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Sustainable Development Platform for a Halal Ecosystem: An Alternative Solution

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ABSTRACT

This study investigates governance and operational challenges within Indonesia's halal ecosystem, focusing on sustainable value creation for halal-certified Micro, Small, and Medium Enterprises (MSMEs). Using a qualitative case study approach, the research involved 15 semi-structured interviews and field observations with MSME owners, certification bodies, local government officials, and religious leaders. Thematic analysis revealed three core findings: (1) institutional fragmentation and role ambiguity, (2) diverse interpretations of halal and tayyib principles, and (3) limited digital infrastructure for traceability and compliance. The study recommends an integrated halal governance platform to bridge regulatory, cultural, and technological gaps. Practical policy suggestions include localized certification support, digital capacity building, and inclusive stakeholder forums. These insight Halal ecosystem; MSMEs; governance; qualitative case study; Indonesia; sustainability; digital infrastructure; policy integrations contribute to halal value chain literature in emerging economies and propose pathways to strengthen sustainable halal development in Indonesia.

Keywords: Halal ecosystem, MSMEs, governance, qualitative case study, Indonesia, sustainability, digital infrastructure, policy integration.

Introduction

The global rise of the halal industry has drawn considerable attention not only from Muslim-majority countries but also from non-Muslim markets seeking to tap into the growing demand for halal-certified products (Golnaz et al., 2010; Tieman et al., 2012). Halal, a concept deeply rooted in Islamic principles, has evolved beyond religious obligations and now encompasses dimensions of safety, sustainability, ethics, and economic development (Talib et al., 2015). In Indonesia—the world's largest Muslim-majority country—the halal sector plays a vital role in supporting economic inclusivity through micro, small, and medium-sized enterprises (MSMEs), which make up more than 99% of total businesses and contribute significantly to employment and GDP (Kementerian Koperasi dan UKM RI, 2022).

Despite this potential, the Indonesian halal ecosystem faces several structural and operational challenges. These include fragmented regulatory oversight, inconsistent implementation of halal standards across regions, lack of stakeholder coordination, and limited access to digital and certification infrastructure for MSMEs (Hasan & Halim, 2021; Hidayat & Khalifah, 2020). Moreover, the pursuit of sustainable development in halal supply chains remains underexplored, particularly concerning the integration of Islamic values such as *halalan tayyiban* with modern governance mechanisms (Khan & Haleem, 2016; Tieman, 2015). This gap has hindered the ability of halal value chains to fully contribute to the broader goals of environmental, economic, and social sustainability.

A significant challenge lies in the disconnect between formal halal certification and grassroots interpretations of Islamic practices, which can differ by locality, religious authority, and cultural norms (Riaz & Chaudry, 2004; Zailani et al., 2017). In addition, while Indonesia has made strides through the establishment of BPJPH (the Halal Product Assurance Agency), the agency's capacity and coordination with other institutions, such as MUI and regional governments, remain a work in progress (BPJPH, 2020; Faturohman & Maulida, 2021). The potential of digitalization to streamline certification processes and improve traceability has also not been fully leveraged in the halal MSME sector.

Although prior studies have addressed halal certification, consumer perception, and supply chain structures, relatively few have investigated the **institutional ecosystem** that supports or hinders the development of a sustainable halal economy. This study aims to fill that gap by examining the governance, stakeholder interaction, and technological infrastructure shaping halal-certified MSMEs in Indonesia. Specifically, the study explores how local actors interpret, implement, and negotiate halal and sustainability standards within an evolving policy and digital landscape.

This paper proceeds as follows: Section 2 reviews the theoretical foundations of halal value systems and sustainable supply chain governance. Section 3 explains the research methodology, including the qualitative case study approach and data analysis techniques. Section 4 presents key findings and thematic patterns. Section 5 discusses the implications for policy, practice, and theory. Section 6 concludes with reflections on limitations and directions for future research..

Literature Review

The halal industry has attracted increasing scholarly attention as a multidimensional system involving religious, economic, and socio-political aspects (Tieman, 2011; Talib & Hamid, 2014). Various scholars have approached the concept of halal not merely as a religious obligation but as a component of ethical consumption and sustainable development (Golnaz et al., 2010; Bonne & Verbeke, 2008). The intersection of halal values with global supply chains has prompted discussions around halal governance, traceability, certification systems, and the role of government institutions (Khan et al., 2018; Zailani et al., 2017). However, much of the literature tends to examine these dimensions in isolation rather than in an integrated framework.

1. Halal Value System and Ecosystem

The halal value system refers to a comprehensive network that governs the processes and practices in accordance with Islamic principles, covering not only product attributes but also ethical conduct in business transactions (Riaz & Chaudry, 2004; Fischer, 2011). Tieman (2015) conceptualizes halal value chains as systems aligned with Islamic values including *halalan tayyiban*, fairness, and social justice. However, implementation of these values varies significantly across regions and stakeholders, particularly in Southeast Asia (Haleem & Khan, 2017; Talib et al., 2017). Scholars have called for an inclusive halal ecosystem that integrates religious, social, and economic institutions to address diverse stakeholder needs (Fischer, 2016; Azam, 2016). Yet, empirical studies on how this ecosystem functions—especially in decentralized contexts like Indonesia—remain scarce.

2. Sustainable Supply Chain Governance

Sustainability in supply chains has been widely discussed in terms of environmental, economic, and social pillars (Carter & Rogers, 2008). In the halal context, sustainability is further enriched by Islamic ethical considerations, such as *maslahah* (public good) and *adl* (justice) (Wilson & Liu, 2010). Tieman (2014) proposes that halal logistics and halal assurance systems contribute to overall sustainability, especially when they incorporate transparency, traceability, and trust among supply chain actors. However, challenges remain in aligning Islamic sustainability principles with operational realities of MSMEs, who often lack access to certification, technology, and institutional support (Zailani et al., 2015; Khan & Haleem, 2016). The literature suggests that sustainable halal supply chains require multi-stakeholder governance models involving both public and private sectors.

3. Role of Policy and Technology

The integration of public policy and digital innovation has emerged as a key enabler in developing halal ecosystems (Tieman, 2011; Rusdianto et al., 2020). In countries like Malaysia, centralized halal governance supported by technology has facilitated certification and compliance (Shafii & Khadijah, 2012). In contrast, Indonesia's decentralized structure poses coordination challenges between BPJPH, MUI, and regional governments (Faturohman & Maulida, 2021). Several studies highlight the role of blockchain, digital traceability, and mobile apps in enhancing halal assurance, yet the adoption of these technologies among Indonesian MSMEs is still limited (Rusdianto et al., 2020; Fadilah et al., 2022). Moreover, there is little empirical evidence on how local actors engage with these technologies in practice.

