
Green digital finance as a way of boosting sustainable development: case of Asia pacific region

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Abstract:

This research aimed to highlight the importance of green digital finance as a way of supporting sustainable development by focusing on Asia Pacific area. The research concluded that green digital finance could be a vital support of sustainable development in the area in question. It contains very good digital services that can contribute in promoting green digital finance, by encouraging a big part population in the world to participate in financing green infrastructures, if they intensify their usage of digital payment, and then the banking system in the region can use their money to finance green development.

Keywords: green finance; financial technology; sustainable development; digital green finance; Asian Pacific area

Jel Classification Codes: G21, P34, Q1, R51.

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1. Introduction :

Many countries have found that green finance is among the main ways of boosting green development and, subsequently, sustainable development. In addition, many international organizations, countries and institutions are increasingly planning to support green development since it is the main trend to protect resources and promote them.

In this context, the international organizations are trying to boost all the countries of the world to adopt a green strategy in their national plans while many countries, in turn, are encouraging their institutions to take care of the strategies aiming to support green development through several ways such as: legislation, green taxes, fiscal exoneration...etc.

So that became issues related to climate risk and global warming occupies an important place in politics of the nation around the world in hope of finding a way to reduce their negative impact on global development. We can make a number of changes in our digital lives to reduce our environmental impact in this area (The European Green digital Coalition, 2023, p. 2).

It refers that a part of financial resources should be allocated to finance renewable energy projects and green infrastructures. For these reasons, many tools like: green loans and green bonds and so on are exclusively oriented to finance projects aiming to protect the environment and stimulate its resources.

As financial technologies become from a day to another a vital crane of economic growth and development all over the world, it is coming to be imperative to use it in order to link green development directly with the financial sector by adopting what it is known currently "green digital finance".

This notion takes a growing place in many regions in the world and especially in Asian -Pacific region since it contains the most growing economies in the planet and the greatest percentage of people in the world is located in the area, the most important country among them is "China".

1.1. Study question:

As the study tries to highlight green digital finance, especially in Asia Pacific area, the main question of the study has been shaped as follows:

How does green digital finance support sustainable development in Asia Pacific region?

1.2. Hypothesis:

Green digital finance may be a critical way of boosting sustainable development since it facilitates the inclusion of the biggest part of people in green infrastructure finance especially in Asia Pacific region owing to the fact that the most important part of the world's population lives in this region.

1.3. The Objectives of the study:

The main objectives of this research are:

- Highlighting the notion of green finance, financial Technology "fintech", and green digital finance.
- Highlighting the characteristics of Asia pacific region in terms of green digital finance.
- Proving that Asian pacific region could be the most capable area in the world to promote green digital finance.

1.4. The importance of the study:

The importance of the study is related to the fact that it gathers between financial technologies and green finance in the world's most populous area.

1.5. Methodology:

The research used descriptive and analytical method, The descriptive in order to highlight green finance, financial technology, green digital finance and highlighting some characteristics of Asian pacific region in terms of its ability to promote green digital finance. The analytical method has been adopted to provide some conclusions about the relationship that exists between green finance and financial technologies and sustainable development, especially in the area in question so as to prove that this area is able to be a vital crane to promote green digital finance.

2.Green digital finance:

2.1.Green digital financeconcept:

Green finance is an approach to manage money in order to generate economic profits and maintain environmental protection. It accentuates financing or investing in projects that yield economic benefits while promoting a sustainable environment (United Nations Environement, 2018, p. 05).

In addition, the notion of sustainable digital finance refers to financing and the related institutional and market arrangements, that promote technological ecosystems. This model is principally based on mobile payments platforms, crowd-funding, peer-to-peer lending, finance-related big data artificial intelligence, machine learning, block chain, digital tokens, and the internet of things , to contribute to the fulfilment of strong sustainable balanced and inclusive growth, by directly and indirectly supporting the targets fixed in the sustainable development objectives (Ryan K & Simon J D, 2019, p. 05).

Also, it's critical to mention that this new financial model does not have a unified definition of green finance, but the main concepts provides three categories of green digital finance. The first category is environmental finance(Salazar J, 1998, p. 5).

Which considers the practical problems of environmental protection, pollution control, resource protection, and other green projects by providing financial services. The second view is about financial innovation, through various financial instruments and products(Xiangyu, Yuanxi, & Guohua, 2022, p. 06).

The third category highlights this concept as a form of finance, which promotes environmentally friendly investment and cultivates an ecoconscious society through green-oriented credit, securities, insurance and investment, and carbon finance (Xiangyu, Yuanxi, & Guohua, 2022, p. 06).

