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Genealogy and Implementation of Green Finance in Asia and Indonesia

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Abstract.
Green finance continues to be developed in the ways with the international community's agreed-realized sustainable development program. Therefore, through this article, we aim to trace genealogy and implementation of green finance in Asia, especially Indonesia, focused on: (a) providing a conceptual and practical explanation of green finance in Asia and Indonesia; (b) describing mechanisms and challenges faced by Asia and Indonesia in implementing green finance programs; and (c) examining strategic policies in Asia and Indonesia to enhance the involvement of institutional investors and private investments in green projects. The research method used in this study is library research. Through library research, relevant references were searched, studied, analyzed, and reflected upon as research findings. The literature sources include textbooks, journals, and other sources related to green finance. The research findings indicate that: (a) The signing of the Paris Agreement in 2015 impacted 196 countries legally bound and committed to including green development as a strategic policy of their respective countries; (b) The lack of clear mechanisms to realize green finance programs is a major challenge for countries in Asia and Indonesia; (c) To date, there are still few countries with binding policies for involving investors in green projects.

Keywords: sustainable development, green finance, green investment

1. Introduction

Economic development which is only focused on maximizing profits is slowly being abandoned along with progress, development and public awareness. Concepts such as environmental finance and sustainable finance have received wide recognition and importance in protecting the environment and promoting sustainable development [1][2]. When discussing green transmission finance mechanisms, studies conducted in developed countries often adopt a market-oriented approach and emphasize the development of market dynamics [3]. These studies highlight the role of investor-provided financing and the exercise of shareholder voting rights, directly influencing corporate decision-making and driving green finance growth. However, in contrast to the situation in Asia, green financing is in most cases controlled by government departments and related financial institutions that are entrusted with accelerating the implementation of a green economy through policies [4]. In addition to exploring transmission mechanisms and developing green finance, there are urgent challenges that need to be addressed such as: (i) Build a framework for building a green finance system, evaluated of the level of developing green finance program; (ii) enhancing the framework for a green financial system; (iii) implementing incentive policiesIn addition, all of the countries–even rich and poor countries–must be engaged in careful planning to maximize the potential for green finance, that estimated to reach 40 Trillion Dollar between in 2012 to 2030 [5].

The green finance includes a administrative mechanisms variety that require financial institutions for engaging in researched and development for support pollution treatment facilities, and participate to ecological protected and restoration. According to Volz [6] this has an impact on extreme climate change and requires an immediate reduction in carbon emissions. There is an urgent need increased investment in green worth to resilient climate facilities across on region. The ADBI assesses of infrastructure gap at US$8 trillion between 2010 and 2020, with 68% of it earmarked for new capacity. specifically, 51% of the investment for electricity facility, roads reach 29%, and 13% telecommunications program. Even in the Asian context, infrastructure investment needs are projected to reach 6.5 trillion USD from 2015 to 2020 [6]. In region of Southeast Asia, in 2015 investation to anticipates an annual need of 110 billion USD to build infrastructure investment supply power, transportion, information infrastructure, technology communication, clean water and sanitation [7].

Based on the above, we excited to explore development and implementation green finance programe in Asia and Indonesia, tracing its genealogy and current practice. It focuses on three main themes: (i) Conceptual and Practical Understanding of Green Finance in Asia and Indonesia. This article provides a conceptual of green finance and examines practically in Asia and Indonesia. This includes an analysis of various instrument of financial and sustainable investments, along with regulatory frameworks that support green finance growth in the region; (ii) Mechanisms and Challenges in Implementing Green Finance in Asia and Indonesia. This article describes the mechanisms used to implement green finance programs in Asia and Indonesia. It explores the role played by governments, financial institutions and the private sector in promoting investment and financing for green projects. In addition, highlighting the obstraction faced for implementing green finance, such as lack of awareness and understanding of the concept, the need for adequate financial capacity, and effective coordination between stakeholders; and (iii) strategic policies in Asia and Indonesia to increase involvement of institutional and private investors in green projects. This article examines the strategic policies implemented at regional and national levels in Asia and Indonesia to encourage the involvement of institutional and private investors in financing green projects. These policies can include fiscal incentives, regulatory frameworks, collaborative initiatives and other actions aimed at encouraging sustainable investment. By explored these issue, our article describe a holistic understanding of the green finance movement in Asia and Indonesia. This report also highlights the strategic challenges and policies that need addressed accelerated the change towards a sustainable economic.

