

Economic Ecology in Rice Agricultural Production Activities in Kasepuhan Gelar Alam

Zihan Lenoviana¹, Iwan Purwanto^{2*}, Andri Noor Ardiansyah³

^{1,2,3} Social Studies Education Study Program, Faculty of Tarbiyah and Teacher Training, Syarif Hidayatullah State Islamic University, Indonesia

*Corresponding Author: iwan.purwanto@uinjkt.ac.id

Article History

Received: 20-05-2026

Revised: 30-05-2026

Published: 30-06-2026

Keywords: Ecological Economics; Sustainable Agriculture; Rice Production; Indigenous Community; Food Security

ABSTRACT

Existing sustainability studies largely emphasize technological intensification and market-oriented agricultural transitions while overlooking indigenous non-market agricultural systems rooted in ecological ethics and communal food sovereignty. This study examines the ecological-economic principles embedded in rice agricultural production within the Kasepuhan Gelar Alam indigenous community in Indonesia. Harmony between humans and nature serves as a fundamental principle underlying nearly all aspects of their agricultural practices. In rice production activities, the community consistently integrates ecological considerations as part of the environment and ecosystem. Nature is perceived as an entity with intrinsic value, independent of human interests, and is respected through strict adherence to customary rules aimed at environmental preservation. Overall, the agricultural practices of the Kasepuhan Gelar Alam community reflect their wisdom and adaptive capacity in responding to climate change. This is demonstrated through their practice of planting rice once a year, guided by traditional calculations based on celestial observations, weather patterns, and optimal soil conditions. By combining tradition and selective innovation, they maintain both cultural and environmental sustainability, embodying a “back to nature” agricultural approach. The Kasepuhan Gelar Alam community represents a sustainable society grounded in ecological principles. Their farming system not only fulfills food needs but also preserves ecosystems and enhances environmental quality through conservation practices such as tree planting, avoidance of chemical pesticides, and prioritization of organic fertilizers. These practices have enabled the community to achieve food self-sufficiency, with rice reserves considered sufficient to meet consumption needs for up to 20 years. This approach provides valuable insights into how sustainable agriculture can be implemented by respecting cultural values, ecological balance, and community needs. It demonstrates that sustainable agriculture can ensure food security without degrading the environment, while preserving natural resources for future generations within the Kasepuhan Gelar

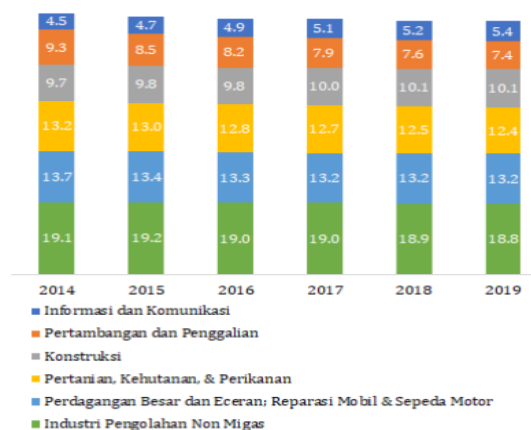
Alam community.

INTRODUCTION

Indonesia is a large country based on agriculture and is endowed with very abundant natural resources distributed across its entire territory. It also has a tropical climate and fertile soil structure, making the region suitable for agriculture. Indonesia’s history also records that, from the colonial period until today, the country cannot be separated from the agricultural sector, as this sector plays an important role in shaping the economic and social realities of communities across various regions of Indonesia.

The agricultural sector has an important role in human existence as it provides food, animal feed, food supplies, industrial raw materials, and bioenergy; absorbs labor; serves as a source of foreign exchange earnings, which constitute state revenue; and contributes to environmental sustainability through environmentally friendly farming practices. On the other hand, meeting the food needs of the population is a major and challenging task, considering that Indonesia’s population is projected to reach 330.9 million people by 2050, making it the sixth largest in the world after India, China, Nigeria, the United States, and Pakistan.

Agriculture is the most important sector in Indonesia’s economy, and even in the reform era it is expected to play a leading role in overcoming economic crises. Therefore, this sector deserves to be a mainstay and a tool for increasing economic growth. This is also stated in a research article written by M. Zainul Abidin, which emphasizes that the agricultural sector plays a significant role in Indonesia’s economy. The agricultural sector contributes to Indonesia’s Gross Domestic Product (GDP), ranking third among six industries after the manufacturing and trade sectors (Graph 1). In 2019, the added value and production level of the Agriculture, Forestry, and Fisheries sector reached IDR 1,354 trillion, or 12.4 percent of the national GDP.



Sumber: BPS (2020)

Figure 1. Contribution of Economic Sectors to GDP 2014 – 2019 (percent)

The same statement was also expressed by the Head of Statistics Indonesia (Badan Pusat Statistik), Margo Yuwono, in an interview on the website www.pangannews.id, stating that the agricultural sector is one of the sectors that makes a major contribution to the

distribution of Gross Domestic Product (GDP) growth, reaching 12.98 percent with a growth rate of 1.37 percent. In addition to contributing to GDP, the agricultural sector also plays a role in food security to meet food consumption needs in Indonesia. The agricultural sector is divided into five subsectors, namely: the food crops sector, plantations, livestock, forestry, and fisheries. Among these five subsectors, the food crops sector is an agricultural industry that produces crops as raw materials for human consumption and animal feed. Rice, corn, soybeans, wheat, cassava, sweet potatoes, sorghum, legumes, and other food crops are included in this sector. The main source of calorie consumption for the Indonesian population comes from the cereals group, reaching 38.54% in 2020, followed by other food and beverage groups at 24.69%. Similarly, the source of protein in the dietary pattern of the Indonesian population also comes from the cereals group, reaching 30.92% in 2020, followed by prepared food and beverage groups at 25.72%.

The development of staple food consumption patterns (carbohydrate sources) is still dominated by cereals, especially rice and wheat, while the contribution of tubers remains low. Rice holds a central position for most Indonesians as a staple food and as an important source of nutrition in the food structure. Therefore, the aspect of supply becomes very crucial, considering the growing population and the fact that rice is a highly strategic political commodity. Thus, domestic rice production serves as a benchmark for food availability in Indonesia. It is therefore not surprising that the Indonesian government plays a significant role in efforts to increase production and stabilize rice prices. Adequate food supply (especially rice) at affordable prices has become the main objective of agricultural development policy.

As one of the main economic sectors that significantly contributes to GDP and food production, rice agriculture also has a major impact on ecosystems and the economic life of communities. This is based on the complex dynamics of farmers' problems, where empirically, farming activities that are anthropogenic and environmentally unfriendly in their management have led, from an ecological perspective, to changes in ecosystems. These transformations are clearly related to changes in pest/disease cycles, soil structure, and water conditions. Achieving optimal productivity in cultivated agriculture is highly dependent on water availability and the presence of various organisms, both micro and macro, which play important roles in supporting growth. In addition, soil aspects also play a crucial role in this ecosystem, contributing significantly to the sustainability of biotic life, including microorganisms, worms, and various types of insects (John W. Doran and Zeiss, 2000). In this context, building farmer independence is very important, including understanding ecological potential, alongside addressing climate change and minimizing dependence on chemical or inorganic fertilizers and pesticides, which continues to increase. This is partly due to a lack of awareness among some farming communities; on the one hand, environmentally unfriendly land use leads to a gradual decline in agricultural productivity, particularly in rice crops, each year. This is caused by ecosystem degradation. Rice farming activities, in producing rice, alter the environment's capacity to provide services for community economic

activities. An important principle in economic ecology is that economic activities should not neglect ecological functions, which must be considered so that the processes remain sustainable.

