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GREEN FINANCE FOR RESILIENT FUTURE

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ABSTRACT

The changing global scenario of the 21st century calls for sustainable development as the growing environmental concerns have posed alarming concerns for the entire world. Therefore, it becomes imperative to adopt renewable and clean energy sources. But sustainable growth requires financing; therefore, Green Finance has become an essential part not only in environmental science but also in business to explore options for addressing its challenges and to make an attempt for greening the banking system, bond market and institutional investors. Green finance has become the core part of low carbon green growth because it combines the environment, financial industry and economic growth. The main aim of Green Finance is to attract investment in green projects, increase return on investment on such projects and discourage polluting investments.

The aim of this paper is to develop an overall clarity in terms of identification of both financial and energy sources that can potentially be considered as green and thereby assessing their impacts and the parameters such as renewable and clean energy sources projects such as: solar power projects, solar rooftop financing, wind power projects, Biomass power generation projects, Hydroelectric projects, other renewable and clean energy sources projects, energy saving equipments etc.

Keywords: Green Finance, Green Energy, Renewal Energy

INTRODUCTION

As per Green Finance Synthesis Report of the G20 Summit, Green Finance is termed as financing of investments that provide environmental benefits in the broader context of environmentally sustainable development. Green finance has become the core part of low carbon green growth because it combines the environment, financial industry and economic growth. The main aim of Green Finance is to attract investment in green projects, increase return on investment on such projects and discourage polluting investments.