2. Literature Review

The thing not easy to define green finance because it involves issues that are too big in the field of financing which includes technology, industry and environmentally oriented business financing. Moreover, this issue will also be related to environmentally friendly financial products and services. Eco-friendly financing recognizes the importance of the environment and natural resources which aims to improve human welfare and social justice while mitigating environmental risks and promoting sustainability ecologies. It recognizes the value of investing in environmentally responsible projects and initiatives.

According to Höhne [8], green finance is the term of refers to financial investments flowed by into sustainable development projects also initiatives, environmental products, and policies that promote sustainable economic development. According to Volz et al [6] green financing as any form investationand loan that considers environmental aspects to improve environmental sustainability. A study from (PWC) [9], regarding the application of green finance in China defines it a financial instrument and services for incorporate environmental factors to making credit decisions. It aims to drive emergence responsibilies investation environment and encourage development of environmentally friendly technologies for industrial business projects. Green financing aims increase flow of financial resources start to public, private and non-profit sectors to priorities of sustainable development [10]. That important of green finance a part is better managing ecologycal and social risks, seizing opportunities that provide reasonable environmental benefits and providing greater accountability [10]. Green finance be able to promoted the transtition in the policy framework, alignment financial incentives, increasing green finance from multisector, adjusted finance public sector decisions in the environmental dimension for the sustainable development goals, increased investment for green and environmentally friendly technologies, finance for sustainability resource based green economy and smart blue climate, increased used green bonds, and many more [10].

According to PWC [9] green finance is defined as the overall support of the financial services industry in sustainable development projects that consider economic growth, social welfare and environmental ecosystems. Green finance of the following: (i) creating superior and environmentally sound industrial, social and economic; (ii) encouraging an increase in environmentally friendly investment prioritizing a low carbon economy; (iii) encouraging multi-sectoral eco-friendly investments in the economy; and (iv) Supporting Indonesia's development principles as outlined in the National Medium-Term Development Plan (RPJM), namely 4P (pro-growth, pro-jobs, pro-poor, and pro-environment) [11] [12]. To see more clearly about the green finance framework, it can be seen in Figure 1, as follows:

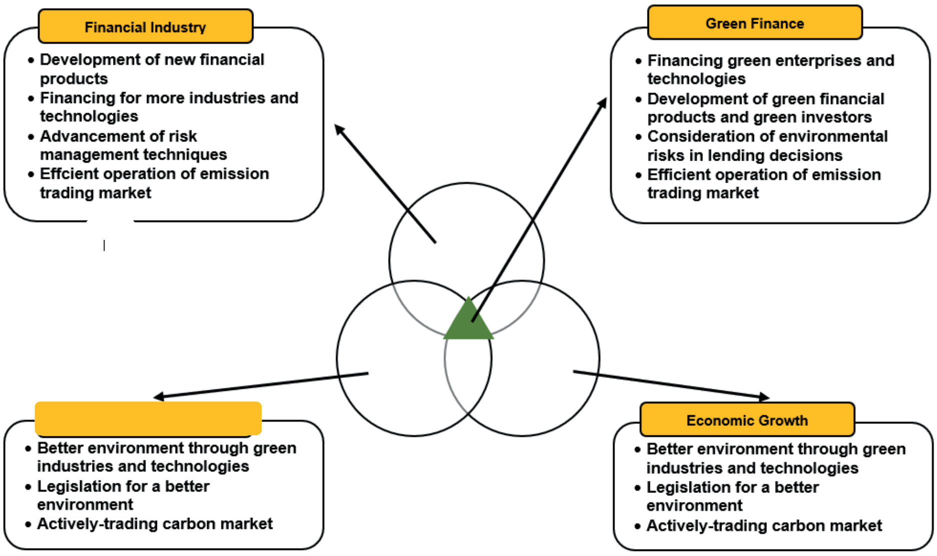

Figure 1: The Green Finance Interface. Source: Financial Strategy to Accelerate innovation for green Growth [13].

3. Method

This research is a literature study conducted by collecting various sources of information and relevant data to explain the research focus. the data sources we collect include scientific publications, government documents, books and various other types of information sources [14][15]. The research process that we carry out begins with identifying the research topic or subject of discussion. Next, we conducted a search through various sources to be evaluated, identifying the information needed regarding theories, concepts, and factual conditions. until the next step we analyze to find novelty and arrange articles [14] [15] [16].

4. Result and Discussion

4.1. Genealogy of green finance in asia and indonesia

Environmentally friendly financing refers to products, services and financial investments aimed at supporting the success of sustainable development [3], [17][17]. This was born as a response to the awareness to increase environmental sustainability. Historically, green finance began with a social movement demanding that industry be responsible for environmental pollution in the early 1970s. The increasingly massive movement led to the establishment of the UN conference in Stockholm in 1972. The movement then re-emerged after Brundtland wrote an article entitled "Our Common Future" which was later published in 1987 by the World Commission for Environment and Development. In the report, development Sustainability is defined as development that is capable of meeting current needs without damaging the environment for future generations [18].

In 1990s the environmental movement has become an international issue. From that year, the concept of corporate social responsibility (CSR) was born as compensation for environmental degradation due to industrial activities. Not much different from the progress previous period, the early 2000s became a historic moment because for the first time, world governments took real action by making an agreement to reduce global warming through the 2005 Kyoto protocol in Japan. This conference produced a clear framework for member countries in targeting greenhouse gas reduction and establishing a global carbon trading mechanism. To support this cooperation, in the 2000s until around 2010, a discourse was formed to provide incentives to countries that were serious about fighting global warming through green finance. Since this time the term green finance has also become known, although it has not received special attention. until 2015, the discourse began to be realized after the paris agreement. This includes the mechanisms and instruments put in place to channel capital for the purpose of environmentally friendly business projects. some of the goals of green finance are to transition to a low-carbon economy, increase renewable energy campaigns, reduce excessive energy use, and create an environmentally friendly life. for more details regarding green finance transformation, as follows:

1. In 2007 the International Finance Corporation (IFC) issued green bonds to finance climate change projects. these efforts were successful and can be seen from the increasing participation of financial institutions in environmental projects [19].
2. The discourse on sustainable investment that integrates environmental, social and governance (ESG) as a consideration for investment decisions is starting to become

a trend. Where investors already have awareness that the economic sustainability is more prospective than the conventional economy [19]

3. The existence of policy support has a major impact on the success of the green finance program. Through this policy, the government has binding legal force for all people to be involved in environmentally friendly projects in the form of incentives, subsidies and other beneficial programs.
4. The provision of international incentives also has a big impact because in addition to awareness of the environment, procuring funds is also very necessary in fighting environmental change, especially for developing countries.
5. Financial institutions such as banks have a big influence because they can control creditors to apply environmentally friendly concepts in the projects they work on.

4.2. Mechanisms and challenges faced by asia and indonesia in implementing green finance programs

The success of the green finance program certainly requires the right mechanism and requires the involvement of all elements, both government, private companies and financial institutions. Based on a literature review, we found that there are at least mechanisms that can be used. First, using the green bond mechanism. According to Setyowati [20] the amount of funds from the sale of green bonds can help realize environmentally friendly projects. Second, through the green loan mechanism by allocating funds to entrepreneurs for sustainable development by providing various conveniences such as low interest rates. Green loans can be provided by banks or other financial institutions following principles such as the Green Loan Principles.

