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Article Reviews

Advancing Indonesia's Rice Industry: Embracing Tayyib Principles Beyond Halal

Ferdi Zanuar Azan[1]*, Nunung Nurhayati[1], Ahlis Fatoni[2], Muhammad Irfan Florid[1], Moza Audina[1]
[1]Bandung Islamic University, Indonesia
[2]International Islamic University Malaysia, Malaysia

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Abstract

Indonesia's rice industry is crucial to its economy and culture, and the integration of Tayyib principles, which encompass broader ethical and quality considerations beyond the conventional emphasis on halal, offers promising prospects for its enhancement. This qualitative study, employing a descriptive-analytical method and literature review, collected data from secondary sources such as journals, books, and official websites related to rice quality, halal, Tayyib, and agriculture. Findings indicate that conventional farming practices often introduce harmful inputs, potentially compromising rice quality and safety, thereby highlighting the importance of adopting Tayyib principles for a more holistic approach. By integrating ethical, sustainable, and quality-driven practices, this research underscores the necessity of a comprehensive approach that ensures purity, quality, and ethical production, fostering industry growth and consumer trust. Despite its qualitative focus, the study suggests that additional quantitative analysis could further elucidate the impact of harmful inputs on rice quality. This research introduces an innovative approach by applying Tayyib principles to Indonesia's rice industry, emphasizing ethical, sustainable, and quality practices to enhance consumer trust and satisfaction.

Keywords *Tayyib, Halal, Rice*

INTRODUCTION

Indonesia is an agricultural country abundant in natural resources on land and in its waters. Most of its population earns a livelihood from agriculture due to Indonesia's characteristics, including a tropical climate and fertile soil, making it suitable for cultivating various crops for food and plantations (Widyawati, 2017). Additionally, the substantial labour force engaged in or reliant on the agricultural sector and agricultural products contributing significantly to the national economy plays a crucial role in Indonesia's overall economic landscape. The agricultural sector is among the sectors with the most potential to contribute to the development and economic growth of the nation, both in terms of employment and income generation. The role of the agricultural sector in Indonesia's development is undeniable (Hayati et al., 2017).

Rice plants (*Oryza sativa L.*) are among the crucial cultivated crops for humanity as they produce rice, a staple food source (Kumarathilaka et al., 2018). Rice is a primary food source for nearly half of the world's population, including most Indonesians who rely on it for sustenance. Therefore, rice holds significant economic, cultural, spiritual, and political value for the Indonesian nation as it profoundly influences the livelihoods of many fields (Ishaq et al., 2017). Consequently, rice cultivation plays a pivotal role in the national economy, serving as a staple food source for the populace and providing livelihoods and income for farmers to meet their daily needs.

Indonesia stands as the fourth-largest producer of rice globally and holds the top position in Southeast Asia, with an estimated production of 34.6 million metric tons of paddy for the

Corresponding author's email: ferdialadzan@gmail.com

2022/2023 season (Kusnandar, 2023). This substantial production reaffirms Indonesia's significant role in global rice cultivation, significantly meeting domestic and regional demands. The nation's consistent and extensive rice cultivation secures its position as a major rice-producing country and underscores its pivotal role in ensuring regional food security.

Nonetheless, conventional methods of cultivating paddy are increasingly challenging due to their heavy reliance on chemical inputs like synthetic pesticides and fertilizers (Budianta et al., 2023). This dependence has led to emerging concerns regarding environmental sustainability, soil health, and potential impacts on human health (Shiva, 2021; Budianta et al., 2023), urging the need for more sustainable and eco-friendly agricultural practices in rice cultivation, as stated by Yang et al. (2021) and Mariyono (2018) that the soil conservation can reduce the use of chemical fertilizer.

While the rice industry may hold halal certification as required for Muslims (Lestari et al., 2023), the prevalent use of chemical inputs raises concerns regarding potential environmental hazards and risks to human health (Hyman, 2021). Despite meeting specific religious or certification standards, including these chemical inputs poses potential threats to the environment and consumers' well-being (Hyman, 2021; Pollan, 2008; Vasta et al., 2024). Therefore, while compliance with halal standards has traditionally been a focal point within this industry (Marohom & Fuerzas, 2023), a broader and more encompassing approach—rooted in Tayyib principles—is emerging as a potentially transformative force.