Based on research findings presented by Kristiyanto et al., in the context of agricultural dynamics between organic and inorganic fertilizers, there is complexity in developing sustainable agricultural patterns. Farmers face a dilemma between using chemical inputs (pesticides) to rapidly increase crop productivity and restoring soil functions by reducing or eliminating pesticide use. The development of ecological farming patterns is indeed challenging, especially since there is no clear empirical evidence of significant short-term economic gains, given the expansion of organic agriculture, as found in research by Maryanti cited in Kristiyanto. Therefore, critical and synergistic evaluation is needed to create breakthroughs in sustainable agricultural patterns.

Studies on the productivity of food crops, particularly rice, using organic and inorganic inputs show varying results. Several studies based on Hapsari and Sudrajat, cited in Kristiyanto, indicate that rice productivity with organic inputs is lower compared to inorganic inputs; however, farmers' income is higher when using organic inputs. According to Frobel, cited in Kristiyanto, this phenomenon is interesting because some types of crops can achieve maximum productivity with a combination of organic and inorganic fertilizers.

In the case of farmers in the Dieng Highlands, Wonosobo, some of them stated that the decline in their harvest yields recently is due to weather changes rather than the type of fertilizer used, whether organic or inorganic. The use of both types of fertilizers is part of the social, cultural, and economic dynamics of the local community. Although the combination of organic and inorganic fertilizers does not significantly affect production yields, ecologically, organic fertilizers contribute to soil conservation, both biotically and abiotically.

According to Frobel G.D., cited in Kristiyanto, optimization of corn production can be achieved using both types of fertilizers; however, this may differ for other crops such as rice. Study results show that, in terms of operational costs and income, the use of organic fertilizers in rice cultivation yields higher results both quantitatively and qualitatively compared to inorganic fertilizers. Therefore, it can be concluded that the use of organic fertilizers in rice farming can be a more advantageous option from both economic and soil conservation perspectives, although the challenges of implementing ecological farming patterns remain a major concern.

Based on the definition proposed by Capra, sustainable development is defined as a society that is able to sustain its own life—namely, a society whose needs (including food) are fulfilled without reducing the prospects of future generations. According to Ariani, achieving food security requires the availability of food in sufficient quantity and quality, distributed at affordable prices and safe for consumption for every citizen to support their daily activities at all times. If food production declines, it means an increased risk of more people falling into poverty and hunger. When food production decreases, a food crisis may occur, leading to

economic, social, and political instability that can threaten national stability. However, efforts to increase rice production are currently hindered by various constraints, including the ongoing conversion of fertile land, climate change, and the declining quality of land resources, all of which contribute to reduced or slowed productivity. In line with this, based on the results of the KSA Survey, in 2021 the harvested rice area in Indonesia reached approximately 10.41 million hectares, a decrease of 245.47 thousand hectares (2.30 percent) compared to 2020. Meanwhile, rice production in 2021 amounted to 54.42 million tons of unhusked rice (GKG). When converted into rice, production in 2021 reached approximately 31.36 million tons, or decreased by 140.73 thousand tons (0.45 percent) compared to 2020. The decline in rice production in the agricultural sector is caused by several factors, including: (1) decreasing land area due to conversion to non-agricultural uses, (2) low land productivity caused by farming practices that do not consider ecological aspects, and (3) climatic conditions and disaster-prone areas that increase the risk of crop failure.

The potential of Indonesia's agricultural industry is supported by its geographical condition, as it is located between two continents and between two oceans, which greatly influences both natural conditions and the lives of its population. This location is also known as a cross position. This becomes a concern when Indonesia, with its high potential for fertile agriculture, actually experiences declining productivity. Therefore, in order to ensure the sustainability of the nation's livelihood, the agricultural sector deserves to be continuously developed, both now and in the future. Although many programs have been implemented to address food issues, agricultural problems persist, and fertile land is becoming increasingly scarce due to ongoing industrial development, infrastructure expansion, and land degradation caused by unsustainable farming practices. The destruction of ecosystems as a whole threatens nature's capacity as a resource for production in its economic function and in performing its regulatory functions. Therefore, it is important to implement agricultural practices that do not damage the environment or natural resources in order to meet human needs. Sustainability and sustainable development thus become the main concerns of ecological economics, emphasizing that there is no longer a dichotomy between economic activities and the natural ecological environment. This is because the functioning of natural ecosystems affects their ability to provide services for economic activities. The economy and the environment are interdependent—what happens in the economy affects the environment, which in turn affects the economy. This highlights that the economy and the environment form a unified system.

Ecological development will be sustainable if the base of natural resource availability remains stable and waste disposal does not exceed the environment's absorption capacity. In addition, ecological problems that lead to land degradation or loss of soil fertility can be avoided. In developing sustainable agricultural strategies, it is expected to create agricultural technologies that can increase yields while remaining environmentally sound, by maintaining land quality, recycling nutrients, conserving water and energy use, controlling pests and

weeds, and sharing expertise with farmers in conserving land, water, and forest resources, using chemicals efficiently, and reducing or utilizing agricultural waste.

Existing sustainability studies largely emphasize technological intensification, productivity enhancement, and market-oriented agricultural transitions while overlooking indigenous non-market agricultural systems rooted in ecological ethics, communal governance, and food sovereignty. As a result, limited scholarly attention has been given to how indigenous communities sustain agricultural production through ecological-economic relations that prioritize environmental balance over market accumulation. This gap is particularly important in the context of global ecological crises and increasing concerns over the sustainability of industrial agriculture. In this context, the Kasepuhan Gelar Alam indigenous community in Sukabumi, Indonesia, represents an important case of ecological-economic sustainability. The traditional village of Kasepuhan Gelar Alam, although it strongly upholds its customary traditions, is very open and does not restrict outsiders who wish to stay in the village, whether for tourism, research, employment, or permanent residence. The customs of the Gelar Alam community are passed down from generation to generation, with one of the key traditions being rice farming activities. The Kasepuhan community emphasizes that no matter what happens, the people of Kasepuhan Gelar Alam will continue farming, as it is a tradition inherited from their ancestors. The natural topographical characteristics of the Gelar Alam area—fertile land, rice fields, and continuously flowing water throughout the year—have contributed positively to the ecosystem in Gelar Alam. The ancestral traditions practiced by the indigenous community have been preserved and continuously maintained. In this regard, as stated by Ahmad and Suryana, a region strives to utilize its local natural resources efficiently and in accordance with its ecological, social, economic, and cultural conditions to meet the needs of its community. This study contributes by conceptualizing Gelar Alam agriculture as an indigenous ecological-economic model of food sovereignty, emphasizing how communal governance, ecological ethics, and non-market rice production practices sustain socio-ecological resilience and environmental sustainability.

RESEARCH METHOD

Method

The approach used in this research is a qualitative one, using a case study. Qualitative research is a research approach that focuses on natural phenomena or symptoms. The case study method is a powerful approach for describing single or complex phenomena with various units of analysis, including individuals, groups (such as families or social classes), communities, organizations (such as schools or companies), and even the national level. This research can involve a single case or multiple cases (multi-case studies), depending on the research objectives and what the researcher wishes to discover or explain. Therefore, the author's rationale for using a qualitative approach is also related to the type of research. The author wants to understand the relationship between indigenous communities and nature in

production management, which aligns with the principles of economic ecology in mapping economic production activities in the rice farming sector in Kasepuhan Gelar Alam.

Research Subjects

The data collection technique used was purposive sampling. Purposive sampling is a technique in which data sources are sampled for a specific reason. To facilitate the researcher in examining the social item or situation being investigated, this specific reason can include, for example, the person who is considered most knowledgeable about what is expected, and the research subject who is also considered someone who has the most expertise regarding the object being studied. The target subjects selected as informants for this research on sustainable production systems are:

1. The Traditional Leader of Kasepuhan Gelar Alam.
2. The Head of the Agricultural Division in Kasepuhan Gelar Alam.
3. The Head of the Domestic Division in Kasepuhan Gelar Alam.

Data Collection and Analysis Techniques

The data collection techniques used in this research were in-depth interviews, observation, and document study. Data triangulation was used to test the validity of the data. The data analysis techniques used were those according to Miles and Huberman: data reduction, data presentation, and conclusion drawing.