Third, sustainable investment funds are obtained by pooling investments from various investors to be allocated to investment portfolios that focus on companies that are committed to environmental, social and governance (ESG). Sustainable investment funds can invest in sectors that contribute to protecting the environment or improving the quality of life, such as renewable energy, clean technology or water management. Fourth, eco-friendly financial institutions specifically focus on financing sustainable projects and investing in financial instruments that support environmental goals. These institutions offer services such as renewable energy project financing, green loans, or sustainable credit. Finally, government incentives and policies can promote green financing through various measures. This could include tax breaks or incentives for sustainable investment, subsidies for green technologies, regulations that support environmental reporting and transparency, and regulations that take environmental risks into account in investment decisions. Through this mechanism, green finance aims to encourage more investors into sustainable projects, accelerate the transition to realizing a zero carbon economy, and address related challenges.

Despite having mechanisms in place in the financial system, in practice it still faces several weaknesses and failures that hinder its ability to effectively respond to environmental and climate risks and take advantage of sustainable investment opportunities. These limitations pose challenges to the financial sustainability of projects, companies, industries, individual lenders and investors, and even entire financial sectors. According to Volz [19] some of the main issues are: (i) There is a general lack of awareness and understanding within the financial industry regarding the potential threats posed by environmental and climate risks to project viability, business operations and financial stability. Many stakeholders fail to recognize the long-term nature of these risks and their potential to cause significant disruption. This limited awareness hinders proactive action to integration environmental risk in the financial decision-making. (ii) There is a shortage of financial industry professionals who have the necessary expertise to assess and manage environmental and climate risk. The lack of staff trained in this area makes it difficult to carry out robust risk assessments and implement effective risk management strategies. Similarly, there is a dearth of experienced professionals in green lending or sustainable project financing, such as in the renewable energy sector. This skill gap increases transaction costs and reduces the attractiveness of green loans over conventional financing. (iii) Availability of bankable and investable projects that are in line with sustainability goals remains a significant challenge. Inadequate investment opportunities in the green sector impede the flow of capital towards sustainable projects. This problem is closely related to the obstacles that the real economy faces, such as regulatory constraints, inadequate infrastructure, and policy gaps, which impede the development of sustainable projects and industries. (iv) The absence of mandatory environmental risk analysis makes lenders and investors reluctant to incorporate these considerations into their decision-making processes. Fear of missing out on lucrative opportunities or of being at a disadvantage can discourage early adopters of sustainable finance practices. Mandatory disclosure frameworks and standard reporting can improve transparency and comparability, enabling financial stakeholders to make more informed decisions.

Addressing this challenge requires a collaborative effort from regulators, financial institutions, policy makers and other stakeholders. Strengthening awareness, building capacity, creating an enabling policy environment, and encouraging the development of bankable sustainable projects are important steps to increased the financial ability to respond to the environment and climate risks while taking advantage of sustainable investment opportunities.

Based on our findings, banks and companies alike are interested in investing in green projects. However, both banks and companies are worried about not getting competitive rates. This is because environmentally friendly projects tend to require a high investment value but with a low rate of return and a long time. Therefore, neither banks nor companies make environmentally friendly projects a priority (1. although according to Volz (18), the bank considers that green finance has a prospective business. However, the lack of interest from creditors to build environmentally friendly projects has made banks also not prioritize promoting green loans as customers. According to Volz (6) the lack of interest is because on the one hand companies are interested, but on the other hand they still consider environmental projects to be less profitable strategically because there are still many business activities that can still be expanded.