In the Quran, the command to consume halal (lawful) food is clear (Intansari et al., 2023), emphasizing the certainty and truthfulness of obeying Allah's directive to consume what is halal and tayyib (good). A Muslim must adhere to this command. Allah, the Most High, states:

يَـٰٓأَيُّهَا ٱلنَّاسُ كُلُوا۟ مِمَّا فِى ٱلْأَرْضِ حَلَـٰلًا طَيِّبًا وَلَا تَتَّبِعُوا۟ خُطُوَٰتِ ٱلشَّيْطَـٰنِ ۚ إِنَّهُۥ لَكُمْ عَدُوٌّ مُّبِينٌ ١٦٨

O humanity! Eat from what is lawful and tayyib on the earth, and do not follow Satan's footsteps. He is truly your sworn enemy (al-Baqarah: 168)

This paper explores the evolution of Indonesia's rice industry by exploring the integration of Tayyib principles. While halal certification ensures adherence to Islamic law, Tayyib principles extend beyond, encapsulating a spectrum of ethical and quality considerations throughout the rice production and supply chain. This broader perspective promises compliance and an enhancement of ethical production, sustainability, and quality within the industry.

By delving into applying Tayyib principles within rice cultivation and distribution, this research seeks to unravel the potential impact on industry practices. It aims to illuminate how adopting Tayyib principles could redefine standards, revolutionize methodologies, and influence policy-making, ultimately steering Indonesia's rice industry toward a more resilient, ethically grounded, and prosperous future.

LITERATURE REVIEW

Halal and Tayyib

The words "halal" and "haram" are terms found in the Quran, used in various contexts with different concepts, some related to food and beverages. Both terms are also employed in the Hadiths of the Prophet Muhammad (PBUH). Linguistically, some opinions suggest that "halal" originates from the root word الحل, meaning permissible according to Islamic law. Al-Jurjani wrote that the word "halal" comes from الحل, signifying "open" (الفتح). Technically, it denotes anything not subjected to prohibition in its use or actions that Sharia law permits. According to Abû Ja'far al-Thabârî (224-310 H), the term "halâl" means free or exempt (Muzakki, 2020).

Abû Muhammad al-Husayn ibn Mas'ûd al-Baghawî (436-510H), from the Shafi'i school of

thought, defines "halâl" as something permitted by Islamic law due to its goodness (al-Baghawî, 1997). Muhammad ibn' Ali al-Syawkânî (1759-1834 H) asserts that something is declared halal when the knot or prohibition preventing it has been undone. This view aligns with al-Syawkânî's perspective (al-Syawkânî, 2007). Contemporary scholars, such as Yusuf al-Qaradhawî, define halal as something through which the dangerous knot is untied, and Allah permits its practice (Qaradhawi, 2002). Meanwhile, 'Abd al-Rahmân ibn Nâshir ibn al-Sa'dî, in defining "halâl," emphasizes how it is obtained—avoiding theft, deceitful acquisition, and transactions involving or resembling haram practices.

From the various explanations provided above, it can be concluded that halal refers to something permitted by Islamic law to be (i) performed, (ii) used, or (iii) pursued because the knot or tie preventing it or elements endangering it have been undone. This also emphasizes the importance of the acquisition method, avoiding transactions involving prohibited practices (Ali, 2016).

Meanwhile, the word "Tayyib" originates from the Arabic language derived from the root word thaba – yathibu – thayyib – thayyibah, denoting something good, thus referred to as tayyib. Regarding the term "tayyib" mentioned in Surah al-Baqarah [2] verse 168, according to Imam Malik, it means "halal," emphasizing Allah's statement "halâl-an" (al-Syawkânî, 2007). From Imam Malik's opinion, it is evident that "halal" and "tayyib" share a similar meaning as a reinforcement (takid) of differentiation in wording. Al-Syâfi'i, as quoted by al-Syawkânî, denotes it as what is delightful (al-Qurthûbî, n.d). Imam al-Thabarî (224-310 H) interprets the term "tayyib" in this verse as something pure, free from impurities, and not forbidden (al-Thabari, n.d). According to Abû Bakr Ibn al-'Arabî, "tayyib" stands in contrast to "alkhabîts" (الخبيث), meaning something undesirable or bad (al-'Arabî, n.d). He further adds that the understanding of "tayyib" refers to two aspects: first, something suitable for the body and tastes pleasant, and second, something permitted by Allah. Meanwhile, al-Hâfizh Ibn Katsîr explains that "tayyib" in this verse signifies what is delightful for humans without endangering their physical or mental well-being (Ali, 2016).

