

The Role of Cooperatives in Encouraging The Implementation of A Green Economy in The Agricultural Sector Based on Local Wisdom in Nganjuk Regency

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ABSTRACT

Sustainable agriculture based on a green economy is an urgent need to address the challenges of the climate crisis, land degradation, and farmers' high dependence on chemical inputs. Nganjuk Regency, as an agricultural region, has significant potential to develop environmentally friendly agriculture through the implementation of a green economy. However, adoption of these practices remains limited due to limited access to information, funding, and institutional arrangements. Cooperatives, as people-based economic institutions, play a strategic role in driving this transformation by providing access to financing, training, and facilitating sustainable supply chains. This research aims to analyze the role of cooperatives in promoting the implementation of green economy principles in the agricultural sector, by emphasizing local wisdom as a cultural value embedded in traditional agricultural practices. This study is crucial for strengthening local institutions and addressing the challenges of sustainable development in the agricultural sector. The targeted outputs of this research include publication in accredited national journals and other additional outputs (IPR, international proceedings, and textbooks) as well as providing policy recommendations for local governments in supporting the strengthening of the green economy in Nganjuk Regency. Thus, this research contributes to encouraging sustainable economic growth based on resource efficiency and environmental sustainability.

ABSTRAK

Pertanian berkelanjutan berbasis ekonomi hijau merupakan kebutuhan mendesak untuk menjawab tantangan krisis iklim, degradasi lahan, serta tingginya ketergantungan petani terhadap input kimia. Kabupaten Nganjuk sebagai daerah agraris memiliki potensi besar dalam mengembangkan pertanian ramah lingkungan melalui penerapan prinsip ekonomi hijau. Namun demikian, adopsi praktik tersebut masih terbatas akibat keterbatasan akses terhadap informasi, pembiayaan, dan kelembagaan. Koperasi sebagai lembaga ekonomi berbasis masyarakat memiliki peran strategis dalam mendorong transformasi ini melalui penyediaan akses pembiayaan, pelatihan, serta fasilitasi rantai pasok yang berkelanjutan. Penelitian ini bertujuan untuk menganalisis peran koperasi dalam mendorong implementasi prinsip ekonomi hijau pada sektor pertanian, dengan menekankan kearifan lokal sebagai nilai budaya yang telah melekat dalam praktik pertanian tradisional. Penelitian ini menjadi penting dalam rangka memperkuat kelembagaan lokal sekaligus menjawab tantangan pembangunan berkelanjutan di sektor pertanian. Luaran yang ditargetkan meliputi publikasi pada jurnal nasional terakreditasi serta luaran tambahan lainnya (HKI, prosiding internasional, dan buku ajar), serta memberikan rekomendasi kebijakan bagi pemerintah daerah dalam mendukung penguatan ekonomi hijau di Kabupaten Nganjuk. Dengan demikian, penelitian ini diharapkan dapat berkontribusi dalam mendorong pertumbuhan ekonomi berkelanjutan yang berbasis efisiensi sumber daya dan kelestarian lingkungan.



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INTRODUCTION

Climate change, environmental degradation, and dependence on chemical-based agricultural inputs have emphasized the importance of developing sustainable agriculture through a green economy approach. A green economy in the agricultural sector emphasizes not only productivity but also environmental sustainability and the long-term well-being of farmers (Pertiwi, 2023). Nganjuk Regency, as an agricultural region, has a strategic opportunity to encourage a

transformation towards sustainable agriculture, particularly through strengthening local institutions such as cooperatives.

Agricultural cooperatives not only function as economic institutions, but also have the potential to be agents of change in adopting environmentally friendly agricultural practices (Jayanti et al., 2023). The role of cooperatives in providing access to capital, technical assistance, and fair and sustainable harvest markets is crucial (Cahyani et al., 2022). On the other hand, local wisdom values such as natural resource management in harmony with nature (Javanese farming culture) are still strongly embedded in rural communities in Nganjuk and can be integrated into green economy principles (Septiandika et al., 2022). Unfortunately, the adoption of a green economy in the agricultural sector is still not optimal due to the lack of synergy between cooperatives, local governments, and farmers. Furthermore, there is not much research that specifically examines how cooperatives can become the driving force for implementing a green economy based on local wisdom (Sutikno et al., 2021).

From the background above, the problem in this research can be formulated, namely, what is the role of cooperatives in encouraging the implementation of a green economy in the agricultural sector based on local wisdom in Nganjuk Regency?

This research is crucial for identifying cooperative role models in supporting environmentally friendly agricultural practices based on local culture. The results are expected to inform policy for developing sustainable green agriculture and strengthening cooperative institutions in the Nganjuk area.

