

Modeling Integrated Waqf-Sukuk for Climate Action (SDG13)

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The discussion on tackling climate change is summarized in the thirteenth SDGs goal. On the other hand, waqf is an instrument of Islamic social funds that has a sustainable nature and has the relevance of waqf to the SDGs, so it has the potential to be developed in its role in fighting climate change and its impacts. This study seeks to see the waqf model that is relevant to the goals of the SDGs by determining the priority of the waqf model that can be applied in Indonesia which is in line with the objectives of SDGs 13 using ANP method. The results of the study indicate that the Waqf & Sukuk model is the right model to support the achievement of the thirteenth goal of the SDGs, namely climate change management. This study also proposes a WOFI (Waqf Owned Financial Intermediary) model framework that is suitable for this purpose.

Keywords: Waqf; SDGs; Climate action; ANP

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INTRODUCTION

Climate change poses complex economic, social and environmental threats to the entire world. Apart from climate-induced heatwaves and debilitating sea level rise, climate change can have far-reaching effects on extant and future energy infrastructure in the region. This could include potential facility failures, decreased building life expectancy, and increased operational and maintenance expenditures on electricity, water, and aviation infrastructure, among others. Even without climate change, the world's countries are currently experiencing severe drought conditions and extreme heat, which typically affect the structural integrity, operation, and service life of water, energy, coastal, and transportation infrastructure. Climate change issues increase the need for the development of more sustainable solutions to address timely climate change challenges in the region (Hassan, 2009; Helm, 2020; Hepburn et al., 2020; Morea & Poggi, 2017; Olawuyi, 2021).

SDG 13, action on climate, has become one of the targets of sustainable development with efforts to take immediate action to address climate change and its impacts. Climate change is a real and undeniable threat to all human civilization. Its effects are already visible and will be catastrophic if no immediate action is taken. Therefore, through education, innovation and adherence to climate commitments, changes are needed to protect the planet. These changes also provide a great opportunity to modernize infrastructure that will create new jobs and promote greater prosperity around the world. (Ali & Kassim, 2020; Syahroni et al., 2020).

On the other hand, with the development of waqf as one of the Islamic social fund instruments, various projects that have sustainable goals can be realized properly for the benefit of the next generation. Through this instrument, society can play its part in giving its attention to help control climate change. Waqf funds can play a role in the SDGs agenda by taking immediate action to combat climate change and its impacts. This is also in accordance with several verses in the Quran making it clear that waqf is not just a charity, such as sadaqah, infaq or zakat, but an investment that lasts from generation to generation for all eternity, making it an eternal charity. (Arner et al., 2020; Dukhan et al., 2021; He & Harris, 2020; Rashid, 2018).

Unfortunately, there has been limited research and implementation on the role of waqf in addressing climate change, especially in Indonesia. Productive waqf has been widely used but the development devoted to

climate change solutions needs to be further explored and evaluated. Therefore, this research aims to design and propose a waqf model for climate protection that is in line with SDGs goal number thirteen as a form of expanding the utilization of waqf in the sustainable development agenda that plays a role not only in the socio-economic field, but also in the environment. (Ministry of National Development Planning/Bappenas, 2019). This study contributes to knowledge by providing various waqf innovations for climate preservation that can be adopted by policy makers. Although this study takes the case of Indonesia, the general framework can be applied in other countries, subject to applicable rules and regulations.

This study is organized as follows. A discussion of the literature review related to the topic is contained in the second section, followed by a discussion of the methods and data used, as well as model development in the third section. Furthermore, the results and discussion of the research will be presented in the fourth section, while the fifth section will present research conclusions and recommendations for stakeholders, especially practitioners and regulators, as well as for further research.

LITERATURE REVIEW

Theoretical Background

Waqf is characterized by its sustainable nature. The Sustainable Development Goals (SDGs) are goals that many countries around the world are trying to achieve. This character of waqf fits perfectly with these goals. The global plan for sustainable development called SDGs has been agreed upon by 193 UN member states. The SDGs have 17 goals and 169 goal-related targets that have a 15-year time frame (2015-2030). Especially in Indonesia, the waqf sector has the potential to be a source of resources and funding for SDGs programs especially in the future. From the many programs run by waqf management organizations, it is clear that waqf has relevance to the SDGs goals to be achieved, such as poverty alleviation and the improvement of education, health, and others. (Abdullah, 2018; Akhtar, 1996; Al-Khouli, 2005; Budiman, 2011a; Hasan, 2006; Marsuki, 2009; Thajudeen, 2018).

