

Religion and Ecology: Environmental Ethics in Maintaining the Food and Energy

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Abstract

Food and energy are a global concern today due to climate change. Some countries are concerned about maintaining the chain of availability of food and energy supplies for the community, especially with the depletion of food supplies and the need for renewable energy. This study aims to analyze the dependence on food and energy and the religious concept of preserving and maintaining the environmental ethics of the depletion of food supplies and fossil energy for Muslim countries. As a system, Islamic economics is expected to be an alternative solution in the sustainability of maintaining the food and energy supply chain ecosystem, starting from raw materials, processing, certification, distribution, and marketing. The method used is through literature review. The results obtained that Muslim countries can play a role in handling food and energy scarcity, including by breaking away from fossil energy dependence by implementing renewable energy, green and blue economy, increasing production capacity and expanding agricultural areas, and providing agricultural and energy technology transfer, diversifying water products, training, and education in the agricultural sector. Although there are regulations on environmental care, the fact that some countries still ignore environmental preservation and sustainability is evident from a large amount of deforestation, drought, flood disasters, deforestation, changes in forest functions, extinction of flora and fauna ecosystems, and global warming. This shows that the process of maintaining environmental ethics is still not optimal. Serious efforts are needed from various parts of the world towards climate change.

Keywords: environmental ethics; food resilience; green economy; halal value chain; sustainable energy

INTRODUCTION

According to the latest FAO report in 2021, the world population is estimated to reach 9.7 billion by 2050 (Zarei, 2020). This will require a 50% increase in global food production by 2030 and nearly 70% by 2050. Although global food production has increased over the past decades, around 690 million people still experienced hunger in 2019. On the other hand, according to a report from the IEA, global energy consumption increased by about 2.3% in 2019. About 80% of global energy still comes from fossil fuels, with crude oil as the most significant energy source, followed by natural gas and coal. Global energy demand is estimated to increase by 4.6% annually until 2030. However, different scenarios show that developing clean energy and energy efficiency could reduce global energy demand by up to 4% by 2040 (IEA, 2023).

At the same time, environmental degradation is a complex and far-reaching problem (Athayde et al., 2022; Gladysz & Kluczek, 2017), and many international organizations and government agencies collect data on various environmental issues around the world (Watson et al., 2019). According to Global Forest Watch, the world lost an average of 10.4 million hectares of forest per year between 2015 and 2020, with Brazil, Congo, and Indonesia being the countries with the highest rates of forest loss (Global Forest Watch, 2023). According to the United Nations, about 25% of the world's land is degraded, leading to reduced agricultural productivity and increased risk of natural disasters. About 2.2 billion people worldwide do not have access to safe water sources, and about 80% of the world's wastewater is not treated correctly. According to the World Health Organization, about 9 out of 10 people worldwide breathe air containing pollutants, which can cause health problems such as respiratory diseases, cancer, and stroke. Meanwhile, according to the United Nations, the global average temperature is rising by about 1 degree Celsius compared to pre-industrial levels. If this trend continues, it could lead to significant impacts such as increased intensity of extreme weather, sea level rise, and ongoing climate change. These data show that environmental degradation is a global problem that requires urgent action from all countries and societies worldwide to address these issues (Ryberg & Chanat, 2022).

Of course, this affects the order of climate change, which can affect food production, world energy consumption, and environmental damage (Ritchie & Roser, 2020). It is necessary to improve the efficiency of food and energy production and develop clean and environmentally friendly energy sources and concrete actions to preserve the environment. This will help meet the world's food and energy needs and reduce negative environmental and climate impacts. Food and energy refers to the complex relationship between production and energy use. In developing countries, food and energy issues are often related to limited access to clean and affordable energy, affecting food production. Energy and food issues in the 57 Muslim-OIC countries vary greatly depending on the country. However, some common issues are heavy reliance on imported energy resources, inequality in access to food, climate change, natural disasters, and commitment to a green economy (Mardani, 2023; OIC, 2023). Muslim countries also face challenges from climate change and natural disasters that affect food and energy production. These countries can increase their resilience to climate change and natural disasters by developing more disaster-resistant infrastructure and technologies (Daher et al., 2021).