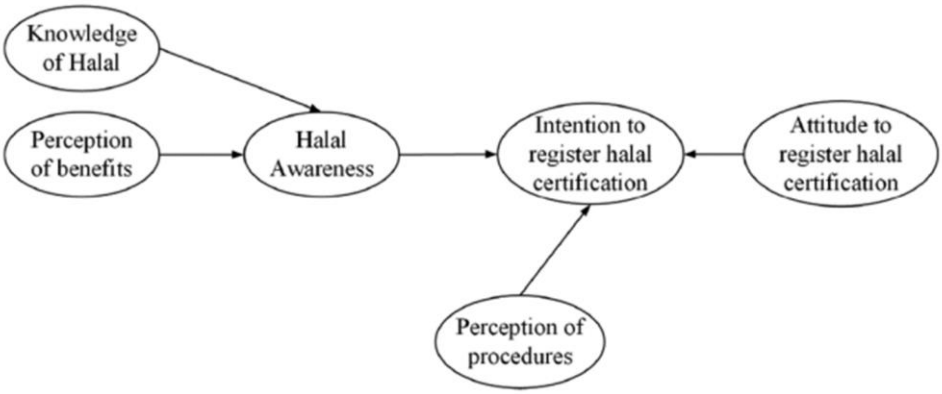

Figure 1: Conceptual model of awareness and intention to register halal certification
Source: Oemar et al., 2022

In the figure above, halal awareness is identified as a link between knowledge about halal or the perception of benefits and the intention to register for halal certification. In Figure 1, halal awareness functions as an outcome influenced by knowledge about halal and the perception of benefits. In addition, halal awareness, perception of procedures, and attitudes in producing halal food play a role in influencing the intention to register halal certification (Oemar et al., 2022).

However, the halal ecosystem also faces challenges that require joint efforts from stakeholders to overcome. For example, many MSEs have a limited understanding of the benefits and processes related to halal certification, which can hinder their participation in the halal market (Eris et al., 2023; Oemar et al., 2022). Addressing these knowledge gaps through targeted assistance programs can help empower these businesses to successfully navigate the certification process. Therefore, strong public-private partnerships as well as the integration of community-based initiatives are essential to create an environment that supports halal standards and practices (Mubarok & Imam, 2020).

The halal ecosystem is a multifaceted network that requires synergistic efforts from various stakeholders, including government agencies, educational institutions, and industry players in order to develop. The importance of halal certification cannot be underestimated, because it is the basis of consumer trust and encourages the sustainability of the business economy in the halal sector. Continuous investment in education, training, and community engagement will be critical to addressing existing challenges and harnessing the full potential of the halal market, especially in Indonesia.

Research Methodology

This study uses a qualitative approach with a case study design to explore in depth the development of sustainable platforms for halal ecosystems, with a focus on the Indonesian context. Data collection was conducted through semi-structured interviews with key stakeholders, analysis of policy and industry documents, and direct observation of halal-certified businesses. Interviews were conducted with key stakeholders such as halal micro, small, and medium enterprises (MSMEs) business actors, halal industrial estate managers, local government officials, halal inspection agencies, and Sharia financing. Purposive sampling is used to select participants who have relevant knowledge and experience in the halal industry and sustainable development.

The data was analyzed using thematic analysis. The thematic analysis process begins with data familiarization through re-reading of interviews, documents, and observations. The relevant data is then coded based on important issues such as sustainability and halal principles. The codes are grouped into main themes, such as sharia and environmental integration, halal value chain challenges, policy support, MSMEs opportunities, and inter-sector synergy. These themes are reviewed for consistency and relevance, and are refined by merging or removing

overlapping themes. Each theme is clearly defined and reported with citations of original data as supporting interpretation.

To ensure validity and reliability, this study applied data triangulation, member checking, and clear trace audits. Ethical considerations are also a priority, with informed consent from all participants and maintaining the anonymity and confidentiality of data. The results of the research are expected to provide valuable insights into the integration of Islamic principles with sustainable practices, as well as contribute to a better understanding of how to build a halal industry that is more ethical, fair, and environmentally responsible.

Results and Discussions

Halal is a value system

Halal is an Arabic word that means "authorized" or "lawful," whereas haram means "forbidden" or "illegal.". Consumption of haram products and services is prohibited for Muslims. Halal is a value system and way of life followed by Muslims, who make up over a quarter of the world's population and are the fastest-growing religion compared to other faiths. Halal can be applied to both products and services in many aspects of life. Our relaxed way of life, which comprises the many views, values, and living standards we have committed, is referred to as lifestyle. Halal has particular reasons in Islam to protect and preserve religious beliefs as well as a healthy way of life.

Halal also incorporates environmentally sensitive elements to improve the lives of future generations. According to further explanation, It should not be harmful to the environment and humanity. Holistically, halal forbids the excessive exploitation of the environment and natural resources, which may negatively impact the quality of life enjoyed by mankind and consequently significantly deplete the abundant supply of edible natural resources. Halal is intrinsically acceptable and easily incorporated into a circular green economy powered by green technologies. Excessive and uncontrollable exploration of natural resources may contribute towards any possible climate changes and is compounded by the application of environmentally unfriendly processing technology which may pollute the environment through generation of various forms and quantity of toxic wastes damaging the environment. Such scenario may likewise threaten a food supply chain, a pillar for sustainable food security. Halal also teaches self-respect and integrity, resulting in a more peaceful atmosphere in all cultures and faiths societies (Stratta, 2015).

Currently, the national knowledge of the Halal Certificate has not progressed significantly. The standstill in Indonesia's halal certification validation regulations necessitates a national campaign to ensure that the Indonesian people can promptly obtain government protection for the full exercise of Their rights as citizens focus on halal food, medical, and cosmetics restrictions. Several factors influence halal awareness, including halal knowledge gained from closely following halal innovations or halal exposition events, halal training, and so on and the length of time it takes to complete the halal certification procedure (Nusran, Wekke dan Triana, 2018).

Furthermore, as stated by Nusran et al. that if the number of halal potential increases, the product flow in the halal certification process will increase significantly. If the product can be handled properly, it will increase its good performance. If a scenario is created, the increase in certified products will be more stable because it does not increase the burden on the Auditor (Nusran et al., 2018).

The halal certification encompasses the complete process of processing halal items before Muslims ingest them, not simply the end product or the raw materials and components per se. Halal standards and practices must be followed throughout from farm to table, the food

supply chain, including various healthy raw materials solely sourced from halal sources and verified safe. Halal does not always imply that the products consumed are high quality and safety. Halal must be supplemented and conform to 'toyyib' standards. Tayyib implemented sanitation and hygienic practices to ensure the safety and quality of halal products. Halal is the industry standard for product quality and safety. as halal certified products complied to internationally recognised quality assurance standards such as Hazard Analysis Critical Control Points (HACCP) and Good Manufacturing Practice (GMP) for safety and wholesomeness of food products (Stratta, 2015).

Meanwhile, according to Nusran that the benefits that will be generated in assisting in making the product halal certificate policy Consumer loyalty to products circulating in the community will increase as a result of the government and authorities improving consumer confidence in halal-certified products and the existence of a Consumption of these halal-certified foods provides a sense of security, image, and customer support (Nusran et al., 2019)

Application of The Halal Ecosystem

The United Nation formulated sustainable development goals identified seventeen initiatives to be implemented and achieved across the globe by 2030. These are the blueprint to achieve a better and more sustainable future for all aiming to elevate the quality of life of global citizens. The keys United Nation Sustainable Development Goals are about sustaining lifestyle and quality healthy living. Eradication of poverty, equal access to education and ensuring food security are the main pillars to contribute to the achievement of the United Nations' Sustainable Development Goals (United Nations Secretary-General, 2014). In Indonesia, the poverty rate is fairly large even though it will decrease in 2024, this can be seen in the figure below.

