



Harvesting Hope: Islamic and Catholic Thought Nurturing Agropreneurial Generations for Sustainable Food Security in Indonesia

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ABSTRACT: This service is based on the urgent need to address the decline in the number of young farmers in Indonesia, which if left unchecked could threaten national food security. This study aims to explore more deeply the potential of Islamic boarding schools in forming agropreneur generations. By using the Participatory Action Research (PAR) method which includes five cycles: knowing, understanding, planning, acting, and changing, this study successfully mapped the potential of Islamic boarding schools. After understanding the potential, an agropreneur education and training program for vegetable and fruit cultivation was implemented. The researchers collaborated with the Wonogiri Agriculture Service as a partner in this study. The subjects of the study included stakeholders of Muhammadiyah Green School Wonogiri, including leaders, religious teachers (asatiz), and students (santri). The results of the study showed that the school has the potential for human resources in the form of motivated santri and asatiz, as well as natural resources in the form of unused agricultural land. The Agropreneur Training Program succeeded in fostering motivation among the santri to be involved in the entire agricultural process, from planting to harvesting, as evidenced by their active participation. Cognitively, both santri and asatiz understand the process of planting, plant care, harvesting, and processing the results. The benefit for Islamic boarding schools is that some of their food needs can be met through the empowerment of these agropreneur students.

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1. INTRODUCTION

- 1 The Indonesian agricultural sector is facing a critical challenge (Panda et al., 2024; Srinivasarao et al., 2024; Wani, 2023): the dwindling number of young individuals willing to pursue farming as a career (Fox et al., 2021; Velasquez et al., 2023). This decline poses a significant threat to the nation's food security (Blotnick et al., 2018; Dang et al., 2023; Inkson, 2004), a concern that resonates deeply with both policymakers and communities (Lim et al., 2017; Pandya et al., 2021). As the older generation of farmers retires (Colognesi et al., 2024; Holt et al., 2024), the gap left by the absence of younger replacements becomes increasingly apparent (Gatson et al., 2022; Simões, 2018; Tessitore et al., 2021). This research explores innovative solutions to address this gap (Mohr & Köhl, 2021; Mrabet & Moussadek, 2022), focusing on the unique role that pesantren, or Islamic boarding schools, can play in nurturing a new generation of agropreneurs—young agricultural entrepreneurs.

Indonesia's identity as an agrarian nation is deeply rooted in its history and economy, characterized by vast expanses of fertile agricultural land and a significant proportion of its population engaged in farming (Majumder et al., 1986; Stanhope et al., 2023). However, recent data from the Central Statistics Agency (BPS) underscores a concerning trend (Mura et al., 2021; Singh et al., 2024): a steady decline in the number of young people opting for farming careers (Freeman et al., 2021a). In 2011, young farmers made up 29.18% of the farming population, but by 2021, this figure had plummeted to just 19.18%. This shift can be attributed to the allure of other sectors, as evidenced by a surge in young individuals gravitating towards the service and manufacturing industries (Freeman et al., 2021b). In 2021, 55.8% of young people pursued careers in the service sector, marking a significant increase from 2011. Meanwhile, those in the manufacturing sector accounted for 25.02%, a figure that has remained relatively stable over the years (Chin & Liu, 2015; Elragal & Elgandy, 2024; Samadder et al., 2023).

The underrepresentation of young farmers is further highlighted by age-specific data from BPS. In 2018, only 885,077 farmers were under the age of 25, while those aged 25-34 numbered 4.1 million. The 35-44 age group comprised 8.17 million farmers, whereas individuals aged 45-54 accounted for 9.19 million. Alarming, those aged 55-64 constituted 6.95 million farmers, with the remaining 4.19 million being 65 and older (Badan Pusat Statistik, 2018). This demographic shift underscores the urgency of devising strategies to attract younger generations to agriculture, ensuring the sustainability of Indonesia's agrarian legacy (Bello et al., 2024; Muazam, 2023; Qvist-Sørensen, 2020). By leveraging the educational and community influence of pesantren, this study aims to explore how these institutions can inspire and equip young people with the skills and mindset needed to embrace sustainable farming practices and secure the nation's food future.

Pesantren have long been integral to Indonesian society (Ma'arif et al., 2023; Sarwenda et al., 2024), not only as religious education centers but also as community hubs that influence social and economic development (Farid & Lamb, 2020; Isbah & Sakhiyya, 2023a). These institutions hold untapped potential for transforming Indonesia's agricultural landscape due to their extensive reach and trusted status (Isbah & Sakhiyya, 2023b; Kawakip, 2020). By integrating agropreneurship into their curriculum (Abdullah, 2022; Aulia et al., 2024), pesantren can inspire and equip young people with the skills and motivation necessary to engage in sustainable farming practices (Kasmah et al., 2023; Sauri et al., 2022). This study investigates how pesantren can catalyze agricultural innovation and economic empowerment (Direktorat et al., 2013).