RESULT AND DISCUSSION

Ecological Economics in Mapping Rice Agricultural Production among the Indigenous Community of Kasepuhan Gelar Alam

Ecological economics is a transdisciplinary effort to broadly connect the natural sciences and social sciences, particularly ecology and economics. Its aim is to develop a deeper scientific understanding of the complex relationships between humans and nature, and to use this understanding to formulate policies that lead to a world that is ecologically sustainable, has a fair distribution of resources (both among groups and generations, as well as between humans and other species), and efficiently allocates scarce resources, including “natural” and “social” capital. This requires a new approach that is comprehensive, adaptive, integrative, multiscale, pluralistic, evolutionary, and acknowledges the high level of uncertainty that exists. Ecological economics examines the relationship between humans and nature. Furthermore, according to Field & Field, economic progress can be achieved by adhering to basic ecological principles; however, if these principles are ignored, economic development is likely to fail.

According to Brown, ecological economists argue that the economy must take ecology into account in order to meet present needs without compromising the future. This concept emphasizes collaboration between economics and ecology as an essential step toward sustainable economic development, without giving absolute priority to either economics or ecology. In practice, the rice agricultural production activities of the Kasepuhan Gelar Alam

community have applied basic ecological principles. The ecological principles used as analytical tools in examining their production practices are based on those proposed by Capra and Ife, as follows:

1. Holistic Approach in Rice Production

Ecocentrism is an understanding that nature has intrinsic value independent of human interests. This perspective emphasizes that humans and other living beings have equal rights and value. It is a normative worldview that sees the universe and everything within it as inherently valuable, and based on this perspective, establishes norms for human behavior in interacting with nature. Based on interviews and observations of the Kasepuhan Gelar Alam community, they apply an ecocentric approach focused on environmental sustainability and maintaining ecosystem balance.

In practical terms, the community conducts tree planting annually to maintain soil fertility, enrich the environment, and preserve water sources:

“...every year, during the change of the year, everyone plants vegetation and trees to fertilize the soil, and especially to maintain water sources so that they do not become barren. This activity takes place once every year...”

Philosophically, this ecocentric principle is rooted in customary laws that prohibit environmental destruction, based on the belief that humans are an integral part of nature and must be responsible for it:

“How can we destroy nature when all our lives depend on nature?”

Thus, ecocentrism is deeply embedded in the practices of the Kasepuhan Gelar Alam community. This is reflected in their awareness, wisdom, and concern for maintaining environmental conditions, as well as their belief that humans are part of nature and must be accountable to it. They do not consider themselves superior to the natural environment, reflecting ancestral wisdom in preserving ecological balance.

Respect for life and nature is also manifested in their prohibition against selling or trading rice and rice seeds. This practice reflects the principle of non-market value in ecological economics, where natural resources and food are not exclusively valued through market exchange mechanisms but are socially, culturally, and spiritually embedded within community life. Rice in the Kasepuhan Gelar Alam community is therefore understood not merely as an economic commodity, but as a collective ecological and cultural asset essential for sustaining communal life and intergenerational continuity.

“Not selling rice and seeds is a form of respect for life and nature. What if our lives were sold to others? How could we live?”

They view this as a form of respect for nature and a way to maintain balance between humans and their environment. The prohibition on buying and selling rice within or outside the community is a crucial part of their culture, emphasizing respect for nature and avoiding the commodification of life.

The Kasepuhan community has a decision-making structure based on customary rules and the authority of the traditional leader (abah). Decisions related to rice production are made collectively, considering input from traditional leaders (rorokan):

“Yes, we usually follow the decisions of the abah, and the abah also receives input and opinions from the rorokan.”

This finding aligns with previous research by Citra Nurkamilah in the *Journal of Religious Studies* titled *Environmental Ethics and Its Implementation in Environmental Preservation in Kampung Naga*, which highlights that indigenous communities possess a deep understanding of ecocentric environmental ethics inherited from their ancestors.

Furthermore, the Kasepuhan community primarily uses organic fertilizers in rice farming, focusing on maintaining soil fertility naturally, while only using small amounts of inorganic fertilizers when necessary:

“...mostly organic, only a little chemical fertilizer as a stimulant. Organic is used more, especially manure, which is better...”

Rice seeds are carefully selected to ensure quality, and their approach reflects an understanding of soil fertility maintenance. This finding is consistent with research by Fandy Ahmad Siregar, which shows that organic fertilizers improve soil structure, increase fertility, reduce erosion, and enhance crop productivity.

This holistic approach reflects the community’s deep understanding of maintaining balance between humans and nature in sustainable rice production. They uphold customary values and local wisdom in protecting the environment, ensuring sustainability, and respecting life and natural wisdom.

2. Sustainability in Rice Production

In the context of agriculture, according to Yakin, sustainability can be viewed as maintaining stable agricultural productivity over time while allowing technological innovation to sustain productivity per unit area. According to MIPL, conservation refers to efforts to maintain balance, quality, function, and environmental capacity. Its goal is to preserve natural resources and ecosystem balance to support human welfare and quality of life.

One often overlooked aspect of agriculture in Indonesia is soil conservation. This is partly because the negative impacts of soil degradation are not immediately visible. However, without effective soil conservation, high productivity and agricultural sustainability cannot be guaranteed. Soil and water conservation methods generally include vegetative, technical, mechanical, and chemical approaches.

The Kasepuhan Gelar Alam community applies vegetative conservation techniques in their agricultural practices. They classify land into three types: entrusted forest (hutan titipan), protected forest (hutan tutupan), and cultivated land (hutan garapan), each serving different environmental, cultural, and resource management roles. As stated by an informant:

“We have entrusted forests, protected forests, and cultivated land... we cannot use protected forests; for farming, we are only allowed to use cultivated land.”

They preserve protected forests and only utilize cultivated land for agriculture. They also minimize chemical use and adopt crop rotation practices:

“We are committed to not using excessive chemicals so the soil remains fertile and nature is preserved. We also practice crop rotation—after planting rice, we plant other crops.”

Natural fertilizers are used to maintain soil fertility, and annual tree planting is also practiced.

The community also adopts a sustainable approach to resource use. They plant rice once a year, use water efficiently, and rely on natural water sources. Land management involves buffalo and traditional tools, reducing reliance on non-renewable energy. From the perspective of ecological economics, this agricultural system reflects the principle of limits to growth, which challenges the dominant paradigm of continuous production expansion and productivity maximization in industrial agriculture. Rather than pursuing unlimited growth, the Kasepuhan Gelar Alam community prioritizes ecological balance, soil regeneration, and long-term sustainability through controlled production practices and restrained resource exploitation.

“We only use water as needed... if necessary, we use irrigation water from Mount Halimun... for land processing, we use buffalo. Tractors use fuel and oil that can damage and pollute the soil.”

They reject pesticide use and believe it disrupts ecological balance:

“There are no pests, so why use pesticides? For what? To kill? Agriculture is a place of life—if life is destroyed there, the balance will be disturbed...”

This reflects strong environmental awareness and a long-term perspective on sustainability.

Economically, the Kasepuhan community adopts a sustainable economic approach based on local wisdom and ecological principles. They practice food diversification by cultivating vegetables, fruits, and fish alongside rice. However, rice remains central due to cultural and traditional values.

Capital (money) is not emphasized in rice production. Instead, the focus is on long-term food security rather than profit:

“There is no profit-loss system for rice. Since ancient times, we have always had sufficient rice supplies... rice farming is not about profit or loss.”

Rice is viewed as a means to sustain life rather than as a commodity.

Regarding technology, they deliberately maintain traditional practices in accordance with customary rules:

“For rice production, we cannot use modern technology; it must be manual and traditional.”

However, they still benefit from irrigation infrastructure, which supports productivity.

The community also applies anti-capitalist principles. Land is collectively owned and managed for communal benefit:

“There is no concept of ownership... land is for life. No one brings land at birth; it belongs to the Kasepuhan as a whole.”