Finally, the benefits of digital finance are various. They contain greater financial inclusion, expansion of formal financial services to non-financial sectors, the provision of reasonable, appropriate and confident banking services to poor individuals in developing countries, supporting gross domestic product (GDP) and contributing in macroeconomic stability...etc. (Hidajat & Dwi, 2022, p. 56)

2.2 Importance of green digital finance:

Green digital finance has the potential to escalate compliance with the Paris Agreement on Climate Change and the sustainable development goals by tackling existing barriers. The Paris Agreement is the biggest binding agreement on climate change and establishes a global action plan to limit global warming(BBVA, 2022).And among the advantages of this type of finance according to (BBVA, 2022): "they help to address the information asymmetry between investors and the real economy by offering data in real time at the level of assets". She also mentions that they enable change to be monitored: "For example, tracking issues of an asset automatically".

3. Green finance and financial technology:

Green digital finance is considered one of the mechanisms for achieving sustainable development goals, as it aims to enhance the environmental dimension and finance environmentally friendly projects, aimed at protecting the environment, mitigating the effects of climate change, and making more efficient use of resources, by exploiting financial technology techniques and promoting the new financial innovation and creativity imposed by new technological developments, which improves the performance of services on the one hand, and contributes, on the other hand, to providing the necessary needs for future generations in a rational and fair manner.

3.1.The concept of financial technology:

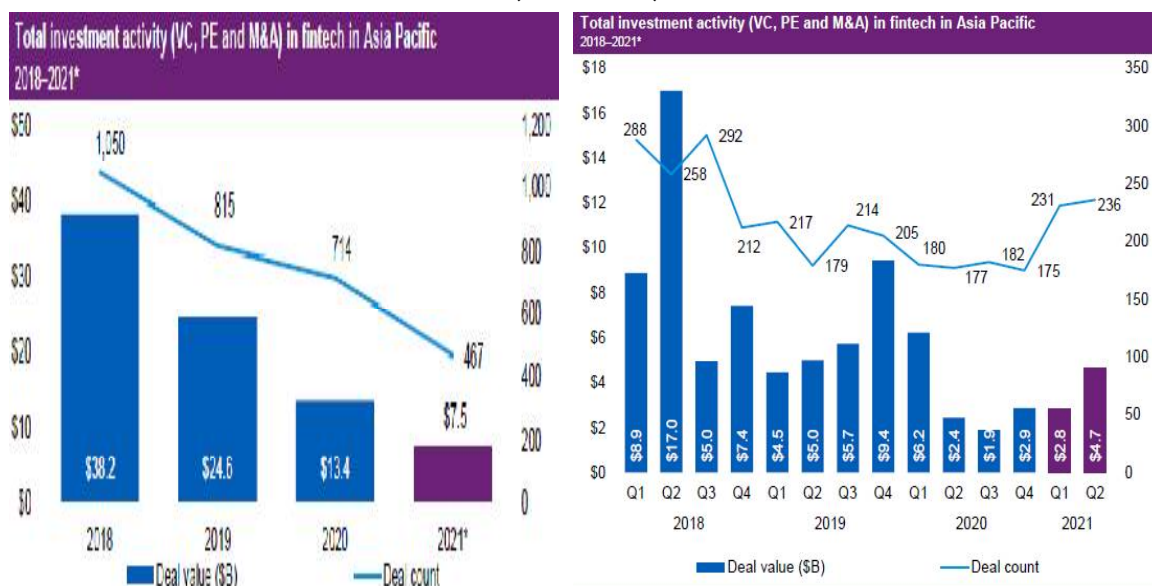
In fact, such trend makes researchers all over the world take increasingly care about this concept in their academic researches, In general, the term digital finance is used to involve a wide range of new financial products, financial businesses, finance-related software, and new forms of digitally allowing customer communication and interaction. While, there is no unanimously accepted definition of the term "fintech", it is commonly understood as a technologically allowing enhancing financial innovation that

gives rise to new business models, applications, processes and products, which may have a material impact on financial markets and institutions and the provision of financial services (United Nations Environement, 2018, p. 13).

In fact, Fintech in its original applications encompasses technologies used and applied in the financial services sector, essentially used by financial institutions themselves on the back end of their businesses, but its applications have expanded to represent technologies used in traditional financial services, including mobile payments, money transfers, loans, fundraising, and asset management (Nassiry, 2018, p. 2).

Where total fintech investment (mergers and acquisitions, venture capital, private equity) in the Asia-Pacific region witnessed a strong recovery in the first half of 2021, after declining to \$4.7 billion through 357 deals in the second half of 2020, The first half of 2021 will witness an investment of \$7.5 billion through 467 deals(KPMG, 2021, pp. 34-36).