The reluctance of young people to pursue a career in agriculture is a complex issue influenced by various factors. According to Malikul Ikram, Director of Research and Development at Biops Agrotekno Indonesia, one significant barrier is the limited use of technology in the agricultural sector. Traditional farming practices often rely on manual labor, which is considered tedious (Kosasih et al., 2022; Saepudin et al., 2023), with hot (Chernyakov et al., 2024), dirty (Nkambule, 2022; Tran et al., 2024), and exhausting working conditions. As a result, many young people, especially millennials, are drawn to urban environments, choosing careers in the manufacturing and service sectors that they consider more comfortable and prestigious. Behind this trend are broader agricultural challenges, including slow technology adoption (Badghish & Soomro, 2024; Subramaniam et al., 2024), inequitable land distribution, and persistently low farmer welfare. These multifaceted issues, which span agriculture, economics, politics, and technology, contribute to the stagnation in a generational renewal of farmers.

Young people's declining interest in farming threatens Indonesia's future food security. Food security includes the availability of staple foods and essential commodities such as rice (Hoshino & Hirao, 2024; Uren & Edwards, 2023), corn (Sari et al., 2022), soybeans (Andiani et al., 2020), sugar (Girsang et al., 2020), and beef (Jerhamre et al., 2022). As the number of farmers decreases, so will the production of these critical commodities, increasing the country's dependence on imports. According to Law Number 18 of 2012 concerning Food, food security is defined as fulfilling food needs at all levels, ensuring sufficient, safe, diverse, nutritious, fair, and affordable food by religious and cultural values. This

multifaceted concept emphasizes the urgency of attracting young people to agriculture to maintain national food security and reduce dependence on external sources.

To generate interest in agriculture among the younger generation, a paradigm shift is needed that can be facilitated by educational institutions. Islamic boarding schools are ideally positioned to lead this change. Historically, Islamic boarding schools have played an important role in developing rural communities, functioning as educational and social institutions. Located mainly in rural areas, Islamic boarding schools are integral to the socio-cultural structure, providing a holistic educational experience that includes spiritual, social, and economic components. This strategic position makes Islamic boarding schools important in shaping millennial students into future farmers and agropreneurs. Research conducted at Muhammadiyah Green School Wonogiri, an Islamic boarding school established in 2020, explores this potential. Despite being a young institution with modest agribusiness activities, Muhammadiyah Green School offers a unique opportunity to nurture a new generation of agropreneurs, contributing to sustainable food security within the school and the wider community. This study aims to illustrate the important role of pesantren in developing young farmers and nurturing the Generation of Agropreneurs for Sustainable Food Security.

While previous studies, such as Yono's 2017 work on "Agropreneurship among Gen Y in Malaysia," have explored the role of academic institutions in facilitating agropreneurship, there is still a gap in understanding the potential of pesantren in this area. Yono's research emphasizes the importance of engaging the Gen Y segment and highlights the role of universities in developing agropreneurial skills. However, this study differs by focusing on pesantren, which are uniquely positioned in Indonesian society to influence youth at the grassroots level. Unlike universities, pesantren offer a more holistic, community-based approach, integrating religious, social, and economic education. This study contributes to the field by examining how pesantren can be leveraged to address Indonesia's specific cultural and socio-economic context, thereby filling an important gap in agropreneurship education that has not been fully addressed by previous studies.

2. Literature Review

2.1 Pesantren as Socio-Economic Hubs

Pesantren, traditionally known as religious educational institutions, have evolved to fulfill socio-economic roles within their communities. Research by (Drexler, 2020) highlights how pesantren foster economic self-sufficiency by nurturing entrepreneurial skills among students (Amran & Abdul Fatah, 2020). This economic empowerment is crucial, as it enables pesantren to become more than just educational entities; they transform into community-centric hubs that support local development. For instance, initiatives such as hydroponic farming, as observed by (Yulianti and Rahayu, 2022), have been instrumental in enhancing the skill set of students, thereby contributing to human resource development. However, these advancements also pose challenges (Cold et al., 2020), such as adequate infrastructure, institutional support, and policy frameworks aligning with these new roles. As pesantren continue to expand their socio-economic impact, addressing these challenges becomes essential to maximize their potential in nurturing young farmers and achieving independent food security.

2.2 Addressing the Young Farmer Crisis

The declining interest among the younger generation in farming is a multifaceted issue impacting Indonesia's food security. Research indicates that several factors contribute to this trend, including limited access to land, poverty, and migration (Tebeje et al., 2020). These factors are compounded by educational challenges such as high dropout rates. To counteract this crisis, various studies propose interventions aimed at empowering young farmers. For example, (Efendi et al., 2022) emphasize the importance of counseling and education on sustainable agriculture practices, utilizing recycled materials and hydroponics to engage youth. Similarly, Ali et al. (2022) advocate for organic vegetable cultivation,

using natural methods to enhance agricultural productivity while providing hands-on training to increase agricultural knowledge. Furthermore, (Sumarti et al., 2017) highlight the empowerment of Arabica coffee farmers through focused support (Fatchan et al., 2015) and the integration of technology in farming practices (Ali et al., 2022), emphasizing the role of young farmers as dynamic agents in agricultural entrepreneurship. These strategies underscore the need for concerted efforts from educational institutions like pesantren to address these challenges and revitalize interest in agriculture among the youth.

