact on green economy stock prices, reflecting the market's sensitivity to fluctuations in energy production and prices. The asymmetric effects of clean energy prices on stock prices highlight the intricate dynamics between financial markets and environmental sustainability. Policymakers and investors must consider these dynamics when making decisions that affect the green economy, recognizing the potential for both positive and negative impacts on financial markets. In conclusion, the case studies of Indonesia and Ghana provide valuable insights into the challenges and opportunities of implementing a green economy. By addressing institutional weaknesses, promoting technological innovation, and understanding the dynamics of financial markets, both countries can make significant strides towards achieving sustainable development goals. The findings from this research

underscore the importance of a holistic approach to green economy implementation, one that integrates economic, environmental, and social dimensions to foster a more sustainable and resilient future.

4. CONCLUSION

A mentioned above, some empirical studies have examined the relationship between energy consumption and economic growth with nonrenewable and renewable energies, there is a gap in research pertaining to the relationship between renewable energy and green economy stock prices. The study covers this gap by focusing on renewable energy markets that have largely been ignored in prior research. The Non-linear Autoregressive Distributed Lagged model (NARDL), which is suitable to examine long-run and short-run relationships between variables have been employed in this study to establish the asymmetric impact of renewable energy and clean energy on green economy stock prices.

In the last decade, there has been an extensive environmental management trend. The environmental management system is the result of many years of experience and experiments in the management system of organizations, institutes and professional communities in a number of countries where the public authorities have been instrumental in this process. The introduction of EMS in businesses has a positive impact on the health and ecological culture of employees and the entire population across the territories adjacent to the organization.

Green economy transformation has the potential to offset environmental, economic and social risks and sustainably improve all sectors of the economy. Such transformation is relevant for a country like Ghana which largely depends on the natural environment for sustenance, and thus highly vulnerable to the ramifications of changing climate. With Ghana's standing as the "beacon of hope" for Africa, it is imperative for the country to adopt more sustainable ways to achieve economic, social, and environmental improvement. The main aim of the paper is, therefore, to analyze Ghana's preparedness to green its economy by employing the SWOT analytical tool.

Green economy means fostering economic growth and development in which natural assets continue to provide resources and environmental services. Green economy provides a practical and flexible approach to achieve concrete, measurable progress on all its economic and environmental principles, while at the same time fully taking into account the social consequences of greening the dynamics of economic growth. The focus of Green economy strategies is to ensure that natural assets can fully realize their economic potential in a sustainable manner. This potential includes the provision of critical life support services – clean air and water, as well as sustainable biodiversity, necessary to maintain food production and human health. Natural assets are not infinitely replaceable, so Green economy policies take this into account.

This paper proposed a discriminant analysis to describe the green economic development. It analyzed a group of countries, classified by their income levels. The analysis result suggests that environment factors such as emissions and area of the forest. are important variables. It also noted that all countries in the world should be responsible for the environment quality, an important key for sustainable life and economic development. Future researches might focus on investigating various trends of country's income level as well as determining how the environmental conditions of the country concerned. Poor countries tend to have a low level of awareness on the environment. They exploited the environment to increase their income.

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The results from the study showed that Ghana has huge potentials with respect to its ability to green the economy. It is therefore important for policy makers to put in place strategies that can help take advantage of the strengths and opportu- nities while serving as solution to the weaknesses and threats. The geography of the country, energy mix potential, policies

in support of green economy, a reduction in poverty levels, and a young and dynamic population are the main strengths for Ghana. The country's location in the tropics for example presents a number of advantages in terms of the number of renew- able energy sources available to her, which is a critical component of green economy transformation. These notwithstanding, a number of weaknesses may threaten the country's ability to take full advantage of the strengths.

Among the identified weaknesses are institutional weakness, lack of sufficient funding, over-reliance on external partners, overdependence on the natural environment, inadequacy of political will etc. Given that these weaknesses have the potential to nullify the strengths identified in the study it is important to take the necessary steps to effectively reduce or eradicate these barriers. The opportunities available for Ghana's economy abound. However, the most critical as identified in the study include the growing awareness and understanding of environmental protection, cross-border collaborations and global attention to cli- mate change, commercial interests in driving the development and transfer of green technologies, reduction and in poverty and effort to reduce illiteracy rate in the country. These opportunities coupled with the strengths presents Ghana with a huge advantage to transition to a green economy. This notwithstanding, Ghana needs to overcome certain threats such as the perception of corruption and its impact on green technology development and transfer. The impact of corruption could have a ripple effect on the cost of green technologies as cost may be inflated beyond the normal. Therefore, to partly deal with the cost of green technologies, it is important to strengthen the country's laws on corruption to serve as a deterrent to those likely to be found culpable especially in the award of contracts for green technology development and transfer. Also, a strong commitment must be made especially by government and other policy makers to support green economy development by paying more attention to science and technology education in the country. In addition, more efforts must be made by government and policy makers to go beyond just signing international agreements and treaties that support green economy transformation to actual implementation.

