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# Green Sukuk – A Viable Global Financing option for Climatic and Environmental Revolution (A Practical Instrument for the Development of Sustainable Energy Projects in Pakistan)

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**Abstract:** In the year 2015, the UN General Assembly with a mission of more sustainable, and better life set the 17 goals for its member countries known as Sustainable Development Goals (SDGs) which are to be achieved by the year 2030. The SDGs are the continuation of “Agenda 21” and “Millennium Development Goals” of the United Nations. Shifting to more affordable & clean energy, and climate action are one of the major goals which were adopted to tackle the threat of climate change. In this paper the goals identified are generic and they have detailed plan of action which links achievement of one goal to that of the other. Proper measurement indicators have been identified with a proper timeline for each zone so that the target must be cross compared with ground actions.

**Keywords:** Green Sukuk, SDG, United Nations, Clean Energy, Agenda 21

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**Introduction:** Green Islamic bonds are investments in renewable energy and other environmental assets that comply with Sharia law. They address the concerns of Shariah law on protecting the environment. Proceeds are used to fund construction, refinance construction debt or pay green subsidies provided by the government. They may involve the securitization of cash flows from future income from projects or assets that have specific criteria attached to them. Although there are many opportunities for green sukuk in the solar energy plans of the Gulf countries, they also have huge potential for sustainable renewable energy, and there is a large investment demand to prevent the impact of climate change. The agenda is to strengthen infrastructure to support economic development and market services, as well as to build the environment, enhance resilience to disasters and climate change, in order to achieve a prosperous, fair and sustainable middle-income country. The challenge faced by many countries is how to coordinate the development of infrastructure and environmental protection. This is one of the goals of sustainable development, namely climate action. To make the aforementioned national development agenda a reality, governments are issuing green financing and green infrastructure development tools. The goal is to achieve environmentally friendly economic growth.

**Affordable and Clean Energy:** According to UNDP report of 2017, approximately 87% of the world population has now access to electricity and with a growth in population of the earth the demand is on raise. The report shocked the world as 60% of the greenhouse gases are because of production electricity from unclean sources, and just 20% of the energy produced was from renewable source by 2015. As of 2017, the target was to achieve 90% energy from sustainable fuel and energy, but unfortunately on 57% of the target have been achieved. Furthermore, about 40% population (approx. 3 billion) is still relying on unhealthy and traditional sources for cooking food. Additionally, renewable energy sector has employed approximately 10.3 million people.

**Climate Action:** According to UNDP report of 2017, from 1998 to 2017, approximately 1.3 million people have been killed by calamities that are directly related to climate change and in the meantime, the greenhouse gases emission is 50% more than that of pre-industrial era. The report indicates that the average temperature of the world has raised 1 Celsius after 1950s, and if things continue in same manner then by 2050 the average temperature will raise as high as 1.5 Celsius which would alternatively raise the sea level to a new unbearable height.

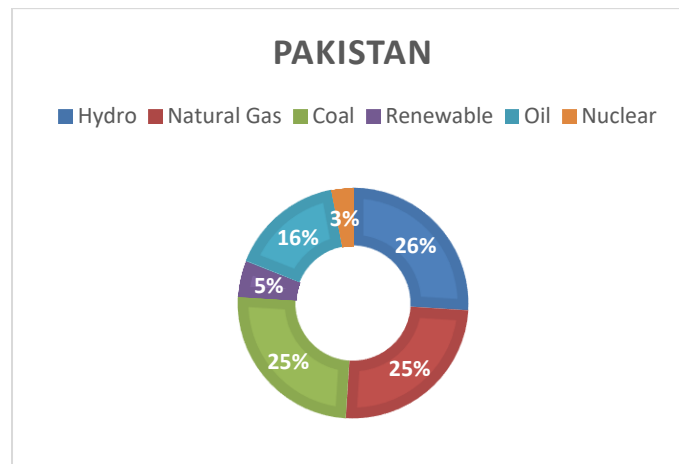
**SDGs and Pakistan:** Pakistani parliament was the first parliament in the world to pass and the SDGs 2030 unanimously and since then it has prioritized the SDGs to become a part of Upper-Middle Class countries by the year 2030. The UNDP has categorized Pakistan as one the top vulnerable countries for climate change and it's ranked at 8<sup>th</sup> worst country to be affected by climate change. DAWN newspaper issued serious of development reports of Pakistan on SDGs in collaboration with UNDP. The reports indicated that to achieve the goal of affordable and clean energy sources, Pakistan has focused clean sources like Water, Solar and Wind. The first solar power plant was set up in Pakistan with the support of Beijing in 2015, wind power stations were built in coastal areas of Sindh and Pakistan has begun working Mohmand dam to meet its energy requirements. To achieve the goal of combating the climate change, the progress report shows that Pakistan is already suffering 9% of its GDP to environmental degradation. Pakistan was the first South Asia country to have a fully dedicated ministry for climate change and Pakistan has registered itself in Guinness World Record book by planting record number of trees. National Initiative of SDGs, Pakistan is constantly working on the goals and publishing the latest reports on the developments.