Fig N° 1: The volume of investment in financial technology in Asian countries (2018-2021)



Source : KPMG : Pulse of Fintech H1'21;P 34 et 36 ; 2021 ; available on :

<https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/08/pulse-of-fintech-h1.pdf>

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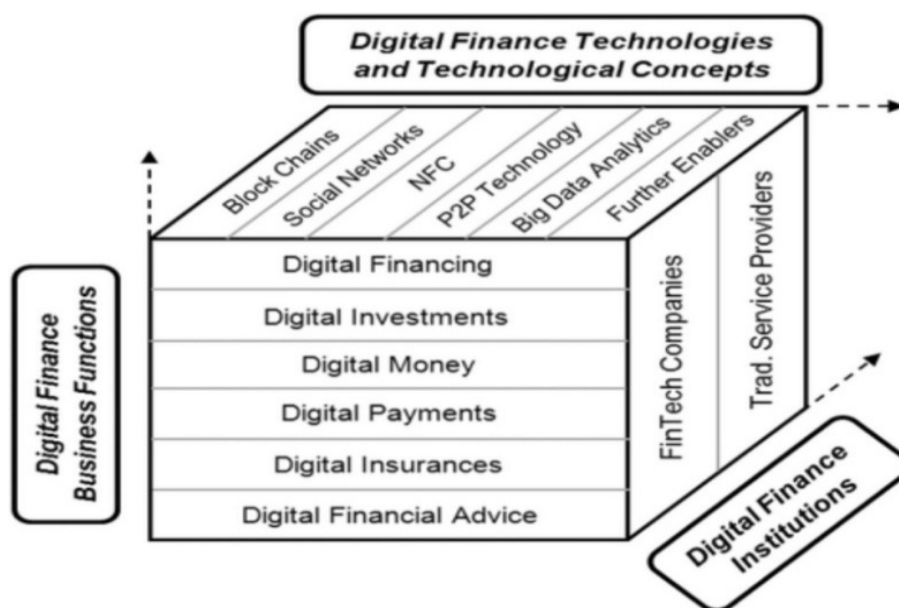
3.2. Technological requirements for green finance:

It is very important to notice that adopting a green digital finance is related to a right way of using some technological technics such as:

- **Big data:** that means it is very critical to collect large amounts of increasingly complex data from several internal and external sources, unlocking opportunities for real time business insights (United Nations Environement, 2018, p. 13).

- **Machine learning and artificial intelligence:** This technology refers to familiarity with the principles of algorithms and the use of advanced computer techniques in order to process and analyze huge amounts of data, with the aim of developing methods to automate decisions, which increases decision-making capabilities (United Nations Environment, 2018, p. 13).
- **Mobile technology:** Modern applications on mobile phones have facilitated access to a wide range of goods and services, as well as facilitating payment and storage procedures for mobile currency without the need for a traditional bank account (United Nations Environment, 2018, p. 13).
- **Advances in web-based financing applications:** Financing applications available on the Internet allow the provision of fast services between various parties, such as peer-to-peer (P2P) platforms that facilitate the process of transferring funds directly electronically between two parties, as well as investment crowdfunding platforms that allow raising funds to finance a project or venture (United Nations Environment, 2018, p. 13).
- **Distributed ledger technology or blockchain:** Blockchain technology allows a trusted transaction database to be distributed across large peer-to-peer networks, making it fundamentally secure, immutable, and using cryptocurrency and transparent stock transactions and records (United Nations Environment, 2018, p. 13).
- **Internet of Things:** using low-cost connected sensors and AI to deliver machine learning that automates discoveries and enables 'intelligent' computers capable to master remotely machines and advices (United Nations Environment, 2018, p. 14).

FigN° 2 :Digital Finance and Fintech



Source: Research Gate, Online documentation, Available on: https://www.researchgate.net/figure/The-Digital-Finance-Cube-and-its-dimensions_fig1_314036928, Consulted on 10 August 2022.

4. Green finance products and services

Until a few years ago, most traditional banks did not practice “green” banking or actively seek investment opportunities in environmentally-friendly sectors or businesses. Only recently have “green” financial products and services become more prevalent; and not only among smaller alternative and cooperative banks, but also among diversified financial service providers, asset management firms and insurance companies. Although these companies may differ with regard to their stated motivations for increasing environmental products (e.g. to enhance long-term growth prospects, or sustainability principles on which a firm is based), the growth, variation and innovation behind such developments indicate that we are in the midst of a promising drive towards “green” financial product development into mainstream banking (North American Task Force (NATF), 2007, p. 10).

Green finance products and services worldwide cover public and private financial sectors such as retail banking, corporate banking, investments, asset management and insurance as will be explained below (North American Task Force (NATF), 2007, p. 15).