This article aims to analyze the availability of food and energy supply chains while maintaining environmental ethics from greed and exploitation of natural resources. This concept and circulation will form a halal value chain (food, fashion, cosmetic, tourism, and financial institutions). The second stage opens up space in the consolidation of making renewable energy. This research contributes to the development of halal foods, creating, collaboration, and energy integration for Muslim countries for the region of countries incorporated in the OIC so that they become solid countries and equal to developed countries worldwide.

Research shows that the critical role of waste and food management technologies using Multi-Criteria Decision Making (MCDM) is established, helping decision-makers to compare and evaluate food technologies (Yap & Nixon, 2015). These tools have been widely used throughout the food-energy industry. The researcher sees a gap in his research that does not use instruments from collaboration not only food but further than that, namely the availability of halal food and food. OIC community serves Muslims who must consume food, clothing, tourism, and the financial sector (Iskandar et al., 2021). However, many Muslim countries still do not consistently pay attention to the environment, even though Islamic teachings have regulated mechanisms and manners toward the environment (Saniotis, 2012).

These five factors have led to Islamic economic sustainability due to the green economy (Mardani, 2023; Qian et al., 2022). Climate change is a necessity that must be faced by mankind as an effort to green the Earth (Baird & Pope, 2022) as is done, namely removing mold from trees because it can accelerate tree death, which can disrupt the ecosystem of trees in the UK. The concept of tree planting in the UK to increase forest cover from the current 13% to 17%-20% by 2050 has worked well. However, researchers see that planting green trees is not enough but how to sensitize-literate about the importance of maintaining environmental ethics and forest areas for sustainability and maintaining environmental ethics and creating renewable energy (Babu et al., 2022; Mardani, 2023).

Management is the most crucial source in dealing with the WEF (water, energy, and food) problem in countries worldwide (Molajou et al., 2021). Researchers see that the problem is not only a management factor but also a matter of collaboration, equality, and creating food and energy sources. This needs to be a priority for people worldwide, considering that fossil energy will soon run out, so halal food and value chains are a priority for the Muslim world community (Lima & Gupta, 2013; Sardiana, 2020). Scholars discuss the importance of economic sustainability by applying the food and energy factors experienced and needed by humans. But more than that, Muslim countries must have a breakthrough in consuming-running a halal supply chain from raw materials to distribution to increase trade and economy between Muslim regional countries, including clothing, food, cosmetics, finance, and halal tourism.

METHOD

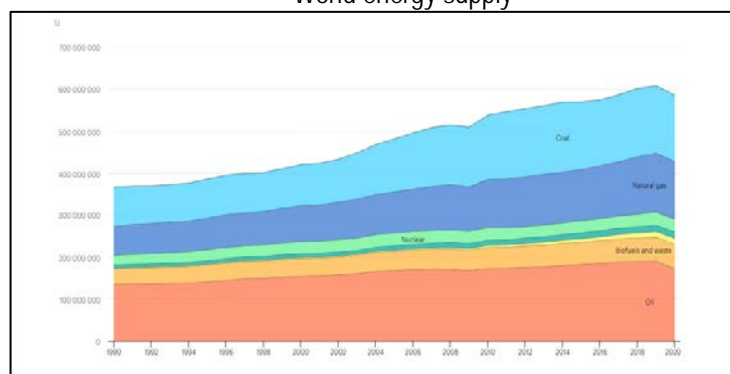
This study involves a literature study with a general formalization approach implemented in the Muslim world countries. Based on this, the formalization approaches are classified according to their propensity to develop the food and energy sectors. Approaches to formalization and barrier categories were validated. In the formalization process, the availability of information in public secondary sources and its geographical location (covering Muslim countries). This article analyzes and discusses the general characteristics according to the type of formalization approach applied, the type of barriers faced, and the possible measures applied (Silvestre, 2018). Starting from this, the study identifies the problems that are persistent barriers that remain and discusses the main enabling factors that can eliminate these barriers in the long run (M. Rahman, 2020).

