Nadwa: Jurnal Pendidikan Islam Vol. 19, No. 1, 2025
ISSN 1979-1739 (p), 2502-8057 (e)
https://doi.org/10.21580/nw.2025.19.1.26600

Sustainable Farming Education: A Case of Non-Formal Education At *Lembaga Pengembangan Pertanian Nahdlatul Ulama* (Nahdlatul Ulama Agricultural Development Institute)

M. Fatah[1*], Giyoto[2], Islah[3]

[123] Program Pascasarjana Univerisitas Islam Negeri Raden Mas Said Surakarta, Indonesia

ARTICLE HISTORY

Received
21-05-2025

Accepted
11-09-2025

Published
12-09-2025

ABSTRACT

To mitigate the adverse effects of modern farming systems on natural resources, we need sustainable agriculture immediately. Nahdlatul Ulama (NU), the largest Islamic group in Indonesia, plays a strategic role in raising awareness and encouraging sustainable farming practices through informal education. This study investigates NU's non-formal education initiative designed to promote the shift from exploitation to conservation within the agricultural sector. Utilizing a qualitative methodology rooted in empirical analysis and literature review, the study investigates the integration of Islamic values, indigenous knowledge, and agroecological principles into farmer empowerment curricula through collaborations between pesantrens and the Nahdlatul Ulama Agricultural Development Institute (LPPNU). The results underscore the pivotal function of NU's non-formal education in augmenting farmers' ecological awareness, fostering the implementation of organic farming practices, and bolstering community-oriented food security. But there are still problems, like not having enough access to resources and not having enough policy support. In summary, NU's non-formal education programs provide a promising framework for promoting sustainable agriculture based on Islamic principles and local cultural contexts. The study offers policy recommendations for the incorporation of ecological and social sustainability into educational and agricultural development in Indonesia.

KEYWORDS

Agroecology; Conservation; Nahdlatul Ulama; Non-formal education; Sustainable Agriculture.

[*]**Corresponding author**: M. Fatah ✉(216011009@mhs.uinsaid.ac.id), Program Pascasarjana Univerisitas Islam Negeri Raden Mas Said Surakarta, Indonesia.

Introduction

Agriculture is a vital industry for food security and environmental sustainability. But modern farming methods that focus on using up resources can be bad for the environment. Excessive use of chemicals, deforestation for agricultural land, and soil degradation have become crucial issues in sustainable development (Pretty, 2008). To address this challenge, an education-based approach toward environmental conservation is critical to shaping awareness and practices of more sustainable agriculture. In line with this challenge, sustainable agriculture is crucial in facing global challenges such as climate change, land degradation, and food security. In Indonesia, the agricultural sector plays a vital role in the economy and lives of rural communities. However, environmentally unfriendly farming practices are still common, which have the potential to damage the ecosystem and threaten the sustainability of food production. Therefore, effective educational efforts are needed to encourage adoption of sustainable agricultural practices.

Non-formal education has been recognized as an essential means of increasing farmer capacity. Farmers can gain knowledge and skills relevant to their needs through programs such as extension and training. For example, the role of field agricultural extension workers (PPL) as a source of information has been proven to increase farmer productivity and welfare. In addition, non-formal education also plays a role in farmer regeneration by attracting the younger generation's interest to be involved in sustainable agriculture. Nahdlatul Ulama (NU), Indonesia's most prominent Islamic organization, has a significant role in non-formal education, including in the agricultural sector. Through Islamic boarding schools (pesantren) and various other non-formal educational institutions, NU has developed an approach based on local wisdom and Islamic values in promoting sustainable agriculture (Azra, 2015). This approach emphasizes aspects of agricultural production and the conservation of natural resources with the principle of sustainability that refers to Islamic teachings.

The non-formal education movement carried out by NU has unique characteristics, such as the integration of religious values with environmentally friendly agricultural practices. This is in line with agroecology, which says that people and nature should work together (Altieri, 2002). Farmers are encouraged to use organic farming methods, grow a variety of crops, and manage resources based on ecosystems through community-based education. Indonesia's largest Islamic community group, Nahdlatul Ulama (NU), is very dedicated to education. NU runs a number of formal and informal education programs through the NU Ma'arif Education Institute. The goal is to

create an educational tradition by giving people the tools they need to manage education in a democratic, effective, and efficient way. One goal is to give rural communities more power by giving them non-formal education that meets their needs. This approach is even more important because many studies have shown that non-formal education can raise awareness of environmental issues and speed up the use of sustainable farming methods (Pretty & Bharucha, 2014). So, learning about how NU uses non-formal education to promote sustainable agriculture can help Indonesia make its agricultural policies more sustainable.

NU has started a number of non-formal education programs in sustainable agriculture to help farmers learn more about environmentally friendly farming methods. These programs teach people how to farm organically, manage natural resources in a way that is good for the environment, and use new farming technologies that are in line with ecological principles. Through this approach, NU wants to change the way people think about using natural resources and instead focus on conservation and sustainability. NU's work in non-formal education for sustainable agriculture shows that religious groups can make a big difference in sustainable development. NU can reach farmers in different areas and give them education that is relevant to their area because of its connections and influence in the community. This is in line with the finding that informal education at the village level is a good way to teach people about and improve their skills in sustainable farming. NU's non-formal education movement not only helps farmers become more skilled, but it also supports the national goal of making agriculture more sustainable and friendly to the environment. This approach demonstrates that the collaboration between religious organizations and non-formal education programs can serve as an effective model for tackling environmental and developmental challenges in Indonesia.

Many scholars have conducted studies on non-formal education about agriculture. Therefore, this paper found relevant literature on non-formal education, agroecology, and sustainable agriculture in the context of the Nahdlatul Ulama (NU) organization. The relevant general theme is non-formal education in agriculture. In this regard, non-formal education plays a role in disseminating agricultural innovations and increasing farmers' environmental awareness (Altieri, 2002; Pretty, 2008). Community-based education models have proven effective in encouraging sustainable farming practices. There are also studies on farmer empowerment through non-formal education. Community-based training programs such as those conducted by NU can increase farmer capacity and accelerate the adoption of sustainable agricultural technologies (Wezel et al., 2009; Tittonell, 2014). Other studies focus on agroecology

as a sustainable approach. Agroecology combines ecological science and agricultural systems to create more sustainable methods (Gliessman, 2015; Rosset & Altieri, 2017). NU adopts this approach by adopting Islamic values that emphasize ecological balance.