The Quran and Hadith outline the foundation for the obligation to consume halal and tayyib food and beverages, plants, and animals. Examples of directives to consume and benefit from what is halal and tayyib are found in various verses such as Al-Baqarah [2]: 168 and 172, Al-Nahl [16]: 114, Al-Mâ'idah [5]: 87 and 88, Al-Anfâl [8]: 69 (Esposito, 2001). In these verses, the term "halal" serves as the basis for the command to consume food and beverages that are both halal and tayyib.

The Use of Synthetic Fertilizers and Pesticides in Indonesia

Indonesia has implemented registration and licensing procedures for all types and groups of pesticides and fertilizers since 1970, coordinated by the Department of Agriculture under Government Regulation No. 7 of 1973 concerning Supervision of the Circulation, Storage, and Use of Pesticides (Untung, 2004). Using chemical fertilizers and pesticides is part of the Green Revolution, an ambitious project initiated during the New Order regime to boost agricultural production using modern technology (Untung, 2004; Firli, 2013). During this period, the government spearheaded rice cultivation and enforced the use of imported seeds, chemical fertilizers, and pesticides, among other interventions (Mariyono et al., 2018). Indeed, the Green Revolution addressed the challenge of meeting the increasing global food demand.

The various forms of "enforcement" seem to stem from the New Order's belief that public trust in the government and establishing national social-political stability could be achieved by ensuring the people's food needs (Baswir, 2002). Consequently, the government promoted using various modern agricultural technologies to boost food productivity. In this regard, Fanslow (2007) stated, "People who had previously relied on traditional beliefs and local knowledge for crop management were suddenly introduced to the modern world."

It must be acknowledged that implementing the *Panca Usaha Tani* (Five Agricultural Efforts) significantly increased productivity across almost all sub-sectors within the agricultural sector. Records show that cotton production increased by 126% in 1974, while rice production increased by 6%. Additionally, horticultural and vegetable crops experienced growth rates of 15% each. Alongside this progress, the use of chemical fertilizers, pesticides, and rice processing tools also significantly increased. In 1974, the use of chemical fertilizers rose by 3% (reaching 339 thousand tons), while the use of insecticides and rodenticides increased by 7% and 119%, respectively, compared to 1972. Similarly, from 1973 to 1974, the use of rice processing tools increased by 21%, rising from 23,974 units in 1973 to 28,952 units in 1974 (Mubyarto, 1981).

As we recall, Indonesia celebrated a significant agricultural milestone by achieving rice self-sufficiency (*swasembada beras*) between 1984 and 1986. From 1980 to 1986, the country witnessed an impressive annual average increase in rice production, reaching 7.1%. Yet, this upward trend was fleeting. Following 1986, rice production saw a gradual decline, prompting the government, by the end of 1988, to confront the challenging decision of importing rice to fulfil domestic food demands (Booth, 1992).

The Impact of Synthetic Fertilizers and Pesticides on the Environment and Human Health

The widespread use of synthetic fertilizers and pesticides (agrochemical inputs) in modern agriculture has undoubtedly revolutionized food production, enabling increased yields to meet growing global demands (Galli, 2015; Shiva, 2021). However, the impact of environmental and human health has raised significant concerns. While enhancing crop growth and controlling pests, these synthetic chemicals often harm ecosystems, soil quality, water sources, and human well-being (Kumarathilaka et al., 2018; Shiva, 2021). Understanding the multifaceted implications of these chemicals is crucial in evaluating their overall impact on the environment and human health.

In addition, another critical aspect that demands attention in implementing the Green Revolution in Indonesia is the array of implications arising from modern agricultural technology, particularly chemical fertilizers (factory-produced) and pesticides. Soepardi (2000) stated that the continuous use of factory-produced fertilizers to stimulate land for nutrient production leads to "land saturation." Consequently, this impacts the land's ability to produce crops optimally (Mariyono, 2018). Similarly, the use of pesticides in pest control paradoxically results in the emergence of increasingly resilient pests due to chemical-induced mutations. Hence, as emphasized by Soepardi (2000) during the 37th Anniversary of Bogor Agricultural University (IPB), farmers demand accountability from intellectual institutions like IPB, considering that the Green Revolution they once championed has adversely affected their current livelihoods.