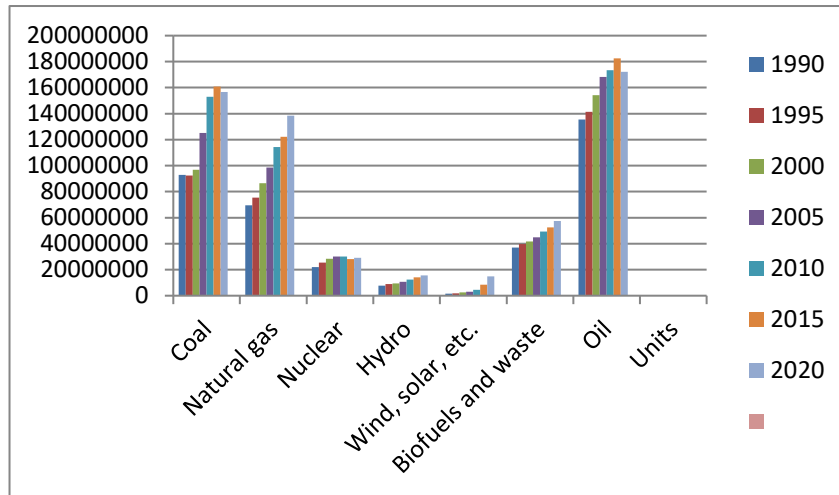
RESULTS AND DISCUSSION

International cooperation and collaboration from all countries are needed to address the world's food and energy problems. One solution is promoting sustainable agriculture and using renewable energy such as solar, wind, and water. In addition, it is also necessary to increase energy efficiency and reduce the consumption of non-renewable fossil energy (van den Heuvel et al., 2020). There is also a need to improve access to safe and affordable food and energy for people worldwide. This can be achieved by improving infrastructure, technology and effective distribution systems. Finally, preventive measures are also needed to reduce political conflicts and improve global security stability, so people can live safely and peacefully and have better access to food and energy.

The world energy imbalance can be seen in the table below:

Figures 1 and 2
World energy supply

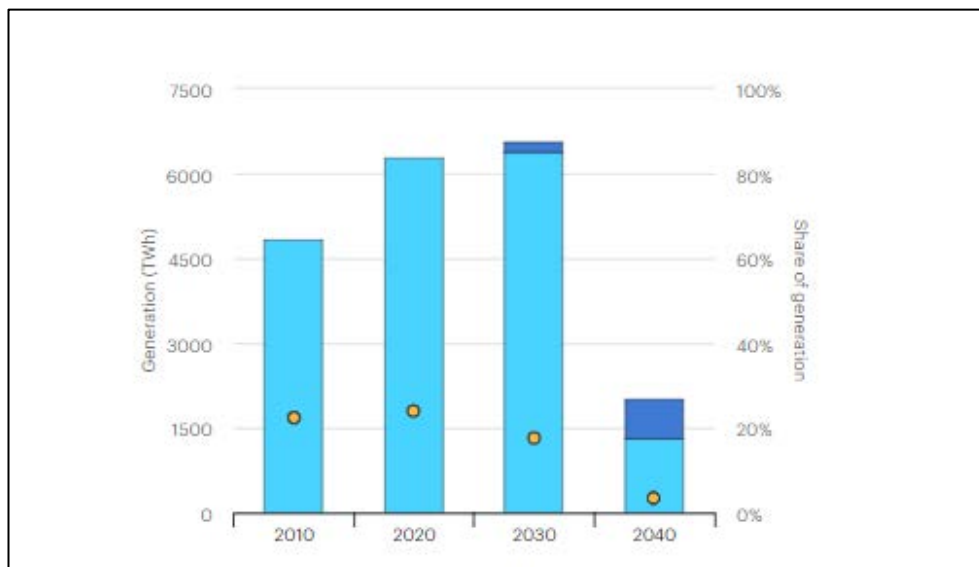




Source: www.iea.org

The data above shows that the world's demand for oil, liquefied natural gas, and coal energy has increased tremendously. The use of fossil-based energy is detrimental to the sustainability of nature, with climate change and carbon gas emissions in the world, challenges from alternative fuels, and changes in driver and commuter behavior. In the future, the gasoline demand will decrease as many switch to electric vehicles. To curb the demand for fossil energy consumption, the government must seriously provide incentives and regulatory policies starting in the 2020s and mid-2030s. The Middle East region is still a country that is expected to continue to supply fuel and petroleum to countries in the world, including Indonesia. This sustainability of demand is also due to the low cost of production compared to other countries.

