

Islamic Green Economy in Virtual Events and Implications for Energy Policy: A Text Analytics

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ABSTRACT

Purpose: This study explores the contemporary discourse on the Islamic green economy from virtual events, e.g., YouTube discussions and recorded Zoom webinars, using a text-mining approach. It aims to identify the dominant themes and conceptual relationships characterizing current discussions on the Islamic green economy. **Methodology:** This study applies machine-learning text analytics to transcripts of discussions among experts on the Islamic green economy from selected virtual events. We used a Python-based tool, i.e., Orange Data Mining, to address four research questions. The analysis includes word analytics using word clouds, hierarchical clustering, topic modeling via Latent Dirichlet Allocation (LDA), and word network analysis. **Results:** The findings show that the Islamic green economy discourse is consistently associated with key themes, e.g., *maqasid al-Shariah*, public policy, sustainable development, and environmental responsibility. Topic modeling reveals close relationships among green economy, Islamic development, sustainability, and government, indicating that the discourse incorporates *tauhidic* values and *maqasid al-Shariah*. Network analysis further demonstrates that the Islamic green economy extends beyond environmental concerns by emphasizing social justice and ecological balance. **Conclusion:** The Islamic green economy provides an integrated framework connecting Islamic values, sustainable development, environmental responsibility, and social justice. **Implications:** The study is limited by its reliance on transcripts from selected virtual events, which may not fully represent the broader discourse on the Islamic green economy. Therefore, the findings should be interpreted within the scope of the selected discussions. **Originality:** This study contributes an empirical text mining perspective by systematically examining the conceptual structure of Islamic green economy discourse in contemporary virtual events.

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INTRODUCTION

Economic growth is often associated with environmental degradation (Wiratama & Safitri, 2023). Environmental problems stemming from natural destruction have a serious impact on sustainable development and ecological inequality, thereby affecting community welfare, because the environment is closely related to the economic system and economic growth (Rahmah Kusuma et al., 2022). Various countries view green development as a key strategy for achieving sustainable growth. Capitalist countries generally adopt global transfers through market mechanisms, legal frameworks, technological and industrial advances, and stricter environmental protection regulations as their main strategies for realizing these aspirations (Apriantoro et al., 2024).

The concept of a “green economy” has emerged as a means of achieving sustainable development by combining economic and environmental elements to address increasingly complex environmental challenges and global economic changes (Auliya & Nurhadi, 2023). Green and sustainable economic development consistently emerges as a crucial agenda across all policies (Latifah & Abdullah, 2024). In addressing these challenges, the Islamic economy offers an alternative approach grounded in the values of justice, balance, and sustainability (Kurniawan et al., 2025). As well as the values of *maqasid syariah*, which serve as a framework for achieving the objectives of Islamic law, including protecting religion, life, intellect, lineage, and property (Apriantoro & Rahayuningsih, 2022). The Islamic Green Economy is an innovative approach that combines sharia values with environmentally friendly practices, such as green investment, zakat for poverty alleviation, and responsible natural resource management (Apriantoro, El Ashfahany, et al., 2025).

Several experts have organized virtual events on social media platforms, which have played a significant role in increasing access to and disseminating information on a sustainable Islamic green economy at the global level. What lessons can be learned from experts’ discussions on the Islamic green economy over the past few years? However, the analysis specifically notes that expert discussions on virtual events on platforms such as YouTube and Zoom regarding the Islamic green economy remain very limited. To address this knowledge gap, this study aims to systematically review video content from YouTube and Zoom containing scientific events on Islamic green economics in the virtual world. The concept of green economy refers to a development approach that emphasizes sustainable and environmentally friendly economic growth. The Islamic green economy combines Sharia values and sustainable development principles (Apriantoro, Saifullah, et al., 2025).

Conceptually, the Islamic green economy emphasizes equitable and efficient resource management, including in the Islamic finance, energy, agriculture, and sustainable industry sectors. Interest in green economy practices has gradually increased in recent years, along with the measurable financial and economic benefits of national and international policies (Apriantoro et al., 2024). Instruments such as green sukuk, productive waqf, and zakat can also serve as catalysts in developing environmentally and socially friendly projects (Apriantoro et al., 2023).

This concept shows that Islamic green economics not only focuses on spiritual aspects but also has practical value in supporting sustainable development. However, in practice, implementing Islamic green economics still faces various challenges. Limited resources, whether financial, technological, or human resources, can be an obstacle to implementing sustainable economic practices. The potential of the Islamic green economy to support sustainable development has been widely discussed through virtual events, such as webinars. Although research on the Islamic green economy has increased in recent years, studies employing big data analytics to examine expert discussions remain scarce (Safna & Aprianoro, 2024). Considering that social media platforms have become important channels for disseminating academic knowledge, this study employs a social media analytics approach to explore experts' discussions on the Islamic green economy through virtual scientific events.

Unstructured data from YouTube and Zoom provide valuable opportunities for scientific research because they capture rich discussions and expert perspectives in real time. Previous studies have also shown that the implementation of the green economy within the Islamic economic framework and its contribution to achieving the Sustainable Development Goals (SDGs) remains suboptimal (Hidayati & Addainuri, 2024). Nevertheless, empirical research utilizing large-scale online discourse to examine experts' perspectives on the Islamic green economy is still limited, indicating a clear research gap that warrants further investigation.