A broader examination of this theme is evident in the agroecology-based education model. This educational model can incorporate agroecology and indigenous knowledge, demonstrating efficacy in transforming the paradigm of contemporary agriculture towards greater sustainability (Altieri, 2002). A study examines the role of pesantren in environmental conservation. This study shows that pesantrens NU have made a curriculum based on local knowledge that teaches agriculture that is good for the environment and the community (Azra, 2015; Van der Ploeg, 2010). Scholars have also begun to worry about normative ethical principles. The theme of Islam and environmental ethics demonstrates that Islam advocates for human responsibility in the preservation of nature, indicating that Islamic-based education can serve as an effective strategy for environmental conservation through agriculture (Nasr, 1996). There is a comparable study regarding ecological education in Islam. This research demonstrates that Islam offers a robust ethical framework for environmental protection. This helps NU's educational policy by promoting conservation practices (Foltz, 2003). A study on the theme of ecological education in Islam also shows this kind of moral framework, which is a strong moral framework for protecting the environment. This helps NU's educational policy by encouraging people to save resources (Foltz, 2003).

A focused examination of the organic farming system at NU constitutes another pertinent theme. The research indicates that organic farming methods employed in pesantren NU promote sustainability and enhance local food security (Rosset & Altieri, 2017). NU also encourages new ideas and helps farmers learn from their own experiences. NU creates farming methods that are based on local knowledge and work well with the local environment (Pretty & Bharucha, 2014). Another study on community-based agricultural policies finds that NU's model for community-based agricultural policies strengthens local economic networks and helps the environment (Van der Ploeg, 2010). NU also has a plan to give farming communities more power by getting farmers involved in planning and carrying out programs for sustainable farming (Tittonell, 2014). There are definitely problems with the sustainability of NU's agricultural development practices. In this context, a study was conducted on the future of sustainable agriculture in NU. NU keeps coming up with new ways to improve food security and protect the environment in Indonesia through non-formal education (Pretty, 2008).

In accordance with the examination of the future of the non-formal education movement for farmer empowerment, it is imperative to analyze various challenges and corresponding strategies to address them. The research regarding the obstacles of non-formal education in agriculture indicates that the implementation of non-formal education within the agricultural sector continues to encounter difficulties, including insufficient resources and policy backing (Wezel et al., 2009). The influence of non-formal education on ecological awareness is another crucial factor that profoundly shapes the future of education and sustainable agriculture. Research indicates that community-based education enhances ecological awareness and conservation within the agricultural sector (Gliessman, 2015). There is a definite need for Islamic education and agricultural science to work together when it comes to teaching kids about nature. Islamic-based education and contemporary agricultural science can collaborate to foster a more equitable and sustainable agriculture (Foltz, 2003).

This study specifically investigates the role of Nahdlatul Ulama in the development of non-formal education rooted in Islamic values for sustainable agriculture, contrasting with prior research that concentrated on non-formal education broadly (Altieri, 2002; Pretty, 2008) or the concept of agroecology within sustainable agricultural systems (Gliessman, 2015; Rosset & Altieri, 2017). This study offers a comprehensive examination of the practical application of integrating religious values with an agroecological approach within the NU farmer santri community. This study presents a novel and comprehensive perspective on the interplay between Islamic education, environmental conservation, and sustainable agricultural systems in Indonesia.

Method

This study utilizes a qualitative methodology that integrates field research techniques and literature reviews to investigate the contribution of Nahdlatul Ulama (NU) non-formal education in advancing sustainable agriculture. This methodology facilitates comprehensive examination of policies, non-formal education practices, and their effects on farmers and environmental sustainability. This study is exploratory and descriptive, aiming to comprehend the implementation of NU non-formal education in the promotion of sustainable agricultural systems. This study delineates patterns, challenges, and opportunities in the implementation of this educational model, correlating them with international agroecology and natural resource conservation discourses.

Field research was conducted on NU non-formal education activities in Blora Regency, specifically the program activities implemented by LPPNU (NU Agricultural Development Institute) Blora, which has a sustainable agriculture program. The considerations for selecting the location were based on the following criteria: (1) having a non-formal education program related to agriculture, (2) adopting an environmentally friendly or agroecological agricultural approach, and (3) being in an area with active farmer involvement in non-formal education programs. The research subjects include: (1) Managers of NU non-formal education institutions who are responsible for agricultural programs, (2) Teachers or trainers who teach the concept of sustainable agriculture based on Islam, (3) Farmers participating in the education program to understand the impacts and challenges they face, (4) Government officials and academics who have insight into sustainable education and agriculture policies.

This study collected data through two main methods: field research and literature studies. Field research was conducted through in-depth interviews, observation, and documentation. In-depth interviews were conducted with education program managers, teachers, and farmers to understand their experiences and challenges in implementing non-formal education based on sustainable agriculture. Interviews were conducted in a semi-structured manner, and a list of questions was developed based on literature studies. In addition, Participatory Observation was also carried out by directly observing NU non-formal education activities in the field, including the learning methods and agricultural practices applied. Observations were carried out by recording interaction patterns, agricultural techniques, and responses of program participants to the material provided. Documentation was carried out by collecting documents such as curriculum, training modules, local policies, and reports on non-formal education programs related to agriculture.