Much research has been conducted on waqf. Some studies have looked at waqf from a number of different angles, for example, the discussion on economic sustainability (Saiti et al., 2019), health sustainability (Handayani & Kamilah, 2019; Ismail et al.,

2019; Qurrata et al., 2019), education sustainability (Osmani & Hoque, 2018), nature sustainability (Ali & Kassim, 2020), and to environmental conservation (Khalfan & Ogura, 2012). The study found that waqf is a source of funding that can be used in many sustainable development projects, including climate change mitigation.

Waqf and the environment in particular have an interrelated and beneficial relationship and have great potential to be applied and proven effective in Islamic history. (Omar & Sanyinna, 2018; Perrin et al., 2020). Waqf can occupy an important role in contributing to achieving a community living environment that is good, comfortable and meets the needs of the ummah. Because funds derived from waqf profits should be able to maintain nature, forests and the environment that will always be needed for human survival (Bagaeen, 2006).

Previous Studies

Based on the literature review, almost all countries in the world are experiencing drastic impacts from climate change. Greenhouse gas emissions are more than 50 percent higher than in 1990. Global warming is causing long-term changes to our climate system, which threatens irreversible consequences if we do not act. (Ma & Cai, 2018; Morea & Poggi, 2017).

Average annual economic losses from climate-related disasters amount to hundreds of billions of dollars. Not to mention the human impact of geo-physical disasters, 91 percent of which are climate-related, killing 1.3 million people and causing 4.4 billion injuries due to various natural disasters from 1998 to 2017. This demonstrates the high need for developing countries to adapt to climate change and invest in low-carbon development (Mekhilef et al., 2014).

The efforts of the SDGs by supporting areas vulnerable to natural disasters due to climate change are expected to contribute not only to goal 13 but also to other SDGs. These actions should also go hand in hand with efforts to integrate disaster risk measures, sustainable natural resource management and human security into national development strategies. With strong political will, increased investment, and using existing technologies, to limit the increase in global average temperature, but this project certainly requires a collective movement with sustainable funding, one of which is waqf. (Abdullahi, 2019; Budiman, 2011b; Olawuyi, 2021; Salleh et al., 2020).

Creating action to combat climate change can be done by several measures, such as strengthening resilience and adaptive capacity to climate-related

hazards and natural disasters in all countries, integrating climate change measures into national policies, strategies and planning. Likewise improving education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

In addition, implement the commitments made by developed country parties to the UN Framework Convention on Climate Change for the purpose of jointly mobilizing \$100 billion per year by 2020 from all sources to meet the needs of developing countries in the context of meaningful mitigation actions and transparency of implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible. Finally, promote mechanisms to increase capacity for effective climate change-related planning and management in least developed countries and small island developing states, including focusing on women, youth and local and marginalized communities. (Ministry of National Development Planning/Bappenas, 2020).

METHODOLOGY

Because the purpose of this research is to analyze the waqf modeling that can be applied by having relevance to the SDGs, especially the thirteenth point, namely handling climate change. Therefore, a method is needed that is able to provide the best results in decision making. The practice of integrating waqf and SDGs has the criteria of developing social funds collaborated with environmental preservation which has the potential to provide sustainable benefits. Based on these considerations, this study uses the Analytic Network Process (ANP) method to propose a waqf model relevant to SDGs and evaluate the best waqf model among the proposed models.

Furthermore, this study seeks to analyze the criteria of the proposed waqf model to help achieve the SDGs from the Maqashid Shariah perspective. This research also seeks to determine the criteria of the six elements of Maqashid Shariah and the proposed waqf model that has the most prioritized impact. Therefore, a decision-making analysis tool is required that is able to provide a measurement of the prioritization of the proposed criteria and model. The prioritization is intended to rank the criteria that affect the proposed waqf model. The method used for this prioritization process is ANP (Saaty, 2005).