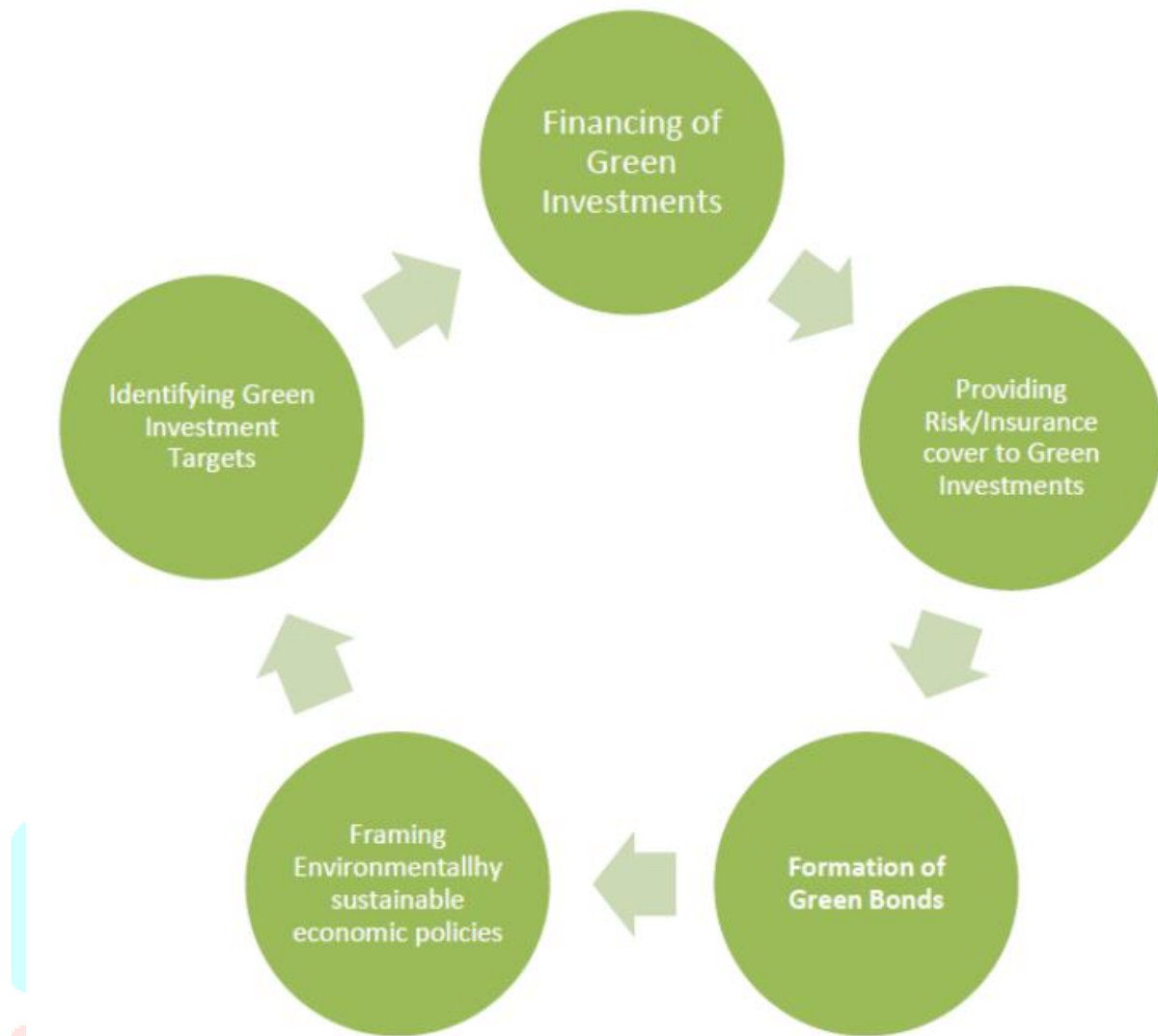


Figure 1.1 Green Financial System

Source: (Malhotra & Thakur, 2020)

Green Industry Areas

Before discussing Green Finance, it is of utmost importance to identify what can be termed as Green and what are the Green Investment Targets or what are the areas that require Green Financing.

Areas which are generally recognized as 'Green' comprise renewable energy generation, storage and distribution, pollution prevention, energy efficiency, green transport, recycling, water conservation and forestation. These Alternative Sources of Energy are discussed as follows:

Renewable Energy

Energy procured from sources that are inexhaustible, or is naturally replenished with time is termed as Renewable Energy. It comprises solar, wind, hydroelectric, geothermal, biomass power, tidal energy.

Clean Energy

The energy procured from renewable sources that emit zero pollution when used; moreover energy conserved by energy efficiency measures is called Clean Energy.

Green Energy

The convergence of renewable and clean energy is known as Green Energy. This is the energy procured from energy sources which doesn't pollute the atmosphere when used. Ideally Green Energy comprises a zero emissions profile. Green energy is primarily a segment of renewable energy. It depicts sources of energy generation with the least environmental footprint – like wind, sunlight, water and heat. It also comprises low-impact energy sources like hydroelectric sources and particular forms of biomass. Along with transforming climate change, greener sources of energy are inexpensive as compared to those devised using fossil-fuels. For instance, wide ranging wind energy and solar energy– which have significantly reduced its cost over the last decade and are affordable now as compared to energy generated by conventional sources like coal in over 50% areas across the world. Green energy does not generate any carbon emissions as compared to energy derived from fossil-fuels; it greatly enhances the air quality that we breathe in, the water resources, and preserves most of our valuable natural resources.

Renewable Energy Technologies

Wind Energy

Energy that uses airflow by way of wind turbines for generating electricity is termed as Wind Energy.

Solar Photovoltaic

It is a system of producing electricity by transforming solar radiation to direct current using semiconductors that demonstrate photovoltaic effect. Photovoltaic electricity generation utilizes solar panels made up of various solar cells that contain photovoltaic material.

Solar Rooftop PV Systems

Solar panels are stationed on residential, institutional or commercial building's rooftop. These panels trap the light emitted by sun and transform it to electrical energy. This arrangement is called solar rooftop photo-voltaic system. It generates clean energy, implying that it would not pollute the environment.

Concentrated Solar Power

This technology uses lenses for concentrating or focusing sunlight upon a confined area and then transforms it to heat for creating steam for operating a turbine for producing electricity.

Solar Thermal Applications

Various systems are developed by harnessing solar energy for domestic and industrial use for instance, heating space, water, agricultural drying, cooking, pumping and lighting etc.

Biomass Energy

This form of energy is produced by converting states of matter derived from biomass. It is the process whereby any organic or biotic matter inclusive of residues or waste from industries, forestry or agricultural industries and municipal sources are converted to energy.