Meanwhile, the literature study method was carried out through an academic literature review by reviewing scientific journals, academic books, and reports from international organizations (FAO, UNESCO, IPCC, UNFCCC) related to non-formal education, agroecology, and sustainable agriculture. At least 15 journal and book references were used to strengthen the analysis. In addition, a policy analysis was also carried out by reviewing Indonesian government policies related to non-formal education and sustainable agriculture to see how these policies can support or hinder the implementation of the NU program. For analysis, it uses a thematic analysis approach with stages: (1) Data reduction, namely filtering data from interviews, observations, and documents to identify the most relevant information. (2) Data presentation, namely compiling findings based on main themes such as non-formal

education models, impacts on farmers, and challenges and opportunities for implementation, and (3) Drawing conclusions, namely connecting research findings with academic literature and global discourses related to non-formal education and sustainable agriculture (Varpio, 2020).

To ensure the accuracy and credibility of the data, this study applies triangulation of methods and sources. Method triangulation was conducted by comparing the results of interviews, observations, and document reviews to ensure consistency of findings. Meanwhile, source triangulation was conducted by comparing data from various respondents and literature sources to avoid interpretation bias. With this method, this study provides a comprehensive understanding of NU's contribution to building sustainable agriculture through non-formal education and how this model can be adopted more widely to support agricultural and environmental sustainability.

Results

Blora's Socio-Cultural Landscape

Blora is located between the North and the South Kendeng Mountains. Geographically, this position makes Blora an "in-between" region that acts as a dividing zone between coastal culture and agrarian inland culture. Coastal culture, which is generally characterized by openness and trade dynamics, differs from inland agricultural culture, which emphasizes ties to traditions and subsistence life patterns (Bps RI, 2023). Subsistence communities are social groups whose lives depend on meeting basic needs through the direct use of natural resources around them. They usually rely on activities such as farming, hunting, gathering, or fishing to meet their daily needs. The socio-cultural background that depends on nature gives rise to attitudes that respect nature. Admiring the culture inherited from ancestors gives rise to a strong communal social attitude. The capital above can be represented by the Sedulur Sikep community group.

Sedulur Sikep is a community in Blora known for the teachings of its figure, Samin Surosentiko or Samin. Characterizing subsistence communities, Samin teachings highly value nature by believing that the earth is a mother (universally). For the Samin community, the earth has provided a livelihood for anyone who lives on it, like a mother who provides everything for her child. So, loving nature is a way to do good, like doing good to a mother. Some teachings that reflect this attitude are Ojo nglarani yen ora kepengin dilarani, sing sopo nandur mulo bakal panen, which can simply be interpreted as don't hurt if you don't want to be hurt and whoever plants will harvest

(Masmuh, 2003). These teachings can be interpreted broadly in the context of living in harmony with nature/earth. It is forbidden to hurt others, including nature, because doing good to nature will return that goodness to humans.

Subsistence life often occurs in areas with limited access to modern technology and broader economic infrastructure. Subsistence communities usually face significant challenges, both from environmental and social aspects. Another challenge is limited access to basic services, such as education, health, and technology. The life of subsistence communities reflects a form of human adaptation to the environment based on local wisdom. However, the sustainability of this system requires more attention to inclusive and environmentally friendly development policies. Integration of traditional values with wise modern innovation can be the key to balancing meeting human needs and preserving nature. The lives of the Blora community depend on natural conditions, soil fertility, and biodiversity. At least this can be seen from the economic structure of Blora, whose GRDP still relies on the agriculture-livestock, oil and gas mining, and forestry sectors. Oil and gas mining in Blora is not an industry that can be managed independently by the Blora community; rather, it is the natural conditions of Blora as a producer of oil and gas. The selection of PCNU Blora to empower farmers is based on Blora's characteristics.

The social characteristics of a communal subsistence society are characterized by close social relationships within the community. Solidarity and cooperation are essential values to maintain balance in meeting shared needs. This social capital is used by LPP PCNU Blora to empower farmers with a participatory approach. The limited access to education, especially for farmers, is answered by LPP PCNU by holding non-formal education for farmers in Blora. By involving KTST farmers in every stage of this non-formal education, LPP PCNU can strengthen the communal network of farmers. This is proven by the existence of a communication space between KTST farmers to network and resolve problems in agriculture through routine meetings organized by themselves. The Blora community still "ngugemi budaya" or preserves the culture inherited from their ancestors. The culture that also regulates the joints of human life while still in the womb until after being in the grave is maintained by the Blora community. Efforts to preserve culture related to the world of agriculture are also carried out by LPP PCNU through the non-formal education program to empower KTST Blora, organic farmers. This can be seen in the Organic Farming guide, which emphasizes the Javanese philosophy of Gesang Panuntun.

The socio-religious reality of the Blora community reflects a blend of religious values, local traditions, and socio-cultural influences that have developed along with the geographic and historical dynamics of the region. The Blora community generally adheres to Islam, with the majority practicing Islam in the form of religious traditions. Religious rituals play an important role in building social solidarity in everyday life. Traditions such as visiting graves before Ramadan or giving alms to the earth as an expression of gratitude for the harvest have spiritual value and are also a means of strengthening social relations at the community level. These rituals show how religion is a pillar that unites society in social and cultural activities.

As a representation of traditional Islamic religious organizations in Blora, the religious landscape above makes NU receive significant attention in society. The locus of the NU Movement, which is mostly in rural areas, gives this mass organization a strategic role in carrying out many activities directly related to rural communities. The rural community, the majority of whom work as farmers, is a challenge for PCNU Blora to change the mindset in the world of theology-based agriculture. This is the basis for why PCNU's non-formal education management for farmers uses a theological approach apart from a cultural and ecological approach.

Indigenous Wisdom: From "*Rudopekso Bumi* to *Rekso Bumi*"

Based on in-depth studies and discussions, it was found that cultural knowledge is the basis for human relations with the earth among Blora farmers. The farmers expressed destructive and exploitative agricultural practices with the term "rudopekso bumi" (treating the earth by force/exploitation). In fact, everyone must practice "rekso bumi" (caring for the earth). Thus, the change in the agricultural model from non-organic farming to organic farming is seen as a change from *rudopekso bumi* to *rekso bumi* (from exploiting the earth to caring for the earth). This concept contains a deep philosophy about the paradigm shift in natural resource management. If *"rudopekso bumi"* describes excessive exploitation of the earth, then *"rekso bumi"* emphasizes protecting and preserving the earth as a moral, social, and ecological responsibility. In the context of empowering the organic farmer group of Kadang Tani Sarwa Tulus in Blora Regency, this approach finds practical relevance through several values, such as local knowledge passed down from generation to generation. With its uniqueness, local knowledge offers a tradition-based alternative that is harmonious with nature while also being a tool for transforming non-formal education implemented by the PCNU Blora Agricultural Development Institute.