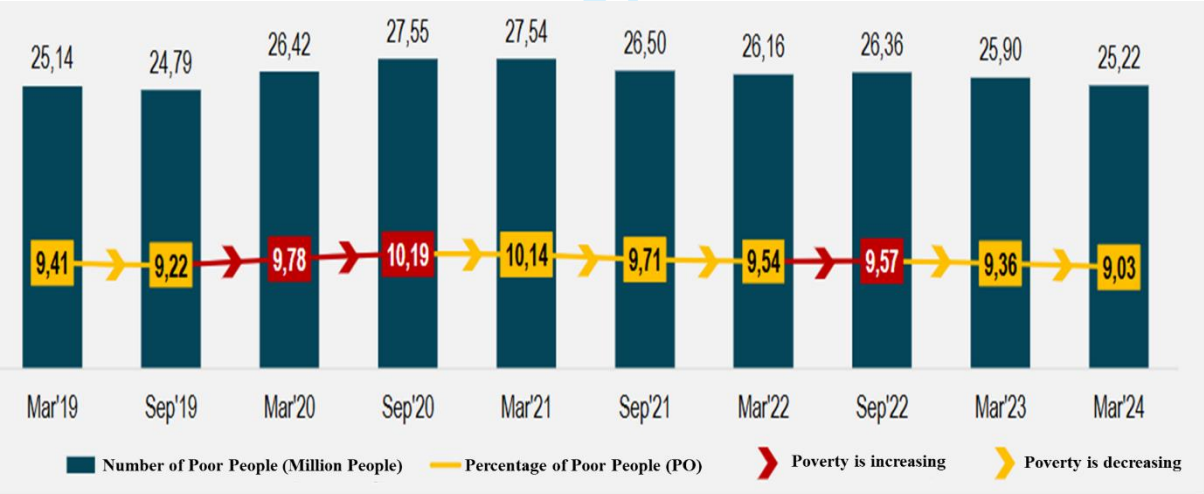

Figure 2: Number and Percentage of Poor Population, March 2019-March 2024
Source: Badan Pusat Statistik Indonesia, 2024

From this figure, it can be seen that in March 2024, Indonesia recorded a decrease in the number of poor people. It was recorded that 25.22 million people were in the poor category, or 9.03% of the total population. This figure shows an improvement compared to March 2023, with a decrease in the number of poor people by 0.68 million people and a percentage decrease of 0.33 percentage points. The national, rural, and urban poverty can be seen in the figure below.

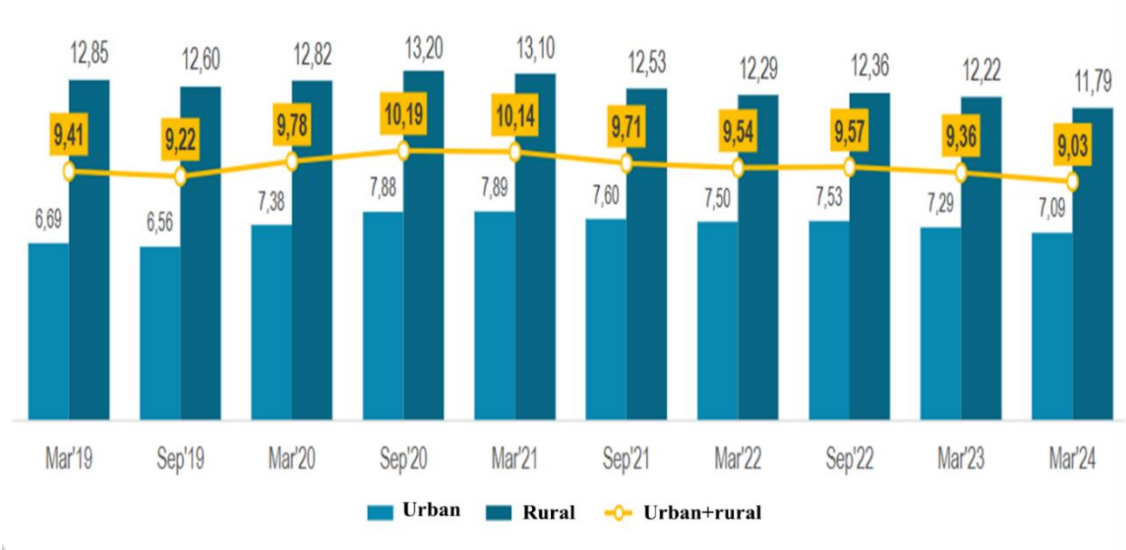

Figure 3: Percentage of Poor Population by Region, March 2019-March 2024
Source: Badan Pusat Statistik Indonesia, 2024

Based on the figure above, the positive trend of decreasing the poverty rate that occurred from March 2020 to March 2024 indicates an improvement in economic conditions, both in urban and rural areas. Badan Pusat Statistik (BPS) noted that in March 2024, the number of poor people will reach 25.22 million people or 9.03% of the total population. This figure decreased compared to March 2023, with a reduction in the poor population of 0.68 million people and a percentage decrease of 0.33 percentage points. However, the poverty disparity between urban and rural areas is still quite wide, so it requires special attention in efforts to equalize development and improve welfare throughout Indonesia. The decrease in the poverty rate is the lowest in the last decade, after increasing during the Covid-19 pandemic (Statistik, 2020).

Furthermore. the greatest challenge to achieve these two keys Sustainable Development Goals (SDG) are about ensuring and sustaining adequate supply of quality food at an affordable cost through food security program and initiatives. The three main indicators of SDG are poverty eradication, zero hunger and healthy wellbeing are inherently supported by effective and sustainable food security. The United Nation sustainable development policy frameworks are essentially based on conventional values and practices. The existing definition of food security does not effectively reflect the halal problems, which is also demanded by around 25% of the world's population. Thus there is a need to develop a sustainable and conducive ecosystem of non-exploitative to ensure the global citizen regardless of cultural practices or faith to attain the desired quality of life through sustainable food security. A sustainable halal ecosystem creates an ideal environment for good and healthy living and a long-term lifestyle within the boundaries of what is allowed and lawful, as defined by the concept of halal, providing an alternative platform to support and achieve these goals. The United Nations established sustainable Development Goals (United Nations Secretary-General, 2014).

The establishment of a sustainable development platform for the halal ecosystem is very important in increasing the effectiveness and reach of the halal industry globally. Indonesia's halal tourism sector faces significant challenges mainly due to the absence of a robust ecosystem that ensures balanced interactions between its components (Rachmiatie et al., 2024). This multifaceted approach is important for developing a holistic ecosystem that meets halal requirements and is aligned with sustainable practices.