Individuals are granted rights to cultivate land but not to own it privately. Seeds and tools are also shared collectively:

“Seeds can be given or borrowed, but not sold.”

This reflects values of cooperation, communal responsibility, and social equity.

Overall, the Kasepuhan Gelar Alam community adopts an ecological-economic approach that integrates sustainability, communal values, and environmental preservation. Their agricultural practices represent a balanced system between economy, ecology, and cultural traditions, offering an alternative model of sustainable agriculture rooted in local wisdom and collective responsibility.

3. Diversity in Rice Production

According to Capra, uniform patterns of life will naturally extinguish life itself because they contradict the very essence of life, which is diversity. In contrast, diverse patterns of life—multicultural systems—help sustain life because they enable partnerships, interdependence, and cyclical relationships as fundamental principles of ecology.

In the context of the Kasepuhan Gelar Alam community, sustainable agricultural practices emerge from respect for differences, particularly in the use of labor as a factor of production. This community consistently follows customary rules and limits the use of modern technology in their agricultural practices. This is reflected in the use of traditional tools such as sickles and mortars, and the rejection of modern equipment such as tractors and grass-cutting machines. This approach is reinforced by the view of the informant Kang Yoyo, who stated that agricultural land management must remain manual and traditional, without involving modern technology:

“We use one set of rules; there are no differences among farmers in practice because we follow customary law. The land management system from beginning to end must be manual and traditional. Anything related to rice must be manual and traditional—no modern tools are allowed. For example, tractors cannot be used; instead, buffalo are used. Cutting grass cannot be done with machines; it must be done with a sickle. Harvesting must be done one by one by hand. Carrying rice must be done manually. Processing rice into grains cannot use a huller machine; it must use a mortar.”

Similarly, according to the informant Aki Koyod, there is no place for modern technology in rice production because the Kasepuhan Gelar Alam community adheres to customary rules that have existed for centuries:

“As I said, rice production follows customary rules that have existed for generations, so there is no difference between me and others; everything is the same. Even if you ask all

the rorokan, the answer will be the same. Regarding technology, there is none in rice production; everything follows ancestral rules from 655 years ago.”

This approach reflects respect for cultural values, environmental balance, and the preservation of ancestral heritage. By adhering to long-standing customary rules, the community ensures that natural resource management and environmental balance are maintained sustainably. It also highlights the importance of preserving cultural diversity and respecting traditions in achieving sustainable agricultural goals. Overall, the Kasepuhan Gelar Alam community demonstrates how ecology and tradition can collaborate to achieve holistic sustainable agriculture, emphasizing the importance of managing both natural and cultural resources as key assets in maintaining balance between humans and the environment.

In facing changes and challenges in rice production, the community relies firmly on inherited customary rules and traditions rather than seeking innovative or creative solutions. They view customary law as the primary guide in addressing agricultural issues and consult traditional leaders such as the Abah for direction aligned with cultural values: “If we need a solution, we ask the Abah. We seek solutions, prayers, and blessings. Usually, the Abah provides solutions that align with customary rules.”

Spiritual aspects also play an important role in decision-making, reflecting deep respect for cultural heritage and traditional values. This underscores the importance of integrating ancestral knowledge with modern contexts in addressing agricultural challenges.

The Kasepuhan Gelar Alam community also demonstrates strong collaboration and communication among farmers, reflecting principles of decentralization and active participation. This occurs through regular monthly meetings known as “selamat bulan purnama” (full moon gatherings), where agricultural and community issues are discussed. As explained by Aki Koyod:

“Every month we hold a thanksgiving/full moon gathering in the middle of the month. Everyone must attend. The rorokan gather, discuss problems, and exchange ideas. It’s about sharing understanding and experiences. We meet once a month, and if there are problems in the village, they can be discussed and solutions can be found together, then conveyed to the Abah for final decisions.”

These meetings serve as a platform for discussion, knowledge exchange, and collective problem-solving. While the Abah holds the final decision-making authority, input from elders (baris kolot) and other members is considered:

“In Kasepuhan, we primarily follow the Abah as the leader, but he also asks the elders to help formulate solutions, although the final decision remains with him.”

This process strengthens community empowerment, allowing members to collaboratively address agricultural challenges and utilize collective knowledge for sustainable farming practices.

The Kasepuhan Gelar Alam community consistently maintains manual and traditional agricultural practices, using tools such as hoes, forks, and buffalo, while avoiding tractors and huller machines. This reflects the application of appropriate technology within their context. According to Presidential Instruction No. 3 of 2001, appropriate technology refers to technology that meets community needs, solves problems, does not harm the environment, and is easy to use while providing economic and environmental benefits.

Based on observations, the community adapts technology to their needs and conditions. For example, they use buffalo instead of tractors, traditional stoves instead of rice cookers, and manual tools instead of machines for processing rice. As stated by Kang Yoyo:

“For rice, we will never use modern technology. It must always be manual and traditional. For other things like phones or TVs, it’s allowed. But for rice, we cannot use rice cookers or machines; everything must remain traditional.”

This reflects their commitment to cultural values and aligns with the concept of appropriate technology, emphasizing suitability to local needs, culture, and environmental conditions.

In dealing with disturbances or changes, the community relies on customary values rather than formal contingency strategies. This reflects the concept of diversity of relationships, which suggests that systems with diverse relationships are more resilient to change. The Kasepuhan Gelar Alam community builds diverse relationships through customs, traditions, and social systems, enabling them to adapt to challenges:

“There are no disruptions from planting to harvesting, even until pounding the rice; everything remains the same according to ancestral rules.”

By adhering to inherited customs, they create stability and flexibility in addressing challenges, even without formal emergency plans. This highlights the importance of traditional values and relational diversity in maintaining community resilience in the face of change.

4. Balance in Rice Production

Cultural identity refers to an understanding of something that is identical with or represents a particular culture. According to Ting-Toomey, cultural identity is the emotional significance of an individual’s sense of belonging or affiliation with a particular culture. Identity itself refers to the distinctive characteristics of an individual or members of a social group. Derived from the Latin word *idem* (meaning “the same”), identity implies similarity or unity within a certain context (Rummen, 1993:157–159). Cultural identity, according to Dorais (1988), is a fundamental awareness of a group’s distinctive characteristics, including ways of life, customs, language, and values.

Interviews with informants demonstrate a deep awareness and commitment to preserving local wisdom in the context of globalization. This commitment is strongly emphasized by Kang Yoyo, who highlights the responsibility to pass down traditional

knowledge and cultural values in agriculture, particularly the use of locally adapted rice varieties:

“For us, preserving local wisdom is both an honor and a responsibility. We continuously pass down traditional knowledge in rice cultivation, such as using local varieties that are well adapted here. At the same time, we strive to teach these values to the younger generation so they can continue our agricultural cultural heritage.”

This transfer of knowledge goes beyond technical aspects of rice cultivation and includes the transmission of cultural values to future generations, reflecting the concept of cultural identity in a globalized context. Aki Koyod further emphasizes that preserving local wisdom is not merely about survival but about living in accordance with customary rules. Rice farming traditions are seen not only as a production method but also as a way of life passed down through generations:

“I feel that preserving local wisdom is more than just survival; it is about ensuring that we live according to customary rules. We firmly uphold rice farming traditions—‘agriculture is to be nurtured, not worshipped.’ This value is not only a way of producing but also a way of life that we pass on to future generations.”

This aligns with the concept of cultural identity, which encompasses ways of life and value systems upheld by a group. By maintaining rice cultivation traditions, the community preserves its cultural identity amid globalization. The application of cultural identity theory helps explain how the preservation of local wisdom becomes an inseparable part of the community’s identity. Their collective commitment not only reflects practical actions but also forms a strong foundation of identity, representing a response to globalization while maintaining cultural continuity.

