

Green Finance: A Roadmap To Green and Sustainable Economy

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The world is well known with the fact that we have a specific amount of non-renewable energy resources but still many of the Nations are dependent on those. In order to eliminate this dependency of non-renewable energy resources to those which can be a renewable source of energy, with this the topic of green finance comes into the play. Still the implications of green finance have major challenges ahead which include problems such as technological factors, storage factors and investment factors and so on. These challenges can be improvised not only with the help of Central governments but also with the help of private sector. Along with these challenges many papers are published with more optimized solutions by which all the factors can be mobilized from an economic perspective. This paper will try to clarify more about green finance and would be able to identify the upcoming pathways that could lead the Nations towards stronger sustainability. Here the importance of green finance products such as carbon financing, green bonds, sustainability loans etc. are also explained in terms of development of green finance that different nations are adopting in order to have sustainable economies. This paper mentions not only the current challenges but also so the current status of green finance along with the recent development of Asia - Pacific region.

Keywords: Non-Renewable Energy Sources, Green Finance, Sustainability, Carbon Accounting, Green Bonds

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Introduction

We, humans are in search of nations with the economies that can build a sustainable subway in terms of environmental stability where the greenhouses gases along with the non-renewable natural resources are playing a vital role in boosting up the industries but on the other hand causing handful of troubles as well. The investment companies are finding ways to shift themselves from the dependency of non-renewable natural resources to renewable natural resources, but the solutions are not sustainable enough that can be used in long run. The dependency on the Union/ Central governments is not enough, along with them the private sectors have to play a lead role in this play as the central government is not capable enough to urge with so much of resources that is required for the transformation into "green economy". Basically, the meaning of green finance is defined by the increase in the following financial levels –

- Banking activities
- Micro-financing
- Insurance
- Investment opportunities

These are expected from the general public, private sector and also from Not-for-profit Organizations in-order to have a sustainable development priority. In other words, managing of the environmental & social conditions through the mode of various opportunities that can help us to bring up a higher rate of return and could be environmental beneficial at the same time.

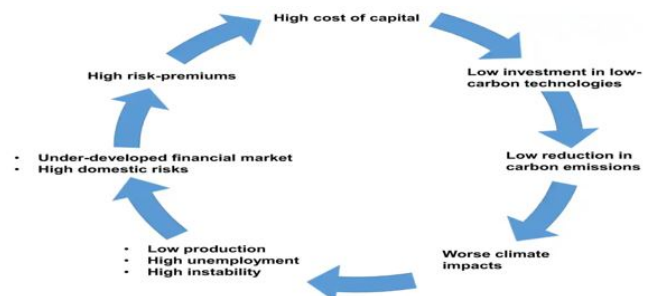
The challenge that we are facing cannot be solved within a short period of time. The process of having a society of green finance will take a long period of time and investment as well because the benefit of green finance cannot be recorded in sort period, this process takes time but will surely pay off. Different nations are adopting different methodologies and techniques to stablish green economy but still are facing issues, including the developed nations as well. Hence, this becomes a global challenge to have economic growth along with having a sustainable progress.

According to our findings and research we can derive at a conclusion that there are mainly 4 problems that is to be needed assessed

By each and every nation whether developed or not developed. If we are able to figure of the permanent solution to these questions than half of the challenged is solved as they can create a clear pathway in which the nations and their central government can march ahead.

The main challenges are as follows –

- **Technology Risk** - Green projects has high technology risk as we don't have that kind of or the level of technology in-order cope and eliminate this risk, ex- solar panels have issues with energy storage and weather dependency – this makes it difficult to evaluate the financial risk in these green projects.
- **Insufficient Information** - countries don't openly share their environmental performance so we have limited info regarding the success and failures of their green projects and plans. This makes it difficult to evaluate and analyse the price and manage the financial & environmental risk.
- **Maturity Mismatch** - many green projects only pay off in long terms but the financial system is majorly dominated by short- and medium-term investments thus resulting in maturity mismatch (as banks resources are based on the deposits that they receive from the surplus unit are used in short to medium term investments as the depositors wants their money back with 1-5 yrs. approx.
- **Lack of Policy Frameworks** - many policy & frameworks do not provide incentive to these banks and financial institutions in-order to invest in these kinds of green projects instead of this they provide subsidies in fossil fuels and other non- renewable natural resources.