Figure 3
Use of gas-fired electricity generation

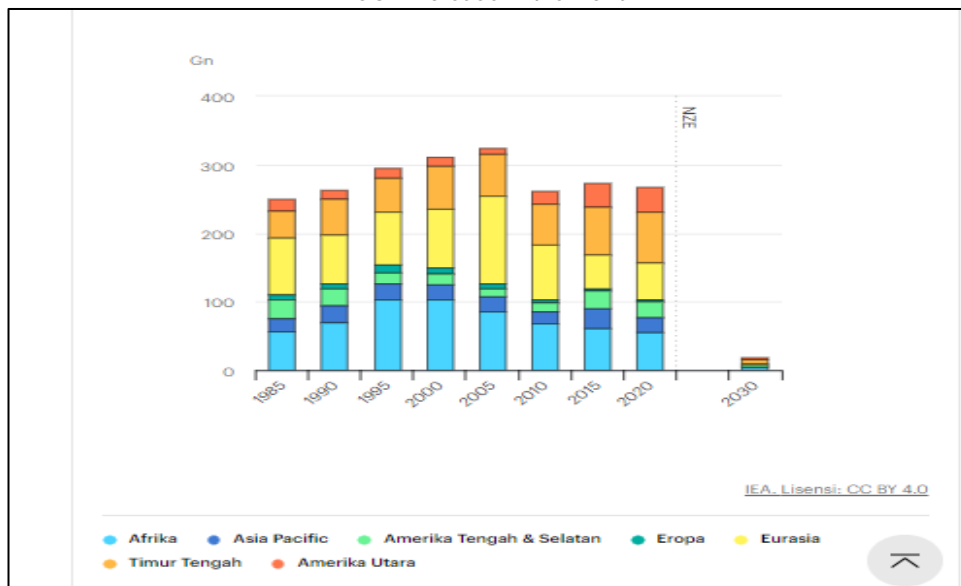


Source: www.iea.org

Gas-fired power generation contracted 2% in 2020 but is expected to increase 1% in 2021, about 6,300 TWh, gas making up 24% of total global power generation in 2020. In the Net Zero Emissions by 2050 Scenario, non-reduced gas-fired power generation continues its growth in the short term, replacing coal-fired generation, but begins to decline in 2030 and is 90% lower in 2040 compared to 2020. Existing gas-fired

power plants must be retrofitted with CCUS or co-fired with low-carbon fuels such as hydrogen to be consistent with Net Zero Scenario levels.

Figure 4
 CO2 increase in the world



Source: www.iea.org

Globally, 142 cm of natural gas was flared in 2020 - roughly equivalent to the demand for natural gas in Central and South America. This resulted in about 265 Mt CO₂, nearly 8 Mt methane (240 Mt CO₂-eq), black soot, and other GHGs being emitted directly into the atmosphere. Five countries (Russia, Iraq, Iran, the United States, and Algeria) accounted for more than half of all volumes flared globally in 2020. Many options are available to reduce flaring but will likely require new gas monetization strategies, business models, and stricter (and enforced) regulations. More companies are committing to eliminate flaring by 2030. The Net-Zero Emissions by 2050 scenario requires all non-emergency flaring to be eliminated globally by 2030, resulting in a 90% reduction in flaring volumes by 2030.

Food And Energy in Muslim Countries

So far, some countries still depend on other countries, especially in food and energy. The development gap between developed and Muslim countries is caused by: dependence on fossil fuels and limited access to clean energy.

Dependence on fossil fuels

Developing countries often rely on fossil fuels to meet their energy needs, which can be a source of pollution and adverse effects on health and the environment. Excessive use of fossil fuels can also disrupt food production by reducing water availability and disrupting biodiversity. Fossil fuel dependency is a condition where people, industries, and governments heavily depend on fossil fuels such as petroleum, natural gas, and coal as the main energy source. This is because fossil fuels are reliable sources of energy that are cheap and easily accessible. However, dependence on fossil fuels negatively impacts the environment and human health, such as air pollution, global warming, and increasing temperatures on Earth.