4.1 Retail banking services:

Retail banking services related to green finance include the following:

- **Green Mortgages/Green Home Loans:** These are highly discounted loans that help incentivize households to purchase or install residential renewable energy, green housing that has water and energy efficient technologies, or invest in retrofits. Green mortgages can also cover the cost of converting a home from traditional to green (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 6);
- **Green commercial building loans:** It is an attractive loan for green commercial buildings, characterized by lower energy and resource consumption (15-25%), lower waste and green building materials, lower operating expenses, improved performance and longer life associated with green functions and features, and less pollution than traditional buildings (North American Task Force (NATF), 2007, p. 20);
- **Green car and fleet loans:** Green car loans encourage the purchase of vehicles that demonstrate high fuel efficiency through low greenhouse gas intensity and/or high fuel efficiency ratings; while enhancing pollution control. The number of these products has increased in recent years, and most of them are offered in Australia and Europe. Most green car loans are offered by credit unions, such as **mecu33** (North American Task Force (NATF), 2007, p. 20);
- **Green cards:** debit and credit cards linked to environmental sustainability activities. Green credit cards from large credit card companies offer to make donations to environmental NGOs equal to

approximately half a percent of every purchase, balance transfer or cash advance by the cardholder(NATF), 2007, p. 23).

4.2 Investment and corporate banking services:

Investment and corporate banking services related to green finance are as follows:

- **Green bonds:** These are fixed-income bonds that finance investments with environmental or climate-related benefits. Green bonds are considered an integral part of “green finance” more generally, which aims to “internalize environmental externalities and adjust risk perceptions” in order to increase environmentally friendly investments. Green bonds can also serve as a hedge against environmentally related financial risks, although in this case additional information is needed about the sensitivity of various bonds to these risks, beyond just the quality of “green” itself (Torsten & Frank, 2017, pp. 89-90);
- **Green securitization bonds:** financial investment in a variety of emerging innovative environmental securitization technologies, including forest bonds; ecosystem securitization programmes; land and aquatic animal securitization bonds, etc (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 06);
- **Green venture capital and private equity:** The capital and financing base for environmental projects through specialized private equity units focused on clean energy growth markets and green investment opportunities is sustainability (clean technologies, low carbon approaches, smart city etc.) (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 06);
- **Green indicators:** indicators that fluctuate as emerging future environmental opportunities and challenges (a series of indicators based on individual industries, including carbon reduction technologies, water and waste, biodiversity, ecological footprint, solar energy, ethanol, renewable energy, resources and natural gas) (EPSC Strategic Notes, 2017, p. 04).

4.3 Asset management:

- **Green financial funds:** Exemption from paying capital gains tax with a discount on income tax provided to citizens who buy shares in a green fund or invest money in a green bank. Hence, investors can accept a lower interest rate on their investments, while banks can provide green loans at a lower cost to finance environmental projects (North American Task Force (NATF), 2007, p. 20);
- **Green investment funds:** These are sustainable investment funds developed for three generations. First generation funds use only exceptional social and environmental standards; While second generation funds use positive criteria that focus on progressive social and environmental policies and practices; Third Generation Funds use exclusionary and positive criteria to evaluate and select potential green

investments, focusing on relative performance in a sector using best-in-class approaches (EPSC Strategic Notes, 2017, p. 5);

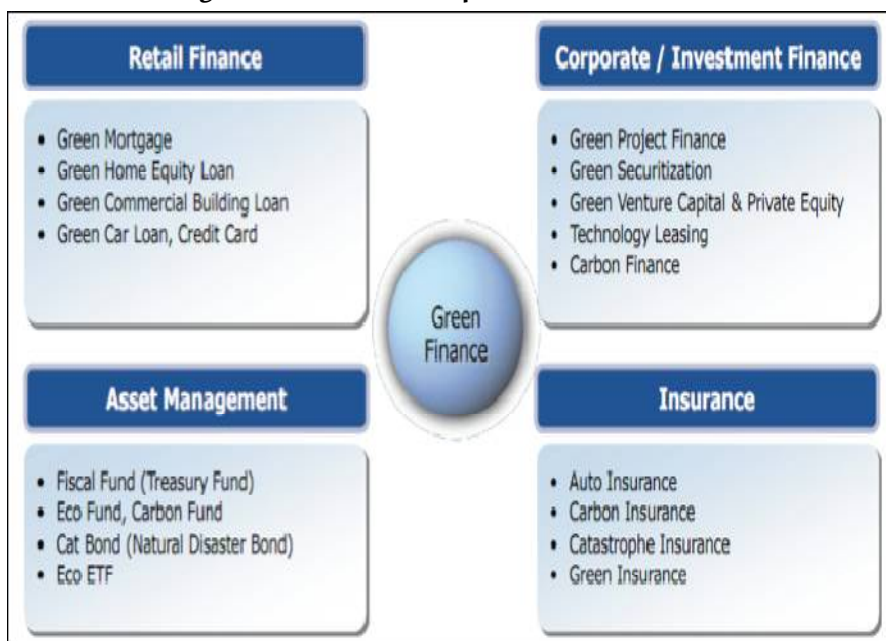
- **Carbon Funds:** A variety of carbon funds to help finance projects that reduce greenhouse gas emissions to reduce climate change. The Carbon Fund, as a collective investment scheme, receives money from investors to purchase carbon dioxide emission reduction credits (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 7);

