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# ROLE OF GREEN FINANCE FOR ENERGY SECURITY & SUSTAINABLE DEVELOPMENT

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## Abstract

Our country has recently focused heavily on economic growth and the GDP while ignoring environmental alterations and sustainable development. The words "green finance" and "finance" are two ambiguous concepts that together make up the term. Green finance is the innovative financial model that the nation has adopted to combine natural assurance with financial growth and prosperity. In this study, the scientists are focusing on the new trends, opportunities, obstacles, and many speculative routes of green finance in India. They are also dissecting the green finance process to understand the goal achieved thus far from the effort made by the Indian legislative of India. According to the analysis, India must focus more on green finance and provide more framework subsidy in order to achieve the sustainable development goal. It acts as a sponsor for both the acknowledgement of great financial development and the realization of the idea of environmentally responsible development. The effect of green money on key advancements in current research is less well understood. From one angle, the research presented in this paper has the potential to build upon and expand already conducted research; however, it can also serve as a foundation for the recognition of significant local development, which is vitally important for the achievement of the district's goals for sustainable development.

**Keywords:** Green Finance, Energy Security, Sustainable Development.

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## INTRODUCTION

In business as well as in the field of natural research, green backing has become vital in the twenty-first century. Every nation, both developed and developing, should make an effort to secure green finance, with estimates estimating that between 2012 and 2030, global green support for green infrastructure will total \$40 trillion. Green finance is the industry benchmark for green loans. It alludes to a progression of managerial techniques that take into account the fact that commercial banks and other financial organizations will keep up their research and development efforts to build facilities for the treatment of contamination and to take part in natural security and reclamation.

The ability of a country's economy to grow depends on its ability to control its finances, which includes reducing poverty and opening up new business opportunities. The common habitat has been exploited and there have been major environmental changes as a result of conventional techniques, which have made it harder for them to meet the demands of both the present and future generations. The relevance of development that can be maintained has increased in this strategy in order to satisfy the requirements for maintainability for the implementation of environmental change efforts. For Venture, this public commitment is insufficient. Green finance, which combines both public and private financing, is the new medium that governments from many countries are adopting for viability. The speculating push in climate-friendly activities is green finance. This instrument is designed with the intention of opening the door to viable projects for capital building and income age on the most favorable source of obligation and value. Green finance is an effort to simplify the use of natural projects to guide company strategies and decisions. It is a market-based financial planning movement. In the next 20 years, government drive will necessitate a huge

amount of speculation, with a far bigger commitment from the private sector to the ongoing financial government mediation.

These days, green finance plays a key role in the global financial system. This is as a result of increasing awareness of low-carbon technologies and focusing attention on programs for naturally sustainable development. According to experts, setting up a free path of speculation (green finance) is "one of the crucial changes inside the current global monetary framework," aimed at ensuring sustainable development, which includes addressing social and ecological challenges. The UN Plan for Sustainable Development is intended to be implemented from 2030 onward with the use of widely available financial instruments. The major nations of the world view the need to integrate its aims into public development plans as potentially one of the most important needs. The feasibility of a green financial framework is consistent with the notion of sustainable development and becomes a fundamental component of it.

## LITERATURE REVIEW

In this analysis piece, Ms. Neetu Sharma (2015) aimed to gauge the clients' level of knowledge regarding green finance and green finance products. Similar to that, this study concentrated on the green finance initiatives taken by the private sector banks. This investigation found that clients are aware of the green financing drive campaign, according to specialists.

In this article by Keerthi B.S. (2013), a professional discusses the new trends and opportunities for green finance in India's growing corporate sector. This essay also discusses certain green business projects and the value of green finance implementation in India.

The author of this article, Priyanka Goel (2016), examined both the green goods and services provided in India as well as the green finance initiatives undertaken by the

country's leading public and commercial sectors. The analyst found that business banks in India are offering a range of green financial products to customers, including green home bank credit plots that have low loan costs to entice customers to choose green housing, vehicle financing that aims to reduce the financing cost on advances taken by customers on the purchase of vehicles using sustainable sources of energy by half, and more. For the installation of solar-powered water siphons, solar-powered water radiators, and solar-powered house lighting systems, Association Bank of India offers ranchers credit-expanding programs.

This study was carried out by Alapati Sai Bharath Reddy (2018) to look into the needs, importance, and significance of green finance in India. This article also discussed the impact of green money on the Indian economy and government initiatives to advance green money.