Fanslow (2007), in his research conducted in Kota Batu, Malang, East Java, stated that while the Green Revolution did provide abundant rice yields for Indonesia, it also brought about social and ecological issues that continue to impact society almost four decades later, with solutions yet to be found. According to Fanslow (2007), the contamination from factory-produced fertilizers and pesticides in Kota Batu reflects numerous similar cases in various rural areas across Java Island. Through his research, Fanslow (2007) discovered a drastic reduction in agricultural land productivity in Kota Batu due to chemical fertilizer and pesticide residues contaminating surface water. Consequently, the land's defertilization has led many in Kota Batu to shift professions towards household industries such as iron and steel—a shift in economic activity that further exacerbates environmental pollution.

Regarding the use of pesticides, besides leading to the emergence of increasingly resilient pests, they also kill various insects or animals crucial in agriculture, such as earthworms that contribute to soil aeration. However, the more urgent concern is the disruption of the natural food chain due to the killing of predator animals, potentially resulting in more significant pest attacks

and larger crop failures than before (Fanslow, 2007; Galli, 2015; Shiva, 2021).

The table below encapsulates a comprehensive overview of the multifaceted impacts on the environment and human health stemming from the utilization of agrochemical inputs. It systematically outlines the intricate connections between these inputs and their repercussions, encompassing various dimensions such as ecological balance, soil health, water quality, biodiversity, and the direct and indirect effects on human well-being. This summary table provides a comprehensive guide to understanding the complex interplay and far-reaching consequences of employing agrochemicals in agricultural practices, shedding light on the intricate web of environmental and health-related implications.

Table 1. The Environment and Health Cost of Agrochemical Inputs

Environmental Cost	References	Health Cost	References
Increase toxic use that harms the environment	Catalini & Papotti (2017); Shiva (2021)	Noncommunicable Diseases NDCs	
Soil Pollution	Dutta and Bortamuly (2018); Habib (2019); IAEA (1982)	Cardiovascular disease	Alleva et al. (2019); Anand et al. (2015); Juul et al. (2021)
Water pollution	FAO (2017); Jimoh et al. (2003); Koumaré et al. (2020); Oregon Department of Agriculture (2012)	Cancer	Alleva et al. (2019); Fiolet et al. (2018); Händel et al. (2021)
Air Pollution	Cassou et al. (2018); Defra (2018); Domingo et al. (2021); Kubiak et al. (2008); Marshall et al. (1995)	Diabetic	Moradi et al. (2021); Rauber et al. (2018); Castro E Silva et al. (2021); Srour et al. (2020)
		Chronic respiratory diseases	Moreno-Galarraga et al. (2021); Rico-Campà et al. (2019)

RESEARCH METHOD

This qualitative investigation employs a descriptive-analytical approach. The methodology relies on the library research method, encompassing a meticulous examination and comprehension of information pertinent to the subject matter found in books, theoretical frameworks, and various documents. The data compilation process involves sourcing information from diverse secondary outlets, including journals, books, authoritative websites, and an array of related materials specifically focused on areas encompassing the concepts of halal, tayyib, regenerative agriculture, and conventional agricultural practices. This inclusive methodological approach aims to gather comprehensive insights from a broad spectrum of scholarly and authoritative sources, facilitating a nuanced understanding of the interplay between these thematic elements within the agricultural context.

FINDINGS AND DISCUSSION

Formulating the Tayyib Principles

Exploring Tayyib principles within paddy agriculture requires a multifaceted approach beyond halal compliance. At its core, Tayyib principles advocate for broader ethical, sustainable, and quality-driven practices, redefining the parameters of agricultural production. In paddy agriculture, this transcends the conventional focus on halal, delving into ethical considerations encompassing every facet of rice cultivation, from seed to table.