2.3 A New Perspective on Economic Development

Max Weber's seminal work, "The Protestant Ethic and the Spirit of Capitalism," profoundly analyzes the interplay between religious values and economic development (Weber & Priyasudiarja, 2015). Weber's thesis diverges from the deterministic views of Marxism (Ahmed, 2022; Ford & Chambers, 2022), which situate religion within the superstructure influenced by economic activities (Holtz et al., 2023). Instead, Weber argues that religious values, particularly those stemming from Protestant ethics, were pivotal in shaping modern capitalism. This perspective highlights the transformative power of ideas in economic systems, suggesting that values can catalyze changes in societal structures. Weber identifies key principles within the Protestant ethic, such as the sanctity of hard work, rational and scientific inquiry of the world, and the importance of frugality. These principles encouraged the development of a disciplined, industrious mindset that Weber termed the "spirit of capitalism." This ethos, according to Weber, was not merely about financial gain but was imbued with a sense of religious duty and moral obligation. The Protestant ethic (Kambali, 2017; Tantowi et al., 2023), therefore, contributed to the emergence of a rational economic order, fostering a cultural environment conducive to the growth of capitalism in Europe. By examining the historical context in which Protestant values flourished, Weber illustrates how these religious beliefs provided a framework for economic behavior that prioritized efficiency, productivity, and reinvestment of profits for communal good, aligning with the broader goals of modern capitalist society (Possamai, A. & Blasi, 2020).

2.4 Protestant Ethics and Capitalist Asceticism

Weber's exploration of Protestant ethics reveals an intricate connection between religious asceticism and the relentless pursuit of wealth (Henry & Oliver, 2022; Mykitiuk et al., 2015), a combination he argues was crucial to the rise of capitalism. Protestant asceticism, particularly among Puritans (Dowie, 2023; Vidgen et al., 2020), emphasized a life of self-discipline and frugality (Miller & Bossomaier, 2024; Piotrowski, 2022), viewing wealth accumulation as a divine mandate rather than a pursuit of personal luxury (Mat et al., 2015; Morley et al., 2023; Sullivan, 2021). This worldview encouraged the reinvestment of profits, not for personal indulgence (Babb, 2021; Sessions & Williams, 2024), but for the prosperity of the community and the glorification of God. Weber contends that this approach to wealth creation fostered a culture of continuous capital accumulation, which became a driving force behind the capitalist economy. The emphasis on reinvestment and economic productivity aligned with the Protestant belief in predestination, where worldly success was seen as a sign of divine favor. This belief system engendered a societal shift towards a rational bourgeois economy characterized by systematic approaches to business and industry. Weber highlights that Protestant communities, emphasizing education and skill development, disproportionately occupied influential positions in the burgeoning capitalist enterprises of Europe. This historical analysis underscores the role of religious values in shaping economic practices, suggesting that the Protestant ethic not only facilitated the emergence of capitalism but also entrenched a moral framework that continues to influence economic thought and practice today. Weber provides a nuanced understanding of how spirituality and economic behavior are interwoven through this lens, offering insights into the cultural foundations of modern economic systems.

3. METHOD

3.1 Research Design and Process Overview

The research employs a structured and systematic approach using a qualitative methodology grounded in Participatory Action Research (PAR). This method is particularly suited for this study as it promotes active collaboration between researchers and community members, ensuring the research is both relevant and impactful. The PAR process consists of five key stages: knowing, understanding, planning, acting, and changing. These stages are sequentially designed to facilitate the integration of agropreneurship into the educational framework of pesantren, specifically targeting the Muhammadiyah Green School in Wonogiri. Below is a flowchart outlining the research process in Figure 1:

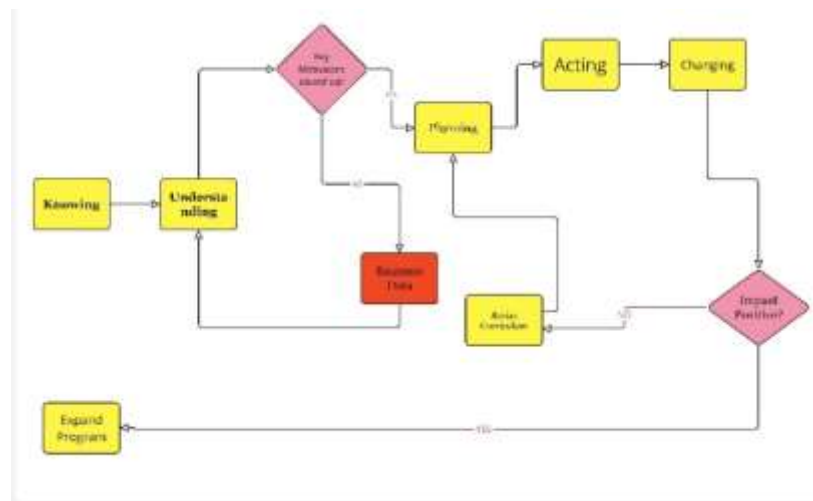


Figure 1. Research Proces

The research process employed in this study (Figure 1) follows a structured flowchart that encompasses five key stages, aiming to integrate agropreneurship within the pesantren educational framework effectively. The initial stage, "Knowing," involves an exploratory assessment of the current state of agropreneurship at the pesantren, focusing on available resources, stakeholder attitudes, and the institution's capacity to support such initiatives. This foundational step is crucial for setting the context and identifying the baseline for further action. Following this, the "Understanding" phase delves deeper into the data collected, aiming to pinpoint the primary motivators and obstacles encountered by students and teachers in embracing agropreneurship. This analysis informs the subsequent "Planning" stage, where a comprehensive agropreneurship curriculum and training modules are developed. These educational materials are carefully aligned with the practical requirements of sustainable agriculture, ensuring relevance and applicability. The "Acting" phase marks the implementation of the program, where participants engage in both hands-on agricultural activities and theoretical learning sessions, bridging the gap between knowledge and practice. Finally, the "Changing" stage involves a thorough evaluation of the program's impact, focusing on the shifts in participants' knowledge, skills, and attitudes towards agriculture. This evaluative component is essential for assessing the program's effectiveness and identifying areas for improvement, ultimately guiding future iterations and enhancements. Through this cyclical and participatory approach, the research not only fosters a dynamic learning environment but also positions pesantren as pivotal agents of change in nurturing young agropreneurs and securing sustainable agricultural practices.

3.2 Key Components of the Research Methodology

3.2.1. Sampling and Participants

The study uses purposive sampling to gather diverse perspectives on agropreneurial potential in pesantren. It includes nine participants: the director, two religious teachers, and six students. This selection aims to provide a comprehensive view of the agropreneurship initiative, with the director offering strategic insights into the school's capacity to integrate agropreneurship into its curriculum. Religious teachers share their experiences regarding the alignment of such initiatives with educational and religious goals. Students, as primary beneficiaries, provide crucial feedback on the program's effectiveness. Engaging these groups fosters collaboration and ensures findings reflect a holistic understanding of the challenges and opportunities in developing agropreneurial skills.

3.2.2. Data Collection Techniques

The data collection techniques utilized in this study are multifaceted, ensuring a comprehensive understanding of the agropreneurship program's impact. Systematic observation was conducted to capture student engagement and motivation, providing qualitative insights into their behavioral changes and enthusiasm towards agricultural activities. Questionnaires, consisting of 20 questions, were administered to assess students' cognitive knowledge in agropreneurship, focusing on their understanding of agricultural practices and business management. In-depth interviews with stakeholders offered valuable insights into their perceptions and experiences, while focused group discussions (FGD) facilitated collaborative analysis, validating data and fostering collective insight into the research topic.

3.2.3. Data Analysis

The data analysis process began with transcribing all qualitative data verbatim to maintain accuracy and integrity. This comprehensive transcription was followed by data reduction through coding and memoing, which were essential techniques for distilling information and highlighting emerging themes and patterns pertinent to the research objectives. The coding process involved categorizing data into meaningful segments that aligned with the study's goals, facilitating a deeper understanding of the participants' experiences and insights. Memoing further enriched this process by allowing the researchers to capture and reflect on insights, ideas, and emerging hypotheses as they arose. Subsequently, the data were meticulously organized according to the research problem formulation, ensuring that key findings were easily identifiable and their broader implications clearly understood. This structured approach not only enhanced the clarity of the analysis but also ensured that the study's conclusions were grounded in robust, systematically analyzed data, ultimately contributing to the research's validity and reliability.

The methodology is informed by previous research highlighting the challenges and opportunities in integrating agropreneurship into educational settings. Studies by Aiken (2017) and Ahmad et al. (2017) underscore the effectiveness of PAR in educational research, demonstrating its potential to catalyze change through active participant involvement. Furthermore, previous studies on agricultural education (e.g., Ali et al., 2022; Sumarti et al., 2017) provide empirical evidence supporting the integration of practical training and theoretical learning to enhance student engagement and knowledge retention.

Table 1. Evidence supporting the integration of Practical and Theoretical

Component	Empirical Evidence
Observation	Observational studies have shown increased student engagement in hands-on learning (Aiken, 2017).
Questionnaires	Prior research indicates that questionnaires effectively measure cognitive gains in agriculture (Ahmad et al., 2017).
Interviews	Interviews provide deep insights into participant experiences and program impact (Ali et al., 2022).
Focused Group Discussions	FGDs validate data through collaborative analysis, enhancing reliability (Sumarti et al., 2017).

3.2.4. Contributions to Education

This research contributes significantly to educational practices by demonstrating the effectiveness of integrating agropreneurship into pesantren curricula. The methodology emphasizes a holistic approach, combining practical agricultural experience with academic learning, fostering a new generation of agropreneurs. The empirical evidence supports the potential for replicating this model in other educational institutions, contributing to sustainable food security in Indonesia. In conclusion, the methodology outlined in this study provides a robust framework for exploring and enhancing the role of pesantren in nurturing agropreneurial generations. By leveraging participatory and collaborative research methods, this study offers valuable insights into the transformative potential of agropreneurship education, paving the way for future research and policy development.