ANP is a general theory used to measure a relatively composite priority ratio from a specific

individual ratio scale. The results reflect the relative measurement of the effects of interacting or interconnected elements. In research aimed at identifying good decision-making methods, the ANP method is relatively superior to other decision-making methods based on several different criteria, such as problem abstraction, width of structure, depth of structure, scientific basis, and validity of results (Saaty, 1996; Saaty & Vargas, 1996).

ANP requires that respondents must be consistent in answering the pairwise comparison questionnaire, with a maximum allowable inconsistency of 10%. (Ascarya & Yumanita, 2011; Rusydiana & Devi, 2013a). However, ANP does not require significant consensus (Kendall's rater agreement) among respondents when they fill out the questionnaire individually. However, we will calculate Kendall's rater agreement to understand the views of different groups of respondents on this topic.

ANP is a development of the Analytic Hierarchy Process (AHP) where levels have a hierarchy. In the AHP network, there are levels of objectives, criteria, sub-criteria, and alternatives, where each level has elements. Meanwhile, in the ANP network, the levels in AHP are called clusters that can have criteria and alternatives in them, which are now called nodes (Azis, 2003; Sipis, 2003). (Azis, 2003; Sipahi & Timor, 2010).

Data

The ANP method requires a focus group discussion (FGD) of knowledgeable respondents.

(Ascarya et al., 2022). The software used in this research is *Super Decision 2.10* and *Microsoft Excel 2013* in processing and analyzing data. ANP is a mathematical theory that is able to analyze the influence with the approach of assumptions to solve the form of the problem (Rusydiana & Devi, 2013). (Rusydiana & Devi, 2017). This method is used in the form of a solution with consideration of the adjustment of the complexity of the problem by parsing the synthesis accompanied by a priority scale that produces the greatest priority influence (Rusydiana & Devi, 2017). (Rusydiana, 2016; Rusydiana & Devi, 2013b).

To understand the different views of the respondents, a group of 8 (eight) practitioners and a group of 8 (eight) experts including 4 (four) academics and 4 (four) regulators on the ANP method were selected using purposive sampling, as the respondents must be knowledgeable/expert on the topic of waqf and SDGs.

The expert informants come from various backgrounds, including practitioners of waqf institutions in Indonesia, waqf regulators, the Indonesian Waqf Board, the Indonesian Ministry of Religious Affairs, DEKS Bank Indonesia, and academics who focus on waqf research topics. In addition, respondents will be involved in various stages of ANP, starting with the construction of the ANP model through in-depth interviews and/or focus group discussions (FGDs), followed by the quantification of the ANP model through interrelated questionnaire surveys.