**Green Sukuk:** Green Sukuk is a shariah compliant Islamic alternate of traditional bond which generates income for the investors as well funds green projects such as tree plantation, renewable energy sources etc. These sukuk can be issued by Government, MNCs or any trustworthy sources through approval from shariah scholars and must be asset backed.

In Indonesia, Green Sukuk has been utilized to engage more investors in supporting sustainable finance, sparking global discussions. The concept of these bonds has also gained traction in Islamic markets, resembling green bonds for socially responsible investments. Unlike previous research mainly focused on developed economies, this study examines this concept in emerging countries, specifically Indonesia. As Indonesia prepares to issue its inaugural green bonds and green sukuk, it's crucial to ensure a smooth integration with existing practices. This research evaluates Indonesia's conventional bond and sukuk markets and assesses the adequacy of prerequisites from a financial stability standpoint.

In contrast to previous Islamic studies, this paper challenges the notion that sukuk practices are immune to instability. It suggests that robust government support can play a stabilizing role in launching green bonds and green sukuk in Indonesia. The study, however, does not extensively examine specific sukuk structures on a case-by-case basis, which could identify potential issues. Instead, the focus is on presenting Green Sukuk as a viable option for funding sustainable projects in developing Islamic nations like Pakistan. The paper will present evidence demonstrating how Pakistan, as the largest Muslim country, can finance its climate-focused projects without relying on foreign debt with stringent conditions. It proposes a suitable project structure and recommends that the Pakistani government finance initiatives through Green Sukuk. This approach aligns with two key UN Sustainable Development Goals: Goal 7 (Affordable and Clean Energy) and Goal 13 (Climate Action).

Before getting into the importance and development of green sukuk, the Pakistan energy mix should be analyzed and study accordingly that is:



The Pakistan's energy mix comprise of more than 50% of thermal energy comprise from gas, oil and coal and only 4.5% is coming out from renewable energy. In order to get into the greater mix like other competing countries we have to increase the financing ventures for the climatic and environmental projects.

**Writing Objectives:** Pakistan is one of the countries in the world going from the wrath of global climatic and environmental damage. By contributing less than 1% in carbon emission in the world the country has been ranked 7<sup>th</sup> in the world from the damage impact of the climatic change. For the purpose of initiating awareness regarding green financing option, improving the climatic and environmental conditions in the country, moving towards more cheaper and sophisticated financing technique, achievement of sustainable development goals and getting sustainability and global footing by implementation of Islamic financial strategies in achieving the new energy mix for the country. In this perspective, two of the recent development activities can be brought back on the grounds of the importance of the green sukuk.

- AEDB Environmental Projects Initiative.
- PSO Bio-Diesel Farm and Government of Pakistan Initiative

**Scope of the Study:** This study has attempted to examine the possibility of green sukuk for the projects announced by the AEDB, the government of Pakistan and the Pakistan State Oil dead Bio-Diesel Farm Initiative where the sufficient funding and business model has been required for the completion of the project and as with the growing popularity with green sukuk it can be a potential instrument for the concerned problems which could generate funds in socially responsible and shariah complaint manner for other climatic and environmental projects in Pakistan as well.

**Limitations of the Study:** The research has a very broad scope and new to this part of the world; so, no firsthand data was collected through any means.

*Literature & Empirical Review:* Some of the literature that illustrates the importance of green sukuk around the world has been mentioned and highlighted.

**Green Sukuk:**

Islamic finance has broader horizon and according to (Obaidullah, 2018) protection of environment through responsible financing matches the broader agenda of Islamic finance. As Islam has guided its followers to act beyond the motive of profit maximization which is also concluded by the protection of human rights and the environment. In the current perspective of debt financing requirement, the various countries are exploring various debt financing options that are other than already in trend and conventional in nature. One of them is the green sukuk. Green sukuk are the Islamic Shariah compliant bonds that are backed by Shariah compliant transactional structure. Other than this these Islamic bonds are effective companion in the capital market and can be used efficiently for the generation of funds. The introduction of green sukuk are not so older than by the year 2007 and continuous development has been notifying and addressing all over the Islamic financial world. Similar conclusion was drawn by (Aassouli, Asutay, Mohieldin, & Nwokike, 2018).

According to (Alam, Fathi, & Ariss, 2016) green sukuk are shariah compliant environmentally friendly vehicles for the generation of funds and for the creation of assets that are environment friendly. The Middle East and gulf countries where the Islamic financial structure has been strong enough can overcome their debt financing requirement by the issuance of such sukuk. The world now has been shifted entirely from the conventional way of treating the subjects to the advanced and special way. In the modern times of changing global methodologies, the climate change and environmental issues are increasing years by years. Global warming and high temperatures are increasing all around the globe and the countries which are not directly engaged into the generations of carbon emissions are worst affected. The countries who are on top of generating carbon emissions are on top of the line of invention of other methods to protect the environment and the world from the upcoming disaster. Indeed, Islamic finance have a solution for this problem as well in the form of Green Sukuk.