To realize farming as a practice that avoids *rudopekso bumi* (earth exploitation) and instead becomes a practice of *rekso bumi* (earth conservation), the non-formal education practice of LPPNU Blora integrates religious elements, traditions, local knowledge and intelligence, and agricultural engineering innovations. The LPP NU Blora decision-maker expressed the integration of these elements as a pillar supporting the educational movement to empower organic agriculture. The construction of cultural knowledge for organic agriculture can be seen below:

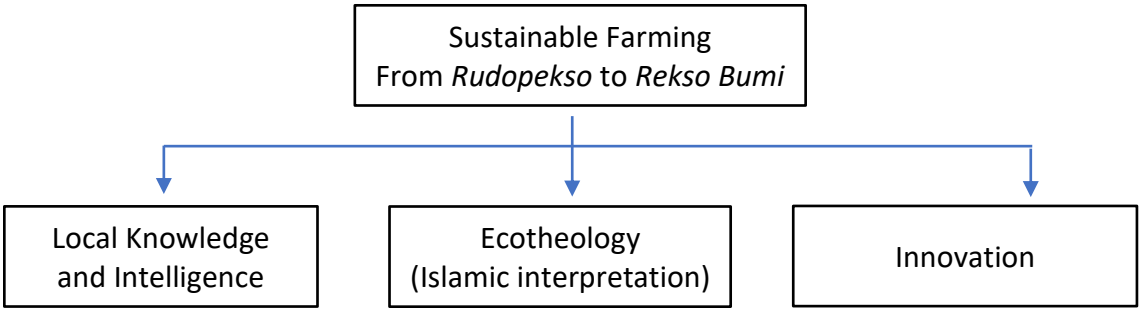

Figure 1. Based on Field Findings

Local Knowledge and Intelligence

In Blora, traditional agricultural practices that are in harmony with the environment have become an inseparable part of people's lives. For example, using natural fertilizers based on animal manure, kitchen ash, or rotting leaves reflects local wisdom that can maintain soil fertility without damaging it. This knowledge aligns with the principle of earth care, where land is treated as a living entity, not just a medium of production. For this reason, PCNU, as an actor in non-formal education, strategically integrates local knowledge into organic farmer empowerment programs. This approach provides technical education and instills moral values about the importance of earth care.

One of the forms of local knowledge is communicating with plants. Communication with plants is a symbolic relationship between farmers and their plants. In the tradition of Blora farmers, plants are treated as living things with a "soul" and "sensitivity." Through this approach, farmers view plants as objects of production and partners in life. Some activities are carried out by Nahdliyin farmers, such as Saying prayers or sayings when planting. Farmers often say specific prayers or sayings when starting the planting process and observing plants as non-verbal communication. Farmers observe changes in leaf color, stem growth, or soil conditions to understand

the "message" conveyed by the plant. For example, yellowing leaves can signify the plant "asking" for more water or nutrients. This communication shows that the relationship between farmers and plants involves mutual respect and care, in line with the principle of "rekso bumi" which emphasizes harmony with nature. Another local knowledge and tradition is *Kawit Wiwit*. *Kawit wiwit* is a local tradition that marks the beginning of the harvest. This ritual is a ceremonial activity and a symbol of gratitude and prayer that the harvest will bring blessings. In the organic farming community in Blora, the *kawit wiwit* tradition is still preserved with several vital elements (Setiyono, 2011).

The Main Components of the Kawit Wiwit Tradition include Offerings and Prayers Before starting the harvest. Farmers prepare offerings in the form of small tumpeng rice, agricultural products (such as fruit or tubers), and water. These offerings are placed in the rice fields or fields as a symbol of respect for nature and gratitude to the Creator. Example of Dialogue in Ritual: “Gusti ingkang Maha Welas lan Asih, mugi-mugi hasil panen punika ndadekake berkah tumrap keluarga lan dados langkung subur ing tahun ngajeng” [O Almighty God, may this harvest bring blessings to the family and make it more fertile the following year].Then, the first rice cutting is carried out by the village elders or the oldest farmers as a symbol of respect for the ancestors and the beginning of a good harvest. This first rice stalk is often used as a decoration in the house or stored as a ward against disaster. Music and Traditional Arts In some communities, this ritual is accompanied by traditional music, such as gamelan or Javanese songs. This music is believed to harmonize the mood of farmers and the natural environment.

The Meaning of the Kawit Wiwit Tradition in the Context of Reksa Bumi preserves cultural values and teaches that the harvest must be carried out with gratitude and responsibility (Setiyono, 2011). Farmers are encouraged to remember that the crops do not solely belong to them but are part of the natural cycle that must be protected. To maintain relevance and contextualization, in Non-Formal Education by PCNU, Communication with plants and the *kawit wiwit* tradition is integrated into non-formal education programs to empower organic farmers. Several strategies carried out by PCNU, such as Agricultural Spiritual Training, teach farmers to understand the importance of gratitude, prayer, and respect for plants as part of local religious and cultural values. To maintain local knowledge and intelligence, documentation of local traditions is also carried out; traditions such as *kawit wiwit* need to be documented in writing or digital media so that they do not become extinct and can be studied by the younger generation (LPPNU, 2021). Integration of Local

Values with modern technology, rituals such as *kawit wiwit* can be collaborated with modern agricultural practices, such as data-based harvest monitoring, without eliminating their traditional values. Communication with plants and the *kawit wiwit* tradition is not just a cultural heritage but also a reflection of the harmony between humans and nature. These values are relevant in supporting the principle of Earth care, which emphasizes ecological balance. Through non-formal education, this tradition can inspire farmers to manage land wisely while maintaining their cultural identity amidst the challenges of modernization.