Research on Islamic green economics is still limited, especially in using a big data analysis approach through the social media platforms YouTube and Zoom, which are analyzed using text mining or sentiment analysis to assess public perceptions of green economics from an Islamic perspective and to discover relevant and applicable knowledge. Previous studies on the Islamic green economy have primarily examined conceptual frameworks, Islamic sustainable finance, green sukuk, Islamic banking, ESG implementation, and the contribution of Islamic finance to achieving the Sustainable Development Goals (SDGs). These studies have provided valuable theoretical and policy insights into integrating Islamic principles with environmental sustainability. However, most previous research has relied on conceptual reviews, case studies, bibliometric analyses, or conventional statistical methods, with limited application of computational text-mining techniques to analyze large-scale expert discussions. Consequently, the thematic structure, semantic relationships, and emerging knowledge patterns within expert discourse on the Islamic green economy remain insufficiently explored. Addressing this gap is important because virtual scientific events on platforms such as YouTube and Zoom have become significant channels for disseminating contemporary knowledge and professional perspectives on sustainable Islamic economics. Therefore, this study applies Orange Data Mining by integrating Word Cloud visualization, Hierarchical Clustering, Latent Dirichlet Allocation (LDA), and Network Analysis to systematically analyze expert discussions from virtual events. Unlike previous studies, this research provides a comprehensive thematic mapping of expert discourse and reveals hidden knowledge

structures that can support future research and policy development in the Islamic green economy.

Word Cloud visualisation and research question 1. A word cloud is a text visualization technique that extracts keywords from text and displays them aesthetically. Word clouds are often used to display words in different sizes based on frequency, aiding text analysis and visual comparison of documents by emphasizing similarities and differences (Ahdan & Sari, 2020; Le & Lauw, 2016). This approach identifies dominant words and maps themes that emerge among speakers. Thus, through word cloud visualization, this study aims to answer RQ1.

RQ1. What are the most frequently used words in discussions among experts on Islamic green economics in events posted on YouTube and recorded on Zoom?

Hierarchical clustering and research question 2. Hierarchical clustering is a data processing technique that divides objects into clusters based on several measures of similarity between data points to find optimal algorithm parameters (Babichev et al., 2020; Ran et al., 2023). Algorithms play an important role in organizing large amounts of information into clusters that yield meaningful insights (Chaudhry et al., 2023). This paper aims to answer the following second research question:

RQ2. What clusters can be generated from the words spoken by experts in the virtual Islamic green economy event?

Latent Dirichlet allocation and research question 3. Latent Dirichlet Allocation (LDA) is an important algorithm in big data analysis, used for topic modeling to discover hidden semantics in text data. This algorithm requires estimating the number of topics, a key hyperparameter, to effectively adjust the model (Hou-Liu, 2018; Zhao et al., 2021). The topic model automatically groups text documents into several selected topics. Latent Dirichlet allocation represents each document as a probability distribution over topics and represents each topic as a probability distribution over words (Schwarz, 2018). This study uses the LDA approach to identify the main topics discussed by experts. Based on this LDA, this work attempts to answer the following questions:

RQ3. What topics can be learned from the discussions among experts at the virtual Islamic green economy event?

Theory of graph, network and research question 4. Graph theory and network theory are fields of mathematics that study graphs as structures representing relationships. This field has grown rapidly since Euler's work in 1736, utilizing modern computational tools to analyze large networks and applying advanced models and probability theory (Farahani et al., 2019). Graph theory is a branch of mathematics that studies mathematical structures that model relationships between objects. A graph consists of nodes and edges that connect them (Kusnadi et al., 2022; Ramya & Suganya, 2018). Graph-theoretic concepts such as "connectedness" and "connectivity" (Dittman et al., 2021) are used in social network analysis to model relationships between individuals (nodes) through edges, describing connectivity and interconnectedness. The degree of a node indicates the number of connections, which

reinforces understanding of social interactions and access to resources (Gruzd et al., 2016). Furthermore, network theory is the study of network systems that reveals the fundamental structure of their universal properties. This theory explores the interaction between network structure and dynamics, providing tools for understanding the relationships and structures within these interconnected systems, revealing similarities in their dependency profiles (Vasiliauskaite & Rosas, 2020).

Graph and network theory provide a foundation for analyzing semantic relationships among words and concepts extracted from textual data. In text mining, network analysis visualizes the co-occurrence of terms and identifies the most central concepts within a corpus, thereby revealing the underlying knowledge structure of a research domain (Takes & Heemskerk, 2016; Tiwari et al., 2023). Therefore, this study employs graph and network analysis to explore the co-occurrence patterns and semantic relationships among key terms in Islamic green economy discussions. Based on this objective, the following research question is proposed:

RQ.4 What are the main semantic relationships among key terms in Islamic green economy discussions?

METHODOLOGY

This study applies a quantitative approach of text mining to examine various sources of digital textual data. Our text mining approaches include text classification, text clustering, data visualization, and LDA analysis. This aims to retain significant information for further analysis. Text mining processes text data to produce high-level analytics that quickly analyze sentiment in sentences (Hermawan & Jowensen, 2023). Text mining can expand research by enabling the testing of existing research questions with contextualized and valid data (Kobayashi, 2017). This study applies the stages of text mining analysis, including Information Retrieval (IR), information extraction (IE), data visualization (DV), and knowledge (KD), as a basis for answering research questions. The text mining model used in this study is presented in **Table 1** by the author.

In this study, purposive sampling was applied to determine information and data sources. Purposive sampling was chosen because it provides researchers with strategic flexibility in their research subjects. Thus, researchers obtain information from individuals or groups who have the ability, experience, or direct involvement in the research topic. Purposive sampling techniques are commonly applied in qualitative research to identify subjective characteristics in selecting samples that are appropriate for the research objectives and targets, thereby increasing the accuracy of the study and confidence in the data and result (Campbell et al., 2020; Nyimbili & Nyimbili, 2024).

The sample selection for this study (**Table 1**) involved 10 experts (n=10) from 4 different YouTube events and 1 Zoom focus group discussion (FGD) uploaded to YouTube. Webinars and Zoom FGDs used as samples took place between June 2020 and April 2025. The entire event is broadcast via YouTube. The sample of 10 experts consisted of 7 men and 3

women from various professional backgrounds, including 6 academics and 4 academics who were also industry professionals. Most experts (n=3) had presentation materials in the form of slides in the video, while (n=7) did not. Of the 10 experts, 6 experts (Islamic green economy webinar on YouTube) spoke in English and Indonesian, while 4 Zoom FGD experts spoke in English. The experts came from three countries: n=5 from Indonesia, n=1 from Malaysia, and n=4 from the United Kingdom.