In Italy, a research has been conducted (Morea & Poggi, 2017) when the government squeezed his incentive-based funding towards the investments in renewable energy sector. The researchers initiated the study with the comparison and rethink funding techniques, they have studied incentive dependency in the wind energy sector in order to reach grid parity, comparing the obtained results with those of Islamic finance and conventional finance.

Specifically, the researchers proposed the utilization of Sukuk Islamic finance instruments to realize tangible assets within Shari'ah-compliant finance, which prohibits interest rates as seen in conventional financial markets. They also established the cost thresholds required for achieving grid parity in the context of renewable energy. Their findings emphasize the crucial link between incentives and the suitability of employing Green Sukuk instruments for sustainable investments in the wind energy sector. This connection is essential within ongoing efforts to combat climate change and reduce greenhouse gas emissions (Richardson, 2019).

A separate study conducted at the University of Indonesia by Siswantoro (2018) indicated substantial investor demand for green sukuk due to its association with environmentally friendly activities, enhancing the image for investors. This initiative aligns with climate and environmental sustainability goals. The research aimed to assess the performance of green sukuk prices following their issuance. Despite significant oversubscription during the offering period, which might suggest positive outcomes post-issuance, the study's descriptive method, comparing green sukuk price movement with that of other green bonds and a similar bond for benchmarking and correlation analysis, revealed a lack of direct correlation between oversubscription and post-issuance performance of green



sukuk. Macroeconomic factors, rather than the positive image of green activities, were identified as the primary drivers of fluctuations in Indonesian green sukuk prices. Investors' focus may primarily be on profit motives, with climate change concerns not necessarily taking precedence.

In a similar vein, a study conducted in Malaysia by Alam, Janor, Jano, and Wel (2012) explored green investment, which is still in its nascent stage not only within the country but also globally. The limited awareness of the green concept among the general population contributes to this situation. Green investment involves considering environmental factors alongside rigorous financial analysis. This study aimed to identify factors influencing Muslims' intention to adopt green investment, utilizing the theory of planned behavior (TPB) framework, which encompasses attitude, subjective norms, perceived behavioral control, knowledge, reputation, and religious values. Data collected from 270 respondents in the Klang Valley area through self-administered questionnaires on a six-point Likert Scale revealed that attitude, perceived behavioral control, knowledge, reputation, and religious values significantly influenced Muslims' intent to engage in green investment. Among these factors, religious values emerged as the most substantial contributor. The study outlines implications and suggests future research directions to promote green investment.

The Green Sukuk and Working Party (GSWP) is working with Middle Eastern bond and sukuk associations for the development of Islamic financial solutions which could benefit the society and environment. In general, Green Sukuk are Islamic alternative of green bonds which could be invested in renewable energy projects as well as other environment friendly areas. The proceeds can be used by either the government itself, or trusted body to finance projects which will also generate profitability for its investors and will help the society in general overcome potential issues. GSWP is similarly a collaboration of industry experts related to the field of project development, sustainable investments, environmental standards, actuarial sciences, capital markets and Islamic finance. GSWP working on following areas:

1. Well-designed sukuk structure of green sukuk will be available, and investors will get the confidence of profitability as well shariah compliance
2. Promotion of ethical and green sukuk products to potential private investors, institutional investors and as well to government
3. Engagement of government as well as private bodies for supporting green projects for the development of greater society.
4. Informing the potential markets on best practices and their impact on society.

As (Dean & Karain, 2016) concluded that it would not be hard for the world to get convinced that green sukuk can offer relatively good alternate, but the bond market around the globe is so strong that it can overshadow it. Especially green bond also offers a solution to sustainable investments in developed countries.

Green sukuk are the new alternatives not for the conventional debt financing techniques but also opening a new domain of development in Islamic finance that has been witnessing its rapid growth on the global village. After the financial crises of 2008 there has been dire need of new financial alternatives other riskier and risk transference structures of conventional financing towards the asset backed and risk sharing mode of financing. Green bonds can come new pathways towards the development of Islamic finance along with the competitive and designed solution towards the environmental and climate sustainability.

**Global Warming and Pakistan:** According to (Farooqi, Khan, & Mir, 2005), the climate change is not only increasing the water sea level, but also it has directly impacted the surface temperature of oceans, exotic circulation in monsoon season etc. The total area of glacier is constantly reducing due to climate change and eventually now, it is the lowest in the past 10000 years. Furthermore, it is directly affecting marine life, forestry, and water productivity resulting in poor agricultural output which is the backbone of country's economy. The farmer in recent years have experienced a very erotic rain season.

Same results were confirmed by (Khan, 2001), Pakistan itself is not a major contributor to greenhouse gases when compared to any developed country of its size, but it is among the major victims. The only major source from Pakistan is the pollution from its energy producing sources and other environmental damage like deforestation, water pollution etc. Apparent impact of climate change is observed in agriculture, forestry, and water related sector as each sector is facing unembellished issues horizontally and vertically. Socioeconomic condition of the country and structural constraints is adding fuel to the problems in identified sectors and halting the progress of adaptation towards the change. The paper has also pointed out three adaptations to cope with the challenges Pakistan is facing which are increasing optimum use of water resources, operational reforms policies to enhance the yield of crops and mass level plantation of trees.