4. RESULTS AND DISCUSSION

4.1. Integrating Islamic and Catholic Thought in Agropreneurship for Sustainable Food Security

As outlined in the study's abstract, this research investigates the declining interest among young Indonesians in farming careers and explores innovative solutions to address this challenge. The focus is on leveraging the potential of pesantren, specifically Muhammadiyah Green School Wonogiri, to nurture agropreneurial generations. This section discusses the study's findings and their implications, emphasizing the integration of Islamic and Catholic thought in fostering sustainable food security.

The religious values instilled in the students at Muhammadiyah Green School Wonogiri serve as the ethical foundation for a worldview that supports agropreneurship activities. In this program, students gain an understanding of Quranic verses related to humanity's role in managing nature. This perspective frames agriculture not only as a means of work and livelihood but also as an expression of gratitude and responsibility for the blessings bestowed by their Creator. Key verses such as Surah al-A'raf verse 58 emphasize the blessings of fertile land: "And the good land, its plants grow abundantly by the permission of the Lord, and the bad land, its plants struggle to grow. Thus, we explain the signs repeatedly for those who are grateful" (QS. 7: 58).

Meanwhile, Surah al-Maidah verse 32 underscores the sanctity of life and the responsibility to preserve it: "... Whoever kills a person, not because of another person (being killed) or spreading corruption in the land, it is as if he has killed all of humanity. And whoever saves one life, it is as if he has saved the life of all humanity ..." (QS. 5: 32). Interviews with the santri reveal that this newfound understanding motivates them, transforming farming into an enjoyable activity that is deeply connected to their spiritual and ethical beliefs. By integrating these religious insights, the program fosters a sense of purpose and commitment among students, aligning agricultural practices with broader spiritual goals and enhancing their engagement with sustainable farming. Therefore, this community service activity focuses on "Planting Fruits and Vegetables" with the theme of "Sustainable Lifestyle," under the topic "Environment as a Source of Life" by the Functional Position Group (KJF) of the Agriculture and Food Office of Wonogiri Regency. The presentation from this activity can be viewed in Figure 1.



Figure 1. Presentation from this activity KJF

4.2. Understanding the Pesantren Framework

4.2.1. Human and Natural Resources

The fieldwork at Muhammadiyah Green School Wonogiri highlighted two significant resources: **human resources** in the form of motivated students (santri) and teachers (asatiz), and **natural resources** such as unused agricultural land. When strategically utilized, these resources can significantly contribute to developing agropreneurial skills and sustainable farming practices. The santri's motivation to engage in agriculture was evident in their active participation in the Agropreneur Training Program, which enhanced their practical skills and fostered a deeper appreciation for sustainable agriculture.

4.2.2. Integration of Religious Values

The integration of religious values into the agropreneurship curriculum was pivotal. Islamic and Catholic teachings emphasize stewardship of the Earth and the importance of community welfare, aligning well with sustainable agriculture principles. This shared value system facilitated a holistic approach to education, where agricultural practices were seen as economic activities and moral and spiritual responsibilities. This integration helped instill a sense of purpose and commitment among participants, reinforcing the importance of agriculture in ensuring food security.

4.3. Agropreneur Training Program Implementation

4.3.1. Curriculum Development

The development of the agropreneurship curriculum at Muhammadiyah Green School was meticulously crafted using the Participatory Action Research (PAR) methodology. This approach allowed for a dynamic and collaborative interaction between researchers, teachers (asatiz), and students (santri), ensuring the curriculum was relevant and tailored to the participants' unique needs and capabilities. Key Components of the Curriculum:

a) Sustainable Farming Techniques

The basic module on sustainable farming techniques in the agropreneurship curriculum at Muhammadiyah Green School is designed to provide students with an in-depth understanding of environmentally friendly farming practices. The module emphasizes the importance of maintaining the sustainability of natural resources by covering topics such as soil conservation, crop rotation, and organic fertilizers. The goal is to instill awareness of the long-term impacts of farming practices and encourage students to adopt techniques that protect the ecosystem. With this approach, students can become agents of change in sustainable agriculture, ensuring environmental sustainability for future generations. This module can be seen in Figure 2.



Figure 2. Modul Sustainable Farming "Harvesting Hope"

b) Plant Care

The majority of the curriculum focuses on crop care, which includes in-depth training on irrigation methods, pest and disease management, and the use of natural pesticides. The goal is to equip students with practical skills that can improve crop health and yields, as well as encourage more resilient farming practices. Through this training, students learn to optimize crop growing conditions and reduce reliance on synthetic chemicals. This not only improves the sustainability of farming practices but also prepares students to face the challenges of modern agriculture. These activities can be seen in the module image in figure 3.



Figure 3. Activities Module "Plant Care"

c) Harvesting and Processing

Understanding the complete agricultural cycle is crucial, and the curriculum addresses this through modules on harvesting and processing. Students learn the best practices for harvesting crops at peak maturity and techniques for processing produce to add value. This knowledge not only prepares them for immediate tasks but also equips them with skills to increase the marketability of their products.

d) Business Management Skills

To round out their education, students are taught essential business management skills. These modules cover topics such as financial planning, marketing strategies, and entrepreneurship. By integrating these skills, the curriculum prepares students to manage their agricultural enterprises effectively, ensuring that they are not only skilled farmers but also savvy businesspeople.