In addition, the supply of fossil fuels is also limited, which means that the supply will run out at some point. To reduce dependence on fossil fuels, shifting to more environmentally friendly and sustainable energy sources, such as solar, wind, and hydro energy, is necessary. Governments and industries need to promote the use of renewable energy and support the development of new and renewable energy technologies to reduce dependence on fossil fuels.

Most OIC countries have abundant oil and natural gas reserves, so most rely on fossil fuel exports to earn foreign exchange. However, most OIC countries also experience difficulties providing adequate energy to their populations, especially in rural and remote areas.

In addition, dependence on fossil fuels is also one of the factors worsening environmental conditions in OIC countries. Air pollution from industries and motor vehicles using fossil fuels adversely affects public health and the environment. Some OIC countries have promoted using renewable energy, such as solar and wind, to reduce dependence on fossil fuels. However, technological and infrastructural challenges remain as barriers to promoting the shift to cleaner and more sustainable energy sources in OIC countries.

Limited access to clean energy

Many developing countries have limited access to clean and affordable energy, which can affect food production and food security. For example, rural farmers may not have adequate access to the electrical energy needed to run farm machinery. Energy use in the food supply chain: Food production, processing, packaging, and transportation require energy, and excessive energy use in the food supply chain can be problematic. For example, long-distance transportation can lead to greenhouse gas emissions and air pollution, affecting food quality and the environment. A holistic and sustainable approach is needed that considers the impact of energy use on food production and food security.

This could include developing affordable renewable energy sources, reducing waste and efficient energy use in food supply chains, and increasing access to clean energy for rural communities. According to the 2020 Global food security index published by the Economist Intelligence Unit, Muslim countries such as Afghanistan, Sudan, Somalia, and Yemen are among the bottom ten countries in terms of food security. This shows inequalities in access to food and nutrition in these countries. Overall, more significant and coordinated efforts are needed to reduce food and energy inequality in Muslim countries. This could include increasing investment in clean energy, improving the productivity and sustainability of food production, and expanding people's access to quality energy and food, all of which can influence and reduce countries' food and energy management (Economist Intelligence-EUI, 2023; Qin et al., 2022).

Food problems in Muslim countries

Food issues in Muslim countries vary greatly depending on the country and region. Some Muslim countries face hunger and malnutrition, while others have problems with food price instability, lack of infrastructure for food distribution, and low agricultural productivity. Some factors affecting food problems in Muslim countries are conflict and political instability, climate change, poverty, poor infrastructure, lack of education and skills, political instability, and lifestyle changes (Adom et al., 2022; Temiz & Dincer, 2021).