The theory of equilibrium (balance) emphasizes harmony and partnership in interactions between men and women. This perspective highlights that both genders should collaborate harmoniously in family, community, and societal life. Gender is understood as roles and behaviors shaped by culture and time.

In the Kasepuhan Gelar Alam community, gender equality and women’s participation in rice production reflect strong cultural values of cooperation and mutual support. As explained by Kang Yoyo:

“All agricultural processes are carried out together and support one another. For example, during planting (*nutu*), women plant the rice seeds while men help carry them. During harvest, men and women work together. This reflects the spirit of cooperation and togetherness among farmers in Kasepuhan Gelar Alam.”

Similarly, Aki Koyod stated:

“Yes, women also participate alongside their husbands—from land preparation to harvest. For example, during *nutu*, women perform the pounding, while men carry the seeds. Everything is done together.”

This aligns with gender equality theories that emphasize recognizing and respecting women's roles in agriculture. Women actively participate in all stages of rice production, from planting to harvesting, demonstrating acknowledgment of their contributions. Task division is based on capability rather than gender—for instance, women are responsible for pounding rice, while men assist in transporting seeds. This reflects a practical and skill-based approach rather than gender-based division.

The concept of active participation of women in decision-making is also evident. Husbands and wives collaborate in all aspects of agriculture, including decision-making processes, highlighting the importance of women's voices in agricultural management. This finding is supported by research by Ni Luh Sinta Yani, which identifies factors influencing women's involvement in agriculture, although in Kasepuhan Gelar Alam, participation is driven not by economic pressure but by customary rules.

Overall, gender equality practices in Kasepuhan Gelar Alam reflect strong cultural values of cooperation, fairness, and recognition of women's roles, enriching our understanding of sustainable traditional agricultural systems.

Agricultural practices in Kasepuhan Gelar Alam, which emphasize environmental sustainability and respect for ancestral traditions, align with concepts in agroecology, sustainable agriculture, and environmental ethics. Although the community may not use formal monitoring systems, they demonstrate a strong awareness of their social responsibility toward the environment.

Agroecology, as a holistic approach integrating ecological, social, and economic aspects, is highly relevant in this context. Practices such as planting rice only once a year to allow land recovery, maintaining soil fertility, and increasing organic matter reflect agroecological principles. As stated by Aki Koyod:

“So far, there has been no soil damage. We plant only once a year to allow the land to rest...”

These practices prevent land degradation and ensure long-term productivity, aligning with agricultural sustainability principles. Environmental ethics are also evident, as the community emphasizes moral responsibility toward nature and respects it as an entity that must be preserved.

In addition, rice farming in Kasepuhan Gelar Alam reflects a subsistence agriculture model, focusing on meeting local food needs and preserving cultural traditions rather than producing for external markets. Agricultural management is based on inherited knowledge and traditions:

“Only the indigenous community gathers for customary activities.”

This approach prioritizes cultural preservation and food security within the community. However, it also indicates limited collaboration with external farming communities. In an increasingly interconnected global context, collaboration could provide

opportunities for knowledge exchange and addressing shared challenges such as climate change.

Nevertheless, the Kasepuhan Gelar Alam community deliberately maintains its traditional agricultural practices to preserve ancestral teachings and cultural values, rejecting forms of modernization that contradict their customs. This aligns with research by Diana Andayani Djoh, which shows that while some communities adapt to modernization, they still maintain cultural values.

Thus, agricultural practices in Kasepuhan Gelar Alam reflect a strong commitment to cultural preservation and identity while also highlighting the importance of balancing cultural continuity with potential external engagement in achieving sustainable agricultural development.

Flexibility in Rice Production

The adaptive practices observed in rice production among the Kasepuhan Gelar Alam community reflect their ability to respond to climate change and agricultural uncertainty. These practices also demonstrate economic resilience and sustainability in their rice production system. Their approach to selecting planting times based on weather conditions and optimal soil readiness illustrates a deep understanding of agroecological principles. Agroecology emphasizes aligning agricultural practices with ecological conditions, and choosing the right planting time according to natural cycles is one of its key principles.

In this context, the Kasepuhan Gelar Alam community adopts an agroecological approach that helps reduce the risk of crop failure and optimize yields. Their wise perspective on harvest outcomes is reflected in Aki Koyod's statement:

“Here, the system is once a year, and there are calculations—it's not random planting... now the weather is unpredictable, unlike before. If there is too much rain during flowering, the yield is not very good. But for rice, there is no concept of loss, so it does not affect our livelihood.”

Although their agricultural system is carefully designed, they cannot avoid the impacts of climate change. Aki Koyod acknowledges that irregular rainfall patterns and increased intensity affect harvest outcomes. These changes create new challenges in maintaining ecological balance and food security within the community. Despite this, their commitment to sustainability remains strong.

Their perspective of not recognizing a “loss system” in rice production reflects gratitude and resilience, even when productivity declines. Sustainable agriculture involves balancing economic, social, and ecological aspects, and their approach—choosing appropriate planting times and maintaining a wise outlook on harvest results—supports long-term sustainability. These practices strengthen resilience by minimizing economic risks while maintaining production stability.

Overall, the adaptive practices of the Kasepuhan Gelar Alam community demonstrate a strong understanding of agroecological principles, economic resilience, and agricultural

sustainability. Their ability to balance tradition and adaptation provides valuable lessons in addressing climate-related challenges in traditional farming systems.

Cooperation in Rice Production

According to Sumarto (2009:116), cooperation refers to partnerships between civil society, government institutions, or the private sector aimed at achieving specific goals based on trust, equality, and autonomy. The partnership between the Kasepuhan Gelar Alam community and the OISCA (Organization for Industrial, Spiritual and Cultural Advancement) from Japan reflects efforts to develop agriculture and empower the community. Community empowerment aims to strengthen local potential and foster independence.

The Kasepuhan Gelar Alam community has received training from OISCA to enhance skills in managing agricultural products such as vegetables and fruits. As explained by Aki Karma:

“For land management, there is assistance from Japan. My children participated, but I did not. It is mainly for training in managing vegetables, livestock, seeds, land, and treatments... but not for rice, because rice follows customary rules.”

Although this partnership focuses on crops such as vegetables (e.g., chili), the community strictly adheres to traditional rules in rice farming. This reflects a balanced approach where innovation is accepted selectively without compromising cultural values.

“Yes, with OISCA it is for empowerment, but only for vegetables and other crops. Rice still follows customary rules.”

The development of vegetable farming helps diversify income sources and improve community welfare. While open to innovation, the Kasepuhan Gelar Alam community remains committed to preserving traditional rice farming practices. This partnership demonstrates how traditional values and modern innovation can coexist to enhance agricultural development and community empowerment.

According to Leonardo Boff, environmental conservation involves loving, maintaining, protecting, and sustaining nature for future generations. For the Kasepuhan Gelar Alam community, environmental preservation is a fundamental principle in agriculture. It involves maintaining a balance between natural resource use and agricultural production processes. This perspective aligns with sustainable agriculture, which emphasizes soil fertility, biodiversity, and prevention of environmental degradation.

As stated by Kang Yoyo:

“For me, conservation means maintaining balance between natural resource use and production. It includes preserving soil fertility, biodiversity, and avoiding environmental degradation. This is important because we depend on agriculture for our livelihood, and conservation ensures sustainability for future generations.”

Maintaining soil fertility is seen as essential for long-term productivity, consistent with sustainable agriculture theory, which highlights soil degradation as a threat to food security.

Environmental preservation is also closely tied to customary rules inherited from ancestors. As explained by Aki Koyod:

“Environmental preservation means strengthening the customs passed down by our ancestors... we cannot arbitrarily burn forests or open land; there are rules and timing. We must protect inherited nature, with clear boundaries—entrusted forests, protected forests, and cultivated land. We must also plant trees every year.”

This reflects the internalization of ecological values embedded in local wisdom. Environmental management in this community is based on protecting ecosystems while respecting natural limits. Such strategies are effective in maintaining sustainability and ecological balance.