Table 1. Data collection details and statistics

Sample	Afiliation	Title	Duration (Approx.)	Language	Source	Link	Spoken word (Approx.)
Dzul Jastri Abdul Rozak	Associate Professor, Dept.of Islamic Banking & Finance	Understanding The sustainable Islamic circular	62	English	YouTube	https://youtu.be/AxpOTgCAn6k?si=0MrQLCvIIImVHJLD	12145
Putri Swastika	Postgraduate academic at UIN Jurai Siwo Lampung and expert in Islamic Economy the field of financial markets and banking services.	Online Course: Sustainable City – Green Islamic Economy	32	English	YouTube	https://youtu.be/kDHhfXE0t3g?si=bgLs7GTEljFIdiS8	1202
Abdus Salam Muharam	Post Graduate Student International Islamic University	Understanding Green Economy Activities Through the Lens of Sharia by Abdus Salam Muharam.	27	Indonesia translate English	YouTube	https://youtu.be/sMXpBtEl_08?si=ipmEijl_y-HHJfBZ	1132
Zakky Bantan	Head of the funding treasury department at the Islamic Development Bank	Green Islamic Finance (Green Sukuks) - (WIF 2021)	9	English	FGD	https://youtu.be/edgMdruHdDs?si=0eFKLq0Uqp6Jvu	1370
Mohamed Rozani Osmana	Senior financial sector specialist at the World Bank office in Kuala Lumpur	Green Islamic Finance (Green Sukuks) - (WIF 2021)	14	English	FGD	https://youtu.be/edgMdruHdDs?si=0eFKLq0Uqp6Jvu	2333
Samina Akram	Managing partner for SAMEC Ethical Finance	Green Islamic Finance (Green Sukuks) - (WIF 2021)	8	English	FGD	https://youtu.be/edgMdruHdDs?si=0eFKLq0Uqp6Jvu	1598

Sample	Afiliation	Title	Duration (Approx.)	Language	Source	Link	Spoken word (Approx.)
Stella Cox	Managing director of TD Cap Group	Green Islamic Finance (Green Sukuks) - (WIF 2021)	17	English	FGD	https://youtu.be/edgMdruHdDs?si=0eFKLq0Uqp6Jvu	1553
Rocy Gerung	Philosopher, academic, political commentator and public intellectual	Rocky Gerung : Green Economy dari Perspektif Islam Episode 1 and 2	28	Indonesia translate English	YouTube	https://youtu.be/pXloo0SNtvc?si=p9LOu8uE1A1bbBv https://youtu.be/06FxMA3M9p4?si=xkiNsbyhvlIJ4Li	3172
Junino Jahya	Senior Lecturer at the University of Indonesia	Rocky Gerung : Green Economy dari Perspektif Islam Episode 1 and 2	21	Indonesia translate English	YouTube	https://youtu.be/pXloo0SNtvc?si=p9LOu8uE1A1bbBv https://youtu.be/06FxMA3M9p4?si=xkiNsbyhvlIJ4mLi	1241
Mubarik Ahmad	Enivormental Consultant and Economis	Rocky Gerung : Green Economy dari Perspektif Islam Episode 1 and 2	50	Indonesia translate English	YouTube	https://youtu.be/pXloo0SNtvc?si=p9LOu8uE1A1bbBv and https://youtu.be/06FxMA3M9p4?si=xkiNsbyhvlIJ4mLi	3801

In **Table 2** summarizes the text-mining workflow adopted in this study, consisting of Information Retrieval (IR), Information Extraction (IE), Data Visualization (DV), and Knowledge Discovery (KD). These four stages provide a systematic framework for transforming raw textual data obtained from virtual events into meaningful knowledge. Information Retrieval was used to collect relevant transcripts, Information Extraction identified relationships among keywords through Natural Language Processing (NLP) techniques, Data Visualization facilitated the interpretation of textual patterns, while Knowledge Discovery generated new insights regarding the discourse of the Islamic green economy.

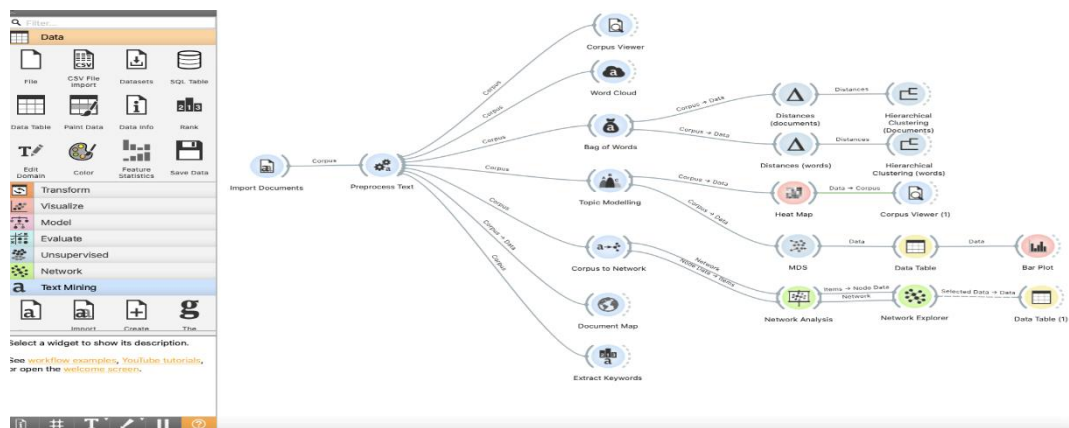
Table 2. Text mining approach

Stage	Description
Information Retrieval (IR)	The initial stage aimed to identify and select relevant documents from large-scale textual datasets using predefined keywords as search queries.
Information Extraction (IE)	The process of extracting relationships among concepts within textual documents through co-occurrence analysis and Natural Language Processing (NLP) techniques to identify the most salient and meaningful associations.
Data Visualization (DV)	The representation of extracted knowledge in tables, graphs, or network visualisations facilitates the interpretation of keyword relationships and supports the formulation of new hypotheses.
Knowledge Discovery (KD)	The process of generating new insights through advanced text analysis involves identifying latent relationships among concepts using indirect approaches. One common technique is the ABC model, in which concepts A and C are inferred to be related even though they do not co-occur directly, as both frequently co-occur with concept B.