The concept of sustainable tourism must include economic factors as well as broader social and environmental dimensions. Sustainable tourism development must include elements of quality improvement and efficiency along with environmental considerations (Zulvianti et

al., 2022). This comprehensive framework emphasizes that halal in tourism cannot be limited to economic metrics alone. This is in line with the findings that halal supply chains must adhere to strict standards that reflect ethical sourcing, sharia compliance, and sustainability considerations (Khan et al., 2021).

The halal ecosystem is supported by various institutions that facilitate the certification process. In Indonesia, the Halal Product Assurance Agency plays an important role in regulating and promoting halal certification. Evidence shows that capacity building and collaborative efforts of Halal Product Assurance Agency can significantly improve the performance of the halal industry and potentially help reduce poverty through job creation and economic growth (Arifai, 2023; Bahrudin et al., 2024).

The halal ecosystem (Figure 4) is embedded with holistic values of halal practices comprises closely interdependence economic sectors that include both upstream and downstream agricultural activities, products manufacturing, and services that include financial institutions. Sustaining the halal ecosystem needs a coordinated and collaborative effort from all relevant stakeholders, including the government as the regulatory authority responsible for protecting halal integrity by implementing relevant halal laws and regulations. For products and processes, policies and actions governing the halal ecosystem must incorporate halal and tayyib. This is one of the most important aspects of the halal ecosystem's development and execution. Farmers and producers must effectively convey their duties to maintain halal integrity by following halal standards and procedures in processing technologies, storage, and distribution (Andersen dan Pandya Lorch, 1997).

Andersen and Pandya-Lorch (1997) said Maintaining a halal ecosystem necessitates good communication and sharing of important information with other sectors of the economy, including the media. Digital media effectively act as a marketing tool to promote halal products and services globally regardless of the size of the enterprises. Financial institutions must provide ongoing support and commitment to halal-related businesses that emerge from the halal food supply chain. Financing in the form of sharia compliant microfinancing will create sustainable small-scale entrepreneurs involved in halal related businesses. The human capital that is competent and knowledgeable is the driving factor behind the halal ecosystem's survival. The human capital that is skilled and aware of halal standards and processes will significantly contribute to the long-term sustainability of the halal ecosystem. Investment for human capital development to support and sustain halal economy is very crucial for the sustainability of halal ecosystem. Each economic sectors of halal ecosystem may directly be impacting on a sustainable food security program and initiatives. Apart from these primary sectors, the ecosystem is further enhanced by services related to lifestyle such as hospitality and tourism (Andersen dan Pandya Lorch, 1997).

The results of research of Nusran previously related to the policy model derived from a System Dynamics simulation showing that the dominant animal product is not halal certified. So that the level of public awareness (consumers) affects the halal products that are consumed. In increasing the importance of halal certification, there are still several policy issues to address to deal with uneven syar'i, where producers cannot display products that are guaranteed to be halal. Halal Slaughterer training increases the certainty of halal product production, because it is showing a significant increase (Nusran et al., 2019).

The halal ecosystem provides a favourable atmosphere for governing quality and healthy living and a sustainable way of living within the boundaries of what is authorized and legal specified by the notion of halal, thus provides an alternative platform to support and achieve United Nation initiated Sustainable Development Goals. The halal ecosystem fosters Islamic economic growth through adherence to strict halal standards and practices.

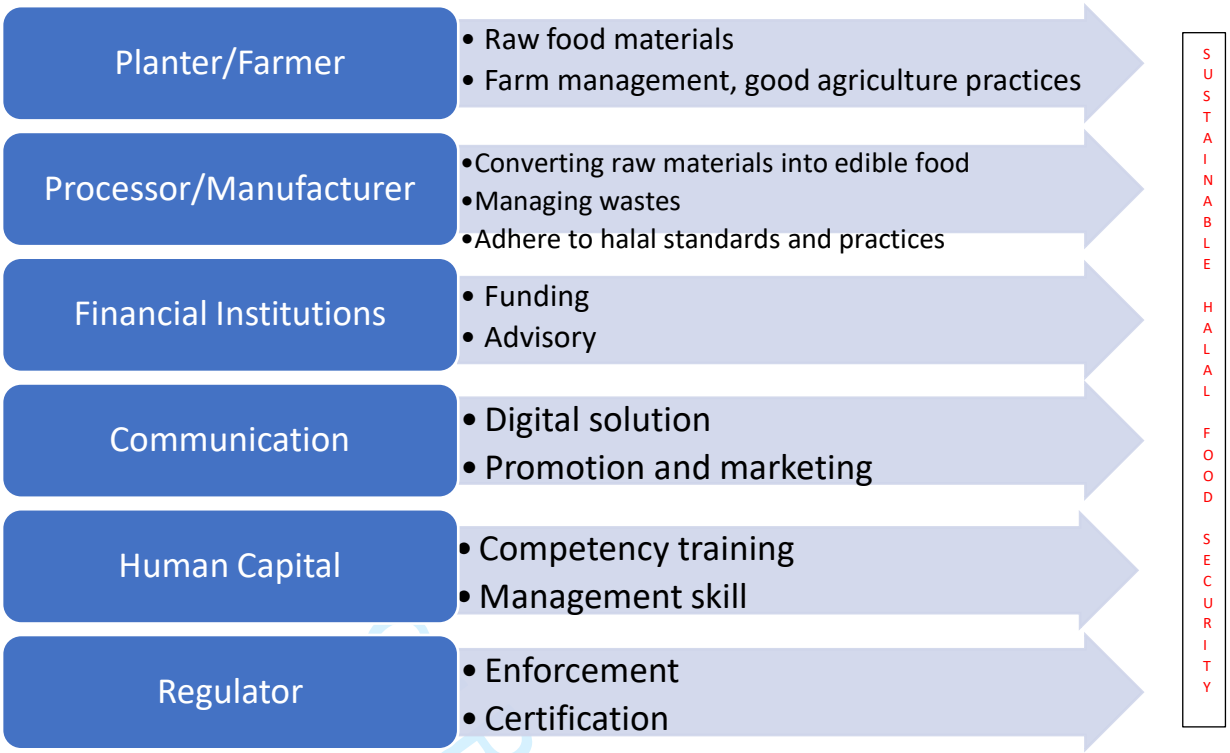

Figure 4: Halal Ecosystem supporting Sustainable Halal Food Security
Source: Andersen and Pandya-Lorch, 1997

The sustainable halal ecosystem serves as an enabler to achieve primary goals of sustainable halal food security; through ensuring availability and accessibility of quality halal food to mankind. The halal ecosystem successfully maintains a continuous halal food supply chain, a key component of long-term halal food security. Each sector collectively formulated a common agenda to ensure sustainability of halal food security program. Sustaining halal integrity is the core critical factor for the halal ecosystem to remain relevant. The most difficult task is preserving halal integrity from farm to table throughout the food supply chain (Andersen dan Pandya Lorch, 1997).