(Kiran & Qurat-ul-Ain, 2017) took a more suggestive approach towards the overall situation as they concluded that severity of climate-change a fact which is largely affecting lives of almost all individuals in Pakistan, but to counter the changes the government has to take more bold steps. It has converted it is economy on cleaner energy forms and more dealing with low carbons in all possible ways. The government has to create awareness particularly among the farming fraternity as they are the one who are major stakeholder in the overall expedition. The government has now more options to address the issue as they can use public and private media sources for it to create awareness regarding it. Capacity building must also be a major priority for the government and option of introducing courses at university level must a key decision from the government. Adequate capacity building programs must also be arranged for farmers to use the limited resources like water, sunlight and other energy sources at optimal level. They must be supported at levels via training and development to take their farming to next step. At macro level, the government has to work on infrastructural development of the country by building new dams, banning sources which are aiding in climate change problem and undertaking mass level afforestation projects.

Likewise, (KHALIL, 2014) have concluded their study with assertion that government in Pakistan has to take innovative steps to tackle the effects of climate change. As climate change and its impact is not discernable in advance, but preemptive measure could ensure minimal loss. Without a robust, accurate & efficient policy at national level; it would be hard for the government to handle climate change issue. If it has to stopped then government has to take on board all the provinces and has to designed a policy which must be long term oriented and each government should follow the targets identified for it.

**Green Banking and Financing:** The Indian banking sector of India was evaluated by (VIKAS, NAYAK, & GOEL, 2014) in their study whose major work was related to green rating standards from the central bank of India, the World Bank's and other stakeholders. Though the banking activities directly do not affect the environment as such nor do they are among the major contributors to global warming, but the greenhouse effect on consumer is substantial which needs to be addressed on urgent basis. The banking industry has to implement green strategies into its operations, financing options, investment option, and even in its buildings. Banks need to incorporate green banking as part of global

corporate citizen. The banks can start from as simple as paperless banking to recycling of all dry wastes. Each bank has to ensure investment in low carbon technologies which would earn carbon credits for them, and to introduce out of the box products/services which would mitigate the risks associated with climate change. The process must be ongoing and there should be environmental assessment after each period.

Both private and public sector banking industry of India was also studied on the same variable of green banking by (Rambalak Yadav, 2013). They found out that Indian banking industry is going through an enormous change whereby the sector is getting modernized by use of net banking, mobile banking etc and moving out from traditional approach of banking. Copying the successful model of western banking system, now they are adopting best environmental practices, introducing activities that are designed for maintaining a better environmental and ecological balance. Though, the step towards green banking is just a stepping stone in long term journey to achieve a win-win situation between financial goals and environmental goals. Activities like “Think Green”, and “reduce, recycle & reuse” taken by banks are highly commendable steps. Next step in this regard should be to create awareness in society in general, and helping other smaller firms to adopt green practices. The variable was also cross examined in Bangladesh by (Mustafizur Rahman, 2013). The adoption of green banking assures a safe tomorrow for upcoming generation and banks has already been advised to make separate green banking policy at bank level. Collective actions are required from the side of consumers and bankers to convert the sector in particular country green.

**Socially Responsible Investment:** In ethical investments; screening is done to eliminate sectors that are considered unethical, even if they are legal. The examples are tobacco, alcoholic product industry, pornography, weaponry, or any other industry that violated human rights. Socially responsible investments have other dimensions add to it as it incorporates environment (in general), social (in particular) and governance. The term is in common use as ESG in traditional financial analysis (Suryomurti, 2017). ESG was also the focus of research for (Talan & Sharma, 2019) who concluded that it is the currently the second largest source for sustainable investment in the world, and largest in North America & Asia. The work identified other avenues regarding ethical investments like negative/positive screening, sustainability theme reporting, norm-based screening and community investing etc. The study revealed that sustainable investment or SRI as the potential solution to most social and ecological issues by transforming the financial markets to accountability for all their actions.

**Islamic Crowd funding and Fintech:** Crowd funding in general is more effective way to generate useful money from public and it has got humane attribute; for instance, mutual cooperation, community support, social responsibility, consultation and altruism. On the other hand, Islamic crowd funding offers more than it; as it inculcates Riba free, socially responsible and sustainable financing (Suleiman, 2016). The Islamic banking industry assets are growing over the years and it will continue to grow as forecast indicate. The initial phase of development of Islamic finance was totally focused on Riba free banking, and development of alternate solutions parallel with conventional banking. Now, the fourth decade is highly focused on achieving the greater goals of Islamic finance such as Higher Objectives of Maqasid of Shariah like equitable distribution of wealth and resources & community based socially responsible financing.