(2018) Gopal K. Sarangi In this paper, the scientist focuses on the financial challenges associated with achieving 175 GW of sustainable goals by 2022, with a particular focus on sustainable power in India. By analyzing various energy blend introduced limits and accumulating the average annual growth rate of India's force age limit, the scientist examines what this can mean for the green development of the Indian economy. The supporting and lending offices such Public Clean Energy and Climate Asset, Delicate Credits from IREDA, Green banks, Green securities, Infrastructural Obligation Asset, etc. were also given special attention by scientists. The analyst also focuses on how institutional and strategy level complexities and vulnerabilities affect the target for environmentally friendly power and clarifies the most expensive goal for interest in environmentally friendly power.

Nagarajan and Parvadavardini (2014) In this article, a specialist tries to determine whether it is practical for Indian ventures to contribute to green finance, studies the

relationship between green development and green supporting, compares which green finance products are successful in the Indian economy, and focuses on both the advantages and disadvantages of green finance. Additionally, scientists focus on public support, like public advances, prizes, or resources in addition to the push made by Bank of Baroda to fund the MOU between the State Bank of India and the Clean Development System for SMES.

Priti Bakhshi and Babita Jha (2019) In this essay, the author makes an effort to discuss the role that green finance plays in the progression of public, private, and non-productive sources of funding for economic growth. This scientist looked into the various ways that green financing gets diverted for commitments in India and suggested some solutions to deal with these roadblocks to aiding in the development of green products. (2017) Md. Sabuj Hoshen In this study, the scientist focused on the share of green financing in various green activities in Bangladesh's banks and non-banking sectors. In addition, a specialist looked into Bangladesh Bank's refinancing plan for green products. The research broke down ongoing green finance drives and their payment of immediate and backhanded shop in green finance.

## METHOD

The objective social or financial connections between regions cause the financial, social, and ecological linkages between districts to have similar spatial effects. It is vital to examine using spatial econometric models to dissect the effect of many components on extraordinary turn of events since it is not possible to assure that the model data for this case fulfills the assumptions of a free and equitably spread standard scattering.

### A. Model Setting

A spatially substantial association and a spatially irritated link are two indicators of a spatial relationship. Variables that are

released in one location may have an impact on another area, causing an overflow impact that manifests as a significant geographic link, when component stream and dispersion are uncommon. Notwithstanding, on the off chance that the effect on different areas isn't associated with the activity of its vital factors yet rather is welcomed on by erratic impedance conditions, the spatial relationship is a spatial irritation relationship. There are three types of spatial Bode models: spatial delay models (SLM), spatial error models (SEM), and spatial Durbin models (SDM). Spatial lag models can be used to calculate the impact of factors found in one area on factors found in nearby districts. Spatial error models are used to explore the effect of regions around regions on variables specified as a result of spatial error terms. The basis of the spatial Durbin model should be considered when the spatial lag terms of the indicated components affect the factors detected. Spatial economic models make it easy to understand how the various components of a unit of perceptual chain are spatially dependent. The made sense of factors and illustrative factors are spatially connected in the Durbin model, meaning that the made sense of factors in one region may be influenced by the made sense of factors and logical factors in the nearby regions. The study selects the monetary distance with per capita geographical weighting framework. incorporating the GDP into the test inquiry model

:

$$W_{ij} = \begin{cases} 1/|\bar{y}_i & \&i \neq j \\ -\bar{y}_j & \&i = j \end{cases} \quad (1)$$

In the above formula,  $y_i$  and  $y_j$  are the per capita GDP of area  $i$  and area  $j$ .

### B. Test for Spatial Autocorrelation

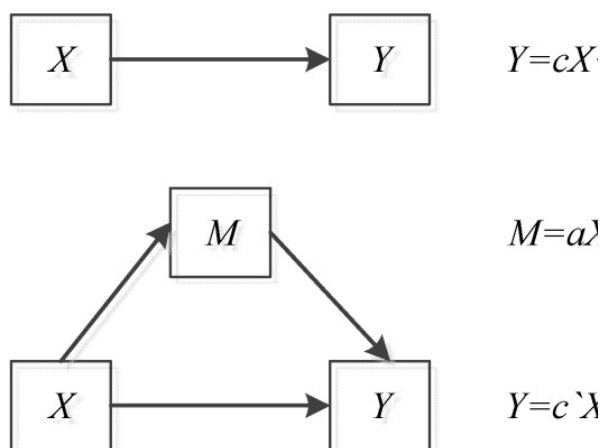
Before using a spatial econometric model to examine what improvements in green money and energy mean for changes in staggering events, we want to determine whether significant improvements in the dependent variable have spatial autocorrelation. It's important to know. Since the scores are not fixed, first-class progress equally exhibits autocorrelation properties. Assessment results are likely to be unpredictable, so it is important to consider geological factors while adjusting the model for backslide studies. In this study, we use Moran's method of recording to examine the global spatial linkages of sublime progress, and to ascertain whether there are geographic linkages in the terrestrial transmission of anomalous events. Moran's list has values in the range (1, 1), and if the value is greater than 0, each point has useful spatial membership. Assuming Moran's document is more modest than 0, we find that each region has a negative spatial affiliation. Assuming the Moran dataset is 0, this indicates no spatial relationship. Moran's I's rating system is as follows:

$$I = \frac{\sum_{i=1}^n \sum_{j=1}^n w_{ij} (Y_i - \bar{Y}) (Y_j - \bar{Y})}{S^2 \sum_{i=1}^n \sum_{j=1}^n w_{ij}}$$

where  $X_i$  is the seen value,  $S^2 = \frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^2$ ,  $\bar{Y} = \frac{1}{n} \sum_{i=1}^n Y_i$  and  $w_{ij}$  is the fractional value of the density cross segment. Moran's  $I \in [-1, 1]$ . For Moran's  $I < 0$ , this gives positive spatial membership.

### C. Model of Mediating Effect

Researchers commonly use the intervening impact model to focus on the relationship between the three elements in order to determine whether there is an intervening impact among the factors. In particular, M is the intervening variable in the unlikely event that X affects Y via M. In Figure 1, the relationship between X, Y, and M is shown as follows.



**Figure 1:** Relationship of X, Y and M.

In Figure 1, *ei* is an erratic mistake. Huge values for a, b, and c indicates the presence of an intervening impact, and the intervening impact stands in for the stomach muscle or c in the all-out impact.

**RESULTS AND DISCUSSION**

This study carries out a careful assessment in light of component determination and talks about the distinctions and relationship between the momentum results and past

specialists based on this reason to feature the advancement of this paper and as per the distinguishing proof of investigation strategies in the former article.

**A. Variable Choice**

**(1) Described variable**

Economic development of high quality (HQED) The article creates a high-quality, low-cost file that includes 13 s-level pointers and three first-level pointers. Table 1 presents the development list framework. Once the negative markers have been converted to positive pointers using the same method, the dimensionless handling is then handled using the best value standardization process. Finally, a reference is used from the Assembled Countries Human Development File. Table 1 displays the findings of the detailed analysis of the quality development record. Although this method of strengthening seems somewhat arbitrary, it is intended to show that quality economic development requires different perspectives.

**Table 1:** Comprehensive evaluation index system

Dimension layer	Index layer	Unit	Attributes	Weights
Ability (0.3158)	Gross domestic product development rate	%	+	0.0388
	Social work efficiency	Ten thousand yuan / person	+	0.2033
	Per capita interest in fixed assets	Yuan	+	0.0468
	Complete retail arrangements of buyer items per capita	Yuan	+	0.0882
	Science and innovation utilization as a degree of Total national output	%	+	0.2267
Structure (0.1562)	The degree of the discretionary business in GDP	%	-	0.0528
	The degree of the tertiary business in GDP	%	+	0.0560
	Populace urbanization rate	%	+	0.0604
	Financial income as a level of Gross domestic product	%	+	0.0566

Benefit (0.2050)	Gross domestic product per capita	Yuan	+	0.2247
	Per capita pay proportion among metropolitan and rustic regions	/	-	0.0335
	Metropolitan registered joblessness rate	%	-	0.0685
	Inhabitant Engel coefficient	%	-	0.0570

According to Table 1, the loads for cap, design, and advantages in the overall pointer framework for high-quality economic development are, respectively, 0.4269, 0.2671, and 0.3060. Financial advancement limit should occupy the most time all through HQED, trailed by improvement advantages and then advancement structure.

## (2) Explanatory variables

Green Finance (GF). His five components of green money are represented by the illustrative elements of green credits, green assurance, green zeal, green security and carbon financing. Given the satisfaction of pointer setting and the openness of data, we group these five factors into prudent levels based on the meaning and type of organization of green money. Green credit checks can be divided into two her classifications:

Move forward and switch. In this case, using the attached document, we explicitly indicate the level of premium utilization rate for six high-energy modern companies above their assigned size in common revenue utilization for advanced tasks above their assigned size. measure. The valuation of green insurance is expressed as the ratio of the market value of the A-shares of the Common Securities Association to the market capitalization of the A-shares. Nonetheless, green insurance ratings are

more relevant to state insurance than natural gambling safety, given the delayed implementation of environmental security mandates and lack of data sharing. 50]. Carbon finance ratings are conveyed by carbon emissions/GDP. When assessing carbon emissions, the use of three main energy sources is estimated. The exact scoring recipe is  $co_2 = w_1 \text{coal} + w_2 \text{petroleum} + w_3 \text{nuclear gas}$ . where  $w_1$  is coal,  $w_2$  is oil, and  $w_3$  is gas fuel side effect factor. These grades typically used by the IPCC and the Public Development and Change Commission's Energy Investigation Association are 0.7520, 0.5845, and 0.4465 respectively. There are 1, 2 and 3 regular carbon change parts in the upper range of .7143, 1.4286 and 1.3330 respectively. Our assortment of EPS information remembers the nuances of carbon finance, green credits, green hypotheses and green assurance. Green Guard information is important to Breeze's information collection.

energy development (ED). To completely evaluate the development of energy, we build an exhaustive evaluation pointer structure with six pointers in three viewpoints, drawing on earlier exploration, beginning with energy supply, usage, and efficiency. We then utilize the entropy method to assess every pointer and fortify the targets. The detailed record structure is presented in Table 2 as follows.

**Table 2:** Comprehensive evaluation index system for energy development

Dimension layer	Index layer	Unit	Attributes	Weights
Energy supply (0.1515)	Energy utilization per capita	Tons of standard coal	+	0.1515
Energy consumption (0.4852)	Coal consumption	Ten thousand tons	-	0.1478
	Power consumption	Billion kWh	+	0.1628
	Gaseous petrol consumption	One hundred million cubic meters	+	0.0524
Energy efficiency (0.2344)	Energy utilization per unit of GDP	Tons of standard coal/10,000 yuan	-	0.0633
	Power utilization per unit of GDP	KWh/CYN	-	0.0598

### (3) Control variables

Environment of the technology market (TME). Leveraging and trading achievements in machinery and legitimate development can benefit from mature and innovative markets. The study evaluates them based on their share of technology market sales in gross domestic product.

Financial Support (FD). Recent scholars have outlined an important part of financial development: in any case, a sound financial system consistently synthesizes social capital, skillfully allocates a portion of social resources, social wealth and investment can be intentionally adjusted. Throughout this cycle, the structure of financial markets has been consistently optimized, with both trading volume and trading frequency steadily increasing. Currently, there is no standardization in the selection of financial development indicators. The study uses the scope, adequacy, and design of financial performance to measure it. In determining the scale of financial development, McKinnon recommended estimating the extent of financial transformation by dividing expanded M2 by estimated GDP. The size of the share between the two

develops in parallel with the size of financial development. In terms of inventories and streams, GoldSmith proposed decoupling all financial assets, termed GDP, to replicate the scale of financial development. The relationship between the two grows with the pace of financial affairs. To determine how much financial assets there are in each sector, the article selects the harmony between transactions and progress of financial institutions in each sector and substitutes them into the calculation recipe, China apparently with M2. It reminds us that we have reliable data of financial assets in different fields. Region is required.

HR, or human resources. The phrase "skilled human capital" refers to the specialized knowledge and abilities a person needs to carry out a certain task and takes into account the level of specialization of workers in a given nation or area. Through the deployment of competent human capital, the needs of the market can be satisfied and expanded in more alluring and cost-effective ways. During the period spent accumulating, the enhancement of its own work efficiency will also stimulate the enhancement of

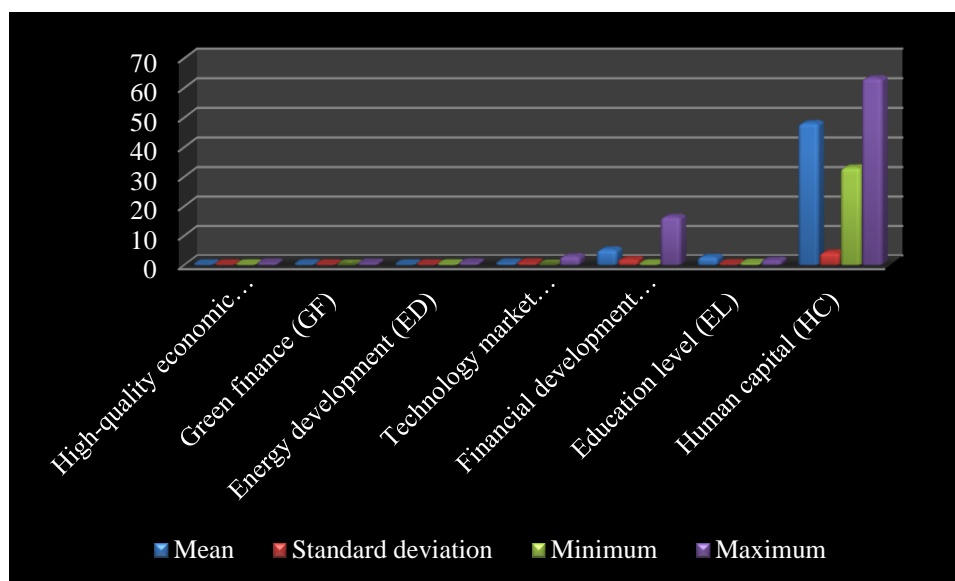
other creation variables' creation proficiency. The enhancement of the creation limit and specialized level is the foundation of autonomous advancement. When it comes to the transportation of trained human capital, employees with professional and specialized knowledge are the most useful entertainers. In addition to technology, they have abilities that were developed on the basis of this theory. Thus,