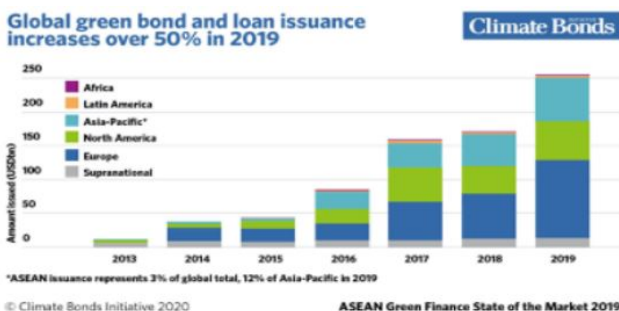
- One of the main and big problem of starting green projects is the investment needed. As mentioned in the challenges point, most of the individuals wants their invested money back within short or medium term but in the case of

- green projects it requires investment for long term because the results of green projects are estimated to be returned over a long period of time. For that investment made for long term are considered to be the best but such investment opportunities are very less, although insurance companies and pension funds can help in-order to invest as their hands are on medium - long-term investment unlike the banking system.

This research reviews the position of green finance over various countries and also provides a basic overview to governance of green finance initiatives and suggestion of alternatives ways to boost up the scale. This will also help to tackle up with the hinderance that we face while we analyse green finance.

Green finance is a subset of sustainable finance as sustainable itself means optimum utilization of natural resource so that the need of present generation can be fulfilled along with that saving of these kinds of resources can also be done. Green finance can be inaction only when we are able to manage our environmental risks, we have the ability to take up opportunities that have the capacity to give out environmental and social benefits and from that a decent rate of financial return can also be derived from it.

Some of such products are also available in the market such as Green Bonds, Green Banks, Carbon Financing, Community based Green Funds etc. such can be a very useful way in-order to promote "green finance".



Objective of the Research

1. This report has been prepared in-order to understand the conceptual areas of the green finance and projects and also to understand the current position of green finance of different nation's as of today's scenario.

2. To have an overview of how green operations are incorporated with the base of sustainability and productivity of non – renewable resources.

3. Understanding the various aspects and strategies different nations and their government are adopting in order to promote green finance and projects.

4. The evolution of green projects and how much it has affected the current environmental problems and as the concept is spreading widely the individuals are also very curious and excited to be a part of these green projects.

5. Showcasing the advantages of green finance in long term and the advantages of diversification in building and innovating new renewable source of resources.

Emergence: The concept of green finance is now everywhere but what made this concept emerge at the first place, what was the need of this concept. As we all are aware of the current environmental crises that are happening and among them the one which have major talks on is the challenge of 'Global Warming'. It is basically the process in which there is constant increase in heating of the Earth's climate system in long term. But the question is what does make the Earth's climate warmer & warmer and the answer to this question is the increase in the Emission on Green House Gases.

The emission of these Green House Gases makes the Earth's climate warmer. Greenhouse gases majorly includes Carbon dioxide (CO₂), Methane (CH₄), Nitrogen Oxide (N₂O) and burning of Fossil Fuels, these play a major role in the increase of Earth's temperature. But the problem does not end here, due to the constant increasing temperature of Earth's atmosphere the Glaciers are melting rapidly due to this the sea levels are also rising creating a big challenge for those countries who have coastal area boundaries which can result in floods in local areas and can also be the reason of the occurrence of tsunami.

In-order to prevent this from happening various meetings and conferences are also being held where different countries are invited and then these kinds of issues are addressed so that a common conclusion can also be obtained as this is a global issue where each and every country's contribution is really important. Meets like Global Earth Submit are held in-order to make everyone understand this

Upcoming challenge that have the capacity to disturb the environmental activities at a large phase.