**Jatropha Curcas & Pakistan State Oil Bio-Diesel Farm Initiative:** According to (Pramanik, 2003), empirical tests of oil extracted from Jatropha Carcus seeds shows that the forty to fifty percent of the oil can substitute conventional diesel. No alteration or modification of any engine working on typical diesel is required while using the biodiesel. Similarly,



(Dhakal, 2012) has found *Jatropha Curcas* as the best alternative for biodiesel production. The study detailed the usage of the seed and as well as the characteristics of the plant. The plant is suitable for mild rainfall area and as well as for problematic soils. The plant can be used to reclaim barren land, relatively safe from animals and grows relatively quickly. The plant grows up to its potential in two years, it removes carbon from the atmosphere and due to high volume of nitrogen and seed cake can be used as organic manure. There are various medicinal usage of the plant and its flower can attract honey bees too. Likewise, (Arya, 2014) have studied the usage of *Jatropha Curcas* in pest control and found out that it can also be used as pesticide and insecticide.

In the year 2005, Pakistan State Oil had taken an initiative on testing basis for the creation of Bio Diesel farm in Pakistan for which the testing land and lab has been installed in Hyderabad, Sindh. After proving commercial viability, Pakistan State Oil proposed the concerned project for commercial progression. PSO has selected “*Jatropha Curcas*” as a prospective plant candidate for bio-diesel because of its unique characteristics. Apart from 400 jobs given on this test project, Pakistan State Oil proposed approximately more than 200 jobs in the farm and other related operational activity. According to the various research, the substantial amount of progress has been made related to these types of projects in countries like India, Brazil, USA, China & Malaysia. Pakistan State Oil projected the decline in import bills for oil after the commercial usage of the renewable alternative of US\$ 1 Bn. With the use of land approximately 1.06 Mn acres, the country can take their energy mix from 4% to 12% towards renewable contribution. There was various challenges has been faced by the project including certification & registration of *Jatropha Curcas* seeds from Min-FAL (Ministry of Food, Agriculture and Livestock), governmental support and seriousness towards the program etc. One of the crucial issue highlighted in the initiation of the project is the unavailability of financing and business model. Pakistan State Oil receivables are always staggering with the big number and there is no sufficient amount of funds and liquidity for the development of such projects. Along with the government has been not serious towards the scope of renewable energy by that time but now renewable energy is one of the most promising energy alternative for the global world from which the Europe has been converted on average of 80% from conventional energy to renewable energy. With the help of public private partnership, government initiative towards the development of Islamic finance and Green Sukuk can be the potential initiative for the development of Biofuels and Biodiesel plants in the country.

**AEDB Renewable Energy Initiative:** According to Renewable Energy Report 2019, the government has taken the initiative of changing the Pakistan’s energy mix of renewable energy contribution from 4.5% to 30% by making an investment of about US\$ 700 Mn with the introduction of more than 600 MW renewable energy in the system through solar, wind and various power projects. Government wants to flux the 8000 MW of various grades of renewable energy through different modes. Investments from Dutch, Turkey, Japanese, Chinese and German companies showed their interest in green energy sector of Pakistan. Again with the help of Public Private Partnership and the government’s initiative towards the green financing for the sustainable development of climatic and environmental infrastructure, green sukuk are one of the viable instruments that can be beneficial for both ends.

### **Green Sukuk and Pakistan:**

There are various projects in Pakistan that can be funded and financed with help of Islamic finance and green sukuk initiative for example:

- Pakistan Green Energy Sukuk

- Diamer Basha Dam, Rawalpindi-Islamabad Dam Project
- Quaid-e-Azam Solar Park, Bhawalpur
- Sustainable Cities & Communities
- Wind Farm 60 MW, Jhampir, Sindh
- Karachi Green Belt Transportation Project
- Peshawar Green Line Transportation Project
- 400 MW Solar Park, Sindh
- Pakistan Banao Housing Scheme

The sectors in Pakistan where Green sukuk can be served as the viable financing and development solution:

- **Renewable Energy:** The green sukuks can be used for the fund creation for renewable and environmental energy projects.
- **Tourism:** Through green sukuks various parks, forests and other green tourism projects can be initiated for economic development.
- **Natural Resources Management:** Green sukuks are one of the viable solution for the creation of natural resources management.
- **Housing & Construction:** Green sukuks have set standards by making green housing and construction projects in Malaysia and Indonesia.
- **Transportation & Commute:** Through Green Sukuk initiative, green transport based on electrical or other sources can be constructed and implemented. More refined fuel etc.
- **Sustainable Agriculture**
- Green sukuks can help establishing more sustainable agriculture projects like development, organic research and food quality and growth.

With the help of green sukuk, Pakistan can get relaxed with many internal and external fronts with the help of such instrumental financing options that leads to development as well as the progression of Islamic finance.

- *Climate & Environmental Sustainability:* Climate and environmental difficulties of the country will minimized. The long term sustainability can be achieved.
- *Development of Islamic Capital Market:* Islamic capital market need to be developed in Pakistan and green sukuk can be a viable initiative.
- *Government Debt Problems:* The government can raised sufficient funding through green sukuk initiative for resolving energy deficiency.
- *Current Account Crises:* Pakistan major imports comprise of oil and after the successful implementation of green measures this can also got relaxed.
- *Cheap and Sustainable Energy:* Through green sukuk initiatives, the cheap and sustainable energy can be available to all consumers that will decrease poverty and reduce inequalities to higher extent.
- *Overall Economic Development:* Energy issues is one of the issue due to which the country has been suffered the most. Green sukuk not only develop the capital requirements but brings overall industrial revolution in the country.
- *Global Certification & Foreign Exchange:* Green Sukuk can also be a source for foreign exchange when issued in foreign currency and can be certified from global climate initiative bodies.