One key aspect involves embracing the ethical treatment of animals and ecosystems within rice fields. Beyond rice plants, these ecosystems host diverse organisms vital for ecological balance (Halwart & Gupta, 2004; Chivenge et al., 2020). Implementing practices that ensure the well-being of these creatures, from beneficial insects to aquatic life, aligns with Tayyib principles by promoting biodiversity and maintaining a harmonious ecosystem within paddy fields. In addition, preserving the environment within paddy agriculture is intrinsic to Tayyib principles. This involves mitigating pollution from chemical inputs commonly used in conventional farming. Transitioning to eco-friendly alternatives or adopting regenerative agriculture practices fosters a healthier environment, reducing the impact on surrounding ecosystems and safeguarding natural resources for future generations (Chivenge et al., 2020; Shiva, 2021).

Another crucial facet of Tayyib principles in paddy agriculture is sustainable farming practices. This pertains to cultivating rice in a manner that minimizes environmental impact, focusing on resource-efficient techniques that conserve water, reduce greenhouse gas emissions, and preserve soil health (Rahayu & Herawati, 2021; Hove et al., 2022). Practices such as organic farming, integrated pest management, and water-saving irrigation methods align with Tayyib principles, fostering a more sustainable paddy agriculture ecosystem.

Ensuring food quality and safety represents another pivotal component of Tayyib principles in paddy agriculture. This encompasses rigorous quality control measures throughout the cultivation and post-harvest stages, ensuring that the rice produced meets stringent quality standards. Emphasizing food safety protocols and minimizing chemical residues in rice grains aligns with Tayyib principles, promoting healthier and safer food choices (Pollan, 2008; Fanslow, 2007).

Ultimately, embracing Tayyib principles in paddy agriculture necessitates a holistic approach that integrates ethical, sustainable, and quality-driven practices. By redefining the agricultural landscape, this approach aims to yield high-quality rice and preserve ecosystems, ensure food security, and promote the well-being of consumers and the environment within Indonesia's rice industry.

Table 2. Tayyib Principles Summary

Tayyib Principles		
Ethical considerations	**Sustainability**	**Quality-driven practices**
Treatment of animal ecosystems, no chemical inputs; transitioning to regenerative agriculture	Conserve water, reduce the greenhouse effect, and preserve soil health	Food safety: no chemical residues
⬇		
Yield high-quality rice and preserve ecosystems, ensure food security, and promote the well-being of both consumers and the environment		

Comparative Analysis; Conventional Farming vs Tayyib Principles

The comparative analysis between conventional practices and Tayyib-aligned methodologies in Indonesia's rice industry unveils multifaceted differences that extend beyond mere religious compliance. Firstly, productivity stands out as a crucial parameter. Conventional farming often relies heavily on chemical inputs like synthetic pesticides and fertilizers, aiming for maximum yield (Khangura et al., 2023). In contrast, Tayyib-aligned methodologies prioritize regenerative and organic farming approaches. While conventional methods may initially yield higher quantities, Tayyib practices aim for sustainable, long-term productivity by nurturing soil health, biodiversity, and ecological balance.

Environmental impact serves as another critical dimension for comparison. Conventional farming's reliance on synthetic chemicals poses significant environmental threats, contributing to soil degradation, water pollution, and biodiversity loss (Rahayu & Herawati, 2021; Kumarathilaka et al., 2018). Tayyib-aligned practices, on the other hand, emphasize environmental stewardship. By minimizing chemical inputs, employing organic fertilizers, and implementing regenerative agriculture techniques, Tayyib principles aim to mitigate the adverse environmental effects associated with conventional practices. This shift aligns with global efforts toward sustainable and eco-conscious agricultural systems.

Economic viability emerges as a central consideration in the comparative analysis. Conventional farming, focusing on maximizing yield through intensive chemical usage, may seem economically advantageous in the short term (Halwart & Gupta, 2004; Shiva, 2021). However, Tayyib-aligned methodologies promote sustainable and ethical production by introducing a paradigm shift. While the transition to Tayyib practices may entail initial costs and adjustments for farmers, the long-term economic viability lies in reduced input costs, increased soil fertility, and a resilient agricultural system that adapts to changing environmental conditions. Furthermore, the growing global demand for sustainably produced food presents an economic opportunity for farmers adhering to Tayyib principles.