If the high consumption of the fossil fuels continues over the nations then the trajectory of the Earth's climate can be devastated as it will lead to increase the temperature of the atmosphere by 4-5 degree Celsius. This change in the temperature can catastrophically hinder the production of food, human health and the whole biodiversity. The government of different nations has decided to keep the degree of Global Warming under 2-degree Celsius but still are not making adequate decisions to provide an environment where there can be low emission of carbon in the atmosphere (Sachs and Du Toit 2015). If we really need to cope up with this situation then we surely need to scale up the funding process as soon as possible as these investments will provide a lot of environmental benefits if we are planning to reach the sustainability goals with the help of new policy frameworks.

The growth of the sustainable society. It also includes various environmental objectives like Control of greenhouse gasses in industries, water disinfection and safeguard of biological diversity. Reduction and Conversion both are related to climate change activities. Reduction refers to avoidance of greenhouse gases emissions in the economic investment and Conversion means reducing the level of exposure of commodities in the effect of climate change. (Höhne / Khosla / Fekete / Gilbert (2012).

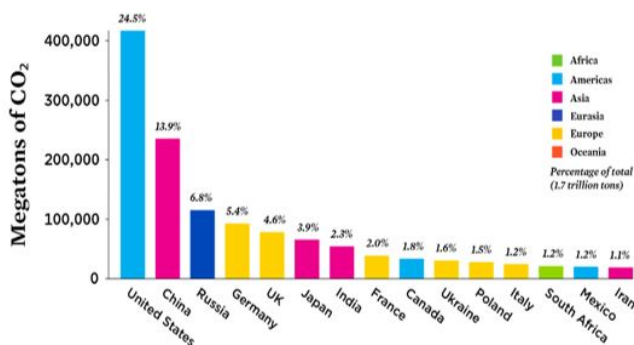
Sometimes, Green Finance can be used in exchange with green investment. It incorporates operational expenditures of green investments that are not included under the concept of green investment. For example, it would include costs such as project preparation and purchase of land, both of which are not only considerable but can also provide financing issues. (Zadek and Flynn (2013).

Green Finance includes any type of investment or loan that considers ecological impact and improve ecological sustainability. Sustainable investment and banking are the significant components of Green Finance. Investment decisions and lending decisions are taken on the foundation of environmental policy and risk management to fulfil environmental sustainability principles. (Böhnke / Eidt / Knierim / Richert / Röber / Volz (forthcoming).

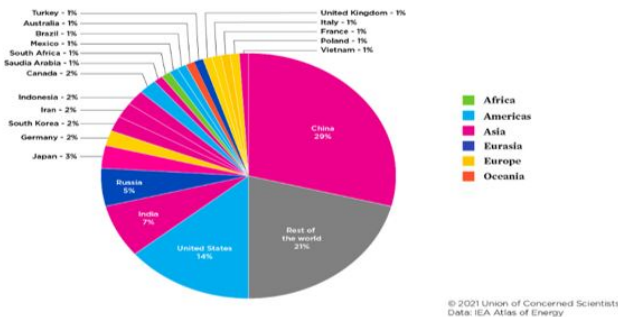
Green Finance is a term that merges the area of finance and banking with environmentally aware behaviour. Many people including individual and industry consumers, manufactures, investors, and financial lenders contribute in it. Green finance can take several forms depending on the participants, and it can be driven by economic rewards, a desire to protect the environment, or a mixture of the two. Research papers of green finance are currently focused on simple concepts and lacks in comprehensive study of green finance in terms of method research, market research, and other topics.

Green finance is a cutting-edge financial model aiming at environmental conservation and resource sustainability. Green finance can guide the flow of funds and achieve effective risk management and optimal allocation of environmental and social resources. Green Finance is a coordinate connection between ecology and finance. Through strong financing instruments, we may encourage the use of renewable energy to achieve environmental conservation. (Yao Wang, Qiang Zhi)

Top CO₂ Emitting Countries, 1750-2020
(from fossil fuels and cement)



Top Annual CO₂ Emitting countries, 2019
(from fossil fuels)



Literature Review

Green Finance means the economic investments which are made on advance sustainable projects, ecological products and regulations that promotes

Green finance is an important factor of low-carbon green economy because it combines the financial industry, environmental conservation and economic growth. Green finance is a market-based investment or loan scheme that takes environmental impact into account when calculating risk. Green investing aims to enhance human well-being and social justice while decreasing environmental hazards and improving environmental integrity by recognising the worth of the environment and its natural capital.