Likewise, what was released by Nusran Concerning the Management of the Supply Chain Process for Meat Products, the slaughterer must meet specific criteria according to Islamic Sharia; namely, the slaughterer must be Muslim, old enough, and understand how the slaughter process works well without any element of torture in the slaughter process (Nusran, 2019). Every Slaughterhouse must have a slaughterer who has been recognized by the MUI as a professional Halal Slaughterer with proof of certification and who follows certain standards. The Slaughterhouse will be guaranteed to produce halal meat due to this. Furthermore Andersen and Pandya-Lorch (1997) that The halal ecosystem operates in a synergistic and cooperative manner to ensure both the sustainable development indicators; eradication of poverty and healthy living are achievable within a desirable time frame. Each and every sector of the halal ecosystem continues to grow in tandem with current technology and social development impacting the lifestyle of every global citizen. Dynamism of halal ecosystem provides flexibility and adaptability to face challenges arising from complex and unpredictable global economic scenarios (Andersen dan Pandya Lorch, 1997).

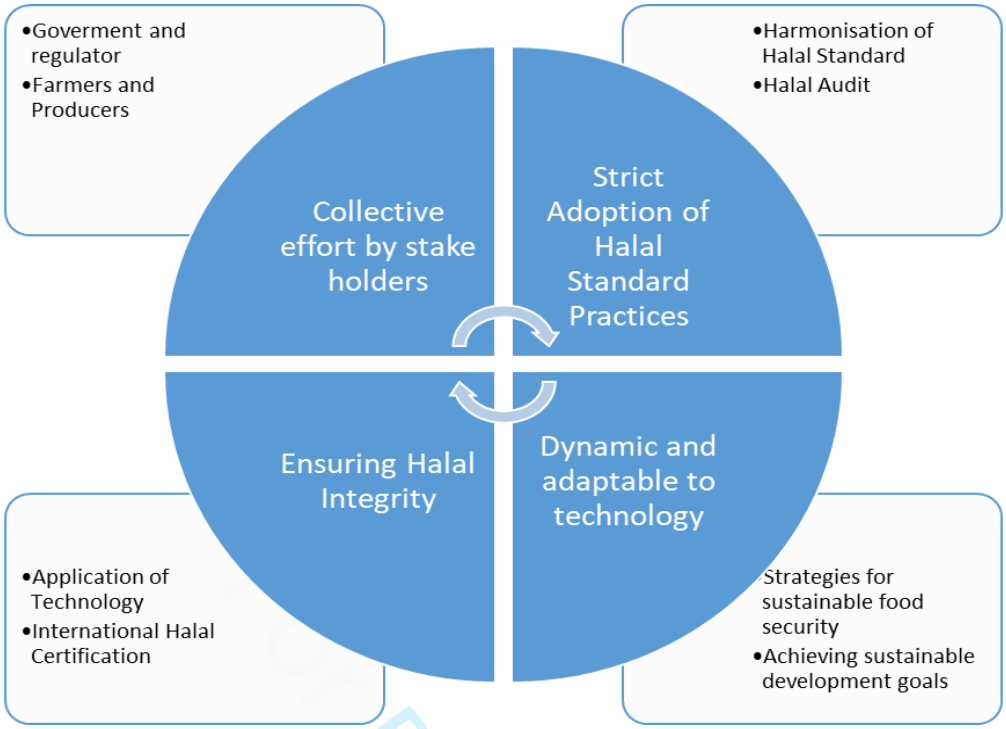

Figure 5: Sustainable Halal Ecosystem
source: Andersen and Pandya-Lorch, 1997

Security of Halal Food

Poverty eradication is the ultimate goal of food security, hunger eradication, and maintaining a healthy lifestyle. Important elements of sustainable food security are about ensuring availability of quality food accessible to all global citizens through proper conversion and utilisation of food raw materials. An effective and efficient food supply chain; characterised from farm to table form as pillar supporting sustainable food security agenda. Each component that constitutes the halal supply chain; raw materials, processor, manufacturer, storage, distribution and consumers are continuously linked through halal logistic system to safeguard the halal integrity.

Environmental variables (climate change, limited water supply, and so on) and Agricultural development policies It may impact a long-term food supply chain's ecosystem, reducing the availability and accessibility of high-quality food, safer foods. The existing notion of food security does not sufficiently reflect the challenges associated with halal certification, which is a requirement of Muslims, who make up around 25% of the global population Despite being rated nutritionally safer for human consumption value and devoid of dangerous pollutants, the halal status of the input and procedures of the raw materials is not explicitly mentioned or specified (Ecker dan Breisinger, 2012). The United Nations Sustainable Development Goals were predicated on the successful implementation of a food security plan primarily built on a continuous food supply chain from farm to table (United Nations Secretary-General, 2014).

By maintaining the long-term viability of halal integrity, halal ecosystems establish a conducive environment for long-term halal food security. Aside from ensuring the quality and safety of halal food, other components of a long-term halal food supply chain must be considered such as raw materials availability and compliance with halal standards in raw materials input, processing, logistics, storage, and distribution, which influence halal integrity. These are the most well-defined important issues affecting the halal food supply chain's integrity and sustainability. Halal standards and practices must be followed throughout the supply chain and value addition. There are problems all along the food supply chain from farm

to table from an unintended wastage due to inevitable environmental factors and inadequate post-harvest handling. The wastes are in different forms and quantities are continuously generated all along the food supply chain and often pose an environmental hazard such as pollution affecting healthy living and lifestyle.

Inadequate post-harvest management wastes around one-third of the raw resources of the original edible food. The post-harvest losses are due mainly to inadequate or inaccessible to relevant process technologies which include logistic, storage and distribution to minimise inherent deteriorative phenomena of fresh agriculture produces. The wastes generated during post-harvest processing are usually the result of either selective extraction of only a limited fraction of the edible portion of the raw materials or ineffective process technology to deal with the raw materials' complicated anatomical characteristics. Otherwise, the wastes generated unintentionally might feed roughly 1 billion people and thus will significantly reduce the incident of undernourishment and hunger globally (Ecker dan Breisinger, 2012).

Halal and tayyib are concepts that forbid waste and the use of damaging techniques, such as processing aids. The halal concept is a social obligation to preserve and conserve a healthy environment. It is a critical component of the halal value system for ensuring a continuous food supply chain to those in need (Figure 6). There will be no waste in both upstream and downstream processes, including processing agricultural products, helps achieve green circular economy goals, emphasizing recycling and reusing wastes or by-products of industrial processes, including agricultural wastes. The ecological equilibrium Current practices, which primarily rely on chemicals as a Assisting in the processing of hazardous wastes may add to the accumulation of hazardous wastes that have an environmental impact if they are not adequately handled or processed before being released into the ecosystem, disturbing the ecological balance and posing a hazard to the environment's survival sustainability and quality of life and They are having an impact on the environment and healthy living. Overexploitation of green resources will become more widespread unless a fair and equitable policy based on halal and tayyib is incorporated and implemented, with profit as the major goal. Halal is intrinsically acceptable and easily integrated into a circular green economy powered by green technologies (Ecker dan Breisinger, 2012).

Waste minimisation is a strategy to ensure a sustainable food supply chain; a building block for sustainable food security. The wastes in different form and quantities are continuously generated all along the food supply chain. Such huge wastage may adversely have affected the availability of much desired source of food raw materials to sustain food security, an important pillar for sustainable development goals (Ecker dan Breisinger, 2012).