This study uses a descriptive qualitative approach to deeply understand the role of cooperatives in promoting green economic practices based on local wisdom in the agricultural sector. The problem-solving strategy was carried out through field studies, observations, and in-depth interviews with cooperative administrators, cooperative member farmers, and local stakeholders. This approach allows researchers to explore the relationship between local values and cooperative practices in supporting sustainable agriculture. Next, a thematic analysis was conducted to identify patterns in the role of cooperatives in facilitating green financing, environmentally friendly agricultural training, and marketing local organic products. This strategy was strengthened by data triangulation to increase validity. This approach is in accordance with that used by (Sudyantara, 2019) and (Khofifah Hany Amaria and Roma Ulinnuha, 2023), which demonstrated the effectiveness of qualitative methods in exploring the socio-economic dynamics of cooperatives in rural areas.

This research offers a new approach by integrating the concepts of green economy and local wisdom in the context of the role of cooperatives in the agricultural sector. Compared with previous research that focused more on the general economic aspects of cooperatives (Sutikno et al., 2021), this study emphasizes the importance of cooperatives as agents of change towards sustainable agriculture. Furthermore, this research considers local values viable within farming communities as an ethical and social foundation for implementing a green economy.

Another advantage of this problem-solving approach is the community-based, participatory approach used in data collection and analysis. Researchers view cooperatives not only as economic institutions but also as social nodes capable of transforming local wisdom values into environmentally friendly practices. This differs from previous approaches, which tended to be normative and structural (Tejomurti, 2018).

The novelty of this proposal lies in the synergy between a descriptive qualitative approach, local value-based thematic analysis, and an emphasis on the institutional role of cooperatives in the green transition. With this approach, the research not only produces descriptive data but also builds a conceptual model of how cooperatives can strengthen green agricultural systems based on local wisdom – a framework that has not been widely explored in previous studies (Cahyani et al., 2022); (Septiandika et al., 2022). In addition to focusing on a descriptive approach to cooperative practices, this research also offers novelty in the form of modeling the role of cooperatives as agents of transition towards sustainable agriculture. This model is developed through field findings that are processed thematically and visualized in a framework that represents the function of cooperatives in the aspects of financing, environmental education, distribution of results, and strengthening local values. This approach is not widely found in previous literature, especially those that examine cooperatives in the context of a green economy based on local culture. Thus, this research provides a conceptual contribution in the form of systemic modeling based on field evidence and local wisdom.

This research is structured in a roadmap that includes three main stages: stages that have been achieved, stages that will be implemented within the research period, and stages planned for further development. In the initial stages achieved, researchers conducted a preliminary study through initial observations at several agricultural cooperatives in Nganjuk Regency and identified the potential for integrating the green economy and local wisdom. Furthermore, a literature review related to the green economy, cooperatives, and local wisdom was conducted.

The stages to be undertaken during the research period (current year) include: developing research instruments, collecting data through in-depth interviews and participant observation, thematic data analysis, and developing strategic recommendations based on field findings. This research will also produce one scientific article and a research-based policy paper. The planned stages for future development include the development of a green cooperative model based on local wisdom, the preparation of training modules for cooperatives, and the expansion of the study to other regions as a form of model replication and contribution to the development of sustainable agricultural policies based on local communities.

This research roadmap outlines the research team's ongoing research, from initial studies to the development of a green cooperative model based on local wisdom. The roadmap stages are as follows:

Table 1 *Roadman Research Design*

Year	Research Stage	Description
2023	Preliminary Study	Initial exploration of cooperatives and local agricultural practices in Nganjuk.
2024	Exploratory Publication	Publication of initial findings on cooperatives and the green economy (exploratory level).
2025	Main Research Implementation	Implementation of the main research (PDP proposal) to examine the role of cooperatives in promoting a green economy based on local wisdom.
2026	Model Development & Training	Development of a green cooperative model guideline and provision of training to cooperative partners.
2027	Replication & Dissemination	Replication and testing of the model in other districts/cities in East Java, followed by international publication.

Source: *Researcher's (2023)*

RESEARCH METHOD

This study uses a descriptive qualitative approach, which aims to deeply understand the role of cooperatives in encouraging the implementation of a green economy in the agricultural sector based on local wisdom in Nganjuk Regency. This approach was chosen because it is able to explore meanings, perceptions, and socio-cultural practices that cannot be explained quantitatively (Chu, PH. and Chang, 2017).