The backbone of green growth is green finance. India now has the chance to grow in a way that reduces the costs of environmental degradation which opens up a whole range of opportunities for the country's financial industry. India now has the chance to nurture in a way that reduces the costs of environmental degradation, which opens up a whole range of opportunities for the country's financial industry. (Parvadavardini Soundarrajan, Nagarajan Vivek).

Banks should not only engage direct investments in sustainable development, but they must also use their indirect power/authority over investment and administration decisions to encourage the business in the market broader in social and environmental objectives. (Hart and Ahuja 1996).

Green bonds will command a higher price. Green bonds are generally issued at a premium, with rates lower by several basis points, after controlling for a variety of fixed and time-varying factors. Green bond ownership will become highly serious, with a small group of investors owning them in higher size, especially when the par value is low or the bond is particularly low risk. (Malcolm Baker, Daniel Bergstresser, George Serafeim Jeffrey Wurgler).

Carbon finance in our country, the requirement and the possibility of developing it by commercial banks, as well as the hope of making it successful is full of risks because it is a new thing with many disadvantages. For example- shortage of experts as well as the restrictions of undeveloped secondary markets.

The following are some ideas for getting carbon money into commercial banks- Commercial banks must strengthen their carbon trading product service capability, operate as selling agents for CDM projects, and develop diverse business models to meet the needs of various projects. (ZOU Fan, YANG Hui, YU Li Qin)

Impact of Green Financing for Corporate Governance in Banking Industry-

Sustainability doesn't mean environment sustainability only, but financial sustainability also. The banking industry, which is the backbone of the economy's financial flow, has expressed concern about the environment in the past. Green finance is the most recent concept in the financial business, and it combines environmental and economic sustainability.

The banking industry is the engine that drives the economy's financial flow. As a result, banking governance is highly valued. Various researches have shown that the environmental practices show a positive impact on business by minimizing the environmental footprints. It helps to minimize the cost and boosts the organizational productivity. Environmental damage caused by commercial activities has become a global problem like global warming, acid rain, increasing greenhouse gases emissions etc.

According to the findings, the idea of green finance directly enhances the achievement of sustainable development goals. The banking industry promotes green financing through personal/consumer banking, wealth management and insurance. As a result, green finance is a positive thing for the banking industry, as it provides benefits to the investors. The scalability of green finance not only improves sustainable economy, but also has huge impact on banking governance. (Sajeewani Jayathilake)

Role of Central Bank in enhancing Green Finance-

The financial sector plays an important role in allocating resources towards green financial system and avoids financing activities that harm the environment due to the massive expenditures required to bring in the green evolution. The research examines how central banks can affect the investment decisions.

The responsibilities of the central bank are determined by the number of factors, including the financial system's structure and complexity, as well as the presence of other public and private institutions that may or may not be able to correct market failures and continuing to support green finance and investment. (Groepe 2016)

To encourage sustainable financing, central banks have a range of effective policy instruments. The study also stated that central banks should not be overburdened.

The division of work among governmental institutions is a major issue in this scenario. The central bank is just one of several public bodies that can affect green investment results (U volz 2017).

Current Status of Green Finance

- At the United Nations General Assembly on Sept 2021, the President of China Xi said that China would not build new coal-fired power plants overseas and would instead encourage the execution of low-carbon energy in emerging economies. In June 2021, at a conference in Cornwall, the G7 nations decided to stop subsidising the new coal-fired power plants in developing nations. China has agreed to maintain domestic funding for the concept of "clean coal," in-order to address domestic electricity shortages which were not caused by the shortage of coal generation capacity, but due to high prices of coal in the nation.