this article utilizes the rate at which schools and universities enlist understudies as an intermediary for skilled human resources notwithstanding the idea of skilled human resources and the straightforward entry to knowledge.

Descriptive statistics are performed as follows in Table 3.

**Table 3:** Variable descriptive statistics

Variable	Observed value	Mean	Standard deviation	Minimum	Maximum
High-quality economic development (HQED)	142	0.2564	0.2623	0.2543	0.7325
Green finance (GF)	142	0.3642	0.2552	0.0642	0.6422
Energy development (ED)	142	0.2442	0.2256	0.2782	0.7623
Technology market environment (TME)	142	0.7404	0.7572	0.0338	2.8984
Financial development (FD)	142	5.2230	1.7858	0.26422	16.3024
Education level (EL)	142	2.6822	0.3452	0.5566	1.5298
Human capital (HC)	142	48.0283	4.2289	33.0335	63.1846



**Figure 2:** Variable descriptive statistics



The data in Table 3 exhibits the significance of commonplace aberrations and the need for further discussion. The median worth of excellent monetary development is just 0.3675, and the most outrageous worth exceeds commonly the base worth. The top and most obviously terrible characteristics, with a standard deviation of 0.1714, are 0.8436 and 0.1634, individually. As far as top notch financial development, it is obvious that there is as yet a sizable uniqueness between the 11 metropolitan regions and locales that make up the Yangtze Stream Monetary Belt. Green money and energy development ordinarily have potential gains of 0.4751 and 0.3553, separately, showing that both of these areas normally have low degrees of development in the Yangtze Stream Financial Belt. While thinking about the thing is happening of each control variable simultaneously, it will in general be recognized that there are still huge holes in the general development of districts and metropolitan regions in the Yangtze Stream Financial Belt, as well as issues with imbalanced and lacking development.

## CONCLUSION

Green finance is a cutting-edge financial structure designed to support the environment and achieve sustainable asset usage. On the off chance that the market component of green finance is balanced, green finance will direct the development of assets and accomplish the board goals of natural gamble relief, the best distribution of environmental resources, and local area assets. Green finance has emerged as a global priority in the development of sustainable economic and financial systems. Every nation is concerned about environmental contamination and climatic variations. In this essay, green funding is addressed in-depth in an effort to demonstrate how important it is for a nation's development. A rise in Earth's surface temperature is causing a variety of problems. Researchers and environmental

experts concur that greenhouse gas releases are to blame. This study emphasized that promoting environmental conservation will significantly cut greenhouse gas emissions. The conclusion that follows is that by removing obstacles and increasing awareness among corporate residents about the need for more sustainable growth, India has a great deal of potential to offer the green foundation necessary for green finance. We believe that in the not-too-distant future, green money will be well-known across all social strata in the world. In addition to summarizing and investigating the exploration findings and advancing the shortcomings and opportunities of the examination as per the above precise examination, the purpose of this article is to provide a hypothetical foundation for the exploration and serve as a reference to the public authority's strategy description.

## FUTURE SCOPE

This investigation offers few compelling reasons, therefore it may very well be seen as a trailblazer in this field and might be taken into consideration for further study. Because the study area was only limited to the regions of Madhya Pradesh, Gujarat, Rajasthan, and New Delhi, the results may vary if additional research is conducted in other parts of India. Additionally, a similar research with different districts or states to uncover similarities and variances might be done.

- More information can be gathered to study the application of the inactive development model to forecast the evolution of the work. Future research may examine how well the development model predicts careers in various situations. Future research may focus on the results of the recommendations made by this investigation.
- There is scope for further investigation into the functional legitimacy of the

financial tools used in this research to focus on the green finance projects.

- Unfamiliar Trade Hedging Office can be researched in order to increase the influence of unfamiliar investments by lowering the cost of money hedging and so eliminating credit risk and liquidity risk. It may also be possible to activate and energize unfamiliar investments for green energy in India.

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