Managing the wastes in a manner subscribed by halal and toyyiban practices will contribute towards creating an inclusive halal supply chain of raw food commodities comprising both edible and non-edible portions of the food commodities. Both edible or inedible portions of agricultural wastes are nutrients rich and characteristically are suitable substrates for isolation and conversion into value-added products or relevant derivatives. Managing wastes generated all along halal food supply chain may create opportunity of various sizes of halal social entrepreneurs supported by the existing halal ecosystem. The dynamism of halal ecosystem is ready to accommodate and propel initiatives to create wealth from wastes.

Furthermore Ecker and Breisinger, 2012 that The use of revolutionary green technology fundamentally founded on halal and tayyib gives a long-term solution for preserving Higher-quality, safer halal food with fewer wastes, thanks to halal integrity. The chain of halal food production starts with healthy halal raw materials that are processed using environmentally friendly technologies, resulting in the least amount of recyclable and reusable trash possible.

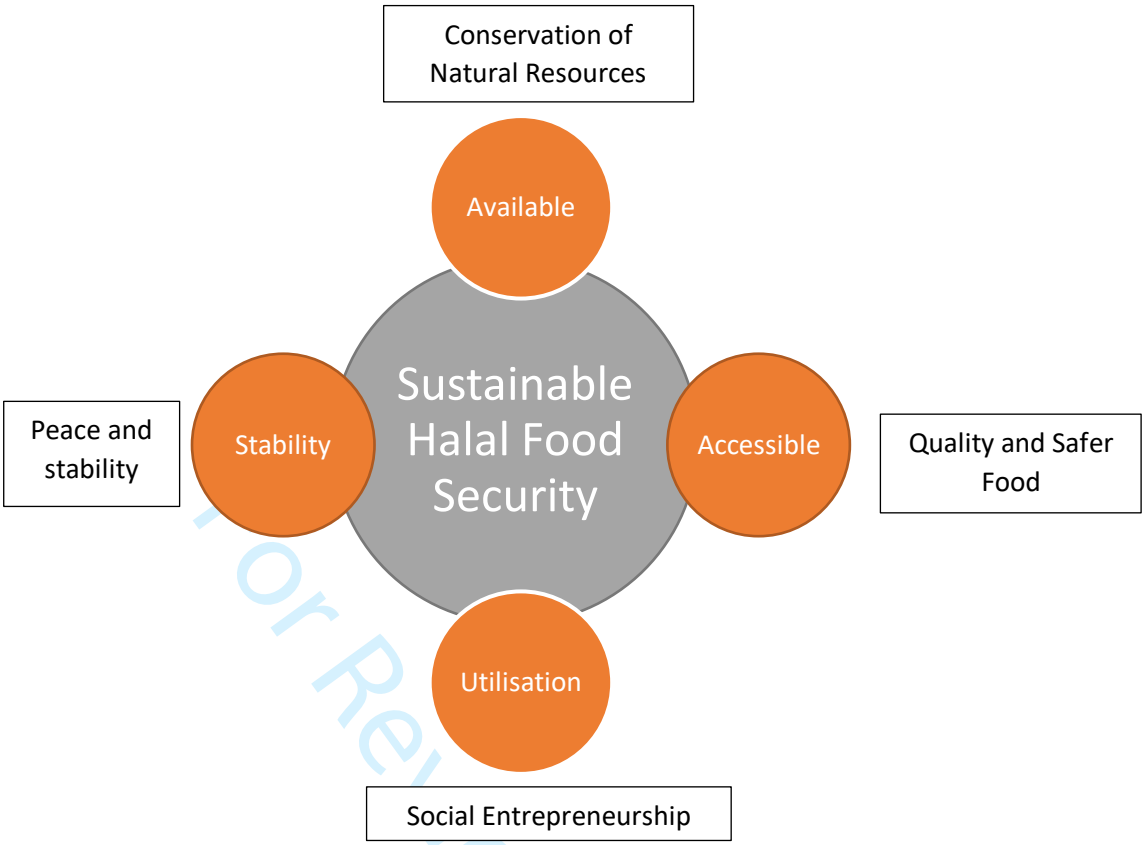

Figure 6: Model of Sustainable Halal Food Security Driven by Halal Ecosystem (Source: Ecker and Breisinger, 2012)

The wastes produced are notably free of hazardous components, but they may still include vital nutrients that humans can use after nutritional enrichment or fortification, as well as additional processing. The "wastes" themselves, depending on their composition, can be used as a support or as a tool component for bio-conversion into value-added products, thereby achieving waste minimization and the halal and tayyib philosophies stress zero-waste strategies and embedded in the circular economy.

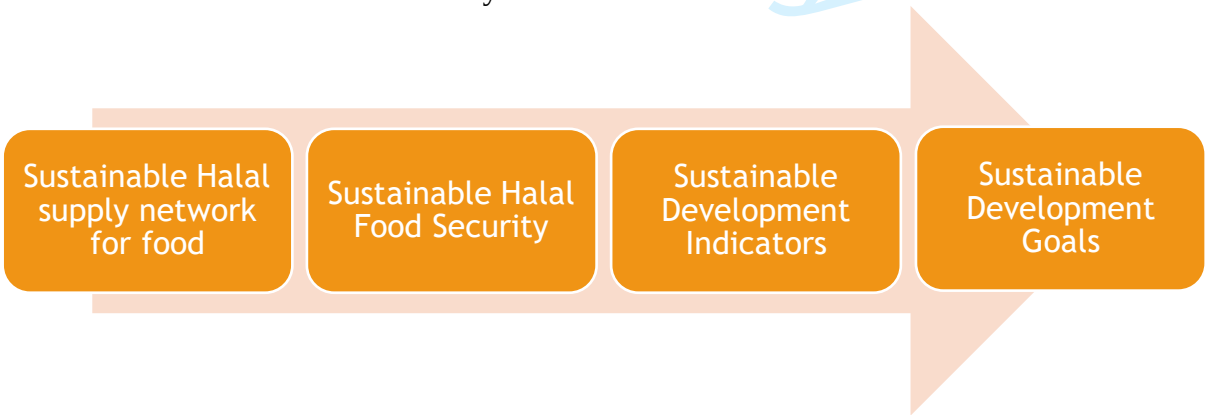

Figure 7: Pathway Toward Achieving Sustainable Development Goals: The Ways Forward. (Source: IFAD, WFP, and FAO, 2013)

Achieving Sustainable Development Goals without compromising elements of halal integrity for the benefit of Muslim and Non-Muslim requires policies and actions to support

and enhance sustainable halal food supply chain, a pillar for long-term halal food security (Figure 7). The markers of sustainable development are quantitative and serve as benchmarks for an efficient and effective sustainable halal food security policies and actions. The halal ecosystem has significant roles in each and every aspect of contributing elements of sustainable development goals (IFAD, WFP dan FAO, 2013)

Conclusion

This research underscores the importance of building a sustainable platform for the halal ecosystem as an innovative solution that is aligned with the United Nations Sustainable Development Goals (SDGs). The integration of halal values in modern economic and social practices not only ensures adherence to Islamic principles, but also offers an inclusive, ethical, and sustainable approach. The findings of the study show that the current food security plan has not fully addressed halal challenges that can have a significant impact on the livelihoods of Muslims. Therefore, a joint effort is needed from Muslim scholars to raise the issue of halal to the food security agenda.