Sources: Adopted from (Hudaefi et al., 2023)

Automatic transcription methods facilitate data extraction, but researchers must manually verify results to minimize errors caused by limitations in speech recognition systems. Artificial Intelligence (AI) speeds up transcription and data analysis. However, several obstacles, such as language usage and technical terms, are not correctly identified by the system (Haleem et al., 2022). The automatic transcription process is an effective step, but human intelligence still plays a role in producing text that is accurate, complete, and true to its meaning. The total duration of the sample videos, namely YouTube and Zoom, is 398 minutes (6.38 hours). Final data consists of 10 text files. Each document is named after the sample experts. These files contain the results of automatic transcription with approximately 29,547 words for analysis. Orange is software for visual data analysis and machine learning development of Orange began in the late 1990s (Ang et al., 2025; Dobesova, 2024). In data mining research, Orange provides a range of machine learning algorithms, including decision trees, hierarchical clustering, heat maps, and box plots (Dobesova, 2024). Orange supports systematic data analysis interpreted through a combination of visual widgets, clustering algorithms, and classification.

Orange is used as a visual-based data analysis tool by organizing workflows and connecting widgets. A circular symbol represents a specific functionality widget. Symbol integrates various data modeling and processing methods (Dobesova, 2024). A widget is designed to perform a specific function, such as reading data, presenting tables, developing models, and visualising machine learning algorithms. This study used a total of 18 widgets in the overall analysis, which is visualized in **Figure 1**.



Source: Analysis from Orange Data Mining

Figure 1. Authors workflow in orange

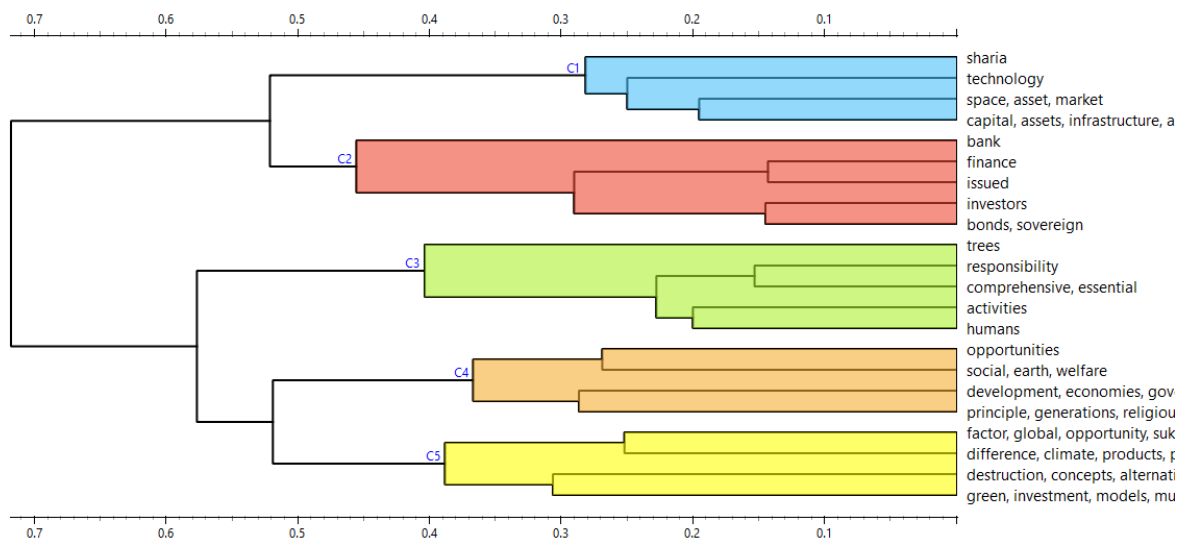
RESULT AND DISCUSSION

The orange word visualization was created to identify the most frequently used words across 29,547 texts from 10 sampled experts. Word could work through a word frequency normalization formula that calculates the weight of a word's appearance relative to the total appearance of all words in the text network. Words of larger size indicate a higher level of word repetition (Fattah, 2016; Munthe & Handoko, 2023; Rinaldi & Russo, 2021).

The word could methodology works based on the following logic: $\frac{sel_w / sel_{tot}}{(net_w / net_{tot})^k} sel_w$. Referring to the number of selected nodes that include the word w , sel_{tot} is the total number of selected table nodes, net_w shows the number of nodes in the entire network that contain the word w , net_{tot} is the total number of nodes in the network, while k is the network normalization coefficient that can be adjusted by the user via an interactive slider (Rinaldi & Russo, 2021).

The visualization of words is shown in **Figure 2**. Produced through text analysis using the Orange widget, it displays several words in the largest size, such as "economy," "Islamic," "sustainable," "social," "green," "people," "development," and "finance." Larger words indicate a higher frequency of appearance in the document and represent the most frequently used words in the sample. This word cloud visualization provides an initial overview of the dominant themes that emerged from the experts' discussions.

An analysis using Orange was conducted to uncover hidden themes in experts' words. Following the preprocessing stage described in the methodology, the cleaned corpus was analyzed using Orange Data Mining. For the hierarchical clustering analysis, the **100 most frequently occurring terms** were selected as input to represent the dominant concepts within the corpus. The cosine similarity algorithm was then applied to measure semantic similarity among these terms and automatically generate thematic clusters. Automatically grouped tokens generate five main clusters. This process yielded five thematic clusters (C1, C2, C3, C4, C5), as shown in **Figure 3**. These clusters summarize the critical themes generated from 29,547 sample words.