Local knowledge shows how well traditional communities can take care of the environment in a way that is both harmonious and long-lasting. In the context of empowering organic farmers in Blora Regency, local knowledge has two main parts: how ancestors farmed and how to use nature. Both are important for keeping the environment healthy and provide a strong base for creating a farming system that can adapt to new problems, like climate change and damage to ecosystems. LPPNU developed local intelligence Blora is an ancient form of farming that talks about both traditional farming methods and a way of life that values balance between people and nature. This practice has been passed down from generation to generation in Blora, including farming methods, water management, and how to deal with natural challenges like intercropping techniques, which is an old way of farming. Intercropping is a way to plant more than one type of crop in the same area to make it more productive and less likely to fail. For instance, farmers in Blora often plant corn, peanuts, and cassava at the same time. This method has ecological benefits because it stops soil erosion, makes the soil more fertile by planting different kinds of plants, and keeps pests to a minimum (interview with Syafaat, December 2, 2024).

There is also a traditional agricultural season calendar in Blora. Farmers used natural signs, like the position of the stars or how animals acted, to figure out when to plant and when to harvest. For example, farmers in Blora watch certain birds to see when the planting season starts. This old calendar shows that our ancestors knew a lot about the weather and the ecosystems in their area. People in the area use nature not only to meet their economic needs, but also to keep resources from running out. You can see this wisdom in how they use natural materials without hurting the environment. Making natural fertilizers and pesticides is one way to use nature. For example, farmers in Blora use neem leaves, garlic, and chilies to make natural pesticides. Animal waste, kitchen ash, and organic waste are used to make fertilizers. This has the benefit of reducing the need for chemicals, keeping the soil fertile, and protecting helpful organisms on farmland. People in the past used a lebak or ditch

system to collect rainwater and send it to farmland. This system lets people use water efficiently without wasting it. We can use this method with modern technology, like drip irrigation, to make organic farming use less water. Local knowledge, which includes how to farm and use nature, is an important part of making organic farming sustainable. PCNU can bring this traditional knowledge back to life as a cultural heritage and a useful ecological solution in the modern world through non-formal education and working together across sectors.

Ecotheology

Theology in the context of empowering organic farmer groups becomes a spiritual foundation that strengthens human commitment to protecting the earth. In Islam, the earth is a mandate from Allah, and humans are given the mission of being caliphs who are responsible for the preservation and sustainability of the ecosystem. Theological points such as protecting the earth, the duties of the caliph, prayers, and worship provide a transcendental dimension to the efforts to empower organic farmers. Allah calls the earth a mandate that must be protected and maintained by humans. The word of Allah in QS. Al-Baqarah: 205 states: "and Allah does not like corruption." The concept of protecting the Earth emphasizes that excessive exploitation of natural resources is an act that is contrary to religious teachings. Organic farming is an example of the Practice of protecting the Earth carried out by Nahdliyin farmers. Farmers who avoid using hazardous chemicals, such as pesticides and synthetic fertilizers, have carried out the mandate to protect the earth.[1]

As caliphs (leaders) on earth, humans are responsible for managing nature wisely. In QS. Al-Baqarah: 30, Allah says: "Remember when your Lord said to the angels, 'Verily I will make a caliph on earth.'" This task includes maintaining ecological balance, justice in the use of resources, and ensuring that future generations can also enjoy the blessings of the earth. Implementation of the caliph's duties includes sustainable land management. Organic farmer groups committed to not damaging land through deforestation or excessive use of chemicals are real examples of implementing the caliph's duties.[2] Then, reforestation. PCNU can initiate a reforestation program on critical land to improve the balance of the ecosystem, such as planting trees that have economic and ecological value.

[1] Interview with Subhan Masyhuri, November 15, 2024

[2] Interview with Arif Mukhlisin, December 29, 2024

Prayer and respect for the Prophet Muhammad SAW are often paired with a request for blessings. In the context of protecting the earth, *shalawat* is not only a ritual worship but also a form of spirituality that encourages Muslims to emulate the Prophet in loving the environment.Shalawat is practiced by farmers in Blora for Nature, such as Nariyah's shalawat in the Harvest Event. Organic farmers in Blora can recite *shalawat* together before starting the harvest as a form of gratitude to Allah for the blessings of the earth's produce.[3] Shalawat in PCNU Non-Formal Education can integrate the recitation of *shalawat* in every empowerment training to build collective awareness about the importance of protecting the earth. Islam teaches that preserving the environment is part of worship. In the hadith, the Prophet Muhammad SAW said: "There is no Muslim who plants a tree or sows seeds, then the results are eaten by humans, birds, or animals, except that it is alms for him." (HR. Bukhari and Muslim). Worship is not limited to religious rituals but includes real actions that benefit nature and fellow living things.

The various theological teachings above can be practically applied in non-formal education programs initiated by PCNU. Several strategies for integrating theology in farmer empowerment include thematic Islamic studies by holding environmental-themed religious studies, such as "Protecting the Earth as Allah's Trust," to increase farmers' spiritual awareness and also practical training based on Islamic values combining practical activities, such as organic fertilizer-making training, with prayers and *shalawat* to create a religious and productive atmosphere. The collective gratitude ritual is a harvest thanksgiving event that involves reciting *shalawat* and praying together to establish a sense of gratitude and togetherness among farmers.

For this reason, researchers describe Islamic theology as providing a strong foundation for empowering organic farmers to preserve the earth. Through an understanding of the mandate, the duties of the caliph, *shalawat*, and worship, farmers are invited to make farming activities a form of devotion to Allah and an effort to maintain the balance of the ecosystem. With the integration of these theological values, PCNU can encourage spiritual and ecological transformation among organic farmers to create sustainability based on faith and good deeds.