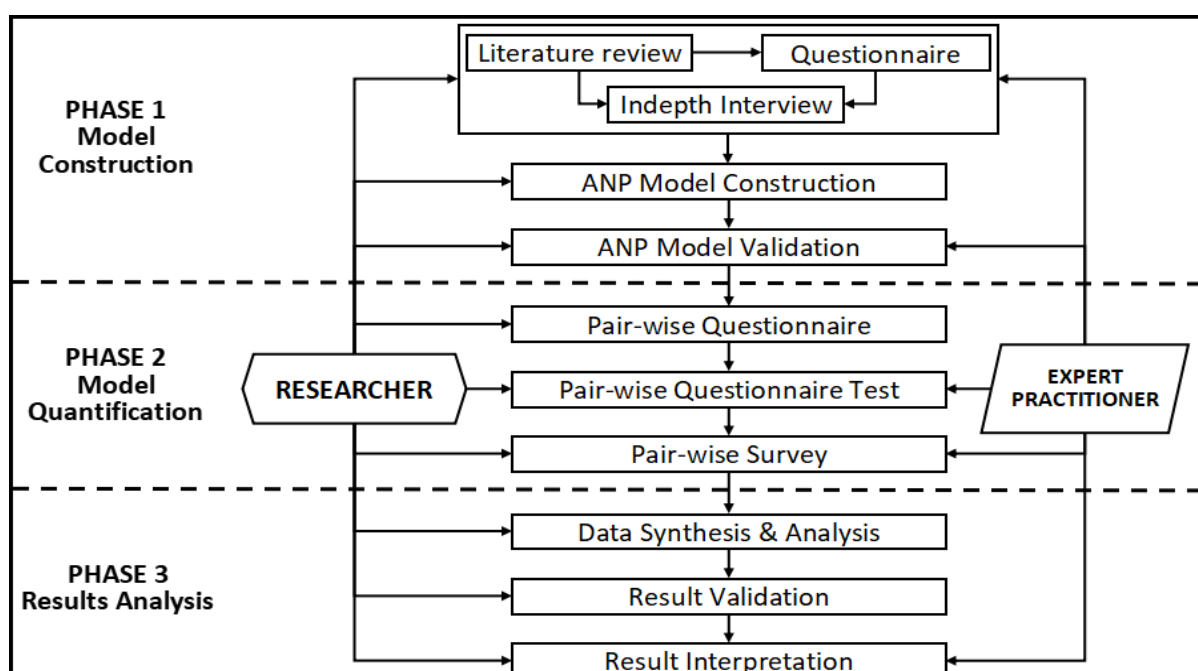


Figure 1. ANP Research Steps

Source: (Ascarya & Yumanita, 2011)

In this empirical study, the steps to be carried out follow three stages, namely model construction, model quantification and result analysis. Stage 1 is model construction or decomposition to identify, analyze and structure the complexity of the problem into an appropriate ANP network. Stage 2 is model

quantification or pairwise comparison, and stage 3 is result analysis.

RESULTS

Table 1. ANP Result on SDG Criteria

SDG criteria	Respondent			Rank All
	Expert	Practitioner	All	
1.Economic	0.317	0.328	0.323	2
2.Social	0.308	0.302	0.305	3
3.Environment	0.368	0.361	0.364	1
Consistency	0.000***	0.000***	0.000***	
Kendall's W	0.203	0.328	0.250	
P-value	0.196	0.072*	0.018**	

***Significant at 1% level; **significant at 5% level; significant at 10% level

The results of this ANP study show which SDG criteria are most important, namely economic, social and environmental. There are two types of criteria respondents, experts and practitioners, combined to find out how much weight each has. Therefore, the environmental criteria with a weight of 0.364 occupies the top position in the top priority criteria. With a weight value of 0.305, social criteria are the third most important thing to look at. In terms of environmental criteria, the SDGs want to pay attention to environmental sustainability as a way to help society achieve the SDGs and ensure a healthy planet.

The study also looked at how consistent the results were. The consistency value in the table above has a value of 0.000, which means that according to the experts all results are the same. Kendall's W also follows the P-Value, which shows how important the data is. The P-Value shows how important the order of the SDG criteria is. There is still debate about the priority ranking if no significant results are found. If the results are significant, then everyone agrees with the rank order. The ANP results for the above SDG criteria were found to be significant.

Table 2. ANP Result on Maqasid Criteria

Maqasid criteria	Respondent			Rank All
	Expert	Practitioner	All	
1DIIN	0.155	0.167	0.161	5
2NAFS	0.173	0.167	0.170	2
3NASL	0.166	0.163	0.165	4
4'AQL	0.125	0.152	0.138	6
5MAAL	0.167	0.170	0.168	3
6BI'AH	0.194	0.157	0.175	1
Consistency	0.000***	0.000***	0.000***	
Kendall's W	0.226	0.044	0.087	
P-value	0.106	0.877	0.217	

***Significant at 1% level; **significant at 5% level; significant at 10% level

The Maqashid Shariah used in this research consists of six parts: protection of religion, protection of life, protection of offspring, protection of intellect, protection of wealth, and protection of the environment.

These six are important to think about when planning a waqf model that can help the SDGs and make the most impactful changes. In addition, it is also necessary to ensure that the objectives and processes remain in line

with sharia law, especially when new waqf models emerge.

Bi'ah is the Maqashid Shariah criterion that is found to have the highest weight value, so it is ranked first in the ANP table. Next, the second most important thing to do is to protect the soul (nafs) with a weighting value of 0.170. At the third priority level you protect your property (maal) with a weighting value of 0.168, or 0.168. The fourth most important thing is to protect your offspring (nasl), which has a weighting value of 0.165. *Diin* has a weight value of 0.160, which makes it the fifth most important thing. In sixth place is the preservation of the intellect ('aql), which has a weight value of 1.138.