4.4 Insurance:

- **Green insurance:** This type of insurance usually includes two product areas: the first is (insurance products that differentiate insurance premiums based on environmental characteristics (environmental risk assessment, environmental auditing and management in all aspects). The second is insurance specifically designed for clean technology and emission reduction activities (green industry insurance, green nanotechnology insurance, green car insurance, energy efficiency building insurance, carbon offset schemes etc.) (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 7);
- **Carbon insurance:** These are insurance products provided by a financial institution to manage carbon credit price fluctuations (The environmental division of the Hong Kong Institution of Engineers, 2017, p. 7).

In general, we can summarize green finance products and services through the following figure:

Fig N° 4 :Green finance products and services



Source:(United Nations Economic Social Commission, p. 02)

5.Sustainable development and green finance:

5.1 The concept of sustainable development:

Sustainable development is based on the responsible use of natural resources by current generations in order to ensure a stable need for future generations. It is an economic development responsible for preserving the natural sustainability system without negatively affecting the total resources available for the use of future generations (Mammeri, 2020/2021, p. 13).

In 2018, the G20 Sustainable Finance Study Group stressed the need to expand consideration of aspects of green finance in order to create opportunities for growth and development that are in line with the concept of sustainable development (such as job creation, growth promotion, and technological development) in addition to environmental aspects (United Nations Environment, 2018, p. 14).

Starting from this point, Sustainable finance can largely be understood as finance that seeks to achieve strong, sustainable, balanced and inclusive growth. It can do this by supporting the Sustainable Development Goals. The 194 member states of the United Nations General Assembly in 2015 adopted a set of common goals to reduce poverty, protect the planet, and ensure prosperity around the world (United Nations Environment, 2018, p. 14).

5.2 Implications of fintech for sustainable finance

Financial technology “fintech” is emerging as a major disruptor of every aspect of today’s financial system. Fintech seeks to offer an alternative to established, centralised services, through disintermediation, using new technologies, including mobile and digital technologies (EPSC Strategic Notes, 2017, p. 15).

Moreover, Sustainable development specialists have emphasized that financial technology, especially block chain technology, has a role in embodying a group of sustainable development applications as a result of its continued development during the same time frame.

The United Nations Environment Program (UNEP 2016) has identified more than twenty distinct applications of financial technology for sustainable development at several levels of implementation, including four applications in energy: pay-as-you-go resource facilities; Flexible energy supply and demand, peer-to-peer renewable energy, and community distributed generation (Nassiry, 2018, p. 4).

6. Green digital finance to support sustainable development goals in the Asia-Pacific region:

Asia pacific region currently is increasingly moving to a wide adoption of strategies aiming to support green finance and fitnech in the hope of limiting the negative effects of global warming and promote sustainable resources.

6.1. Digital architecture in the Asia-Pacific region:

The existence of digital infrastructure is a precondition for sustainable digital finance. Asia-Pacific have some of the most well-connected digital markets in the world. There are 2.7 billion mobile

subscribers, around two thirds of the region's population, which indicates the potential market size (Ryan K & Simon J D, 2019, p. 13).

Several Asian countries are at the top of the fintech adoption index, where China's 69% adoption rate, India ranks second with an adoption rate of 52%, while Hong Kong comes third with about 32% and South Korea and Singapore stand together at 23%. Moreover, Asia-Pacific boasts the highest levels of e-commerce in the world (Ryan K & Simon J D, 2019, p. 13).

In this context, "The Accenture Asian FinTech Innovation Lab was launched in Hong Kong with eight start-ups and institutional support from foreign banks such as: Bank of America, Bank of China (Hong Kong), Barclays, Credit Suisse and UBS. In Singapore, the Monetary Authority of Singapore launched an initiative called the Fintech and Information Group, and pledged to spend US\$225 million in the fintech sector over the next five years" (United Nations Environment, 2018, p. 17).