Definition of Green Finance

The universally accepted definition of Green Finance is not available yet as this field is still evolving. However, some of the prominent definitions of Green Finance are as follows:

According to the Chartered Banker Institute, Green Finance can be defined as any process, financial initiative, product or service that is intended towards environmental protection or towards management of environmental impacts, investment and finance.

According to G20 Green Finance Study Group, Financing that would bestow environmental benefits for environmentally sustainable development would be termed as Green Finance.

According to Green Finance Initiative, investing in any means of reducing CO₂ emissions or increasing resource efficiency is termed as Green Finance. It comprises green crowd funding for small-scale, community schemes right up to green bond issuance for major infrastructure projects or corporate energy-efficiency schemes.

According to Organization for Economic Co-operation and Development (OECD), The finance needed for attaining economic growth and at the same time bringing down pollution levels and greenhouse gas emissions, reducing waste and enhancing efficiency in usage of natural resources is termed as Green Finance.

According to People's Bank of China, Green Finance policy pertains to a sequence of policies and institutional set-ups to encourage private investments for green businesses like energy conservation, environmental protection and clean energy by way of economic services that includes private equity funds, lending, shares, bonds and insurance.

According to Government of Germany, a deliberate method for incorporating the financial sector in the revolutionizing process for resource-efficient & low-carbon economies, and with reference to climate change adaptation is referred to as Green Finance.

According to European Banking Federation, Green finance comprises, but is not restricted to: (a) Environmental facets (greenhouse gas emissions, pollution, biodiversity, air or water quality issues) (b) Climate change-associated facets (renewable energy, energy efficiency, mitigation & prevention of climate change linked serious activities).

According to Malhotra & Thakur (2020), Funding the activities such as any commercial ventures, policy making, Risk/ insurance solutions, Bonds etc. having notably lesser detrimental impact than the current situation being accomplished or having a positive environmental impact can be called Green Finance.

Financing Options

Although the sources of financing options for renewable energy globally, are very few in numbers, these are described as follows:

Green Bonds

A green bond is a kind of fixed-income investment that is categorically allocated to raise funds for environmental and climate projects. These bonds are generally asset linked and sponsored by the granting body's balance sheet, so they generally bear the credit rating that is identical to their issuer's auxiliary debt obligations.

Green Funds

A mutual fund or other investment mechanism that would only invest in a company that is considered socially cognizant or directly stimulate environmental commitment is known as Green Funds. A green fund can be in the form of a concentrated investment mechanism for companies involved in environmental friendly business areas, for instance, renewable energy, green transport, waste and water management.

Green Credit

Any or all interests, rights, credits, benefits, entitlements, or allowances that arise from or is concerned with reducing greenhouse gases along with discretionary environmental endeavours, and any rights for creating, transferring, trading or assigning derivatives or other marketable instruments depending upon the reductions in greenhouse gas that would may or may not arise in future, and comprises renewable energy credits and energy efficiency credits that are issued in any country or state level scheme or any national or international agreement presently or in the coming time.

Green Finance in India

The following initiatives were undertaken in India for financing the renewable energy sector:

National Clean Energy and Environment Fund (NCEEF)

was created in the year 2010-11 through the finance bill for financing clean energy initiatives by imposing a cess called „Clean Environment Cess“, levied on the production or import of coal. However, this cess was diluted with the advent of GST Act, 2017.

Priority Sector Lending

Under RBI's programme, lending was intended to be granted to small renewable energy projects on priority basis. However, owing to the regulatory concerns, financing of the projects got delayed beyond the prescribed norms (CoPU 2017).

Green Bonds

The guidelines for issuing and listing Green Bonds were announced in the year 2015 by SEBI. In the aforementioned year, green bonds were issued for the first time in India, subsequently; SEBI issued the requisites for disclosure and listing of green bonds. However, Green bonds constitute only 0.7% of total bonds traded in financial market, i.e. in insignificant proportion with respect to the total bonds issuance (Ghosh, Nath, & Ranjan, 2021).

Green Banks

The idea of IREDA becoming the first green bank of India was conceptualized in the year 2016. However, the idea could not be brought into reality owing to lack of mainstreaming of these kinds of financial institutions and inability to provide financing for renewable energy projects at cheaper rates (Sarangi, 2018).