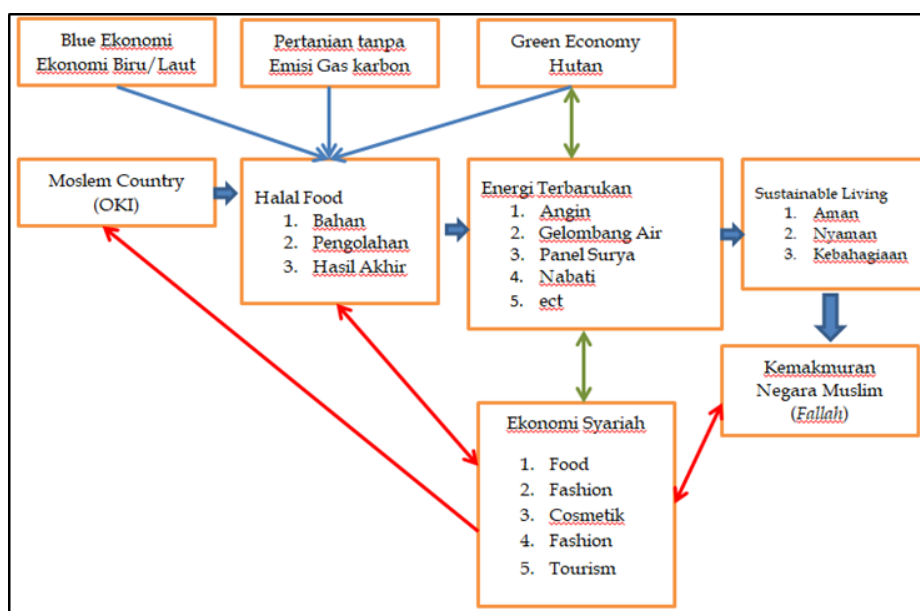
Religion and Environmental Ethics

Many Muslim scholars throughout history have illuminated developing legislation regarding animal rights, flora, settlements, cities, waters, forests, wildlife, land use, and other aspects of managing the Earth's finite natural resources. At the height of Islamic civilization, the Shari'ah required establishing conservation areas, where development was strictly forbidden for exploitation and had to protect natural resources (R. Rizk, 2014). These areas often bordered wells, rivers, and canals to protect water sources from pollution (Anwar et al., 2019; M. T. Rahman & Bukhori, 2022). In addition, grasslands, forests, wildlife, and woodlands cannot be privately owned or monopolized, as they are considered public property that the state must manage for the common good (Yousri, 2005). The color green is considered by many scholars, such as Al-Qaradawi, as the most blessed color for Muslims and a strand of "green jihad" or green economy that is appropriate to address the global environmental crisis (Mardani, 2023). Economic activities are governed by halal-haram codes and restricted to the broader community's interest. Organizations must protect the environment from harm through their policies and processes and an additional obligation for funders of new projects (Mardani, 2021; Mardani & Gunawati, 2020; Rosyad et al., 2022). In other words, a company's environmental agenda should reduce harm to the point of strengthening the company's strategy through green development and social progress.

Collaboration between Muslim Countries

Collaboration between Muslim countries in handling food and energy scarcity can be an effective solution to overcome this problem. Some ways of collaboration that can be done between Muslim countries are by exchanging technology, Muslim countries can share technology and knowledge related to handling food and energy scarcity. This can be done through cooperation between research institutions, universities, or government agencies responsible for these fields. Joint agricultural programs are encouraged to increase food production. This can be done by optimizing the use of existing land and natural resources and improving the quality and quantity of seeds used. Related to food and energy trade, Muslim countries can trade food and energy to help each other overcome scarcity. Improving human resources quality can be improved by improving education and training for farmers and experts in food and energy. Infrastructure development can build transportation networks that facilitate food and energy distribution and facilities and infrastructure that support food and energy production and processing (Cantelmi et al., 2021). Through this collaboration, it is hoped that Muslim countries can help each other to overcome the increasingly complex problems of food and energy scarcity.

Figure 5.
 Model of halal value chain development in OIC Countries



Source: Private Document, 2023.

Halal supply chains can be important for Muslim countries because halal products are essential for Muslim consumers and can also be an important source of economic revenue for countries that produce halal products. Some forms of halal supply chain are the process of raw materials, which must ensure that the materials used in the production of halal products meet the requirements of Islamic sharia, including the way of processing and processing these materials. Manufacturers must ensure that all stages of production of halal products are carried out by the requirements of Islamic sharia, including the use of halal ingredients, appropriate processing and processing, and maintenance of hygiene and sanitation. Halal products must be certified by a halal certification body recognized by the national halal authority. This certification guarantees that the requirements of Islamic sharia have produced halal products. Halal products must be distributed through halal distribution channels, including appropriate transportation and storage. Marketing of halal products must be done honestly and not misleadingly, and not in violation of Islamic Sharia requirements. Muslim countries can strengthen the halal supply chain by strengthening halal certification infrastructure, developing strong regulations, and increasing public awareness and understanding of the importance of halal

products. Muslim countries can also cooperate with other countries to promote halal products and increase trade (Abdullah & Laila, 2022; Iskandar et al., 2021).