## Sukuk Structure, Term Sheet and Documentation of Green Sukuk:

*Proposed Structure for PSO Bio-Diesel Farm Initiative:* Land of Pakistan State Oil (PSO) has been proposed as the Underlying Asset - With PDSCL acting as the agent of the Certificate-holders. The proposed structures that can be used in the issuance of green sukuk are:

1. Istisna cum Ijarah structure is one of the proposed structure for the issuance of green sukuk where Istisna can be given in first leg for the construction of renewable plant and then the shares will be rented through Ijarah in second leg – Renewable Energy Structures etc.
2. Istisna cum Diminshing Musharaka structure can be another proposed structure where Istisna can be given in first leg for the construction of renewable plant and then the units will be transferred as per DM agreement – Renewable Energy Structures.
3. Ijarah cum Waqf structure can be made significant sukuk structure as investments from the subscribers divided into two; one goes into the Ijarah Sukuk and one small portion into the waqf fund for the development of SGDs – Transportation Facilities with Schools, Water Purification Plant.
4. Ijarah cum wakalah structure is one of the simplest structure for the green sukuk issuance where subscribers becomes the owner of the usufruct of the assets and the issuer get the funds for the development of the assets – Energy Bill Payments, Import of assets, projects etc.
5. Wakala structure can also be a proposed structure for the issuance of green sukuk when the subscribers become the shareholders and the issuer become the agent on behalf of the subscribers.
6. Musharaka structure can also be the significant structure for the issuance of green sukuk when the subscribers become the partners with the issuer in the assets and the subscribers rent out their share to the issuer for the rental income.
7. The other proposed structures can be Muzara that is based on sharecropping, Musaqa that is based on irrigation and mugharasa based green sukuk that has been based on agricultural farming and cultivation. In the Muzara sukuk structure, the issuer of sukuk is the owner of the land and the subscriber is the cultivator on the land or may be the owner of the land (cultivates itself too). It has been issued for the purpose of mobilization of funds for the financing an agricultural project. In Musaqa the sukuk certificates can be issued for the irrigation activities related to the trees for fruits and vegetables where the issuer may be the owner of the land or irrigator while the subscribers are those who assume the obligation of irrigation or are owners of the land. On the other hand, mugharasa certificates may be issued for the purpose of plantation of trees and undertaking related work and expenses so the certificate holder may become entitled to share in the land and plantation. As all these shariah compliant modes are there for agricultural activities that comes under the ambit of sustainable development goals and climatic and environmental sustainability therefore green sukuk can be viable option under these structures for the development of green financing and Islamic finance.

**Asset Details:** The Land of Pakistan State Oil (“the Asset”) has been identified as the proposed asset for issuance of the Green Sukuk. Valuation of the Asset shall be carried out by two PBA approved independent valuers, and the lower of the two valuations will be accepted as the sale price of the Asset. The assets other than the land of Pakistan State Oil (PSO) if constructed and present can also be consider before the issuance of sukuk.

*The Structural – Explanation:*

1. The State Bank of Pakistan will hold an auction to identify potential subscribers.
2. Subscribers will initiate a subscription with Pakistan Domestic Sukuk Company Limited (PDSCL). PDSCL will record commitments and be appointed as an agent by subscribers for specific purposes.
3. An Agency Agreement will be established between PDSCL (as subscribers' agent) and the State Bank of Pakistan. SBP BSC will be appointed as a Paying Agent to collect subscription proceeds, manage rentals, act as a Reference Agent and Registrar.
4. PDSCL will execute an Issuance Undertaking with Pakistan State Oil or Government of Pakistan, committing to issue Sukuk. PDSCL will also become an agent for investors/certificate holders.
5. PDSCL (as agent for investors/certificate holders) will sign a Purchase Agreement with Pakistan State Oil or Government of Pakistan (via the Ministry of Energy & Development) to buy a defined portion of an asset at an agreed price (Purchase Price) matching the Sukuk issue amount.
6. After the Purchase Agreement, investors/certificate holders gain ownership of the asset share while PSO retains the registered title on behalf of investors.
7. PSO will create a Declaration of Trust, acknowledging its role as custodian of the asset's registered title for investors' undivided ownership share.
8. Following title acquisition, PDSCL (as agent for investors/certificate holders) will establish an Ijarah or Diminishing Musharaka Agreement with the Government of Pakistan (via the Ministry of Energy and Development). The asset share will be leased to the government, generating rentals based on agreed terms. The government can nominate affiliates like PSO to use and maintain the asset.
9. A Service Agency Agreement will be enacted between PDSCL (as agent for investors/certificate holders) and the Government of Pakistan (via the Ministry of Energy & Development). The government becomes a Service Agent, responsible for asset-related services for a nominal fee.
10. The Government of Pakistan (via the Ministry of Energy and Development) commits to purchasing the Leased Asset at maturity or in case of Lease Event of Default and Termination. In Diminishing Musharaka, the government will progressively buy asset units over the tenor.
11. The Government of Pakistan (via the Ministry of Energy and Development) agrees, via a Cost Undertaking, to cover Sukuk issuance fees, expenses, and indemnities.
12. The Islamic Banking Department of the State Bank of Pakistan will oversee proper execution and legal documentation aligned with Shariah principles, ensuring compliance and smooth management throughout the Sukuk's tenor. The process repeats for additional fund requirements until full asset ownership by investors/certificate holders.