The Kasepuhan Gelar Alam community maintains harmony between humans and nature. Rice farming is conducted only once a year in accordance with customary rules, reflecting respect for natural cycles. As stated by Aki Karma:

“Rice is planted once a year; other crops are optional. Humans need rice to live, so planting must follow rules and rituals. Customary rules respect nature, as shown in every ritual related to rice.”

Their agricultural system is deeply rooted in cultural values, including land classification into cultivated land, protected forest, and entrusted forest. This ensures balance between production and conservation.

From an ecological economics perspective, the practices of the Kasepuhan Gelar Alam community reflect sustainable agriculture principles that emphasize balanced interaction between humans and the environment. Their respect for customary rules aligns with environmental conservation principles that prioritize traditional practices in preserving nature.

Overall, environmental preservation in Kasepuhan Gelar Alam represents a concrete example of how communities can practice sustainable agriculture by integrating cultural values with ecological knowledge. This is consistent with research by Suparmini et al. on the Baduy community, which highlights how local wisdom-based environmental management supports sustainability. Both communities demonstrate that strong adherence to cultural values and ecological principles can effectively maintain environmental balance and ensure long-term sustainability.

Cooperation in Rice Production

According to Sumarto (2009:116), cooperation refers to partnerships between civil society, government institutions, or the private sector aimed at achieving specific goals based on principles of trust, equality, and autonomy. The partnership between the Kasepuhan Gelar Alam community and OISCA (Organization for Industrial, Spiritual and Cultural Advancement) from Japan reflects efforts to develop agriculture and empower the community. Community empowerment aims to strengthen local capacities and promote self-reliance.

The Kasepuhan Gelar Alam community has received training from OISCA to enhance skills in managing agricultural commodities such as vegetables and fruits. As stated by Aki Karma:

“For land management, there is assistance from Japan. My children participated, but I did not. It focuses on training in vegetables, livestock, seeds, land, and treatments... but not for rice, because rice follows customary rules.”

Although this partnership focuses on non-rice commodities such as vegetables (e.g., chili), the community strictly adheres to customary rules in rice farming. This reflects a selective adoption of innovation without compromising cultural values.

“Yes, with OISCA it is for empowerment, but only for vegetables and other crops. Rice still follows customary rules.”

The development of vegetable farming contributes to income diversification and improved community welfare. While open to innovation, the Kasepuhan Gelar Alam community remains committed to preserving traditional rice farming practices. This partnership illustrates how traditional values and modern innovations can coexist in supporting agricultural development and community empowerment.

Environmental Conservation

According to Leonardo Boff, environmental conservation involves loving, maintaining, protecting, and sustaining nature for future generations. For the Kasepuhan Gelar Alam community, environmental preservation is a fundamental principle in agricultural practices. It emphasizes maintaining a balance between natural resource utilization and agricultural production processes. This perspective aligns with sustainable agriculture, which highlights soil fertility, biodiversity, and the prevention of environmental degradation.

As expressed by Kang Yoyo:

“For me, conservation means maintaining balance between natural resource use and production. It includes preserving soil fertility, biodiversity, and avoiding environmental degradation. This is important because we depend on agriculture for our livelihood, and conservation ensures sustainability for future generations.”

Maintaining soil fertility is considered essential for long-term productivity, consistent with sustainable agriculture theory, which identifies soil degradation as a major threat to food security.

Environmental preservation is also closely linked to customary rules inherited from ancestors. As explained by Aki Koyod:

“Environmental preservation means strengthening the customs passed down by our ancestors... we cannot arbitrarily burn forests or open land; there are rules and timing. We must protect inherited nature, with clear boundaries—entrusted forests, protected forests, and cultivated land. We must also plant trees every year.”

This reflects the internalization of ecological values embedded in local wisdom. Environmental management within the community is based on protecting ecosystems while respecting natural boundaries, which contributes to sustainability and ecological balance.

The Kasepuhan Gelar Alam community maintains harmony between humans and nature. Rice cultivation is conducted once a year in accordance with customary rules, reflecting respect for natural cycles. As stated by Aki Karma:

“Rice is planted once a year; other crops are optional. Humans need rice to live, so planting must follow rules and rituals. Customary rules respect nature, as shown in every ritual related to rice.”

Their agricultural system is deeply rooted in cultural values, including land classification into cultivated land, protected forest, and entrusted forest, ensuring balance between production and conservation.

From an ecological economics perspective, these practices reflect sustainable agriculture principles that emphasize a balanced interaction between humans and the environment. Their adherence to customary rules aligns with environmental conservation principles that prioritize traditional ecological knowledge.

Overall, environmental conservation in Kasepuhan Gelar Alam represents a concrete example of how communities can implement sustainable agriculture by integrating cultural values with ecological knowledge. This is consistent with research by Suparmini et al. on the Baduy community, which demonstrates that local wisdom-based environmental management supports sustainability. Both communities highlight that strong adherence to cultural values and ecological principles effectively maintains environmental balance and ensures long-term sustainability.

a. Sustainable Agriculture

According to Salikin, there are five criteria for managing an agricultural system to achieve sustainability, which can be associated with the rice farming system of the Kasepuhan Gelar Alam community:

1. Economic Viability

The agricultural system in Kasepuhan Gelar Alam emphasizes economic feasibility for farmers and their families. Their traditional farming practices are not only aimed at fulfilling food needs but also at providing a sustainable livelihood. Furthermore, the use of traditional tools and techniques helps reduce external costs, thereby minimizing negative impacts on both society and the environment.

2. Ecologically Sound and Friendly

The Kasepuhan Gelar Alam community pays close attention to ecological balance in their agricultural practices. They actively preserve local ecosystems and maintain natural resources. Their farming approach integrates ecological systems comprehensively and focuses on the maintenance and restoration of agricultural resources, aligning with this criterion.

3. Socially Just

The agricultural system is grounded in strong social values. The community respects the rights of individual farmers and upholds fair access to resources, information, and markets. They also emphasize intergenerational sustainability, practicing agriculture with the belief that land and cultural heritage must be passed on to future generations.

4. Culturally Appropriate

The farming system is deeply aligned with cultural values, traditions, and religious beliefs. The community places significant importance on local knowledge systems and farmers' perspectives, which play a central role in planning and implementing agricultural practices.

5. Systems and Holistic Approach

Agricultural practices in Kasepuhan Gelar Alam are based on a holistic perspective that considers all aspects of life, including biophysical, social, economic, cultural, and political dimensions. Agriculture is viewed as an integral part of a larger system that interacts dynamically with external activities and other factors influencing sustainability.

Overall, rice farming practices in Kasepuhan Gelar Alam reflect many of the essential criteria for sustainable agriculture as proposed by Salikin. The community has successfully maintained a balance between traditional agricultural practices and societal needs, while preserving strong cultural and ecological values.

In addition to balancing traditional rice farming practices with community food needs, food availability is a key parameter in achieving food security. According to Eicher, food security is reflected in the fulfillment of food availability, distribution, and consumption, which in turn indicates the adequacy of nutritional intake and the health condition of individuals.

The average number of *leuit* (traditional rice barns) illustrates the level of rice availability within the Kasepuhan Gelar Alam community. Based on research conducted by Ikmaludin et al. in the study “*Typology of Agricultural Cultivation Systems and the Sustainability of Food Availability in the Kasepuhan Gelar Alam Community, Sukabumi*,” the average number of rice barns per household is 2.08 units. Each barn generally has a capacity of approximately 300–1,000 bundles of rice, equivalent to around 1,500–3,500 kg of dry unhusked rice (with one bundle averaging 4–5 kg of dry grain).