The halal food security ecosystem opens up opportunities for various business initiatives related to food sizes that adhere to halal values and practices, which can contribute to poverty eradication and quality of life improvement. By leveraging the dynamism of the halal ecosystem, strategies to maintain halal food supply chains through waste minimization offer sustainable solutions that have a positive impact on the environment. Therefore, investing in a sustainable development platform for the halal ecosystem is a strategic step to realize a fairer, more sustainable, and ethical economy globally, as well as ensure food security that is aligned with halal values and sustainability principles.

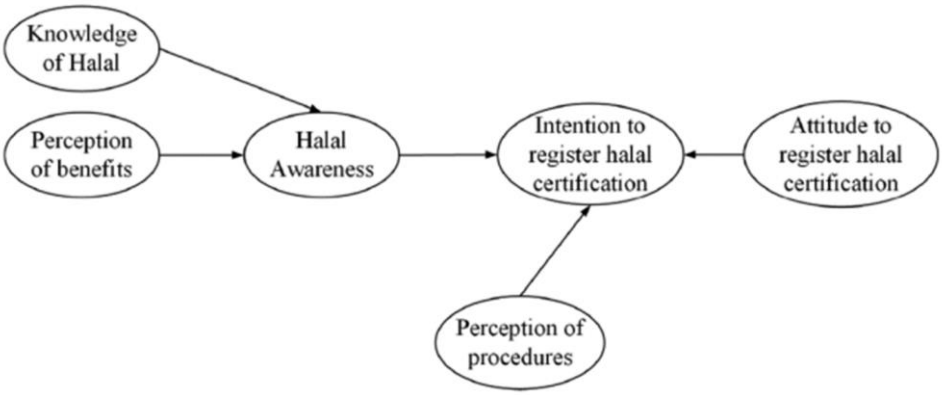

Figure 1: Conceptual model of awareness and intention to register halal certification
Source: Oemar et al., 2022

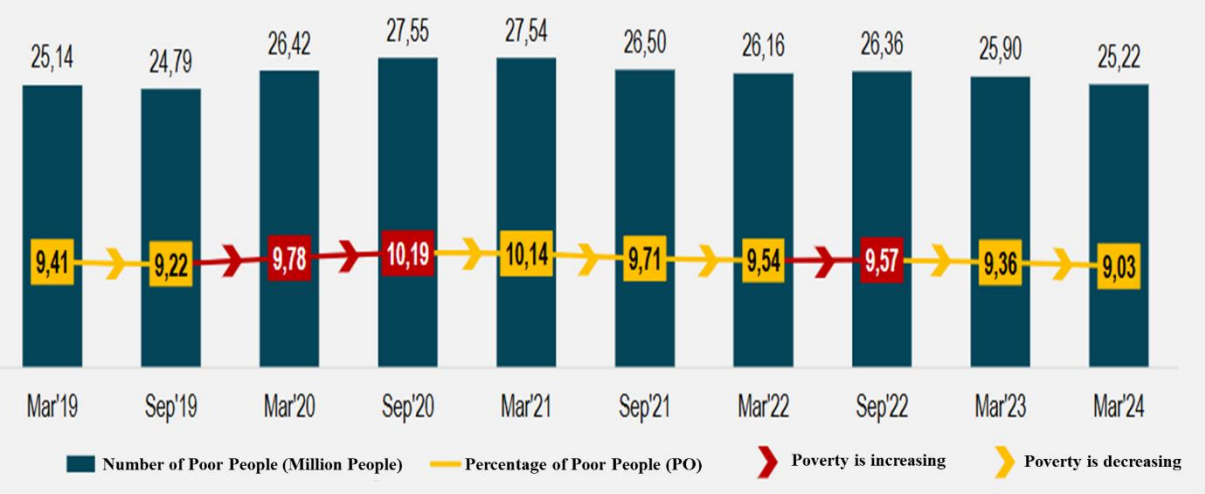

Figure 2: Number and Percentage of Poor Population, March 2019-March 2024
Source: Badan Pusat Statistik Indonesia, 2024

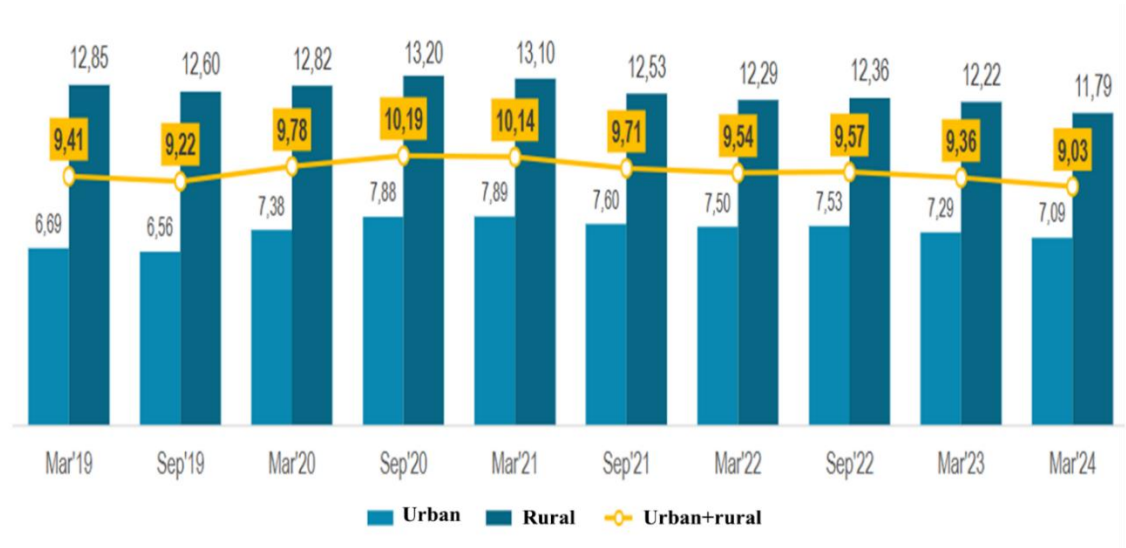

Figure 3: Percentage of Poor Population by Region, March 2019-March 2024
Source: Badan Pusat Statistik Indonesia, 2024

Figure 4: Halal Ecosystem supporting Sustainable Halal Food Security
Source: Andersen and Pandya-Lorch, 1997