On the other hand, Volz [21] also revealed that the lack of knowledge on the part of both banks and companies is one of the biggest obstacles to the success of environmentally friendly projects. For example, Volz [21]found that many bank staff have not mastered environmental risk analysis in green finance. So they are not able to see the potential that can be obtained in green financing. This reason is what causes the Bank to seem to avoid financing for green projects. This describes need for a strategic step as an effort to increase the capacity of banks as facilitators and to be more involved in environmentally friendly projects and investments. According to Volz

it is first necessary to provide a clear definition of green finance. This will greatly assist companies and banks in expanding their business.

Many companies are not interested in taking credit to invest in natural resources that do not provide profitability for their business continuity. This shows that both banks and companies need guarantees and incentives to engage in sustainable projects. This opinion was also expressed by Volz [21]the lack of interest in banks to provide credit for environmentally friendly projects unless regulations force it. on the other hand, companies are worried that they will lose the moment to gain profits if they invest in environmentally friendly projects, unless they are forced through binding regulations. According to Volz [21] in the context of regulation it is necessary and accompanied by a consistent and conducive environment-friendly investment framework, not a series of incoherent policies and regulations as is currently the case.

4.3. Strategic policies in asia and indonesia in increasing the involvement of institutional and private investors investing in green projects

Asian countries already have guidelines and regulations on sustainable finance. Among the 21 countries in Asia that represent green banking, also have various regulatory instruments and introduce environmental and inclusive risk management such as Bangladesh, China, India, India, Mongolia, and Vietnam. Meanwhile, Laos, Nepal, Pakistan, the Philippines and Thailand are also working on developing green policies. while Bangladesh and China in particular, have now become pioneers in realizing green finance [6], for further details can be seen in Table 1 below:

China has made various efforts to solve environmental problems which began in 1995 through the Announcement on Credit Policy for Environmental Protection [6]. Entering 2012, the China Banking Regulatory Commission (CBRC) seriously began socializing the Green Credit guidelines with the hope of campaigning for the green banking sector. this rule was formed with the aim of providing incentives to banking institutions in China to enhance campaigns on green credit, make credit structure adjustments, mitigate environmental and social risks, strengthen their contribution to the real economy, and facilitate growth and economic structure [6]

The issuance of the Guidelines for Green Credit reflects that China has made environmental impact an instrument in making economic policies. Because, with this issuance, China's banking sector is to provide priority on green projects. Of course CBRC seeks to direct green finance to contribute more to China's development. Mainstreaming green credit fits in with China's broader sustainability goals and its commitment to confronting environmental degradation. Moreover, the guidelines also show that China is improving the banking sector through mitigating environmental and social risks. integrating environmental and social risk management into credit practices, directly encouraging banks to assess and address potential risks associated with lending activities. According to Lv et al [22] the approach taken by China is an attempt to minimize bank losses and maintain long-term Chinese economic stability.

In addition, the Green Credit Guidelines also aim to facilitate China's economic transition towards a more sustainable and inclusive economy. Through the integration of environmentally oriented credit structures, this can indirectly encourage banks to support green industries and projects. This approach aims to contribute to the transformation of China's economic growth model, promoting a more sustainable and balanced development path. As a result of green credit policies, China has transformed

Table 1: Green Finance Policy in Asia and Indonesia.