Table 1. Household Food Availability Based on Leuit

Leuit Characteristics	Average per Household
Number of Leuit (units)	2.08
Amount of Rice in Leuit (bundles)	400.88

The analysis in Table 2 shows that the agricultural land carrying capacity level in the Kasepuhan Gelar Alam community is 1.44, which is in class II according to the

agricultural land carrying capacity classification. This indicates that the Kasepuhan Gelar Alam community has a high agricultural land carrying capacity index. An agricultural land carrying capacity index of 1.44 generally indicates that the Kasepuhan Gelar Alam community is capable of achieving food self-sufficiency. This value indicates that the rice supply for consumption by the Kasepuhan Gelar Alam community far exceeds demand. This aligns with Susanto's statement that the surplus land carrying capacity indicates that the local land availability is still sufficient to meet the needs of biological production in the region.

Table 2. Land Carrying Capacity Value

Harvested Land Area (ha)	Sample Population	Minimum Physical Requirement (kg/capita/year)	Average Land Productivity (kg/ha)	Agricultural Land Carrying Capacity
48,115	186	124.80	694.07	1.44

Thus, the local cultural wisdom of the Kasepuhan Gelar Alam community demonstrates positive results in meeting their rice needs.

b. Mapping of Rice Agricultural Production in Kasepuhan Gelar Alam



Figure 2. Kasepuhan Gelar Alam Production Map – Gelar Alam

The Kasepuhan Gelar Alam traditional village relocated 2 km from its original location, Kasepuhan Gelar Alam, to Kasepuhan Gelar Alam. This relocation was due to the Kasepuhan's tradition of ngalalakon, which is carried out at the behest of the ancestral leader as a form of obedience to ancestral traditions.

At the rice production points shown on the map, three coordinate points are identified, as follows:

1. Leuwit Kasepuhan Cipatgelar, coordinates S0648'25.5" / E106030'23.6"

This coordinate point houses the leuwit kasepuhan or leuwit rurukan, owned by the incumbent Kasepuhan leader (father). This leuwit is where the rice harvested from the upland and rurukan rice fields is stored. This leuwit also serves to store unhusked rice for a longer shelf life. This is where a process called pare girik (a traditional rice

deposit) occurs, where residents contribute to customary or *rurukan* (tax) contributions, with the amount spent equal to the initial seed cost. The *leuwit* serves as a storage area for harvested rice. In the context of sustainable agriculture, proper rice storage is crucial to prevent waste and ensure year-round food availability. The *leuwit* helps maintain the quality and quantity of stored rice, in accordance with the principle of sufficient food availability. During dry seasons or declining rice production, the *leuwit* serves as a food reserve. This reflects the concept of food security in sustainable agriculture, where effective rice storage helps communities cope with uncertainties in food production due to seasonal changes. 2. Saung Lisung Kasepuhan Gelar Alam was obtained at coordinates S0648'26.5" / E10630'23.1" and Saung Lisung at coordinates S0648'20.6 / E106030'22.5.

At these coordinates, the Saung Lisung is a simple structure consisting of a roof and four supporting pillars. It serves as a place for processing paddy into rice using a pounding method. For traditional Sundanese people, the Saung Lisung plays a crucial role in the rice farming process. While the *leuit* is used to store paddy, the Saung Lisung is used to process the paddy into rice. Inside the Saung Lisung, there are tools such as a pestle and mortar used in the rice pounding process. The Saung Lisung is a clear example of utilizing local resources in the agricultural process. By utilizing this simple structure, traditional Sundanese people reduce their dependence on modern technology or external resources that can negatively impact the environment. This reflects the principles of ecological economics, which emphasize the sustainable use of local resources and the balance between rice production and local ecological balance. Traditional agricultural practices involving saung lisung can help prevent environmental degradation and maintain soil fertility.

CONCLUSION

Based on the results of research on economic ecology, this study reveals the dynamic relationship between humans and nature in the rice production process. Harmony between humans and nature is a principle that underlies almost all aspects of their agricultural practices. In rice production activities, the Kasepuhan Gelar Alam community continues to consider ecology as part of the environment and ecosystem. The Kasepuhan community views nature as an entity that has value in itself, independent of human interests, and they respect nature and uphold customary rules in preserving the environment. Overall, the agricultural practices of the Kasepuhan Gelar Alam community reflect their wisdom and ability to cope with climate change by planting rice once a year according to the selection of planting times that align with star calculations with optimal weather and soil conditions, combining tradition and innovation, and maintaining cultural and natural sustainability by implementing back-to-nature farming.

The Kasepuhan Gelar Alam Community is a sustainable human community based on ecological principles, so this community carries out sustainable agriculture where rice

agricultural resources to meet the needs of the Kasepuhan Gelar Alam Community while maintaining the ecosystem or improving environmental quality by practicing tree planting conservation, not using pesticides that pollute water and are resistant, also prioritizing the use of organic fertilizers in producing rice and preserving natural resources this also makes Kasepuhan Gelar Alam in implementing food self-sufficiency so that the supply of rice for consumption by the Kasepuhan community is said to be surplus and sufficient for the needs of the next 20 years. The findings challenge dominant productivity-centered agricultural paradigms by demonstrating that long-term food security and environmental sustainability can be achieved through indigenous ecological knowledge, communal governance, and non-market agricultural practices rather than through intensive industrial production systems. They prove that sustainable agriculture is to achieve food security without damaging the environment, and environmental sustainability and pass on natural resources to future generations in the Kasepuhan Gelar Alam Community.

ACKNOWLEDGEMENT

We would like to express our deepest gratitude to all parties who have contributed to this research. Our sincere appreciation goes to our colleagues for their valuable suggestions, support, and inspiration throughout the research process. We also extend our heartfelt thanks to all participants and respondents who generously dedicated their time to take part in this study. In addition, we would like to acknowledge the institutions and organizations that provided support and facilities for the implementation of this research. Every contribution and assistance provided has been highly meaningful to the smooth execution and successful completion of this study. We truly appreciate all the hard work and collaboration that have been established throughout this research.

REFERENCES

- A. Sonny Keraf. (2010). *Environmental Ethics*. Jakarta: Kompas Book Publisher.
- Abidin, M. Zainul. (2021). "National Economic Recovery During the COVID-19 Pandemic: An Analysis of Labor Productivity in the Agricultural Sector." *Indonesian Treasury Review: Journal of State Treasury, Public Finance, and Public Policy*, 6(2), 117–138. <https://doi.org/10.33105/itrev.v6i2.292>
- Agustiati. (2009). "The Capitalist Economic System." *Capitalist Economic System*, 152–166.
- Ahfandi Ahmad. (2022). *Management of Food Production and Consumption in Society to Support Sustainable Agriculture*. Edited by Safrinal. West Sumatra: CV Azka Pustaka.
- Ahmadi, Rulam. (2016). *Qualitative Research Methods*. Yogyakarta: Ar-Ruzz Media.
- Aldianto, Rudi, Jasruddin, & Hidayah Quraisy. (2015). "Gender Equality Among Javanese Ethnic Transmigration Communities." *Equilibrium Pendidikan Sosiologi*, 3(1), 1–10.
- Arwati, Sitti. (2018). *Introduction to Sustainable Agricultural Science*. Makassar: CV Inti Mediatama.