On the other hand, it is important to point out that Asia-Pacific is quickly migrating to higher speed mobile networks, with 4G taking over and 5G expected to gain a significant position in the region by the end of the decade. GSMA estimate that 5G connections would touch 675 million users in Asia-Pacific region, with more than half of the global total for 5G. This development lays a vital foundation for the rapid spread of IoT and its promised advancements in the automated monitoring of green assets (Ryan K & Simon J D, 2019, p. 13).

6.2. The importance of thematic bonds in achieving sustainable development goals in Asia Pacific region:

We can define thematic bonds as debt securities issued by governments and private sector entities on the condition that the funds raised are used to finance projects that have a clear social and environmental impact. Thematic bonds are similar to fixed-income syndicated bonds, offering predictable returns to investors in the form of a fixed coupon in exchange for medium- and long-term financing. There are different types of bonds available under the thematic bond banner, including green bonds, social bonds, sustainability bonds and SDGs (Economic and Social Council, 2021, p. 2).

There are different types of bonds available under the banner of objective bonds, which are as follows: Green bonds; Social bonds; Sustainability bonds and sustainable development goals.

We can provide some examples of the types of thematic bonds made by some countries in the Asia-Pacific region:

- In 2020, the government of Thailand issued sustainability bonds, and through this process it was able to raise \$988 million, a third of which was used to strengthen the health sector and support vulnerable groups, while the rest it was allocated to finance climate adaptation and mitigation projects (Economic and Social Council, 2021, p. 2);
- Examples of green bonds issued in the region in recent years include sovereign green bonds in Fiji and sovereign green sukuk (Islamic bonds) in Indonesia. In 2017, Fiji's sovereign green bonds raised \$46.5 million and were the first bonds of their kind issued by a developing country. In contrast, sovereign green Islamic bonds in Indonesia raised \$1.25 billion in 2018, the first of its kind in the world.

Sovereign bonds are intended exclusively to finance efforts to address climate change in a Sharia-compliant manner. Proceeds fund projects in the areas of renewable energy, energy efficiency, sustainable transportation, waste-to-energy, waste management, as well as climate resilience in vulnerable areas (Economic and Social Council, 2021, p. 3).

There has been a significant increase in the issuance of thematic bonds in recent years (see figure below), and several governments have used them to finance policy measures needed to address this problem.

Fig N° 04 :Thematic bond issuance in Asia pacific region



Source:(Economic and Social Council, 2021, p. 4)

While the list of green bond issuances in Asia-Pacific is expanding, technical capabilities across countries remain uneven, and the full potential of the market remains untapped. The data shows that in 2020, the governments of China, Japan and the Republic of Korea accounted for nearly 80 percent of green bonds issued, followed by Indonesia, Thailand and Singapore. Globally, green bonds still represent only 2 percent of the total bond market, indicating that there is significant room for them to grow and bridge the financing gap to respond to climate change and support the Sustainable Development Goals.

6.3.The Global Green Finance Index (GGFI) in Asia pacific region:

This is the eleventh edition of the Global Green Finance Index GGFI 11(see the upcoming table)(GGFI11, 2023, p. 47). The GGFI is a factor assessment index, based on a range of instrumental factors, quantitative measures, and a worldwide survey of finance professionals' assessments on the quality and depth of green finance offerings in financial centers(GGFI11, 2023, p. 47).

TableN° 1.Top 15 Asia/Pacific Centers In GGFI 11

Centre	GGFI 11		GGFI 10		Change in Rank	Change in Rating
	Rank	Rating	Rank	Rating		
Singapore	11	610	16	541	5	69
Sydney	13	608	10	548	-3	60
Seoul	15	606	12	546	-3	60
Wellington	18	603	19	538	1	65
Shanghai	20	601	17	540	-1	61
Melbourne	23	598	18	539	-5	59
Shenzhen	25	586	20	537	-5	49
Busan	26	585	21	536	-5	49
Beijing	27	584	23	534	-4	50
Tokyo	31	580	24	533	-7	47
Qingdao	35	576	31	526	-4	50
Hong Kong	37	574	41	516	4	58
GIFT City Gujrat	41	570	44	513	3	57
Osaka	42	569	32	525	-10	44
Guangzhou	44	567	27	530	-17	37

Source:(GGFI11, 2023, p. 47)

The table shows the results of ranking the main financial centers in the region in question basing on many instrumental factors and other aspects such as:(GGFI11, 2023, p. 45)