The social dimension plays a crucial role in this comparative analysis. Conventional farming practices may inadvertently contribute to health issues for farmers and consumers due to exposure to chemical residues (Pollan, 2008; Hyman, 2021). In contrast, Tayyib-aligned methodologies prioritize the well-being of both farmers and consumers by reducing exposure to harmful chemicals and promoting healthier food choices. Additionally, Tayyib practices foster a sense of environmental responsibility and ethical stewardship, contributing to improved community well-being and social harmony.

Consumer preferences and market dynamics constitute another noteworthy aspect of comparison. With an increasing global focus on sustainability and ethical consumption (Pollan, 2008), Tayyib-aligned rice holds the potential to tap into niche markets that prioritize quality, environmental consciousness, and ethical production. Conventional rice, while potentially meeting mass demand, may face challenges in adapting to shifting consumer preferences and emerging market trends.

The comparative analysis underscores the transformative potential of Tayyib-aligned methodologies in Indonesia's rice industry. Beyond the confines of conventional practices, Tayyib principles offer a holistic approach that considers productivity, environmental impact, economic viability, social well-being, and consumer preferences. This comparative exploration serves as a foundation for understanding the nuanced benefits and challenges associated with transitioning from conventional to Tayyib-aligned rice production in Indonesia.

Impact on Industry Growth

Adopting Tayyib principles within Indonesia's rice industry holds substantial potential to

profoundly impact its growth, resilience, and overall sustainability across various facets, including economic, market, and consumer perspectives.

Adopting Tayyib principles within Indonesia's rice industry presents a transformative shift that is not without its challenges. One primary hurdle is transitioning from conventional farming to more ethical and sustainable practices. This shift requires a fundamental change in agricultural techniques, necessitating farmer education, training, and adopting new methodologies. Additionally, there are considerable cost implications associated with this transition, including initial investments in eco-friendly technologies, organic fertilizers, and pest management alternatives. Such financial commitments might pose barriers, particularly for smaller-scale farmers who may lack access to resources and incentives for this transition. Moreover, substantial awareness gaps exist within the agricultural community regarding the benefits and methodologies of Tayyib principles, requiring robust educational initiatives and widespread outreach programs to bridge these knowledge disparities.

However, amidst these challenges lie promising opportunities. Embracing Tayyib principles offers a potential avenue to meet the increasing market demand for ethically produced and environmentally sustainable rice. As global consumers become more conscious of their food choices, a growing preference for products cultivated through eco-friendly practices (Pollan, 2008). This evolving consumer mindset could create new market niches, allowing rice produced under Tayyib principles to command premium prices, offering farmers economic incentives.

Economically, embracing Tayyib principles can foster a more resilient and diverse agricultural sector. While initial transitions might incur costs due to adopting sustainable practices and reducing reliance on chemical inputs, the long-term benefits are promising (Chivenge et al., 2020). Improved soil fertility, reduced environmental degradation, and enhanced crop resilience can lead to increased yields and reduced production costs (Jordon et al., 2022; Khangura et al., 2023). Additionally, the emphasis on quality can create market differentiation, potentially commanding premium prices for sustainably produced rice, thus boosting profitability for farmers and stakeholders (Shiva, 2021). The comprehensive market report compiled by the Data Bridge Market Research team encompasses detailed expert analysis, import/export trends, pricing assessments, production consumption patterns, as well as evaluations of technological advancements and patent developments stated that the organic rice, which is close to the tayyib principles, its market reached a value of USD 1.97 billion in 2021 and is projected to achieve USD 3.94 billion by 2029. This growth is anticipated at a CAGR of 9.05% between 2022 and 2029.