- Ayun, Qurotu, Shidiq Kurniawan, & Wahyu Adhi Saputro. (2020). "The Development of Agricultural Land Conversion in an Agrarian Country." *Vigor: Journal of Tropical and Subtropical Agricultural Sciences*, 5(2), 38–44. <https://doi.org/10.31002/vigor.v5i2.3040>
- Bandur, Agustinus. (2019). *Qualitative Research: A Multidisciplinary Approach Using NVivo 12 Plus*. Bogor: Mitra Wacana Media.
- Barlian, Eri, & Iswandi U. (2021). *Human Ecology*. Sleman: Deepublish Publisher.
- Cavalcanti, Clóvis. (2010). "Conceptions of Ecological Economics: Its Relationship with Mainstream and Environmental Economics." *Estudos Avançados*, 24(68), 53–67.
- Costanza, Robert. (2019). "Ecological Economics." In *Encyclopedia of Ecology* (2nd ed., Vol. 4), pp. 258–264. <https://doi.org/10.1016/B978-0-12-409548-9.11124-8>
- Costanza, Robert. (2019). "Ecological Economics." University of Vermont, Burlington, VT, USA, 4, 258–264.
- Costanza, Robert. (2019). *An Introduction to Ecological Economics*. University of Groningen. Cambridge Core. <https://doi.org/10.1017/CBO9780511805547.003>
- Darmastuti, Rini. (2013). "Mindfulness in Intercultural Communication: Mindfulness in Intercultural Communication within the Samin and Rote Ndao Communities, East Nusa Tenggara." Book Chapter 5, p. 296.
- Djamal Irwan Zoer'aini. (2003). *Principles of Ecology: Ecosystems, Environment, and Conservation* (11th ed.). Jakarta: PT Bumi Aksara.
- Djoh, Diana Andayani. (2018). "The Impact of Modernization on Social Change in Farming Communities in Kambata Tana Village, East Sumba Regency." 2, 1–23.
- Emzir. (2011). *Data Analysis: Qualitative Research Methodology*. Jakarta: RajaGrafindo Persada.
- FAO. What Is Agroecology?
- Fathur, Reynaldi Pratama. (2019). "Government and Private Sector Partnership in the Semarang Tinjomoyo Market Program 2018 (Case Study: Tinjomoyo Tourism Forest, Semarang City)." *Journal of Politic and Government Studies*, 8(4), 251–260.
- Fransisca Erna S., Mohamad Harisudin, & Wiwit Rahayu. (2018). "Analysis of the Role of Agricultural Subsectors in the Development of Karanganyar Regency: A Comparative Performance Index Approach." *SEPA: Journal of Agricultural Socioeconomics and Agribusiness*, 14(1), 28. <https://doi.org/10.20961/sepa.v14i1.21040>
- Ghulamahdi, Munif, Sandra Arifin Aziz, & Maya Melati. (2022). *Agricultural Ecology* (1st ed.). Bogor: IPB Press.
- Gusti, N. I., Ketut Roni, Faculty of Animal Husbandry, & Udayana University. (2015). *Soil and Water Conservation Methods*, 1–30.
- Ikmaludin, Ikmaludin, Cecep Kusmana, & Suwaib Amirudin. (2018). "Typology of Agricultural Cultivation Systems and Sustainability of Food Availability in the Kasepuhan Gelar Alam Indigenous Community, Sukabumi." *Agricultural and*

- Environmental Policy Review, 5(1), 14–26.
<https://doi.org/10.29244/jkebijakan.v5i1.28756>
- Isbah, Ufira, & Rita Yani Iyan. (2016). “Analysis of the Role of the Agricultural Sector in the Economy and Employment Opportunities in Riau Province.” *Journal of Socio-Economic Development*, 7(19), 45–54.
- Julismin. (2013). “Impacts and Climate Change in Indonesia.” Department of Geography Education, Faculty of Social Sciences, State University of Medan, 5.
- Karmini. (2018). *Agricultural Production Economics*. East Kalimantan: Mulawarman University Press.
- Keraf, Sonny. (2013). “Fritjof Capra on Ecological Literacy.” *Diskursus: Journal of Philosophy and Theology*, 12(1), 54–81.
- Kristiyanto, Rijeng Kristiana, & Netty Demak H. Sitanggang. (2018). “Ecology-Based Agricultural Land Conservation in the Dieng Highlands, Wonosobo.” *National Seminar on Educational Science and Technology*, 108–119.
- Kurnia, Undang, & N. Sutrisno. (2008). “Agricultural Environmental Management Strategy.” *Journal of Land Resources*, 2(1), 59–74.
- Minister of Agriculture of the Republic of Indonesia. (2021). *Strategic Plan of the Ministry of Agriculture 2020–2024 (Revised Edition)*. Jakarta: Ministry of Agriculture.
- Ministry of Agriculture of the Republic of Indonesia. (2021). “Food Consumption Bulletin.” *Food Consumption Bulletin*, 12(1), 32–43.
- Niman, Erna Mena. (2019). “Local Wisdom and Efforts to Preserve the Natural Environment.” *Missio Journal of Education and Culture*, 11(1), 91–106.
<https://doi.org/10.36928/jpkm.v11i1.139>
- Nugroho, Adhi Setyawan. (2021). *Village Community Empowerment Based on Appropriate Technology*. Guepedia.
- Nurkamilah, Citra. (2018). “Environmental Ethics and Its Implementation in Natural Environment Preservation in Kampung Naga Community.” *Religious: Journal of Religious and Cross-Cultural Studies*, 2(2), 136–148.
<https://doi.org/10.15575/rjsalb.v2i2.3102>
- Pangannews.id. (2022). “BPS: Agriculture Contributes 12.98 Percent as One of the Top Three Contributors to National GDP.”
- Parmawati, Rita. (2019). *Ecology, Economy, Equity: An Effort to Balance Ecology and Economy*. Malang: UB Press.
- Rachman, Maman. (2022). “Conservation of Values and Cultural Heritage.” *Indonesian Journal of Conservation*, 8(1), 30–39.
- Rivai, Rudy Sunarja, & Iwan Setiajie Anugrah. (2011). “Concepts and Implementation of Sustainable Agricultural Development in Indonesia.” *Forum Penelitian Agro Ekonomi*, 29(1), 13–25. <https://doi.org/10.21082/fae.v29n1.2011.13-25>

- Santoso, Budi. (2006). "Language and Cultural Identity." *Language and Cultural Identity*, September 2006.
- Siregar, Robert Tua, Marihot Manullang, Sarintan E. Damanik, et al. (2019). "Fertilizer Subsidies to Increase Rice Production (Case Study in Silaen Village, Toba Samosir Regency)." 1(2), 96–107.
- Solahuddin, Soleh. (2009). *Agriculture: The Nation's Future Hope*. IPB Press.
- Suparmini, Sriadi Setyawati, & Dyah Respati Suryo Sumunar. (2015). "Environmental Conservation Among the Baduy Community Based on Local Wisdom." *Journal of Humaniora Research*, 18(1). <https://doi.org/10.21831/hum.v18i1.3180>
- Tanjung, Fahmi, Rafael Purtomo Somaji, & Badjuri. (2015). "Contribution of the Food Crop Subsector to Regional Income in Madiun Regency."
- Universitas Medan Area. "Productivity of Crop Plants." Fandy Ahmad Siregar, 1–11.
- Wardhana, A. M., M. I. Fauzi, R. P. Hendarti, & Arini. (2022). "The Role of Food Diversification in Facing the Food Crisis." *Post-Pandemic Economy Recovery*, 2(3), 20–29.
- Wijaksana, Gumilar, Muhammad Safri, & Parmadi Parmadi. (2017). "Contribution and Elasticity of Subsectors within the Agricultural Sector in Tebo Regency." *Jurnal Paradigma Ekonomika*, 12(2), 77–86. <https://doi.org/10.22437/paradigma.v12i2.3943>
- Yani, Ni Luh Sinta, & Luh Indrayani. (2021). "Women's Participation in the Agricultural Sector to Support Family Welfare from a Feminist Perspective (Case Study in Songan Village, Bangli, Bali)." *Ekuitas: Journal of Economic Education*, 9(2), 261. <https://doi.org/10.23887/ekuitas.v9i2.33065>
- Yudiarini, Nyoman. (2011). "The Transformation from Traditional Subsistence Agriculture to Commercial Agriculture." *Ejournal Undwi*, 2(1), 1979–3901.
- Yulianto, Kiki. (2016). "Agroecology: A Future Model of Sustainable Agriculture." *Science and Technology*, 1(3), 46–51.
- Yusuf, Maulana, Dede Suhendar, & Eko Hadisantoso Prabowo. (2014). July Edition, Volume VIII No. 1. UIN Sunan Gunung Djati Bandung, VIII(1), 159–181.
- Yusuf, Muri. (2015). *Quantitative, Qualitative, and Mixed Research Methods*. Jakarta: Prenadamedia Group.