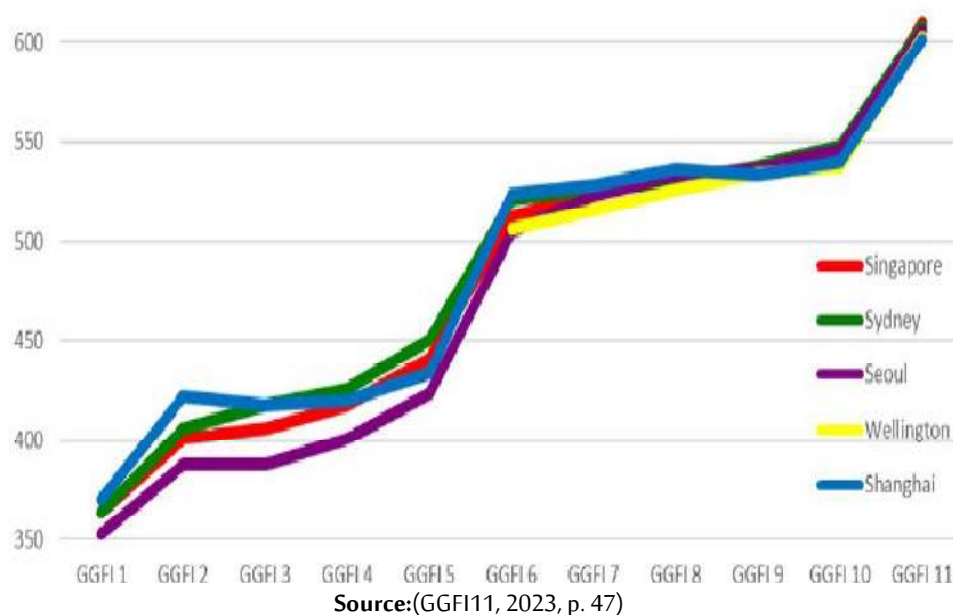
- Global Innovation Index;
- The Global Financial Centres Index;
- OECD Country Risk Classification;
- IESE Cities In Motion Index;
- Domestic Credit Provided by Banking Sector (% Of GDP).

The table above illustrates that there are many centers that have succeeded to ameliorate their ranking such as: Hong Kong, Wellington, Singapore, GIFT City Gujrat..., in comparison with the previous edition (GGFI10) which provides evidence that there is a very important trend into supporting green finance in the area. **Singapore** ranked 11th with an estimated rating of 610 during the release of GGFI11, compared to the tenth issue, with a difference of 69, where it was ranked 16th with an estimated rating of 541, advancing by 5 places. **Wellington** advanced one place, ranking 18 with a rating of 603 during issue 11, compared to issue 10, where it ranked 19 with an estimated rating of 538. **Hong Kong** ranked 37th

with an estimated rating of 574, after it was ranked 41st with an estimated rating of 516. As for GIFT City Gujrat, it was ranked 41 with a rating of 570 during GGFI 11, compared to GGFI 10, which was ranked 44 with a rating of 513. In addition, the improvement of the ranking in the region proves the huge contribution of the financial sector in green development, knowing that as much as the centers are developed in terms of fintech, they can ameliorate their GGFI ranking.

The following figure also shows us the five highest ratings for the Asia and Pacific regions during the various issues.

Fig N°05: Top Five Asia/Pacific Centre Ratings Over Time



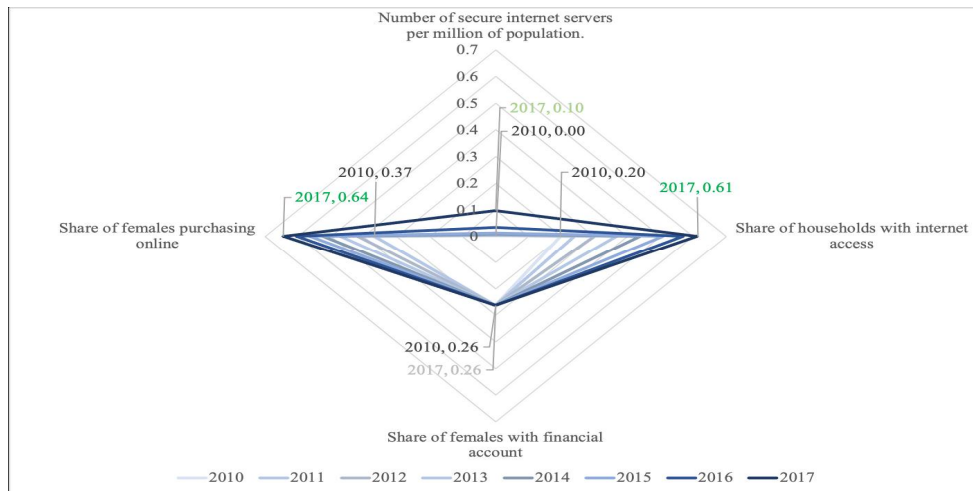
Singapore, Sydney, Seoul, Wellington, and Shanghai witnessed progress at an increasing pace until the sixth issue, but between the seventh issue (GGFI7) and the ninth issue (GGFI9), these countries experienced a kind of stagnation, so that the ratings during these three issues remained limited to between 500 and 550, and this is the result of the coincidence of these Periods with the years of the Corona pandemic, where the world's economies experienced a terrible recession during this period, but after the pandemic, these countries returned, increasing their numbers to exceed 600 during issue 11 (GGFI11). In general, it can be said that:

- Singapore rose above Sydney and Seoul to take the leading position in the region.
- Singapore, Sydney, Seoul, Wellington, and Shanghai featured in the top 20 in the world.
- Respondents from Asia/Pacific, Eastern Europe & Central Asia, and people operating across more than one region rated these centres above average.

6.4. Comprehensive index of sustainable regional digital integration

Finally, figure 6 plots Asia-Pacific's sustainable integration profile for all sustainable indicators across years (from light blue in 2010 to darkest in 2017) for a quick and intuitive look into the progression and state of the region's sustainable digital integration (Anukoonwattaka, Romoo, Bhogal, & Bentz, 2021, p. 24).

Fig N°06: Asia-Pacific sustainable regional digital integration index indicators 2010-2017



Source: (Anukoonwattaka, Romoo, Bhogal, & Bentz, 2021, p. 24)

Asia and the Pacific's overall sustainable integration score has largely been driven by substantial progresses in household's access to internet and in female's access to online purchasing. These indicators mirror the rising ubiquity of the internet across the world in positive a movement towards an inclusive and interconnected region. However, it is important to note that little to no progress has been achieved in increasing the number of secure internet servers per million of population regionally, as well as in creating a more inclusive digital environment by empowering females to access financially instruments online. These are key points for advancing the region's sustainable digital integration and underpin a long-lasting and successful Asia-Pacific-wide digital transformation (Anukoonwattaka, Romoo, Bhogal, & Bentz, 2021, p. 24).

6.5. Swapping debt for climate for green development:

A debt swap is an arrangement between a debtor and a creditor where the latter forgives debt owed to them in exchange for a commitment by the debtor to use the local currency equivalent of the outstanding debt service payments for a particular purpose (Economic and Social Council, 2021, p. 8).

One example of an initiative that could benefit from a debt-for-climate swap is the Pacific Resilience Facility of the Pacific Islands Forum Secretariat. The facility is aimed at providing grants to governments to fund small-scale, community-level disaster risk reduction projects, such as small-scale

coastal protection projects or retrofitting critical infrastructure, community centers and schools (ESCAP, 2021, p. 4)

While the Facility is expected to be funded by capital contributions from development partners and multilateral development banks, a debt-for-climate swap mechanism is also being considered. The ESCAP secretariat is currently providing technical assistance to the Pacific Islands Forum Secretariat to assess the feasibility of such a mechanism (Economic and Social Council, 2021, p. 9).

7. Conclusion:

This research illustrated that green digital finance is an approach to maintain environmental protection by allocating some resources to finance green infrastructures. It uses financial technologies in order to facilitate the connection between finance resources and the provision of these resources to promote green development. Also, the research focused on Asian pacific area since it is among the most important region in the world in terms of the usage of financial technologies. In fact, it contains the well-connected digital markets in the world, which facilitate the promotion of green digital finance. In this context, it is worthy to mention that the biggest population of the world, existing in the area in question, could make it having a big impact of financial technologies on green development. Such impact appears especially if financial inclusion strategies will be widely adopted by the countries of the area in order to allocate enough resources to finance green infrastructures and, subsequently, promote sustainable development.

Study results: among these results are the following:

- ✓ The Asian Pacific region is full of capabilities and characteristics that enable it to embody green digital finance in order to achieve sustainable development;
- ✓ Big data, mobile platforms, blockchain technology, and the Internet of Things are the regulatory and legal requirements for green digital finance;
- ✓ FinTech not only helps propel inclusive and sustainable development in the global economy, but it can also be used to help preserve nature and support the green transition more broadly;
- ✓ -Asia and the Pacific have a technological infrastructure that helps it embody green finance while promoting sustainable development;
- ✓ -The success of many countries in the region in improving their classification according to the Green Finance Index, which is evidence that there is an important trend to support green finance;
- ✓ Thematic bonds are considered one of the most important basic standards in the Asia-Pacific region for financing sustainable development goals;

- ✓ -The idea of debt-climate swaps contributes, on the one hand, to financing projects to mitigate the effects of climate change and adapt to it, and, on the other hand, to reduce the debt burden on developing countries in the Asia-Pacific region;
- ✓ In the future, the Asia- Pacific region may become one of the regions most capable of promoting green finance.

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