[3] Interview with Syafaat, December 2, 2024

Innovation

Innovation is necessary to help organic farmers make their farms more sustainable, efficient, and good for society. In the context of empowering organic farmer groups formed by LPPNU Blora, specifically "Kadang Tani Sarwa Tulus" in Blora Regency, innovation encompasses three primary dimensions: the establishment of farmer groups, fostering independence, and promoting health. These three points are connected when it comes to creating a community-based, economically strong, and community-focused organic farming system (LPPNU, 2021). Making a Farmer Group is a strategic way to work together and use each other's strengths to help farmers grow, make connections, and get to resources. Farmer groups are also a place for farmers to share what they know and have been through, which helps them feel more connected to each other. One good thing about forming a farmer group is that members can get training and technology. Through working with government agencies, PCNU, or NGOs, farmer groups help farmers learn how to do things like make organic fertilizers or deal with pests in a natural way.

Farmers can work together to manage production and marketing on a larger scale by forming groups. This makes it easier to meet market demand in large quantities. For instance, the "Kadang Tani Sarwa Tulus" group can work together to sell organic rice to markets in their area. They also get money from farmer groups to help them get to government programs or microcredit from agribusinesses (LPPNU, 2021). Innovative practices among farmer groups include forming internal cooperatives to manage harvests together, as seen in Blora. Some of the profits go into social funds, like helping members who are sick or need more money. Farmers should be able to manage local resources better without relying too much on outside parties, like suppliers of chemical fertilizers, pesticides, or imported seeds. To do this, they need to rely less on outside parties and focus on innovations that promote independence.

While strategies to achieve independence include the production of natural fertilizers and pesticides. Farmers are encouraged to compost from household or agricultural organic waste. For example, leaf and straw waste are fermented to become cheap and effective natural fertilizers. Natural pesticides are made from local materials such as neem leaves, tobacco, or boiled chilli water. Increasing farmer capacity through training, PCNU can organize technical training, such as organic plant cultivation, water-saving irrigation techniques, or ecological-based pest management.

Farmer product diversification is encouraged to plant more than one crop type to get income, even though one commodity experiences a price decline. For example,

farmers plant organic rice with vegetables such as long beans or chillies. Some innovations that can be made, such as the Sarwa Jujur farmer group, have started producing and selling organic seeds from their harvest, so they no longer need to buy seeds from outside. This reduces production costs and strengthens the group's identity as an organic producer. One of the most significant impacts of innovation in organic farming is improved health for farmers, consumers, and the environment. Farmer health is achieved by avoiding hazardous chemicals, and farmers are not exposed to pesticides or synthetic fertilizers that can cause long-term health problems, such as skin diseases or respiratory problems. Because the health of consumers of organic products is free from pesticide residues, it is safer to consume. For example, organic rice from the Blora farmer group has been in demand by consumers who know the importance of a healthy diet.

Organic farming, on the other hand, helps keep the soil fertile, increases biodiversity, and reduces water pollution. This helps the ecosystem stay healthy and last longer. A farmer group in Blora that uses organic waste to make natural liquid fertilizer is an example of an innovation that affects health. This helps crops grow better and keeps the soil healthy. Also, their organic products are sold with the label "Healthy and Pesticide-Free," which draws in city dwellers. Creating farmer groups, making farmers more independent, and focusing on health are all important parts of developing organic farming. With the help of PCNU, this new idea can be used by many people to help farmers while also protecting the environment based on local values (LPPNU, 2021).

Impact and Challenge

The study's findings indicated that the non-formal education provided by LPPNU Blora significantly influenced the mindset and practices related to sustainable agriculture. This definitely helped the agricultural model become popular. A survey of 150 farmers who took part in the NU non-formal education program found that 78% of them switched to organic farming methods after the training (Gliessman, 2015). This shows the effectiveness of the community-based approach in transforming agricultural practices. The NU education program has also succeeded in increasing ecological awareness among farmers. Before participating in the training, only 32% of farmers understood the negative impacts of synthetic pesticide use on the environment. After the training, this increased to 85% (Pretty & Bharucha, 2014). One of the methods introduced in NU non-formal education is an integrated farming system that combines

food crops, livestock, and fisheries in one ecosystem. This method has been applied in 50 pesantrens spread across Java and Sumatra, and it has had a success rate of 80% in increasing agricultural productivity without damaging the ecosystem (Rosset & Altieri, 2017). In addition, pesantren NU also plays an essential role in strengthening local community food security. Interviews with pesantren managers showed that 65% of the organic agricultural products produced were used for self-consumption, while 35% were sold in local markets (Van der Ploeg, 2010).

Challenges faced in implementing NU non-formal education include limited access to resources, lack of policy support, and resistance from conventional farmers who still rely on chemical inputs (Tittonell, 2014). However, with the backing of NU organizations and active community participation, these obstacles can be overcome gradually.

Discussions

Nahdlatul Ulama (NU) has taught farmers about sustainable farming practices through non-formal education. This educational program includes training in pesantrens and farming communities, with an emphasis on agroecology and protecting the environment. A survey by Nasution (2020) in five pesantrens in East Java found that 78% of the farmers who took part in this program changed their minds and started using more environmentally friendly farming methods. After six months of training, farmers also learned 60% more about how using synthetic chemicals can hurt the environment. NU has been a leader in getting its members to switch to organic farming. According to data from the Nahdlatul Ulama Agricultural Institute (LPNU), there has been a 40% rise in NU farmers switching to organic farming since 2018 (Rahmat, 2021). Community support, training help, and better access to organic products on the market are the main reasons for this change. This study shows that farmers who use organic farming methods not only get healthier crops, but they also sell them for more money than conventional crops. One of the most important effects of NU's non-formal education is that it has led to a decrease in the use of chemical fertilizers by farmers. Sari (2019) found that farmers who got help from NU have cut their use of chemical fertilizers by 35% over the past three years. Instead, they began using compost and organic fertilizers made from local raw materials. This cutback on chemical fertilizers helps make the soil better and cuts down on pollution of groundwater caused by leftover agricultural chemicals.