CONCLUSION

Food and energy scarcity has hit various countries worldwide, including Muslim countries that are members of the Organization of Islamic Cooperation (OIC). This problem can be handled by transferring and exchanging technology between Muslim countries, using renewable energy, implementing a green economy and blue economy, and providing training and education for Muslim countries to create equity in the halal supply chain ecosystem from the food, clothing, tourism, finance and other sectors so that the sustainability of development and economic equality of Muslim countries is better maintained. However, we must maintain environmental ethics to live interdependently and sustainably.

REFERENCES

- Abdullah, I., & Laila, N. Q. (2022). The contestation of the meaning of halal tourism. *Heliyon*, 8(3), e09098.
- Adom, R. K., Simatele, M. D., & Reid, M. (2022). Addressing the challenges of water-energy-food nexus programme in the context of sustainable development and climate change in South Africa. *Journal of Water and Climate Change*, 13(7), 2761–2779.
- Anwar, R. K., SJORaida, D. F., & Rahman, M. T. (2019). Socializing Fragrant River Program as a Strategy for Introducing Environmental Literacy to the Upper Citarum Community. *Journal of Environmental Management and Tourism*, 10(3), 597. [https://doi.org/10.14505/ijemt.10.3\(35\).14](https://doi.org/10.14505/ijemt.10.3(35).14)
- Athayde, S., Fonseca, A., Araújo, S. M. V. G., Gallardo, A. L. C. F., Moretto, E. M., & Sánchez, L. E. (2022). The far-reaching dangers of rolling back environmental licensing and impact assessment legislation in Brazil. *Environmental Impact Assessment Review*, 94, 106742.
- Babu, S., Rathore, S. S., Singh, R., Kumar, S., Singh, V. K., Yadav, S. K., Yadav, V., Raj, R., Yadav, D., & Shekhawat, K. (2022). Exploring agricultural waste biomass for energy, food and feed production and pollution mitigation: A review. *Bioresource Technology*, 127566.
- Baird, A., & Pope, F. (2022). 'Can't see the forest for the trees': The importance of fungi in the context of UK tree planting. *Food and Energy Security*, 11(4), e371.
- Cantelmi, R., Di Gravio, G., & Patriarca, R. (2021). Reviewing qualitative research approaches in the context of critical infrastructure resilience. *Environment Systems and Decisions*, 41(3), 341–376.
- Daher, B., Hamie, S., Pappas, K., Nahidul Karim, M., & Thomas, T. (2021). Toward resilient water-energy-food systems under shocks: Understanding the impact of migration, pandemics, and natural disasters. *Sustainability*, 13(16), 9402.
- Economist Intelligence-EUI. (2023). *Energy transition will move slowly over the next decade*. <https://www.eiu.com/n/>
- Gladysz, B., & Kluczek, A. (2017). A framework for strategic assessment of far-reaching technologies: A case study of Combined Heat and Power technology. *Journal of Cleaner Production*, 167, 242–252.
- Global Forest Watch. (2023). *Pemantauan Hutan Yang Dirancang Untuk Aksi*. <https://www.globalforestwatch.org/>
- IEA. (2023). *Data and statistics*. <https://www.iea.org/countries>
- Iskandar, A., Usman, A. H., & Shaharuddin, S. A. (2021). Role of Islamic economic and finance in renewable energy: some quotation from Quranic verses and Indonesia experiences: Peranan ekonomi dan kewangan Islam dalam program-program tenaga boleh diperbaharui: beberapa petikan dari ayat-ayat al-Quran dan pengalaman Indonesia. *Al-Irsyad: Journal of Islamic and Contemporary Issues*, 6(1), 583–595.
- Lima, M. G. B., & Gupta, J. (2013). Governing Food and Agriculture in a Warming World. *Global*