Source: Analysis from Orange Data Mining

Figure 3. Words clustering

Cluster dendrograms illustrate the hierarchical structure of word connections. A greater vertical distance between clusters indicates a lower semantic similarity between word groups. Conversely, the lowest clusters indicate strong thematic connections that can be used to identify the most meaningful hidden themes in the data corpus. Words combined at the shortest height (i.e., Figure 3) can help identify hidden themes. Based on the visualization results, Cluster C1 consists of words that have the highest proximity at the lowest level, such as “sharia,” “technology,” “space,” “asset,” and “market”. This group of words indicates the theme of Sharia principles applied to technology and asset management within the financial market. Cluster C2 shows a grouping of words such as “finance,” “issued,” “investors,” and “bonds,” which are connected by the closest distance. This term represents financing through financial instruments such as bonds, as well as the role of investors in the public finance framework. In Cluster C3, the words “trees,” “responsibility,” “activities,” and “humans” form the shortest height. This cluster concerns human responsibility for the ecosystem in the context of environmental sustainability.

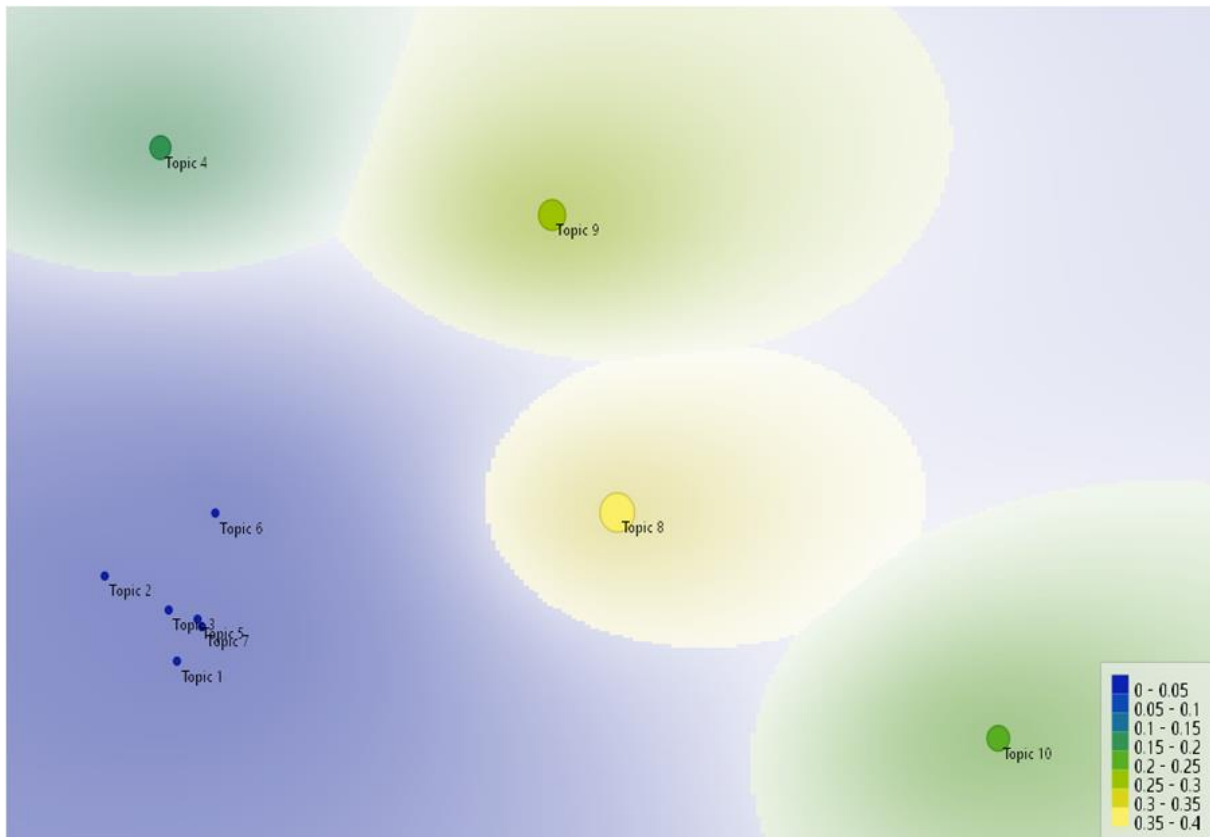
Cluster C4 includes “social,” “earth,” “welfare,” and “development,” forming words with the shortest high distance. This cluster describes the themes of social welfare and sustainable development in an economic context. In cluster C5, “green,” “investment,” “model,” and “alternative” show the highest proximity. This term describes the themes of green investment, alternative approaches, and sustainable development. The dendrogram shows that the cluster at the shortest height explains the critical themes obtained from the sampled words. This study uses Latent Dirichlet Allocation (LDA) for topic modeling to reveal hidden thematic structures in a sample containing 29,547 words. The LDA framework can be expressed as $I_i = (A_i, A_2 \dots, A_n)$, where each A_i indicates the topic distribution in document i , while n represents the number of topics specified in the model (Bao & Wang, 2021; Hudaefi et al., 2021; Vayansky & Kumar, 2020).

In this study, 10 topics were identified for analysis **Figure 4** is a screenshot of the author’s work using Orange Data Mining. To determine the optimal number of topics, several LDA models were tested with different topic numbers ($k = 3, 4, 5, 6, 8$, and 10). The models were evaluated based on topic coherence and interpretability. Models with fewer topics tended to merge several distinct themes into broader categories, reducing thematic specificity. In contrast, the 10 topic model produced more coherent and distinguishable themes, capturing the diversity of discussions related to the Islamic green economy, sustainability, Islamic finance, environmental stewardship, and energy related issues. Therefore, the 10 topic model was selected as it provided the most meaningful and interpretable representation of the dataset.