4.3.2. Collaborative Approach

The implementation of the Participatory Action Research (PAR) methodology at Muhammadiyah Green School has significantly influenced the development of a dynamic agropreneurship curriculum. This approach fosters active engagement with key stakeholders, such as students (*santri*) and teachers (*asatiz*), ensuring that the curriculum is not just comprehensive but also aligned with the specific needs and aspirations of its users. By involving these groups in the curriculum development process, it becomes an evolving entity that is continually improved through ongoing feedback and real-world experiences. This iterative method allows for a flexible educational framework that can adjust to new challenges and opportunities, thereby maintaining the relevance and impact of the content delivered.

In addition to its adaptive nature, the curriculum offers a rich combination of theoretical knowledge and practical skills essential for students to thrive as agropreneurs. It encompasses various topics, including sustainable farming practices, plant care, harvesting, processing, and critical business management skills. This multifaceted approach equips students with a comprehensive understanding of the agricultural sector, highlighting the significance of sustainability and innovation. By enhancing both technical competencies and critical thinking abilities, the curriculum prepares students to tackle the complexities of modern agriculture. Ultimately, this initiative not only improves their career prospects but also contributes to the overarching objective of achieving sustainable food security in Indonesia, positioning them as future leaders in their communities.

4.3.3. Hands-On Agricultural Activities

The hands-on agricultural activities implemented in the Agropreneur Training Program were a crucial element in bridging the gap between theoretical knowledge and practical application. These activities provided a robust platform for students (*santri*) and teachers (*asatiz*) to immerse themselves in the complete agricultural cycle, from initial planting to the final harvest. Engaging directly with the land, participants gained firsthand experience in sustainable farming practices, which not only enhanced their technical skills but also deepened their understanding of the agricultural ecosystem. This experiential learning approach was designed to cultivate a sense of ownership and responsibility among the participants, as they witnessed the tangible outcomes of their efforts. By working collaboratively on tasks such as sowing seeds, managing irrigation systems, and controlling pests through natural methods, the students developed a comprehensive skill set that is crucial for modern agropreneurs. Furthermore, the program emphasized innovative techniques and sustainable practices, encouraging students to think critically about resource management and environmental impact. This active involvement fostered a deeper connection with the land and instilled a sense of pride and accomplishment in the participants. As a result, the hands-on activities not only supplemented the theoretical components of the curriculum but also inspired a genuine interest in agriculture, motivating students to pursue careers in this vital sector. Ultimately, these practical experiences reinforced the program's overarching goal of nurturing a new generation of agropreneurs who are well-equipped to contribute to sustainable food production and security in Indonesia.

4.3.4. Collaborative Partnerships

Engaging with the Wonogiri Agriculture Office was pivotal to the success of the Agropreneur Training Program at Muhammadiyah Green School. This partnership provided essential resources and expertise, aligning the program's educational objectives with the broader agricultural policies of the region. By facilitating access to unused agricultural land, the collaboration allowed students to gain hands-on experience in farming, enhancing their practical skills and understanding of sustainable agricultural practices. Moreover, the involvement of local government agencies created a supportive framework that ensured the program's smooth implementation and long-term sustainability. This collaboration not only strengthened the educational impact of the program but also reinforced the importance of community and governmental support in fostering agropreneurial skills among students. By leveraging these partnerships, the program effectively addressed the challenges of declining youth interest in agriculture, positioning itself as a replicable model for other educational institutions seeking to enhance food security and economic empowerment. Through continued cooperation and resource sharing, such partnerships can significantly contribute to nurturing a new generation of agropreneurs capable of sustaining Indonesia's agricultural legacy.

4.3.5. Agropreneurial Actions for Food Security

The Agropreneurial Actions for Food Security at Muhammadiyah Green School were structured to transform attitudes towards farming and empower students with sustainable agricultural skills. The following table outlines the key actions and outcomes of the program:

Table 2. Outlines the key action and outcome of the program

Stage	Action	Outcome
1. To Know	Engage with the pesantren community to raise awareness about food security and cultivate partnerships.	Established key partnerships with the Agriculture Office of Wonogiri and Muhammadiyah leadership, fostering confidence in achieving self-sufficiency in food security.
2.To Understand	Conduct in-depth analysis and discussions to identify motivations and barriers for agropreneurship among participants.	Identified key motivators such as spiritual values and barriers like traditional perceptions of farming, guiding program design and engagement strategies.
3. To Plan	Develop a comprehensive agropreneurship curriculum integrating religious values and practical farming techniques.	Created a curriculum focusing on sustainable farming, business management, and ethical stewardship, aligning educational content with spiritual and economic goals.
4. To Act	Implement hands-on agricultural activities, allowing students to apply theoretical knowledge in real-world settings.	Enhanced students' practical skills and engagement, fostering a sense of ownership and responsibility towards sustainable agriculture.
5. To Change	Reflect on program outcomes with the expert team and pesantren management to ensure continuous improvement and sustainability.	The program led to a shift in mindset among students and teachers, viewing farming as an enjoyable and viable business opportunity, aligned with SDG Goal 2: Zero Hunger.