Renewable Purchase Obligations (RPO)

RPOs are defined under the Electricity Act, 2003 and National Tariff Policy, 2006. RPO is an obligation for the electricity distribution licensees to purchase a certain specified percentage of power via renewable sources of energy. But, as disclosed by the Ministry of Power, the compliance for RPO is very low across the nation (Mishra, 2020).

Renewable Energy Certificates (REC)

These are market based instruments that were introduced to facilitate RPO compliance. These are traded at the Power Exchange of India Ltd. and Indian Energy Exchange. The first trading took place in the year 2011.

Subsidy Programmes

The GoI, grants 30% subsidy in most of the states for solar rooftop installation to residential, institutional and social areas. In few special category states like Sikkim, Lakshadweep, Jammu & Kashmir and Uttarakhand, 70% of total installation cost is granted as subsidy for rooftop solar installation (Solar Subsidies, 2019). Despite all the efforts initiated for mobilizing the required finance for renewable energy sector with a portfolio of financing sources, there is lack of financing for renewable energy sector.

Challenges for Development of Green Projects

Existence of Various Risks

As most green energy technologies are new, there are several associated risks. From mechanical breakdowns of wind power generator gearboxes to breakages of the panels of photovoltaic projects, the potential losses can reach millions of dollars, with major damage interrupting projects and businesses. This is not the whole story, however, as other risks accompany these projects—especially the weather. Most green energy projects depend on the climate and sunlight. The unpredictability of the weather, such as clouds that reduce the sun's irradiation or changes in wind strength, can have a significant negative impact on energy production and affect the feasibility of these projects.

Low Rate of Return and Lack of Capacity among Market Players

Green technologies are often earlier in the development stage and less commercially viable than technologies in the fossil fuel field, many of which date back 100 years. This makes green technologies more expensive and riskier. A lack of access to conventional financing sources increases the debt cost (borrowing interest rate). New and expensive green technologies and access to expensive debt markets reduce the rate of return in green projects compared with fossil fuel projects. On the other hand, the majority of energy subsidies globally supports fossil fuels rather than the green sector.

REVIEW OF LITERATURE

Frimpong, Adeabah, Ofosu & Tenakwah (2020) told us about seven prominent green finance products of banks which are green loan/bonds, green investment, climate finance, green infrastructural bonds, green insurance, green securities, and carbon finance. Their study also identified 21 key determinants of green finance of banks with the 9 topmost determinants being: risks, banking sector regulations, bank size, environmental policies and climate change, internal practices and ethics, technology and innovation, religion, interest rates, social inclusion and social justice.

Wang & Zhi (2016) described that If the market mechanism of green finance is rational, green finance can guide the flow of funds and achieve effective management of environmental risk and optimal allocation of environmental resources and social resources. The effective regulation of policies will avoid the information asymmetry phenomenon and solve the moral hazard. The construction of environmental protection should consider setting up the mechanism of efficient green finance system coordinating the relationship between the ecology and finance.

Parvadavardini & Nagarajan (2016) emphasised that India today has the opportunity to grow in a manner that moderates the costs of the environmental degradation, and this, in turn, presents a vast range of opportunities for India's financial sector. Banks not only need to make direct investments in sustainable development, they also need to leverage their indirect control over the investment and management decisions to influence the business into fulfilling broader social and environmental goals. There is a plethora of opportunities in the area of environmentally responsible finance, which banks can profitably exploit.

Keerthi (2013) India's energy supply is not able to keep pace with the high economic growth rates in the country. This results in persistent power shortages and frequent power cuts. In order to minimize import dependency in the conventional energy sector, the Indian Government is increasingly focusing on strategies for enhancing energy efficiency and utilizing renewable sources. The main emphasis here is on MSMEs, because of their great importance for the Indian economy and in light of their huge potential for increases in efficiency. Energy efficiency in particular is often neglected by MSMEs due to limited access to technical know-how and appropriate financial products.

Jha & Bakhshi (2019) Considering the alarming increase in pollution level in India, it becomes imperative to tap the untapped potential of green Finance to finance green projects or investments. There is a need for blended finance which can reduce the overall cost of capital of private capital investors. The government of India should frame a clear green investment strategy focusing on long term, economy wide view. India should focus not only on domestic investors but also on foreign investors. The green finance instruments should be designed in such a manner that it should attract both local and international investors.