Topic Modelling		Tue Dec 23 25, 19:57:29
Latent Dirichlet Allocation		
Number of topics: 10		
Topics		
1: islamic, green, finance, economy, people, social, resources, earth, environment, sustainable 2: economy, development, people, business, values, islamic, nature, ethics, efficiency, social 3: issue, economy, green, balance, perspective, people, sustainable, islamic, resources, environment 4: people, economy, development, ethics, business, ecological, islamic, nature, social, values 5: islamic, green, finance, development, people, economy, social, sustainable, resources, sukuk 6: people, economy, development, social, business, islamic, ethics, future, nature, individual 7: islamic, green, finance, economy, social, people, sustainable, resources, development, market 8: green, islamic, economy, development, sharia, resources, sustainable, people, global, industry 9: green, issue, islamic, economy, people, balance, sustainable, perspective, environment, resources 10: islamic, finance, green, market, social, earth, wealth, bank, time, responsible		

Source: Analysis from Orange Data Mining

Figure 4. Topic modeling via LDA

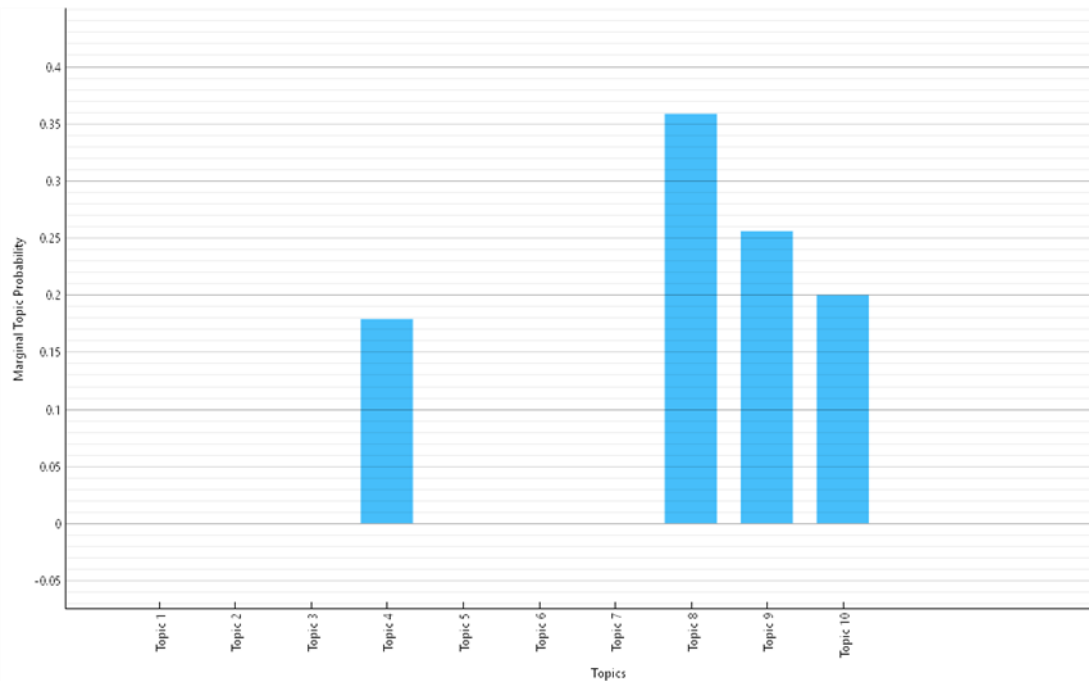


Source: Analysis from Orange Data Mining

Figure 5. MDS visualisation of topic modeling

Representatively, topic 8 shows the greatest dominance, with the largest visual size among the topics. This indicates that topic 8 has the highest MDS value, making it the most important topic in this study. Topic 8 is the largest of the topics and is depicted in a different color (namely, yellow). **Figure 5** presents the multidimensional scaling (MDS) visualization of the topic modeling results. MDS projects the semantic relationships among topics into a two-dimensional space, where the distance between topics reflects their similarity. Topics located close to one another indicate stronger semantic relationships, whereas topics positioned farther apart represent more distinct thematic content.

As shown in **Figure 5**, Topic 8 is represented by the largest circle, indicating that it contributes the greatest proportion of the analyzed corpus. Topics 9 and 10 are positioned relatively close to Topic 8, suggesting that these topics share similar discussions related to Islamic green economy, sustainability, and development. In contrast, Topics 1, 2, 3, 5, 6, and 7 are located farther away, indicating that they represent more specialized themes. Overall, the MDS visualization demonstrates that the discourse on the Islamic green economy consists of several interconnected thematic clusters while maintaining clear conceptual distinctions among specific topics.



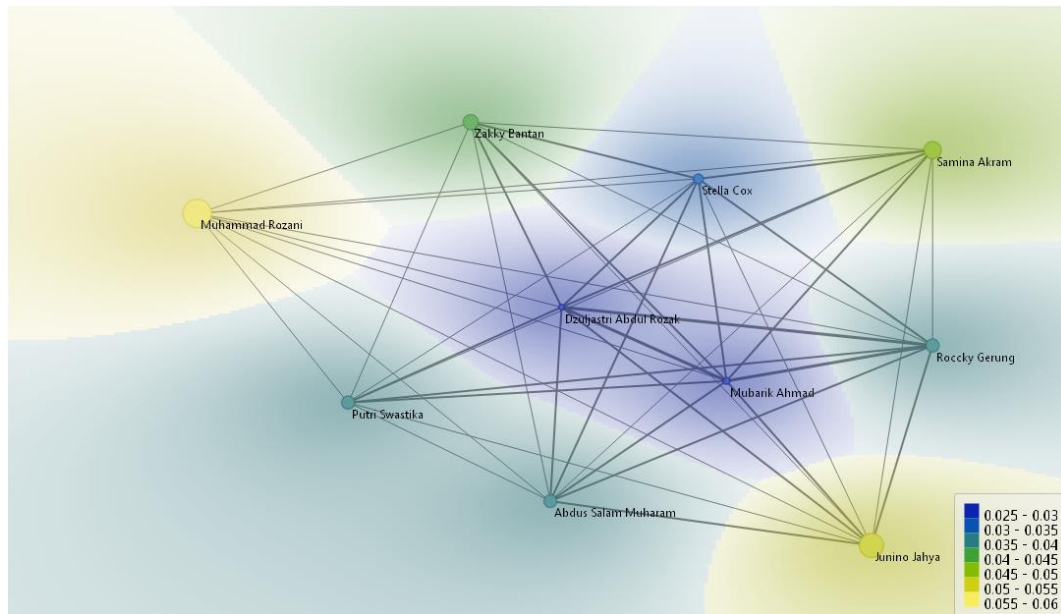
Source: Analysis from Orange Data Mining