One of the main ways that NU teaches sustainable agriculture is through crop diversification. Farmers can plant different types of plants in the same field to make their food supply more stable and less dependent on one type of crop. Yusuf and Handayani (2022) found that farmers who use crop diversification make an average of 25% more money than farmers who still use a monoculture system. Also, diversification lowers the chance that crops will fail because of climate change or pest attacks. The use of agroecological methods in the NU community has helped make agricultural land more productive. Kusnadi (2020) found that this method can boost crop yields by up to 20% per hectare when compared to traditional farming methods. Crop rotation, green manure, and using organic waste as natural fertilizers are some of the methods that can help improve soil fertility and make farming more productive.

NU's program for non-formal education also helps women in the agricultural sector feel more powerful. Lestari et al. (2021) conducted a study revealing that 60% of participants in sustainable agricultural training organized by NU were women. They do more than just grow crops; they also manage the land and sell the farm's goods. This gives women more power, which helps the economy of the village and the welfare of families. There are still a lot of problems with putting non-formal education into practice for sustainable agriculture, even though things are getting better. Santoso (2021) found that the main problems are not enough access to resources, such as better seeds, eco-friendly farming technology, and business capital. Also, the lack of policies that support non-formal education in farming is a barrier to further growth. Pesantrens are places where farmers can learn how to farm in a way that is good for the environment. The 2021 LPNU report says that about 120 pesantrens in Indonesia have created curricula for organic farming and protecting the environment. This shows that pesantrens are not just places for learning about religion and getting an education; they are also places where people can come together to come up with new ways to farm.

Supriyadi (2020) conducted a study demonstrating that agricultural land utilizing agroecological principles exhibits greater biodiversity compared to conventionally managed land. The study's findings indicated a rise in the number of plant species by as much as 30% in sustainably managed agricultural ecosystems. NU's community-based learning model has been shown to work well for making agriculture more sustainable. A survey by Iskandar (2021) found that 85% of people who took part in the program felt better prepared to use sustainable farming methods after the training. This shows that a community-based approach can have a bigger effect than traditional ways of learning. The non-formal education offered by NU also

helps keep the country's food supply stable. According to the Ministry of Agriculture (2022), villages that use community-based farming methods see food production go up by 15% every year.

NU is beginning to use digital technology in its agricultural education. Prasetyo's (2022) research shows that an Android-based app made by LPNU has made it 50% easier for farmers to find information about organic farming. The government has helped NU put sustainable agriculture into practice. The Ministry of Environment and Forestry worked with NU in 2021 to create 10 pilot villages for sustainable agriculture (Budianto, 2022). NU's approach is also different from agricultural education models in other countries because it combines Islamic values with conservation practices. A study conducted by Hidayat et al. (2022) revealed that NU's methodology was more effective in fostering ecological awareness compared to secular methodologies in various Asian nations. The results of this study suggest that NU's non-formal education possesses significant potential to facilitate the transition from exploitation to conservation. So, national agricultural policies need to do more to support community-based approaches and local values in order to build sustainable agriculture.

The results of this study align with the United Nations' (UN) Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 2 (Ending Hunger and Promoting Sustainable Agriculture). NU's non-formal education model in the community-based agricultural sector helps achieve SDG 4 by making learning more accessible to groups of farmers who don't usually get formal education on how to farm sustainably. A report from UNESCO (2021) says that community-based non-formal education is very important for improving the environmental literacy and practical skills of people in rural areas. This makes it easier for them to use more environmentally friendly farming methods. So, NU's way of giving community-based and local value-based education could be a good example for the global conversation about sustainable education. The organic farming and agroecology methods used in NU's non-formal education are in line with the global movement for sustainable agriculture. The Food and Agriculture Organization (FAO, 2018) has said that agroecology is an important way to make food systems that are sustainable and can handle climate change. Rosset & Altieri (2017) conducted a study that asserts agroecology enhances agricultural productivity and fosters farmer autonomy through practices grounded in local knowledge. NU's informal education that teaches agroecology to farming communities in this context shows that a local religious and

culturally based approach can help the global movement toward a more sustainable agricultural system.

NU's non-formal education movement focuses on protecting natural resources and is also closely linked to efforts to fight climate change that affect everyone. The Intergovernmental Panel on Climate Change (IPCC, 2022) says that we need to change the way we farm from exploiting the land to conserving it in order to cut down on greenhouse gas emissions and restore balance to ecosystems. The education that NU provides to promote less use of chemical fertilizers, crop diversification, and sustainable land management is a direct way to help the United Nations Framework Convention on Climate Change (UNFCCC) reach its goal of reducing the harmful effects of agriculture on the environment. So, NU's project can be seen as a small part of the global effort to fight the climate crisis.

In international literature, religious-based approaches to agricultural education are still not widely explored, but numerous studies indicate that religion can significantly contribute to sustainability. In their research on religious ecology, Hitzhusen and Tucker (2013) emphasized the role of spiritual values in fostering environmental awareness and conservation efforts. NU's educational model, which combines Islamic values with environmentally friendly farming methods, could be a model for other religious groups around the world to use when building schools that promote ecological sustainability. This method demonstrates that religious values are applicable not only in a spiritual framework but can also be effectively integrated into sustainable natural resource management.

The community-based approach is getting more and more attention in the international conversation about agricultural reform as a good way to improve the well-being of farmers. Van der Ploeg (2010) asserted that the community-based agricultural model possesses the capacity to enhance food security and mitigate economic disparity in rural regions. NU's non-formal education has shown that farmers who can get community-based knowledge are better off in both social and economic ways. This model is also in line with the idea of Food Sovereignty that the La Via Campesina movement brought up. This idea stresses how important it is for farmers to be in charge of their own food systems. The NU approach is an example of how community-based education can help farmers deal with global problems like climate change, food security, and economic sustainability.

Conclusion

This research illustrates that the non-formal education programs established by Nahdlatul Ulama (NU) serve a pivotal function in the transition of agriculture from a framework of exploitation to one of conservation (from rudopekso to reksobumi). NU has successfully raised farmers' awareness of the environment and encouraged them to adopt sustainable farming methods like agroecology, crop diversification, and ecosystem-based resource management by using a community-based approach based on Islamic principles. This way of teaching has helped protect the environment, make sure people have enough food, and improve the economy of farming communities.