Country	Year	Policy
China	2007 2008 2012 2014 2015	China Banking Regulatory Commission (CBRC), People's Bank of China (PBOC), Ministry of Environmental Protection (MEP): Green Credit Policy ("Opinions on Enforcing Policies and Regulations on Environmental Protection to Prevent Credit Risk"); MEP and China Insurance Regulatory Commission: Green Insurance Policy ('Guiding Opinions on Environmental Pollution Liability Insurance' China Securities Regulatory Commission (CSRC) and MEP: Green Securities Policy ('Guidance Opinions on Strengthening the Oversight of Public Companies' China CBRC: Green Credit Guidelines CBRC: Green Credit Monitoring & Evaluation mechanism and Key Performance Indicators Checklist launched PBRC: Green Finance Task Force PBOC: Green Financial Bond Directive and Green Bond-Endorsed Project Catalogue for bonds issued by financial institutions and corporations National Development and Reform Commission (NDRC): Guidelines for enterprise and municipality bonds PBOC: Green Finance Committee
Bangladesh	2008 2011 2015 2016	Bangladesh Bank: Circular on 'Mainstreaming Corporate Social Responsibility in Banks and Financial Institutions in Bangladesh' Bangladesh Bank: 'Policy Guidelines for Green Banking' and 'Guidelines on Environmental Risk Management' Bangladesh Bank: Updated Guidelines on Environmental and Social Risk Management (ESRM) for Banks and Financial Institutions (draft in consultation) Bangladesh Bank: 'Integrated Risk Management Guidelines for Financial Institutions'
Indonesia	2014 2017 2018	Indonesia OJK: Roadmap for Sustainable Finance in Indonesia 2015-2019. Financial Services Authority (OJK) Regulation No. 51/POJK.03/2017 concerning the Application of the Principles of Sustainable Development for Financial Services Institutions and Issuers Government Regulation No. 99 of 2018 concerning Management of Environmental Funds
Mongolia	2014	Bank of Mongolia & Mongolia Banking Association: Mongolia Sustainable Finance Principles and 4 Sector Guidelines
Vietnam	2015	Vietnam State Bank of Vietnam: Directive on Promoting Green Credit and Managing Environmental and Social Risks and 10-sector checklists
India	2016	India Securities and Exchange Board of India (SEBI): Disclosure requirements for issuance and listing of Green Bonds

Source: Report and Fostering Green Finance for Sustainable Development in Asia [6]

from an initial principle-based approach to standardized performance appraisal metrics established by all legal banks [23].

Meanwhile, in 2014 the People's Bank of China established a Green Finance Task Force, which developed 14 recommendations covering information disclosure and flow, legal framework, fiscal incentives, and institutional design [24]. The Green Finance Task Force was succeeded by the Green Finance Committee, appointed by the People's Bank of China, to develop green finance practices, including environmental disclosure, environmental stress testing for the banking sector, and guidelines for greening China's overseas investments. In December 2015, the People's Bank of China published the Green Financial Bond Directive and the Green Bond-Endorsed Project Catalogue for bonds issued by financial institutions and corporations. Simultaneously, the National Development and Reform Commission (NDRC) issued guidelines for enterprise and municipality bonds, marking the first government-sponsored green bond guidelines globally. China considers the development of a green bond market as a crucial means of mobilizing private capital for sustainable development. Furthermore, China has actively promoted the concept of green finance on a global scale. In January 2016, during China's G20 Presidency, the Green Finance Study Group was launched, co-chaired by China and the United Kingdom [24].

5. Conslusion

Environmental deforestation can cause uncontrolled climate change due to exploitation of natural resources. In dealing with this problem, there is awareness at the international level to develop a control mechanism that can bridge the gap between business interests and environmental protection through the conception of green finance. The development of campaigns to achieve environmental balance began in the 1980s and continues to grow today. The Paris Agreement in 2015 became an important milestone in efforts to preserve the environment through green finance, in that all of the countries in the world are responsibility to participate. Solutions that can be used to overcome these problems are to create strong regulations, provide tax incentives, and integrate all stakeholders to increase investment in green projects. specifically in Indonesia the issuance of Financial Services Authority Regulation (OJK) No. 51/POJK.03/2017 concerning the Application of the Principles of Sustainable Development for Financial Services of Institutions and Issuers or Government Regulation No. 99 of 2018 concerning Management of Environmental Funds. However, further steps are still needed to strengthen the green finance mechanism, including in terms of developing sustainable finance, better ESG reporting standards, and stronger government support. Raised awareness and concerted action by all parties will help create a sustainable investment climate and drive the shift to a greener and more sustainable economy.

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