Green economy means fostering economic growth and development in which natural assets continue to provide resources and environmental services. Green economy provides a practical and flexible approach to achieve con- crete, measurable progress on all its economic and envi- ronmental principles, while at the same time fully taking into account the social consequences of greening the dy- namics of economic growth. The focus of Green economy strategies is to ensure that natural assets can fully realize their economic potential in a sustainable manner. This potential includes the provision of critical life support services – clean air and water, as well as sustainable bio- diversity, necessary to maintain food production and hu- man health. Natural assets are not infinitely replaceable, soGreen economy policies take this into account.

Within the framework of our research, the methodol- ogy of functional modeling and graphical description of processes (IDEF0) was used. This functional model is giv- en the opportunity to visually show the process of improv- ing the green economy within the country, in particular at the government level. After the theoretical formation of all stages of this model, it was applied within the frame- work of the structural units of management in Ukraine and Poland. After its implementation and analysis, it can be concluded that this model is effective and can be used in the context of improving the performance of the green economy in government.

The use of this methodology will allow preserving the ecosystem, biodiversity of the country, minimizing and rationalizing the consumption of energy, water and other types of resources. Through the introduction of highly ef- ficient green technologies, it is possible to achieve a reduc- tion in carbon emissions and to minimize or even prevent the generation of all forms of waste and pollution. The scheme we have developed allows you to see a list of the main ways to improve the principles of a green economy

In the last decade, there has been an extensive environmental management trend. The environmental management system is the result of many years of experience and experiments in the management system of organizations, institutes and professional communities in a number of countries where the public authorities have been instrumental in this process. The introduction of EMS in businesses has a positive impact on the health and ecological culture of employees and the entire population across the territories adjacent to the organization.

EMS examines the production process in detail from the point of view of the negative impact on the environment through industrial waste management. To effectively address the industrial waste management issues, organizations are recommended to use the techniques focused on reducing environmental expenditures in the structure of production cost and motivating business entities to adopt the policy of resource conservation and waste treatment.

Based on the research results, the main prerequisites for implementing environmental management in industrial organizations have been identified. The mechanism for introducing environmental management components has been suggested as an important constituent of an organization's competitive strategy. The algorithm of selecting resource-saving measures within the environmental management of the organization has been presented. On the basis of the given algorithm, nature conservation measures within the construction and food industry organizations have been ranked. Considering the complexity of the

connection between the functional elements of the eco-economic system and the material and raw-material flows, the place of waste in the reproduction system has been determined. This allowed justifying possible directions of industrial waste utilization in the organization and evaluating their impact on the results of economic activities.

Ensuring the development of a green economy when selecting the necessary tools requires considering the possibility to save material costs through returning industrial waste to production. Such measures influence the effectiveness of organizations, their social and ecological responsibility and are aimed at ensuring the health and social protection of future generations.

Green economy means fostering economic growth and development in which natural assets continue to provide resources and environmental services. Green economy provides a practical and flexible approach to achieve con- crete, measurable progress on all its economic and envi- ronmental principles, while at the same time fully taking into account the social consequences of greening the dy- namics of economic growth. The focus of Green economy strategies is to ensure that natural assets can fully realize their economic potential in a sustainable manner. This potential includes the provision of critical life support services – clean air and water, as well as sustainable bio- diversity, necessary to maintain food production and hu- man health. Natural assets are not infinitely replaceable, soGreen economy policies take this into account.

Our empirical results confirmed a strong asymmetric co-integrationrelationship among selected variables under concen. The results summarized that rebewable nergy generation siginicant negative impact on green economy stock prices in Asian and European merkets (except U.S market). For the clean egergy prices have a positive and negative significat impact on green economy stock prices of Asian and Europen merkets (negative effect for U.S market). Furthermore, findings from short-run coefficients of clean energy stock prices have a positive affect on green economy stock prices under the selected Asian, European and U.S markets. Change in renewable energy generation stock prices have a negatively insignificant impacts on Asian and European green economy stock prices., short-run coeffficients of renewable energy geration negatively and positively impacted on green economy stock prices of U.S market. In addition, the wald tests results showsthat the green economy stock price adjustment is running towardsthe long- and short-run steady increment regarding positive and negative shocks in renewable energy generation and clean energy.

Finally, multipliers shows the cumulative effect of renewable energy generation and clean energy on green economy stock prices long-run and short-run asymmetries. The dynamic multipliers confirmed that prices of renewable energy generation have a positive (negative) impact on green economy stock prices in Asian and European stock markets. However, renewable energy generation has a negative impact on green economy stock prices in the U.S market. The multiplier graphs show that the positive effects of renewable energy generation prices are greater than the negative effect. Indeed, clean energy prices respond quickly to the changes (both positive and negative) on green economy prices in all markets. In sum, the negative shocks dominate positive shocks in renewable energy generation and clean energy,and results indicate that a positive and negative relationship wasnoted between these covariates and green economy stock prices.

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