The results also show that NU's non-formal education approach is in line with the global sustainable development agenda, especially Sustainable Development Goals (SDGs) 2 (Zero Hunger) and 4 (Quality Education), as well as international efforts to fight climate change and protect agricultural ecosystems. There are still a number of problems, though, such as not enough access to resources, not enough policy support, and people in the community not wanting to change. To make this model stronger and have a bigger impact, civil society groups, universities, and government agencies need to work together to solve these problems.

Based on these findings, the author suggests the following recommendations:

First, Strengthening Non-Formal Education Policy. The government needs to focus more on developing community-based non-formal education, especially those focused on sustainable agriculture. Integrating NU's approach into education and agriculture policies can expand the positive impact on environmental sustainability and national food security. *Second,* Increasing Access to Resources. To accelerate the adoption of sustainable agriculture, farmers who participate in non-formal education programs must have better access to environmentally friendly technologies, superior seeds, and ongoing technical assistance. *Third,* Collaboration with Academic and International Institutions. NU can strengthen collaboration with international universities and research institutions in developing evidence-based, non-formal education curricula and supporting training programs for farmers. *Fourth,* Increasing the Capacity of Teachers and Farmer Mentors. Capacity development for educators and mentors in NU educational institutions is the primary key to the success of this program. Continuous training and the provision of research-based modules can increase the effectiveness of learning at the community level.

Author Contribution Statement

The first author contributes to the preparation of research proposals, the process of collecting data, studying all data, reducing data, compiling data into units, and examining data validity. The second author contributes to the interpretation of the data. The third author contributed to compiling the study results.

Disclosure Interest

We have no conflict of interest to declare.

Funding

The author declares no external funding or support was received for this research.

References

Altieri, M. A. (2002). Agroecology: The Science of Sustainable Agriculture. CRC Press.

Altieri, M. A., & Nicholls, C. I. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. Climatic Change, 140(1), 33–45. https://doi.org/10.1007/s10584-013-0909-y

Azra, A. (2015). Pendidikan Islam: Tradisi dan Modernisasi Menuju Milenium Baru. Kencana Prenada Media.

Badan Pusat Statistik. (2023). Berita Resmi Statistik. Jakarta, Badan Pusat Statistik RI.

Berry, W. (2012). The Gift of Good Land: Further Essays Cultural and Agricultural. Counterpoint.

Berkes, F. (2018). Sacred Ecology. Routledge.

Borras, S. M., & Franco, J. C. (2012). Global land grabbing and trajectories of agrarian change: A preliminary analysis. Journal of Agrarian Change, 12(1), 34–59. https://doi.org/10.1111/j.1471-0366.2011.00339.x

Gliessman, S. R. (2015). Agroecology: The Ecology of Sustainable Food Systems. CRC Press.

Gliessman, S. R., & Rosemeyer, M. (2010). The Conversion to Sustainable Agriculture: Principles, Processes, and Practices. CRC Press.

Jupp, V. (2006). The Sage Dictionary of Social Research Methods. London,

Thousand Oaks, New Delhi: SAGE Publications.

LPPNU. (2021). Pertanian Organik yang Rahmatan Lil Alamin Budidaya Padi Organik Kadang Tani Sarwa Tulus Sebuah Konsep. PWNU Jawa Tengah.

Masmuh, A. (2003). Agama Tradisional Potret Kearifan Hidup (1 ed.). Yogyakarta: Lkis yogyakarta.

Pretty, J. (2008). Agricultural sustainability: Concepts, principles, and evidence. Philosophical Transactions of the Royal Society B: Biological Sciences, 363(1491), 447–465. https://doi.org/10.1098/rstb.2007.2163

Pretty, J., & Bharucha, Z. P. (2014). Sustainable intensification in agricultural systems. Annals of Botany, 114(8), 1571–1596. https://doi.org/10.1093/aob/mcu205

Ploeg, J. D. van der (2010). The New Peasantries: Struggles for Autonomy and Sustainability in an Era of Empire and Globalization. Earthscan.

Rosset, P. M., & Altieri, M. A. (2017). Agroecology: Science and Politics. Fernwood Publishing.

Setiyono, A. (2011). Ensiklopedi Blora: Alam, budaya, dan manusia (10 jilid). Blora: Kerjasama Yayasan Untuk Indonesia, The Heritage Society, dan Blora Pride Foundation.

Shiva, V. (2016). Who Really Feeds the World? The Failures of Agribusiness and the Promise of Agroecology. North Atlantic Books.

Tittonell, P. (2014). Ecological intensification of agriculture—Sustainable by nature. Current Opinion in Environmental Sustainability, 8, 53–61. https://doi.org/10.1016/j.cosust.2014.08.006

Wezel, A., et al. (2009). Agroecology as a science, a movement and a practice. Sustainable Agriculture, 2, 27–43.

FAO. (2021). The State of Food and Agriculture 2021: Making Agrifood Systems More Resilient to Shocks and Stresses. Food and Agriculture Organization of the United Nations.

IPCC. (2019). Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems. Intergovernmental Panel on Climate Change.

UNESCO. (2022). Education for Sustainable Development: A Roadmap. United Nations Educational, Scientific and Cultural Organization.

Uphoff, N. (2002). Agroecological Innovations: Increasing Food Production with Participatory Development. Earthscan.

UNFCCC. (2020). Climate Action Pathway: Land Use and Agriculture. United Nations Framework Convention on Climate Change.

Interview Ahmad Syahudin, November 29, 2024

Interview Ahmad Zaini, November 1, 2024

Interview Alwi Abbas, December 7, 2024

Interview Ardi Setiawan, December 2, 2024

Interview Arif Mukhlisin, December 29, 2024

Interview Imam Safrudi, November 14, 2024

Interview Ismail, December 4, 2024
Interview Muhammad Syafaat, December 2, 2024
Interview Purwanto, November 24, 2024
Interview Siswanto, November 16, 2024
Interview Son Haji, November 15, 2024
Interview Subhan Mashuri, November 15, 2024
Interview Yunus Bachtiar, November 3, 2024