*Note:* As per the rules of Ijarah, all claims of ownership related expenses (including Major Maintenance and takaful expenses) during a Rental Period by the Service Agent shall be paid by the Agent or his appointed agent from the Rental income on behalf of Certificate Holders.

As per the rules of Diminishing Musaharaka, the all claims of ownership related expenses during the service period has been divided as per the ownership ratio in the asset.

## Key Documentation:

- *Certificate Subscription Undertaking* – This is one of the initial document in the subscription of sukuk and process of sukuk issuance. Under the said document, subscribers will appoint Pakistan Domestic Sukuk Company as their agent (the “Agent”) for the purposes set out in the subscription activity.
- *Agency Agreement* – This is the document signed to bind the agent that is Pakistan Domestic Sukuk Company Limited and the State Bank of Pakistan as its agent to collect and supervise the sukuk monetary proceedings from the subscribers.
- *Issuance Undertaking* – The said document executed between Pakistan Domestic Sukuk Company Limited and Government of Pakistan in the favor of the subscribers, whereby agent will undertake to issue the Sukuk to the subscribers.
- *Purchase Agreement* – The said document executed between Government of Pakistan for purchase of an agreed percentage of the Asset at an agreed price equivalent to the Sukuk issue amount.
- *Declaration of Trust* – The declaration has been signed between the beneficial owner of the asset in favor of the investors to the effect that the owner is holding the registered title of the asset in trust for the investors to the extent of their undivided share in the ownership of the asset.
- *Ijarah Agreement* – The said document will be signed between Government of Pakistan and the Pakistan Domestic Sukuk Company Limited that is acting as an agent on behalf of subscribers and investors. The terms and conditions mentioned in the Ijarah agreement should be agreed by both the parties and should be reviewed by the Shariah advisory board. No further changes and amendments will be done without prior information to the parties and the advisory board.
- *Service Agency Agreement* – This document execute between Pakistan Domestic Sukuk Limited Company and the Government of Pakistan in which government act as the agent to carry out services related to the asset during the term of the lease in consideration for fee.
- *Purchase Undertaking* – The Government of Pakistan through this document will undertake to purchase the asset at the exercise price at maturity or upon a event of default and termination.
- *Cost Undertaking* – Government of Pakistan will undertake through a Cost Undertaking to pay all applicable fees and expenses and provide indemnities associated with the Sukuk issuance.

## Fact Sheet & Term Sheet:

*Transaction Structure:* The Sukuk is based on the mode of Ijarah or by Diminishing Musharaka whereby the Lessor/Investors, being owners of the Assets, receive rentals from the Lessee during the Sukuk tenure. Detailed transaction structure can be mentioned as below:

### *Nature of Asset:*

- Land & Constructed Assets of Pakistan State Oil (can be act as trustee)
- Trustee means, subject to the provisions of Clause 5 below, PSO, in its capacity as trustee in respect of the Trust Assets pursuant to this Declaration of Trust, and shall be construed in the manner provided in Clause 5; Trust Act means the Trust Act, 1882 as amended or re-enacted from time to time.



*Initial Subscription:*

- Initial subscription of can be from PKR 100 Mn
- Further go down to various issues in tranches.
- Green-shoe option can be considered amounting PKR 100 Mn.

*Face Value:*

- From PKR 1,000/- to onwards.

*Lessor:*

- An Investment Agent (acting on behalf of Sukuk investors) – Pakistan Domestic Sukuk Company Limited
- Individuals/General Public
- Corporates
- Financial Institutions

*Lessee:*

- Government of Pakistan (GOP)
- Ministry of Energy and Development
- AEDB
- Ministry of Finance

*Issuer:*

- Pakistan Domestic Sukuk Company Limited

*Paying Agent:*

- SBP Banking Service Corporation (SBP BSC)

*Investment Agent:*

- An Islamic Financial Institution Issuer & Trustee Pakistan Domestic Sukuk Company Limited (PDSCL) Sukuk

*Tenure:*

- Proposed tenor can be Five years, Ten years, Fifteen years etc.

*Pricing:*

- Attractive Pricing: Base Rate that is KIBOR plus 2%, 3% and above.
- Less attractive pricing: Base Rate that is KIBRO plus 0.5%, 1% etc.
- It is pertinent to note that the takaful and other charges will be part of the proposed pricing.

*Rental Frequency:*

- Semi-Annual/Annual: Risk of major maintenance costs relating to the Assets being recoverable from the Investor/Lessor by deduction from the Exercise Price/Rental. The Assets will be purchased by the Investment Agent from the GOP on behalf of the Investors such that the ownership in the Assets.