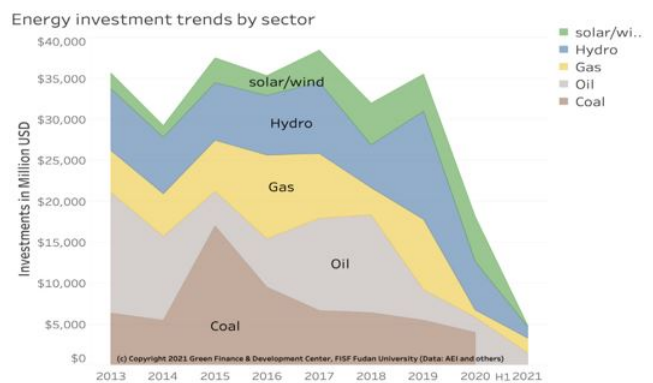
Finally, China and India later ensured that coal consumption rate would be reduced rather than eliminated in the final COP26 agreement.

- The G7's Build Back Better World (B3W) under US leadership in June 2021 and the European Union's Global Gateway in December 2021 (together with the UK's Clean Green Initiative) were amongst the new global development programmes launched in 2021. This is a positive as well as difficult development.
- The Green Belt and Road Partnership, which included 29 nations, was introduced in June 2021; the B3W's (Build Back Better World) emerged with main goals for global infrastructure development for green growth; and the Global Gateway also promises to mobilise funds for green, clean, and secure infrastructures.
- In the year 2021, biodiversity finance has played a vital role in politics, financial institutions, and in central banks. This is an urgently required improvement to green finance in order to address not only the climate change, but also the rapid loss of biodiversity and the resulting financial hazards.

The G7 nations committed in May that to conserve or protect at least 30 per cent of their respective countries land and at least 30 per cent of their (or preferably the entire world's) ocean by 2030.

- However, biodiversity loss is continuously increasing, and financial institutions risk measurement and reporting systems are still being developed. Action will have to be taken much more wisely in current year 2022.
- China have developed with global involvement policy that has been enhanced to include the Belt and Road Initiative (BRI). The President Xi has emphasised the BRI's importance on a number of occasions, including the Bo'Ao Forum in April 2021, where he has emphasised the role of the Belt and Road Initiative Green Development Coalition and the Green Investment Principles, and the Forum on China-Africa Cooperation (FOCAC) in November 2021, where he emphasised China's support for BRI countries. The BRI is also becoming more environmentally friendly. After introductory remarks by Minister of Environment Huang Runqiu, the BRIGC launched the implementation guide for the "Traffic Light System" for BRI projects in October 2021.

We saw no new coal-related finance or investment in 2021, despite a sharp drop in solar and wind investments.



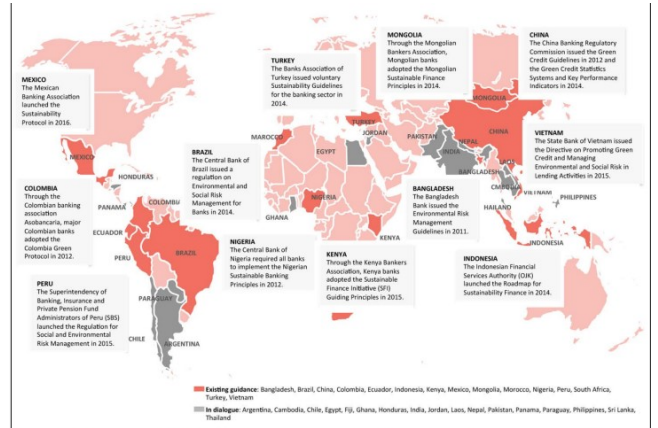
The number of nations that have signed a Memorandum of Understanding (MoU) with China to join the Belt and Road Initiative (BRI) as of December 2021 is 145.

The current status basically states that nations are moving forward towards green finance and trying to establish sustainability across their nations, trying to shift the dependency from non-renewable energy source to renewable energy source.

Products like Green Bonds, sustainability bonds, social bonds and also green and sustainability linked loans are also emerging. This process is being carried out with slow pace but yet crucial one, due to the challenges mentioned above it makes nations to decelerate the speed of green finance.

The graph below shows the growth in these products.