Figure 6. Bar Plot Visualisation of Topic Modelling

The bar chart in **Figure 6** shows the topics with the highest marginal probability: topic 8 (0.35), followed by topic 10 (0.2), topic 9 (0.25), and topic 4 (0.17). This distribution shows that topic 8 has a significant dominance over other topics. All experts surveyed had MDS values, and topic 8 showed high representativeness because it was formed from the contributions of 10 experts involved in this study. This shows that topic 8 is the most representative in explaining the main issues that emerged from the analysis of 29,547 words. Topic 8 contains the keywords “Islamic,” “green,” “Islamic,” “economy,” “development,” “sharia,” “resources,” “sustainable,” “people,” “global,” and “industry”. This keyword is the main keyword for finding knowledge from the sample.

In network analysis, the structure of components in a complex system is depicted visually as nodes and edges, with nodes representing social entities or system elements and edges representing connections between them (Yang et al., 2018). The statistical model used to capture associative network balls is the family of Exponential Random Graph Models (ERGMs), originating from the probabilistic literature on social networks. ERGMs are formulated as follows: $\frac{\exp\{\theta' z(X)\}}{k(\theta)}$ In this formulation, X represents the realization of the random variable X , while $z(X)$ is the statistical sector of the network that contributes to the number of local formations of a certain type found in the network. Furthermore, θ is a parameter vector that indicates the strength of a particular structural effect influencing network formation. Meanwhile, $k(\theta)$ is a normalization constant that ensures that all networks have a total probability of 1. Parameter estimation θ is generally performed using a pseudo-likelihood approach to approximate the normalization constant and produce consistent estimates. Through the ERGM model, researchers can examine the formation of relationships

within networks by inferring local structural parameters that shape the network's overall dynamics (Huang & Butts, 2024; Lauritzen et al., 2018; Yang et al., 2018). In this study, network analysis using Orange software was applied to examine the relationships between words and documents spoken by experts.



Source: Analysis from Orange Data Mining

Figure 7. Document Network Visualization

The results of the analysis are shown visually in **Figure 7**, presents an undirected network consisting of 10 nodes (documents) and 45 edges (relationships), with a network density of 1. The average degree of 9, indicating that each document is connected to other nine document. Consequently, the network forms a complete graph in which every document is directly linked to all others. Figure 7 illustrates the level of similarity among the 10 expert documents based on the content they expressed. Nodes with larger sizes represent higher proximity centrality values. Muhammad Rozani and Junino Jahya have the largest node sizes, with proximity centrality values of 0.0616 and 0.0548, respectively. These values indicate that their documents occupy more central positions in the network and exhibit stronger relationships with the other expert documents.

Word network analysis is applied to identify and explain the most dominant patterns of word association in a sample text. The previously processed text was reprocessed, with an emphasis on the 71 tokens (words) with the highest frequency. The threshold used by the author to form a word network (statistically determined value) is 5, the window size (word collection) is 100, and the frequency threshold is 10. These steps produce a word network comprising 71 nodes representing the most frequently occurring words in the corpus and 2386 edges (word associations). Figure 8 presents a word network illustrating the semantic relationships among the 71 most frequently occurring words from the 29,547 sample words. Larger nodes indicate higher usage in the text sample. Since the main topic of discussion, "green Islam," is illustrated as the largest node (yellow) in Figure 8, this explains why 10

the discussion. The closer and more connected the nodes are, the stronger the semantic relationship between the corresponding concepts. The word network visualization in **Figure 8** shows strong relationships among these concepts, indicating that experts view sustainable economic development as two complementary goals within the framework of Islamic economics. Unlike previous studies that examined Islamic green economics through conceptual analysis, this study directly identified these themes through an analysis of transcripts from expert discussions at various virtual events using a text mining approach. The experts in this study have examined the important role of the Islamic green economy, which integrates Sharia values with sustainable development.

The word network visualization in **Figure 8** shows a strong relationship between the principles of green environmental sustainability, economic growth and development, and Sharia-based Islamic values. The discussion led by speakers Abdus Salam Muharam and Zul Jastri Abdul Rozak highlighted that the concept of a green economy from an Islamic perspective has a strong foundation for moving toward an economy that is fair, sustainable, and oriented toward the well-being of society, in accordance with Sharia values. This reaffirms that social justice is key to ensuring that economic development not only benefits a select few but also supports the well-being of the broader community. This study identifies that the Islamic green economy is consistent with the principles of tawhid, khalifah, mizan, and amanah. Abdus Salam Muharam states that economic activity is a moral and spiritual responsibility of human beings as khalifah, who are obligated to maintain a balance between economic development and environmental sustainability. Therefore, economic activities that cause environmental damage and overexploitation are contrary to Sharia principles. The results of this study reinforce these findings by showing that experts consistently link environmental sustainability to humanity's moral responsibility as God's vicegerents on Earth. The integration of Sharia values into environmental governance is considered capable of enhancing the legitimacy of policies while also encouraging public participation in sustainable development.

In his presentation, Junino Jahya linked the green economy to the *Maqasid al-Shariah*, particularly in terms of the protection of life (*hifz al-nafs*), property (*hifz al-mal*), and progeny (*hifz al-nasl*). Junino Jahya stated that environmental protection in the green economy is a form of *hifz al-nasl*, in which the environment is viewed as part of the religious obligation to protect future generations. This means that, from an Islamic perspective, a green economy must be in harmony with Sharia values in order to strengthen environmental sustainability and economic development, in line with social justice and moral responsibility.