- Environmental Politics*, 13(August), 46–64. <https://doi.org/10.1162/GLEP>
- Mardani, D. A. (2021). Convergence Islamic Values as Economic Development. *Jambura Equilibrium Journal*, 3(1).
- Mardani, D. A. (2023). Wakaf dan Ekonomi Hijau: Upaya Mengurangi Perubahan Iklim dan Emisi Gas Karbon. *La Zhulmaj Jurnal Ekonomi Dan Bisnis Islam*, 2(1), 23–34.
- Mardani, D. A., & Gunawati, R. (2020). Apakah Religiusitas Sebagai Faktor Penarik Terhadap Kepuasan Nasabah (Studi Kasus BMT Idrisiyyah Tasikmalaya). *Jurnal Sosial Ekonomi Dan Humaniora*, 6(1), 62–67.
- Molajou, A., Afshar, A., Khosravi, M., Soleimani, E., Vahabzadeh, M., & Varianni, H. A. (2021). A new paradigm of water, food, and energy nexus. *Environmental Science and Pollution Research*, 1–11.
- OIC. (2023). *OIC Secretary-General Participates in the Second Saudi Green Initiative Forum*.
- Qian, X.-Y., Liang, Q.-M., Liu, L.-J., Zhang, K., & Liu, Y. (2022). Key points for green management of water-energy-food in the Belt and Road Initiative: Resource utilization efficiency, final demand behaviors and trade inequalities. *Journal of Cleaner Production*, 362, 132386.
- Qin, J., Duan, W., Chen, Y., Dukhovny, V. A., Sorokin, D., Li, Y., & Wang, X. (2022). Comprehensive evaluation and sustainable development of water–energy–food–ecology systems in Central Asia. *Renewable and Sustainable Energy Reviews*, 157, 112061.
- R. Rizk, R. (2014). Islamic environmental ethics. *Journal of Islamic Accounting and Business Research*, 5(2), 194–204.
- Rahman, M. (2020). *Filsafat Ilmu Pengetahuan*. Prodi S2 Studi Agama-Agama UIN Sunan Gunung Djati Bandung.
- Rahman, M. T., & Bukhori, B. (2022). Religious social communication for the conservation of the riverbank area. *Jurnal Iman Dan Spiritualitas*, 2(1), 1–6.
- Ritchie, H., & Roser, M. (2020). Environmental impacts of food production. *Our World in Data*.
- Rosyad, R., Mardani, D. A., Zailan, W., & Kamaruddin, W. (2022). Living Work Ethics of Muslim Entrepreneurs in Tasikmalaya City, Indonesia. *Religious: Jurnal Studi Agama-Agama Dan Lintas Budaya*, 6(1), 13–24.
- Ryberg, K. R., & Chanat, J. G. (2022). Climate extremes as drivers of surface-water-quality trends in the United States. *Science of The Total Environment*, 809, 152165.
- Saniotis, A. (2012). Muslims and ecology: fostering Islamic environmental ethics. *Contemporary Islam*, 6(2), 155–171.
- Sardiana, A. (2020). Halal literacy and halal product purchase dimension: A preliminary study. *Insight Journal (IJ)*, 6(28), 277–294.
- Silvestre, R. (2018). A Brief Critical Introduction to the Ontological Argument and its Formalization: Anselm, Gaunilo, Descartes, Leibniz and Kant. *Journal of Applied Logics*, 5(7).
- Temiz, M., & Dincer, I. (2021). Design and analysis of nuclear and solar-based energy, food, fuel, and water production system for an indigenous community. *Journal of Cleaner Production*, 314, 127890.
- van den Heuvel, L., Blicharska, M., Masia, S., Sušnik, J., & Teutschbein, C. (2020). Ecosystem services in the Swedish water-energy-food-land-climate nexus: Anthropogenic pressures and physical interactions. *Ecosystem Services*, 44, 101141.
- Watson, R., Baste, I., Larigauderie, A., Leadley, P., Pascual, U., Baptiste, B., Demissew, S., Dziba, L., Erpul, G., & Fazel, A. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. *IPBES Secretariat: Bonn, Germany*, 22–47.
- Yap, H. Y., & Nixon, J. D. (2015). A multi-criteria analysis of options for energy recovery from municipal

- solid waste in India and the UK. *Waste Management*, 46, 265–277.
- Yousri, A. al-R. (2005). Sustainable Development: An Evaluation of Conventional and Islamic Perspectives. In *Islamic Perspectives on Sustainable Development* (pp. 22–57).
- Zarei, M. (2020). The water-energy-food nexus: A holistic approach for resource security in Iran, Iraq, and Turkey. *Water-Energy Nexus*, 3, 81–94.



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