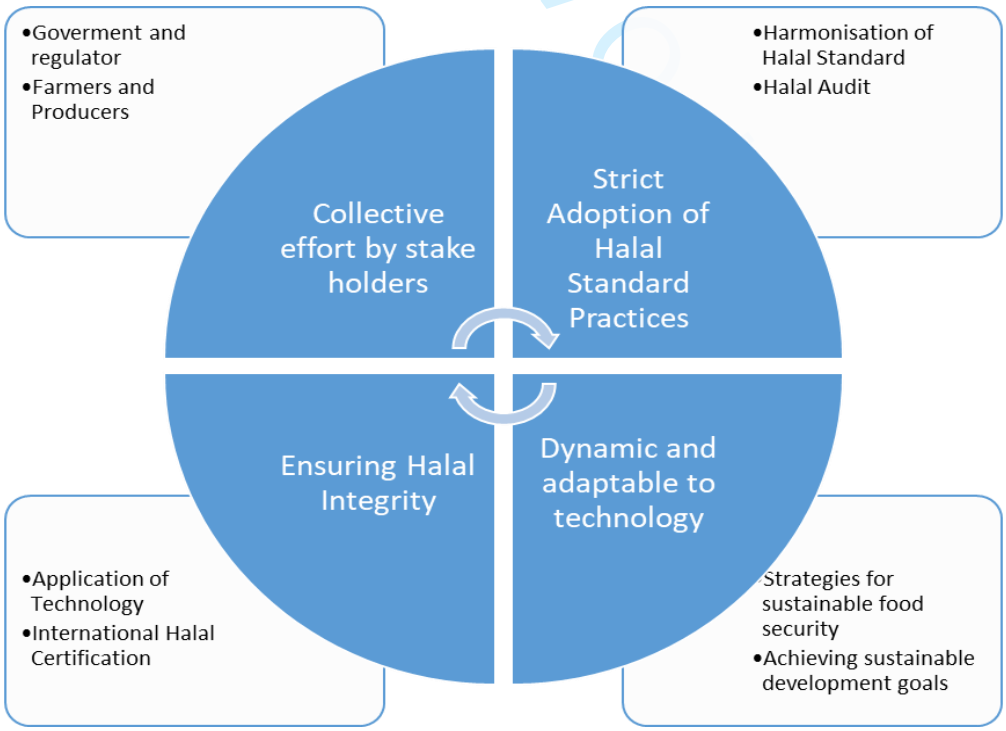

Figure 5: Sustainable Halal Ecosystem
source: Andersen and Pandya-Lorch, 1997

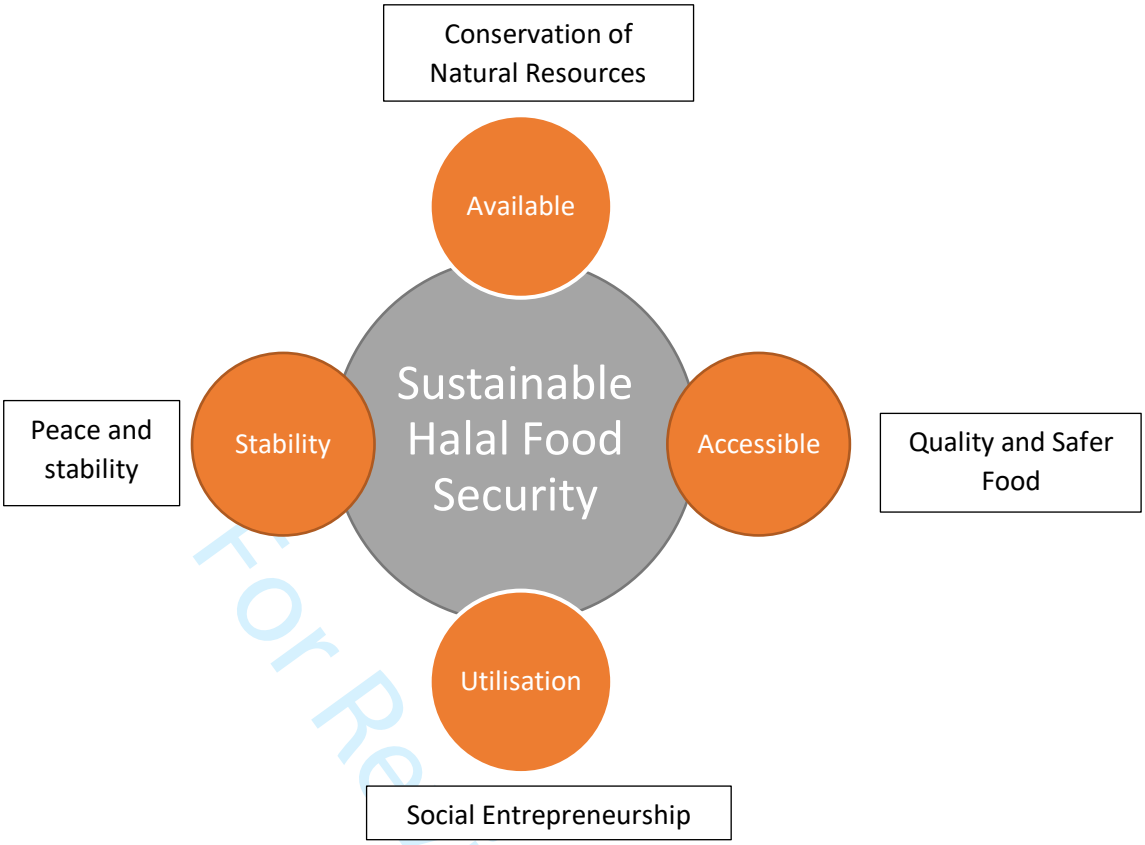

Figure 6: Model of Sustainable Halal Food Security Driven by Halal Ecosystem (Source: Ecker and Breisinger, 2012)

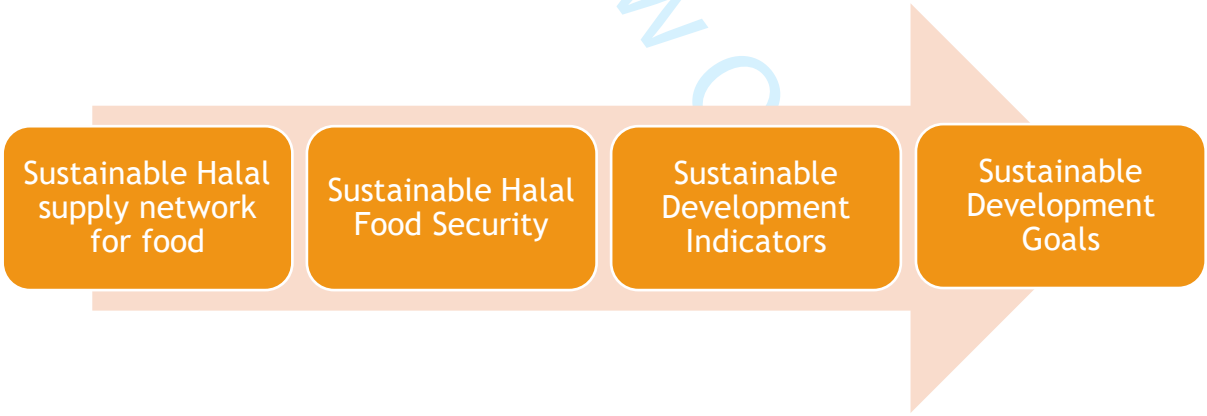

Figure 7: Pathway Toward Achieving Sustainable Development Goals: The Ways Forward. (Source: IFAD, WFP, and FAO, 2013)

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