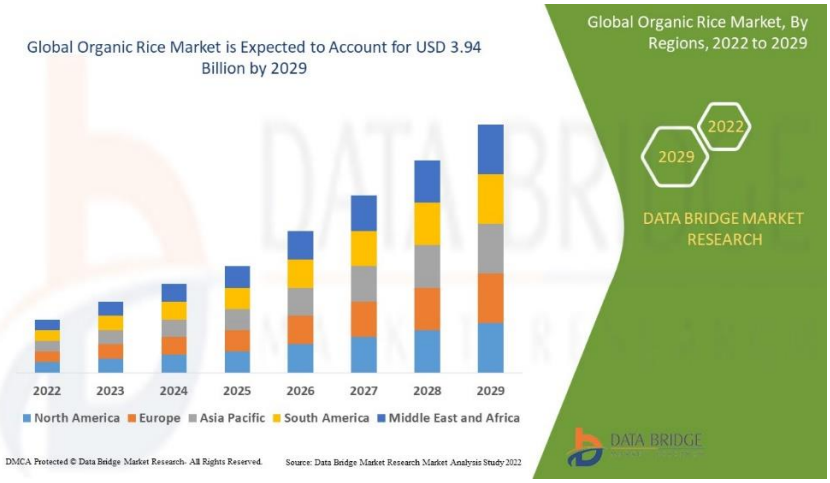

Figure 1. Global Organic Rice Market

Market competitiveness stands to benefit significantly from the adoption of Tayyib principles. As global markets increasingly favour sustainably produced goods, Indonesian rice cultivated through ethical, sustainable practices gains a competitive edge. Meeting consumer demands for environmentally friendly, high-quality products can open doors to new markets and partnerships, positioning Indonesia as a leader in sustainable rice production within the international arena.

Consumer perceptions and preferences are crucial in shaping market dynamics (Soesilowati et al., 2021). Integrating Tayyib principles aligns with growing consumer concerns about health, environmental impact, and ethical sourcing. The industry can capture consumer trust and loyalty by offering rice products cultivated through sustainable and ethical means. Increased consumer confidence in rice's safety, quality, and ethical sourcing can significantly drive demand, stimulating industry growth (Ashari et al., 2019). Moslehpour et al. (2014) and Hsu et al. (2016) indicate that concerns about food safety and subjective knowledge significantly positively influence attitudes toward organic food and purchase intentions, while the natural content of the food significantly positively affects attitudes toward organic food.

Moreover, embracing Tayyib principles can positively impact the overall sustainability of Indonesia's rice industry. Reduced chemical inputs and improved agricultural practices lead to a healthier environment, preserving natural resources and safeguarding biodiversity (Kumarathilaka et al., 2018; Chivenge et al., 2020). This fosters a more resilient agricultural ecosystem that is less vulnerable to external shocks, climate change, or resource depletion, contributing to the country's long-term sustainability of rice cultivation.

In essence, the adoption of Tayyib principles not only promises economic benefits and market competitiveness but also addresses crucial environmental and ethical considerations. This holistic approach sets the stage for a more robust, sustainable, and consumer-driven rice industry in Indonesia, fostering growth while preserving the environment and meeting the evolving needs of consumers.

CONCLUSION

In conclusion, integrating Tayyib principles into Indonesia's rice industry marks a transformative departure from conventional practices, extending beyond halal compliance. Tayyib principles encapsulate a broader ethical and sustainable approach that encompasses the entire spectrum of rice production, from cultivation to consumption. This journey toward Tayyib-aligned practices presents an opportunity to redefine agricultural norms, emphasizing religious compliance and ethical, environmental, and quality-driven considerations.

Exploring Tayyib principles in rice production signifies a pivotal shift towards ethical and sustainable farming methodologies. It underscores the need for a comprehensive approach, addressing challenges such as transitioning from conventional methods, cost implications, and fostering stakeholder awareness. However, within these challenges lies a horizon of opportunities: the potential for enhanced market demand, long-term environmental sustainability, and economic viability through premium-quality produce.

By embracing Tayyib principles, Indonesia's rice industry stands poised to chart a new trajectory that harmonizes ethical, sustainable, and quality-driven practices. This transition aligns with global movements toward responsible consumption and production, positioning Indonesia as a frontrunner in fostering a resilient, ethical, and prosperous rice industry that meets the demands of the present without compromising the needs of future generations. Ultimately, incorporating Tayyib principles represents a holistic pathway to ensure purity, quality, and ethical production within Indonesia's rice sector.

LIMITATION & FURTHER RESEARCH

One limitation of this research is its primary focus on qualitative data, which could be complemented by quantitative analysis to provide a more comprehensive understanding of the scale and specific impact of harmful inputs on rice quality within the industry. Future research should incorporate a mixed-methods approach, combining qualitative insights with quantitative data to measure the extent of these inputs and their effects more precisely. Additionally, longitudinal studies could track the long-term benefits of implementing Tayyib principles, offering a deeper evaluation of their impact on industry sustainability, consumer trust, and overall rice quality.

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