In practice, the Islamic green economy encourages Islamic financial institutions to shift toward more robust and sustainable financing. This was evident from the presentations by speakers Rocky Gerung and Junino Jahya, who stated that instruments such as green sukuk, productive waqf, and ESG (environmental, social, governance) Sharia financing can serve as mechanisms to support sustainable development while adhering to Sharia principles. Sharia-compliant financial instruments have the potential to serve as a more stable and ethical financing alternative for supporting green infrastructure and renewable energy. These

findings are consistent with the research (Ulfah et al., 2024; Zumbraegel, 2022) It states that green sukuk have been used to finance renewable energy and environmentally friendly infrastructure projects in various Muslim countries while maintaining compliance with Sharia norms. Notably, this study shows that this instrument was a central topic in the discussion between Rocky Gerung and Junino Jahya regarding the future of the Islamic green economy, thereby demonstrating the growing attention to sustainable finance in academic forums.

The research findings have important implications for energy policy the terms “green,” “finance,” and “sustainable” indicate that Sharia-compliant financial instruments have great potential to support the transition to clean energy Green sukuk, ESG based Sharia financing, and productive waqf can be utilized as alternative financing options for renewable energy and energy efficiency projects. The prominence of the word “people” as one of the dominant terms indicates that the effectiveness of energy policies is determined not only by financial considerations but also by public engagement, which can be achieved through improved energy literacy, education, and public participation in the policy planning and implementation processes.

Using the epistemological approach of tawhid as a foundation for thought, Dzul Jastri Abdul Razak emphasizes that knowledge, economic policy, and development practices stem from an awareness of the oneness of Allah and humanity’s responsibility as vicegerents. Sustainability is understood as a form of social worship that integrates spiritual, economic, social, and ecological aspects. Sharia-based sustainable development policies and practices are an effective strategy for linking Islamic principles with global development. Contextualizing Sharia law within development policies not only strengthens Islam’s relevance in the global discourse but also enables the realization of equitable, inclusive, and sustainable development. This study makes a unique contribution by analyzing how experts actually discuss this concept in virtual forums. The use of YouTube and Zoom webinar transcripts, with Orange Data Mining as the data source, to identify dominant themes, patterns of interrelationships among concepts, and developmental patterns based on real-world conversations within the discourse on Islamic green economy which can serve as the basis for formulating energy policies that are more responsive to sustainability issues.

PRACTICAL IMPLICATION

This study suggests that a Sharia-based green economy can serve as a strategy for sustainable development by integrating economic growth, social justice, and environmental conservation. The application of the principles of tauhid, khalifah, mizan, and amanah can encourage the government, Sharia financial institutions, and business actors to develop economic policies oriented toward profit, sustainability, and the public interest, particularly in the sectors of natural resource management, renewable energy, and environmental protection. Furthermore, for Islamic financial institutions, Islamic financial instruments such as green sukuk, productive waqf, and ESG-based financing (Environmental, Social, and Governance) hold significant potential to support the financing of green, environmentally

friendly projects and sustainable development. Thus, Islamic financial institutions can strengthen financial product innovations that are oriented toward profitability while also prioritizing social and environmental impacts. **Theoretical Implications** This study reinforces the concept of Islamic economics as a principle of Sharia economics and a paradigm for sustainable development. The research findings indicate that the *maqasid al-sharia*, particularly *hifz al-nafs*, *hifz al-mal*, and *hifz al-nasl*, have conceptual linkages in supporting environmental conservation efforts and the enhancement of social welfare. This study also expands the discourse on Islamic green economics.

THEORETICAL IMPLICATION

This study provides empirical support for Islamic economic theory by demonstrating that Sharia principles are closely associated with sustainable development. The findings suggest that the *maqasid al-sharia*, specifically *hifz al-nafs*, *hifz al-mal*, dan *hifz al-nasl*, can serve as a conceptual framework for explaining the relationship between environmental protection, social welfare, and economic development. Furthermore, this study enriches the discourse on Islamic green economics by positioning the principles of *tawhid*, *khalifah*, *mizan*, and *amanah* as ethical foundations that links economic activities to environmental responsibility. This framework demonstrates that sustainable development from an Islamic perspective **extends beyond** economic growth but also toward a balance among economic, social, spiritual, and ecological dimensions.

Theoretically, this study contributes to the development of the literature on Islamic green economics by demonstrating that virtual events can serve as a source of empirical data to **examining the evolution** in contemporary discourse. The text-mining-based approach applied in this study complements previous research, which has been dominated by conceptual approaches and literature reviews. Through a data-driven analysis of expert discourse in virtual events, this study extends the methodological approaches available to the development of Islamic economic theory and demonstrates the potential of digital discourse as an empirical source as a foundation for empirically understanding the evolution of the concept of Islamic green economy.

CONCLUSION AND RECOMMENDATION

This study examines key points from webinars on the Islamic green economy by analyzing 29,547 words obtained from speech-to-text transcripts of 10 experts across four YouTube webinar sessions and focus group discussions (FGDs) uploaded to YouTube. The data were analyzed using Orange Data Mining through word cloud visualization, Latent Dirichlet Allocation (LDA), hierarchical clustering, topic modeling based on multidimensional scaling (MDS), as well as graph and network analysis to identify patterns, themes, and relationships among concepts in the experts' discussions. The findings indicate that the Islamic green economy is understood as a framework that integrates environmental protection with Sharia

values through the principle of *maqasid al-shariah*, *tauhid*, *khalifah*, *mizan*, and *amanah*. Furthermore, discussions on Islamic financial instruments, including green sukuk, productive waqf, and ESG-based financing, highlight their potential to support energy transition, renewable energy development, and sustainable infrastructure.

The novelty of this study lies in the utilization of virtual event transcripts from YouTube and Zoom as empirical data sources and the application of a text analytics approach using Orange Data Mining to map the development of Islamic green economy discourse. The findings provide practical implications for governments, regulators, and Islamic financial institutions in formulating sustainable development policies by integrating Sharia principles into green financing instruments. Future research may expand data sources across various digital platforms and languages, while incorporating advanced text analysis methods such as dynamic topic modeling and sentiment analysis. This study also provides insights for policymakers in developing sustainable energy transition strategies that integrate Sharia principles, public literacy, and collaboration among governments, Islamic financial institutions, and communities.

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