The issuance of green and sustainability bonds, those are the proceeds that will be exclusively applied to environmental and/or community projects and these are expected to jump off 24% to \$400 billion in the year 2020 from a previous record of \$323 billion that was achieved last year.



Source: Created with information from the Sustainable Banking Network website (December 2017), http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/company-resources/sustainable-finance/sbn

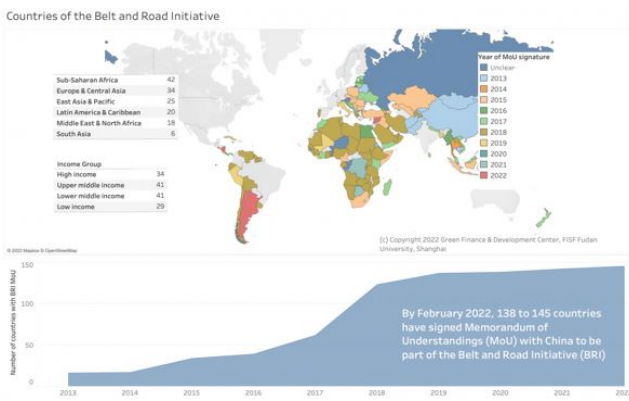
Development of Green Finance in Asia

With the reference of having a circular economy, resources always play a vital role. Thus, having a sustainable finance or green finance itself has a wider role to play here in the matter of poverty reduction. (Asif Iqbal, Joint Director, Sustainable Finance Department at Bangladesh Bank, the country's central bank)

In the recent years we have seen Bangladesh who is a low-income generating country when compared to different nations and this they are embracing themselves to move towards having sustainable financing – and is also a member of IFC-facilitated Sustainable Banking Network.

According to the world bank estimations the impact of COVID-19 has the capability of pushing 40-60 million peoples into the trap of poverty. So, in these kinds of scenarios having a sustainable finance becomes more important in-order to help such economies to push through and re-build the state of poverty. (senior IFC Officer)

Once there was a stage at which the low-income generating nations of the Asia and Pacific were being adversely affected by COVID-19, it's all the more vital for countries to embrace sustainable financial development to build resilience for the future. (Nena Stoilkovic, IFC's Vice President for Asia and Pacific)



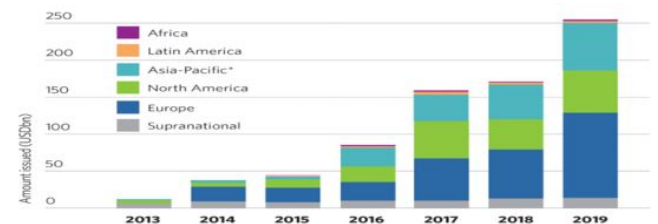
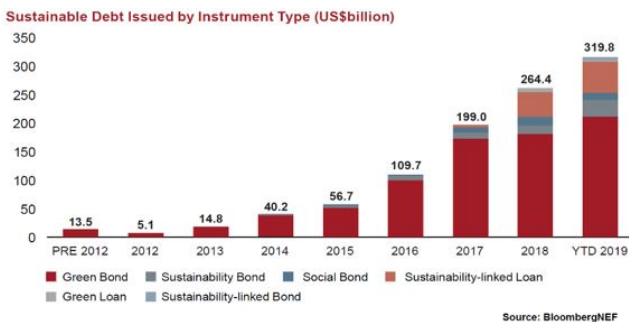
In the graph we can see that there has been tremendous growth in green bonds.

Green bonds are the bonds whose revenues are invested in cost-effectively friendly projects.

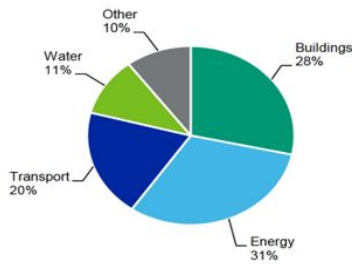
Bonds that are externally approved as green have the biggest market and shareholding effects.

Using a simple framework that includes assets with non - financial value we analyse pricing and ownership patterns in the US corporate municipal green bond markets.