Bi'ah or the environment is clearly a top priority in this aspect (SDG-13). Because in Islam, one of the main goals of the Shari'a is to protect nature and its sustainability. Muslims should put preserving their religion first, first because waqf is a way of worshipping Allah, as well as a way of donating wealth and helping others. What is meant by "safeguarding religion" is

maintaining and keeping the Islamic faith alive in the person who is waqfing or achieving the SDGs, so every process and stage must be checked to ensure it has been done in accordance with sharia rules. The second thing to do is to safeguard the soul (nafs), which means that one should try to avoid the bad things in life and ensure that it stays alive. This is also similar to the scheme of how waqf is organized and how the SDG criteria are used.

The table above shows that Maqashid Shariah experts have different opinions. Since the P-Value does not indicate that the priority order has been agreed upon by the respondents, it can be concluded that they have not agreed on the priority order. The experts are still debating the rank order. They think that all parts of maqashid sharia are equally important, so it is difficult to rank the priority levels. So, although there is a ranking that shows which things are most important, the significance of the order is not very high. Another good thing about the weight value is that it is very consistent with 0.000.

Table 3. ANP Result on Alternative Waqf Model

Alternative Waqf Model	Respondent			Rank All
	Expert	Practitioner	All	
1Waqf & ZIS	0.183	0.116	0.149	4
2Waqf & Takaful	0.113	0.120	0.117	5
3Waqf & Microfinance	0.165	0.181	0.173	3
4Waqf & Bank	0.195	0.191	0.193	2
5Waqf & Sukuk	0.342	0.390	0.366	1
Consistency	0.000***	0.000***	0.000***	
Kendall's W	0.346	0.690	0.478	
X ²	11.100	22.100	30.600	
P-value	0.025**	0.000***	0.000***	

***Significant at 1% level; **significant at 5% level; significant at 10% level

The table above shows the ANP weighting results of five alternative waqf models. Starting from the waqf model whose social ratio compared to commercial ratio is higher to the lowest, namely Waqf & ZIS, Waqf & Takaful, Waqf & Microfinance, Waqf & Bank and Waqf & Sukuk. The five models have different weight values.

Based on the ANP weight assessment, the first rank that is the top priority in implementing the waqf model for climate action is the Waqf & Sukuk model with a weight value of 0.366. Furthermore, the second rank is Waqf & Bank with a weight value of 0.193. Then the third rank is Waqf & Microfinance with a weight value of 0.173. The fourth rank is Waqf & ZIS with a weight value of 0.149. Finally, Waqf & Takaful is the fifth priority and the weight value is 0.117.

The objective of the top-priority waqf model is Waqf & Sukuk, which seeks to improve the welfare of the community by boosting the economy through various developments. The model, which received a weighted score of 0.366, focuses on increasing the development of productive waqf so that the utilization of waqf is not limited to waqf beneficiaries, but also has a positive impact on development, especially in relation to tackling climate change, which seeks to take immediate action to combat climate change and its impacts.

This model is also expected in the long run to reduce social and economic inequality between countries in order to realize inclusive welfare. Based on the model proposed in this study, it is found that the model with a

larger commercial portion is the most important alternative waqf model with various roles that it can fulfill. Among the allocation forms of this model is using

waqf to address climate change for better development through sukuk instruments.