### *Risk Mitigation:*

- The amount of the aforementioned expenses will be set off against the Supplementary Rental for each rental period. Under this mechanism Supplementary Rental will be payable in advance by GOP for each Rental Period; which will be held by SBP BSC for and on behalf of Investors. Any claims during the rental period for expenses made will be settled from this advance payment. Actual expenses charged by the Service Agent in one Rental Period will become the amount of Supplementary Rental in immediately subsequent Rental Period.
- In case the actual expenses in any Rental Period are more than the corresponding Supplementary Rental, the Investors/Lessor shall be required to pay the differential /excess amount to GOP. However the amount will be recovered from the Rental due to the Investors/Lessor in that Rental period. This will result in a reduction in the Rental Amount payable to Investors for that period and possibly a further loss in the principal amount invested leading to a reduction in overall yield/return on the Sukuk Certificate. Similarly if the actual expenses are less than the corresponding Supplementary Rental, the Investors will receive the excess amount thereby leading to an increase in overall yield/return on the Sukuk Certificate.
- In case the actual expenses charged for the last Rental Period are higher than the Supplementary Rental, it will not be possible to adjust this amount in the next Rental Period as this will be the final Rental Period. The Investor/Lessor will have to bear the cost. However, if the actual expenses in any Rental Period are higher than the Supplementary Rental amount the Service Agent is only allowed to incur actual expenses worth no more than 150% of the Supplementary Rental amount without prior consent from the Investment Agent.
- The Service Agent will be required to obtain prior permission, for incurring expenses exceeding the current Supplementary Rental by 50%, from the Investors/Lessor. In case the Lessor/Investors do not provide the permission, this will be a termination event.

### **Challenges**

As the green sukuk has multiple benefits and developmental features, it has certain challenges as well as we pursue in the context of Islamic capital markets in the country:

- Green Sukuk may expose to higher risk profile as it involves a sophisticated degree of new technology.
- Islamic capital market need to be developed in Pakistan and green sukuk can be a viable initiative.
- It has a small secondary market and investors require robust secondary market for meeting the investors' liquidity expectations.
- There is an absence of the standard and verification system for performance measurement of green sukuk.
- Through green sukuk initiatives, the cheap and sustainable energy can be available to all consumers that will decrease poverty and reduce inequalities to higher extent.
- Green Sukuk is not a simple transaction as it carries huge amount of funds so proper check and balance and monitoring has been required. The sukuk proceedings are also to be monitored.

### **Conclusion & Discussion:**

The study examined the scope of shariah compliant green sukuk and how effective can it

be in a country where majority of population is Muslim. Through this model the government can get rid of interest-based debt trap and fund public projects via easy and halal manner. PSO biodiesel initiative also indicates that government can appreciate projects which will help government to finance clean energy. Government and policymakers should have to divert special attention towards the green sukuk as it is one of the most important elements for achieving the desired results. Likewise, the investor's awareness in this regard is highly important as they should be guided about the broader benefits and potential perks of this type of investments.

There are some challenges to potential green sukuk offering as well. The Green Sukuk may expose to higher risk profile as it involves a sophisticated degree of new technology and importantly Islamic capital market or secondary market need to be developed in Pakistan. Similarly, standard performance practices during the phase of accounting and performance measuring can also be a challenge as well. Furthermore, Green sukuks can become additional instrument along with the development of Islamic REITs that can also become the viable Islamic capital market instrument for the investment in environmentally friendly and SGD housing and constructional schemes. Public-private partnerships can also involve in joint collaboration with government agency or another private-sector company that can be used to finance, build, and operate projects, such as public transportation networks, parks, and convention centers. Through this, Shariah Compliant Mutual Funds can also be introduced by the companies that will only invest in the securities and investments related to the climatic friendly and environmentally sustainable framework.

### **Recommendations:**

Following recommendations has been proposed for the development of green sukuk as well as the Islamic finance in the country:

**1. For the Government and Public & Private Partnerships:** Following recommendations can be made to government based on the above study.

- The government can offer Green Sukuk product to overseas Pakistanis or foreigners to generate fund for green projects.
- It is a very easy method of crowd funding whereby citizens will fund for public projects which would not only provide public service, but also will be shariah compliant.
- The green sukuks can also be issued in foreign currency for attracting more foreign investments and unique products like zero coupon sukuks or Islamic fintech solution based on block chain technology can also be initiated via the same model.
- Green sukuks and likewise projects can be made digital via Islamic crowdfunding through which maximum funds could be gathered and certification from international rating agencies and climate initiative programs can add value to them.
- Green funds can be introduced on the ground of green sukuks.
- Public private partnerships can enhanced through the initiative.
- The sustainability index number and the ranking can be improved globally and nationally.

**2. For Future Researchers:**

- Indonesia, Malaysia, UAE and Islamic Development Bank have taken lead in offering Green Sukuk; therefore, First hand data can be used to cross check the effectivity of this model.

- New variable can be added and the model can also be checked for other green solutions.
- First hand data can be taken from botanical farms to cross compare it with secondhand data available on *Jatropha Carcus*.
- The new projects related to energy and development can be proposed and studied in the context of green sukuk financing.

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