Green municipal bonds are issued at a discount to otherwise comparable regular bonds, as expected.



Energy and buildings continue to dominate green bond use of proceeds
Percent of 2019 global green bond issuance



Sources: Moody's Investors Service, Climate Bonds Initiative

According to the study of "Necessary Ambition: How Low-Income Countries Are Adopting Sustainable Finance to Address Poverty, Climate Change, and Other Urgent Challenges" – this majorly focuses on 11 low income generating countries and how efficiently they are performing in-order to promote green finance and sustainability. The 11 countries include - Bangladesh, Cambodia, Mongolia, Lao People's Democratic Republic, Nepal, and Pakistan. And the report says that Bangladesh, Nepal, and Mongolia also are showing a strong momentum for green finance, keeping pace with more mature financial markets.

Financial Authorities to different nations of Asia such as India, Japan, Indonesia, China, Mongolia, Singapore, Vietnam etc., such countries have started taking various financial initiative from which the progress of green finance can be boosted up. Now, nations are trying to be at the forefront in terms of green finance and related initiatives. Many of such nations have also successfully established a Sustainable Banking System.

India had started focusing on green finance way back in 2007 itself, in the month of Dec 2007 the central bank issued a notice regarding CSR (Corporate Social Responsibility) for sustainable development. It also included the issue regarding the environmental problems and the increase of global warming. In 2008, a committee was formed by the name of National Action Plan on Climate Change (NAPCC) with a vision and mission in-order to out-line the broad policy framework so that the problems of environment and global warming issues can be handled (Jain 2020). In May, 2017 the SEBI (Security & Exchange Board of India) issued a set of guidelines for the issuance of Green Bonds and also specified the disclosure requirement.

According our research and analysis the china has taken up the lead in the area of Asia-Pacific

As various companies are accounted for approx. 33% of merger and acquisitions activities in the year 2020. Not only this, China has taken a global lead in having 20% accountable of having sustainable deal making activities and then followed by US – 9% and then India and Italy – 7%. So as of now the China has emerged up with a pioneer in the area of green finance and China has the largest market for Green Bonds.

Russia, the largest country by land area have also emerged up with different green projects and have shown its contribution towards environment. The Russian Government has come up with different idea with the motive of reducing CO2 and NOx emission and to increase energy efficiency with the use of modern technologies and having optimal utilization of natural resources. Dependency will be on renewable energy source and restoring the biodiversity. They have divided their green projects into 8 distinct industry groups, these include – waste management, energy, construction, manufacturing, transportation and industrial machinery, water supply and discharge, agriculture, natural landscape (rivers, water bodies, biodiversity).

Conclusion and Recommendations

The assessment that we carried out in this research paper clearly signifies that the major challenge of establishing a green economy is the source of funding. The challenge is largely entangled with the nature of financial markets we have across the nations because generally, people love to invest in short terms which is not credible for establishing any green project. As the number of risks also arises with the green projects and for that various efforts are being taken up by the central governments in-order to reduce the level of risk and support innovative funding's ideas (like green bonds, carbon financing etc.) along with innovative technological upgrades.

In-order to improvise the technological risk, investments are needed in the field of searching and developing new and innovative green products and technologies and the central government along with central banks should plan how they can invest in green projects through small and medium-term investments as well. Not only technological risk

Impurification is needed along with that the challenge of insufficient information should also be handled. The government and companies should give full disclosure about their green project and how much beneficial it has been since its establishment. It will not only be able to lower the financial risk barrier but also will be able to figure out what are the mistakes that are been done so others can avoid this and could improvise even more. We have different platforms that help us & to guide us – GREEN FINANCE PLATFORM – it has a global network of different countries, organizations and experts as well.

Recommendations can also be made to the government regarding the policy framework. The central government, central banks, financial institution and experts should act together and should make various arrangements in-order to develop reliable green financial policy frameworks. It is the duty of the government to spread awareness among the individuals regarding green finance and its applications. This research paper was examined and evaluated with in-depth knowledge and is totally based on research finding. Therefore, it has been made clear that the effect of having green projects across different regions have been started up with the support of government and private sectors.

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