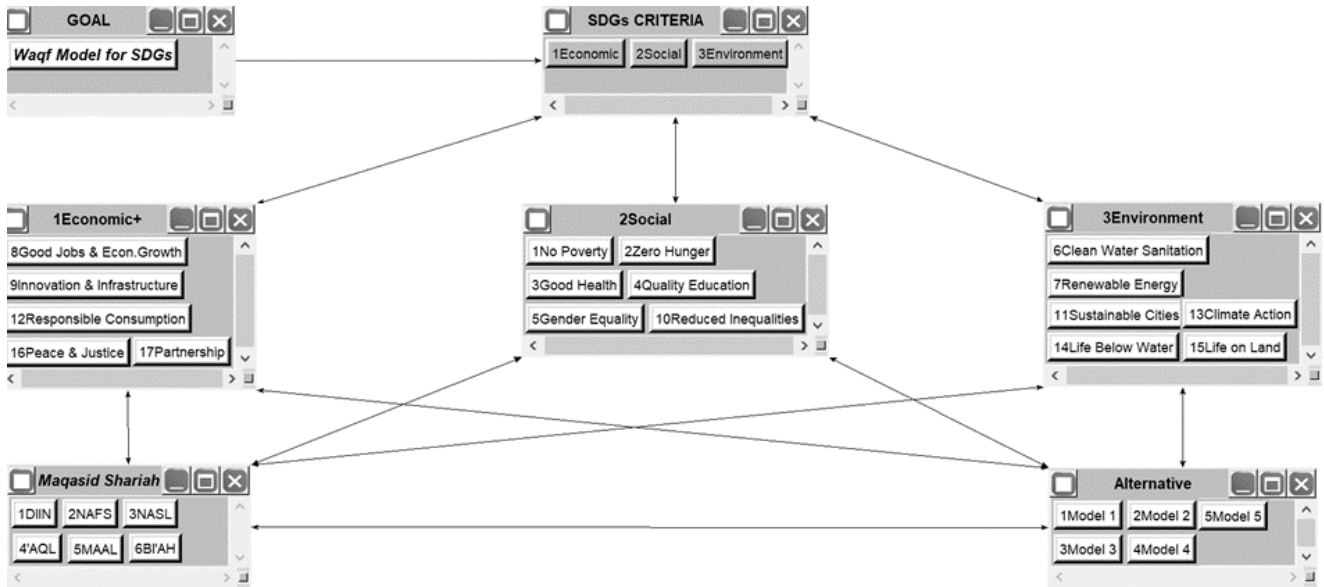


Figure 2. ANP Model Framework in SuperDecision 2.10

There are three factors to be considered when modeling SDGs waqf: economic, social, and environmental. This is shown in Figure xxx. Another thing to note is that each of the three criteria has sub-criteria. The economic criteria have five sub-criteria or objectives, the social criteria have six sub-criteria or objectives, and the environmental criteria have six sub-criteria or objectives. They are then linked to the Maqashid Shariah perspective, which consists of six different parts. Finally, there are five possible models for implementing waqf relevant to the SDGs.

Findings

This research finds that a suitable waqf model scheme for waqf and climate change management is a modification of the WOFI model: Waqf-Owned EBIN (equity-based financial intermediary) model in the waqf for Solar Farms research. (Ari & Koc, 2021). This model combines Waqf-Sukuk which is the first priority in the SDG 13 waqf model and Waqf-Bank which is the second priority with the following framework:

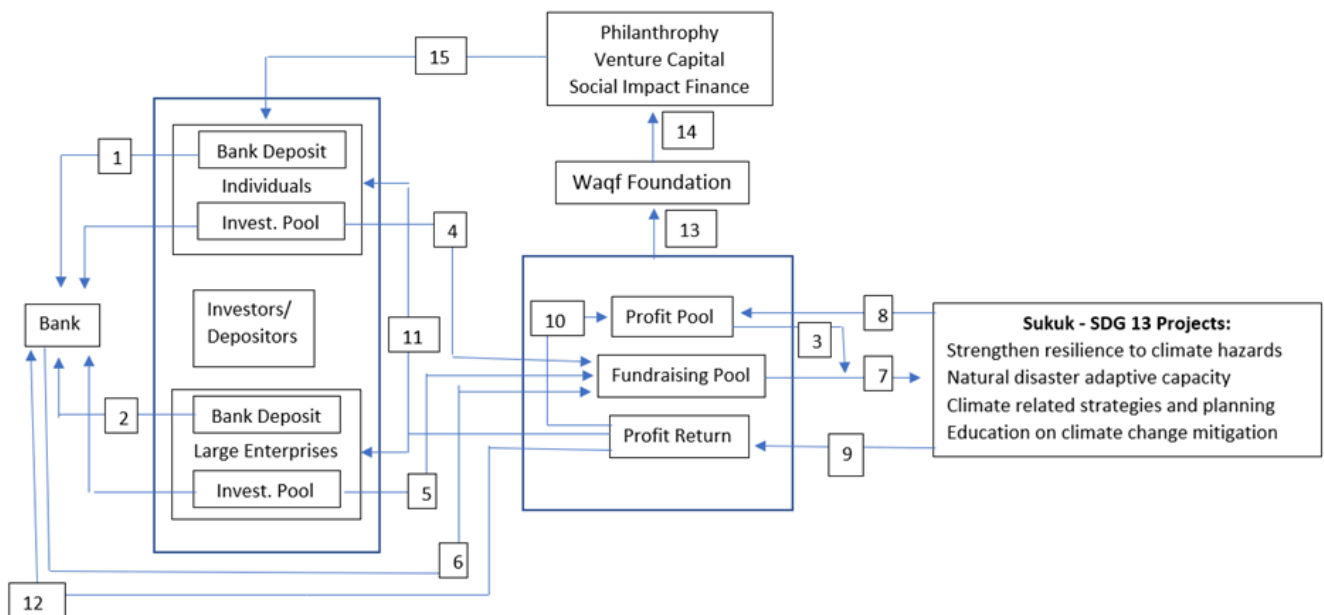


Figure 3. SDG 13 Waqf Model Framework

In the scheme, individuals (1) and large corporations (2) deposit their savings with banks in the form of time deposits. They can withdraw at any time and any amount for investment. WOFI invests in sukuk with projects relevant to SDG 13 such as strengthening resilience to climate hazards, natural disaster adaptive capacity, climate-related strategies and planning and education on climate change mitigation, adaptation, impact reduction and early warning (3).

Furthermore, after a certain amount of time, WOFI becomes self-sufficient in funding SDG 13 projects, and assists with wealth inequality which has a positive impact. It should be noted that there is a priority list for investing in SDG 13 projects, and the order of investment is represented with numbered arrows. First, WOFI invests under policy rules (Arrow 3), followed by individuals (Arrow 4), large companies (Arrow 5), and banks (Arrow 6). In addition to WOFI sources, the remaining costs can be financed by individuals (Arrow 4) without any investment restrictions. If there is still a shortage of funds, then large companies finance the rest (Arrow 5). As a last resort, banks will contribute to cover the remaining costs (Arrow 6) and will participate in the SDG 13 project as sukuk holders.

WOFI invests in SDG 13 projects on behalf of sukuk holders (Arrow 7). The SDG 13 sukuk project distributes profit proceeds at the end of each year. At the end of each year, WOFI receives a percentage of the total profit proceeds from the SDG project as an intermediary share (Arrow 8). WOFI earns a percentage of the profits as the project developer (Arrow 8) on top of the intermediation share.

The remaining percentage of the total profit proceeds collected from the SDG 13 project by WOFI (Arrow 9) is distributed to sukuk holders as coupons. There is no priority in the distribution of profits from WOFI to sukuk holders according to their share. WOFI is also a sukuk holder with respect to its investment of the fees (Arrow 3), and as such, has its own share of the profits (Arrow 10).

WOFI transfers all profit proceeds to the waqf with its ownership (Arrow 13) except for the capital required for the SDG Project 13 sukuk investment in the following year (Arrow 3). The waqf redistributes the profits to society (Arrow 15) through philanthropy, venture capital and social impact financiers (Arrow 14).

This model of collaboration between sukuk waqf and waqf aimed at addressing climate change is expected to expand the usefulness of sukuk. On the other hand, this model also helps support the achievement of targets

related to SDG 13 which focus on the integration of climate change measures into national policies, improved education, increased awareness and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

CONCLUSION

The role of waqf is crucial in funding climate protection schemes, precisely in line with SDGs goal number 13, which is to take urgent action to combat climate change and its impacts. The waqf instrument can be collaborated and coordinated with the SDGs that aim to build a good and sustainable climate safeguard gradually and consistently. In supporting this program, the potential contribution of waqf is very potential and can be very significant. Various types of waqf can be developed to achieve climate-related targets, such as strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries, integrating climate change measures into national policies, strategies, and plans, improving education, awareness, and both human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning, so as to meet the needs of current and future generations.

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