The Agropreneur Training Program at Muhammadiyah Green School successfully integrated educational and religious frameworks to enhance food security, empowering students as agents of change in their community. This structured approach not only addressed immediate food needs but also fostered a long-term commitment to sustainable practices and the broader goals of the Sustainable Development Goals (SDGs). Empowering communities is closely related to food security. The definition of food security according to positive law in Indonesia is already stated in Law Number 18 of 2012 and Government Regulation Number 17 of 2015. It is explained that food security means the fulfillment of food for every individual, in terms of both quality and quantity. More specifically, food security means the condition of fulfilling food for the country down to the individual level, reflected in the availability of sufficient, safe, diverse, nutritious, equitable, and affordable food that is in line with the religion, beliefs, and culture of the society, to enable a healthy, active, and sustainably productive life.

The researcher identified the potential for food security at Muhammadiyah Green School (pesantren through the stages of Participatory Action Research with 5 cycles (to know, to understand, to plan, to act, and to change) that are implications of the agropreneur training program. First, to know. In this stage, the researcher participated in the inculturation processes. This process was carried out by communicating with Muhammadiyah Green School pesantren about the issues of food security and the potential for cultivation there. This activity aimed to provide insight into the importance of the pesantren having independent food security. At this stage, cooperation with partners who can contribute to achieving this goal was explained. In this case, the Agriculture Office of Wonogiri Regency and the Empowerment Council of the Muhammadiyah Regional Leadership in Wonogiri were brought in as partners. This process was carried out to build the pesantren's confidence that they actually have the potential and ability for independent food security. The inculturation process took place in August 2023.

Secondly, to understand. In the to understand stage, the researcher delved into the needs that could

address the potential issues of self-sufficiency in food security at the Pesantren. From August 1 to August 7, 2023, consultations were conducted with the Agriculture Office of Wonogiri Regency, simultaneously exploring the issues on the ground, specifically at Muhammadiyah Green School pesantren. As a result, the researchers initiated solutions to the problem of the availability of tools and materials for farming, necessitating the preparation of equipment, fertilizer ingredients, vegetable and fruit seeds, vurticulture media, organic pesticide materials, and more. Additionally, the lack of knowledge and agribusiness skills for food security among the pesantren community was identified as an issue. To address these problems, it was concluded that there is a need to organize education and training in agribusiness for food security at the pesantren.

Thirdly, to plan. In this stage, the researcher developed a schedule for implementing agropreneur training/workshops for the students of Muhammadiyah Green School, both pre-planting and post-planting. The planning included: 1) Introduction to Basic Techniques of Multiculture Plant Cultivation; 2) Training on Making Planting Media (Seeds), Fertilizers, and Organic Insecticides; 3) Training on Plant Germination, Planting, and Care; 4) Post-Harvest Training (Processing Cassava into Getuk Lidri); 5) Monitoring Plant Care and Maintenance Until Harvest; 6) FGD Evaluation and Review of Training Implementation. In planning stages 1, 2, 3, and 4, the focus was more on theoretical and practical preparation, while planning numbers 5 and 6 were more focused on supporting the implementation and reviewing the results, subsequently formulating the pesantren's policies for food security.

Fourthly, to act. The act stage began with the purchase of planting tools such as hoes, sprayers, shovels, vurticulture media, and others; materials such as compost fertilizer, microbe growth liquid, concoctions, and others; plant seeds such as water spinach, pakchoy, eggplant, chili, lemongrass, basil, and others. The implementation of the workshop took place over two days, from August 11 to 12, 2023, from morning to afternoon. The workshop activities involved bringing in expert partners from the Agriculture Office of Wonogiri Regency and covered: 1) Introduction to Basic Techniques of Multiculture Plant Cultivation; 2) Training on Making Planting Media (Seeds), Fertilizers, and Organic Insecticides; 3) Training on Plant Germination, Planting, and Care; 4) Post-Harvest Training (Processing Cassava into Getuk Lidri). Subsequent implementation included mentoring and monitoring the independence of the pesantren in caring for plants until harvest. This was carried out from August 13, 2023, to September 22, 2023, with direct monitoring at the location every 14 days by the Agriculture Office, and intensive monitoring through a WhatsApp group created earlier by the outreach team and the Agriculture Office. On September 23, 2023, a Focus Group Discussion was held with the involvement of students, asatiz (Islamic teachers), gardeners, the Outreach Team, the Agriculture Office of Wonogiri Regency, and the Empowerment Council of the Muhammadiyah Regional Leadership in Wonogiri. In this FGD, the field team presented the plant care process, followed by the students responsible for observing, watering, fertilizing, harvesting, reseeding, and so on. The results, challenges, joys, and the plant care process were then reviewed by the expert team. In this FGD phase, the pesantren director made a commitment to make this program a mandatory extracurricular activity at Muhammadiyah Green School, motivating students to develop the capability and capacity to achieve food security at the pesantren.