Sumit Kumar (2022) emphasise for Going forward, in the pursuit of creating and nurturing new market segments and product innovations, efforts to improve domestic institutional investor base, rating systems relevant for new products, building bench market yield curve, creating more risk-hedging instruments with deeper liquidity pools, including institutional and retail investors for green bonds, developing examinations and certifications for professionals involved in green bonds, information media, journals and publications devoted to green bonds markets, research studies and specialized courses on green bond markets, etc. will assume importance and significance in creating a strong and vibrant green bonds market in India.

Bhatnagar, Taneja and Özen (2022) To achieve net-zero emissions and other climate and environment-related objectives, considerable investments in decarbonisation and innovation across all sectors of the economy will be necessary. Greening the banking system is critical to facilitating these investments. Numerous nations are still in the early stages of greening their financial sector. Indeed, there is considerable consumer pressure as well. Requests for “green” financial goods are increasing in number, as are client refusals to invest in firms that do not meet the new sustainability standards. As a result, financial service providers are under increasing pressure from investors and rating agencies to develop suitable measures for sustainable management and behaviour and face new rivals that make sustainability a central pillar of their business cases.

OBJECTIVES

The objectives of this study are:

1. To evaluate whether Green Finance or investing in greener sources of energy contributes to the economic development of India from an environmental point of view.
2. To determine the underlying incentives of implementing green finance from the financing provider's perspective.
3. To ascertain public perception and their willingness to opt a greener energy/financial choice if provided in comparison to traditional options.
4. To assess the nature and direction of growth in jobs creation in the field of renewables.

RESEARCH METHODOLOGY

The research methodology that has been used for the research process of this paper is through retrieval and selection of secondary data from various relevant papers that outlines the meaning, importance and various instruments of green financing. And, also the status of green financing in India and its further scope.

RESULT AND DISCUSSION

1. Owing to financing the renewable energy sector by Indian government; it has resulted in significant decline of Carbon emissions. Needless to say the decline in carbon emission is good for the environment and human health, which is well established. With this fact established, it can be asserted that Green financing or in simple terms financing such projects will benefit environment as well as society in a sustainable way. Such financing is needed to be promoted separately in order to boost the sustainable development and requires more focus.
2. Given the results of Demand-Supply gap it suggests that there is enough market share in energy sector that can be grabbed by the renewables, not only the gap is huge but it is still increasing probably due to rapid urbanization in India, which further increases the demand for energy. Hence there are opportunities for financiers/investors if they invest in Green energy sector owing to huge demand that needs to be catered.
3. It can be deduced that perception among public about renewable systems is positive compared to the traditional sources and there is significant willingness among people to adapt to green energy resources, which can even be used to predict prospective customers.
4. Growth in jobs in the renewable sector is not exponential. But, there is significant growth in jobs owing to green finance in renewables sector

CONCLUSION

The study aims to streamline decision making related to financing the renewable energy projects or related projects to improve environmental sustainability. India has huge potential for renewable energy projects however in spite of having enormous potential, in solar, wind, biofuels, hydro, etc. India has not been able to tap the increasing number of such projects in sync with current needs and standards. India's energy consumption is 8.5 times higher as compared to energy generated by renewables. A new field of green finance has emerged in recent years to study, financing of renewables. The study is a modest attempt to understand the various aspects of Green financing and instruments related to it. A prime facet of this study aims to analyse the effect of various instruments of green finance in assessing a renewable project which would then give us an insight into, how these instruments can be beneficial to investors, policy-makers, financiers, economy and end users. This would go a long way in increasing the share of Renewable Energy and improve sustainable development in India. This research is very relevant for the developers operating in renewable energy sector, wind energy, solar PV, CSP market, financiers/investors interested in investing renewables, policy makers and companies providing services in these sectors. A clear understanding of Green finance, associated risks, benefits, and various impacts on economy, environment, customer's willingness and requirements, requirements of companies operating in these sectors will help in developing better green resources in India. It can also help policy makers in designing of policies related to development, use and sales/purchase of renewables which will eventually contribute to Indian economy and its development.

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