Fifthly, to change. Together with the expert team, the researcher invited the pesantren management to reflect on the results. As a result, the pesantren will continue this food security service program, at least to meet the daily vegetable and fruit needs. The students changed their mindset about farming, traditionally associated with something dirty, turning it into an enjoyable activity with potential for business. All of this is grounded in a mental attitude and awareness to fulfill the role of humans as stewards of the Earth. This mindset will empower the millennial generation with a focus on SDGs, especially Goal 2: Zero Hunger. The impact of the Agropreneur Training program at the Muhammadiyah Green School Pesantren in Wonogiri was identified by the researcher through evidence of responses from the asatiz (Islamic teachers) and students in interview activities.

Table 3. Identification of Students' Responses in the Agropreneur Training Program

No.	Participant	Experience	Perception
1.	Aido	He observed that there were no pests on the cultivated plants.	The agropreneur program activities are highly enjoyable, thus necessitating the continuation of this plant cultivation program.
2.	Ardiyan	He encountered minor setbacks in the growth of the plants.	The agropreneur program activities are enjoyable and it is necessary to continue this cultivation program.
3.	Sofwan	He encountered obstacles related to the differing growth rates of Pakcoy and water spinach due to differences in their planting locations. Additionally, there were disturbances from rabbits damaging the plants.	The agropreneur program activities are highly productive but require better time management to integrate with academic activities.
4.	Rosyid	The results of farming can yield insights into plant irrigation techniques. Additionally, individuals gain experience in the cultivation of specific vegetable varieties.	He is impressive in this activity, but they need training in harvesting procedures.
4.	Seila	He proposed implementing scheduled watering for the Group. Additionally, it is necessary to prevent chickens from damaging the plants.	The impression is that this activity is highly enjoyable. They argue that lettuce plants were not cultivated because they were deemed too small.
5.	Lutfiana	He discovered from the outset of planting, guided by the female Islamic teacher. There are husks in the planting medium that grow along with the rice, and they need to be removed.	She suggests that in addition to planting vegetables, one should also consider growing fruit. He finds the idea of cultivating fruit plants quite delightful
6.	Miska	He feels that it is easiest to care for and grow leafy vegetables. Their growth is smooth and rapid, albeit they require an ample water supply.	She suggests that the harvesting process should be effectively communicated, enabling them to discern which crops should be harvested first.

The results of mapping the messages and impressions of the students indicate the potential of Human Resources originating from the students themselves. The impressions of the students show their seriousness in the process of cultivating plants in the pesantren. Meanwhile, the messages conveyed in the table indicate motivation and potential to establish the pesantren as a basis for food security. In line with the principles of Catholic asceticism that played a role in developing Capitalism in Weber's theory (Adair-Toteff, 2016; Ghosh, 2022), the enthusiastic participation of students in the entire series of education and training in agropreneurship at the pesantren is a form of pesantren asceticism. This pesantren asceticism involves the utilization of wealth and potential, whether in the form of natural resources, human resources, assets, and time owned by the pesantren, not used for leisure but accumulated as capital to be developed.

As a result of education and training in agropreneurship at the pesantren, students have a mindset to be more active and productive. Students' activities become more intense than before, with less time wasted. Students become more aware of utilizing the pesantren's yard, which has been idle and unproductive for a long time. These lands are used for cultivating vegetables and fruits. With their new mindset, students can avoid wasteful behavior (letting something become useless). In Islam, there is a doctrine, "indeed, wastefulness is Satan's companion." The results of cultivating vegetables and fruits can meet some of the pesantren's needs, allowing the budget for vegetables and fruits to be used for other

necessities (Irfan, 2020). When pesantrens incorporate agropreneurship into their curriculum, alumni will eventually emerge who are ready to become young farmers. These young farmers are not traditional farmers with minimal preparation but farmers with competent knowledge, skills, and adequate agropreneurship experience. From their role, more structured and massive social change will occur, leading to a society with strong food security.

5. CONCLUSION

The research conducted at Muhammadiyah Green School Islamic boarding school highlights the transformative potential of integrating religious values with agropreneurship education to address the decline of young farmers in Indonesia. This initiative has shown that food security within pesantren can be effectively achieved through the empowerment of students, rather than relying solely on doctrinal teachings. By fostering a worldview rooted in religious doctrines, the Agropreneur Training Program equips santri with essential knowledge and skills in sustainable agriculture and entrepreneurship. Key elements contributing to the program's success include the utilization of available land, the involvement of skilled trainers, the provision of necessary agricultural resources, and collaborative engagements with pesantren stakeholders. These components collectively foster an environment where students are motivated by religious understanding to actively participate in agricultural activities, thereby aligning their efforts with the broader mission of stewardship and gratitude as outlined in their spiritual teachings.

The program's implications extend beyond individual empowerment, inspiring religious teachers (asatiz) to incorporate agropreneurship into the curriculum and sustain the momentum of these activities. This research underscores the potential of pesantren as catalysts for agricultural innovation and community empowerment, providing a replicable model for other institutions. Future research should focus on expanding this model to broader community settings, enhancing its impact and contributing to national food security efforts. By empowering rural communities to engage in Agropreneurial activities, the government can strengthen Indonesia's agricultural sector and ensure a sustainable food future for the nation.

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