Data collection was conducted through in-depth interviews with cooperative administrators, farmer members, traditional/local leaders, and representatives from relevant agencies. In addition, participant observation was conducted to document agricultural practices that reflect green economic values and local wisdom (Mahendra and Bawono, 2022). Documentation and literature studies were also used to strengthen field findings. The data obtained were analyzed using a thematic analysis approach, which is the process of identifying, analyzing, and reporting patterns or themes that emerge from qualitative data (Braun and Clarke, 2022). The analysis steps include data transcription, familiarization, initial coding, theme search, theme review, theme definition and naming, and report preparation (Kartikasari and Rahayu, 2018). To ensure the validity of the data, source and method triangulation techniques were used (Alfansyur and Mariyani, 2020), as well as member checking with key informants to ensure that the researcher's interpretation corresponds to the reality on the ground.

This research focuses on agricultural cooperatives in Nganjuk Regency that have practices or potential to implement green economy principles. Informants were selected using purposive sampling, with certain criteria, such as active involvement in cooperative activities and the implementation of environmentally friendly agricultural practices. This method is expected to provide an in-depth understanding of how cooperatives can be catalysts in sustainable agricultural transformation based on local values, as well as generate policy recommendations and strategies for strengthening cooperatives in the context of a green economy (Miles and Huberman, 2007). The research flowchart is as follows:

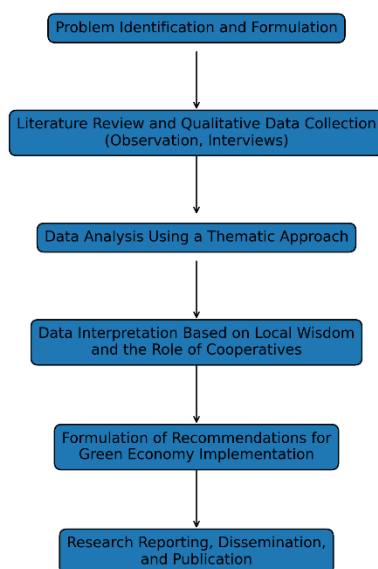


Figure 1 Sequential Research Framework Illustrating the Qualitative Approach to Analyzing the Role of Cooperatives in Advancing Green Economy Practices Based on Local Wisdom

In the data analysis process, in addition to identifying key themes regarding the role of cooperatives, this study will develop a conceptual model of cooperative roles based on field findings. This modeling is conducted using a thematic mapping approach that groups cooperative roles into strategic functions (such as education, financing, marketing, and preserving local values). This model will be visualized in diagram form to show the interrelationships between roles and actors, as well as the cultural and structural dimensions that support the implementation of a green economy.

This modeling process adapts a grounded visual framework approach and serves as the basis for developing policy recommendations. Validation was conducted through focus group discussions (FGDs) with cooperative partners, local leaders, and other stakeholders. The final result, a conceptual model, will be included in the article and output documents.

RESULT and DISCUSSION

The results of this study indicate that cooperatives play a fundamental role in strengthening the implementation of a green economy in the agricultural sector in Nganjuk Regency. Cooperatives function as intermediary institutions that not only facilitate economic transactions but also promote sustainable agricultural practices. The access to financing provided by cooperatives to farmers reduces dependence on capital from formal financial institutions, which is often burdensome, thus opening up space for the development of environmentally friendly farming businesses. This aligns with the findings of Sutikno (Sutikno et al., 2021), who emphasized the importance of cooperatives as drivers of transformation towards a green economy in rural areas.

Informant Questionnaire List

1. Informant: Cooperative Manager

Question: What is the role of cooperatives in supporting farmers to switch to environmentally friendly agricultural practices?

Answer: The cooperative provides access to low-interest capital for organic farming businesses and provides technical training on topics such as composting, natural pest control, and efficient water management. We also help market our green produce to ensure farmers have a secure market.

2. Informant: Cooperative Manager

Question: Are there any institutional innovations in cooperatives being undertaken to encourage a green economy?

Answer: We established a dedicated "green cooperative" unit that manages sustainable training programs, established partnerships with private institutions for organic product marketing, and began utilizing digital platforms to enable farmers' products to reach a wider market.

3. Informant: Farmer Member of Cooperative

Question: What benefits did you feel after participating in the cooperative program related to environmentally friendly agriculture?

Answer: My harvests are healthier, and the soil is fertile again because I'm not dependent on chemical fertilizers. Furthermore, the cooperative helps me sell organic produce at better prices, resulting in a more stable income.

4. Informant: Farmer Member of Cooperative

Question: What are the biggest challenges when transitioning to a sustainable farming system?

Answer: It was challenging at first because the initial costs of producing organic fertilizer were

higher and the plant care time was longer. We also struggled to access markets that truly valued environmentally friendly products.

5. Informant: Representative of Related Agency (Agricultural Service)

Question: What support does the local government provide to cooperatives implementing a green economy?

Answer: We provide technical assistance, organic seed assistance, and facilitate access to organic certification to increase market recognition for farmers' products. However, we acknowledge that specific regulations for green cooperatives still need strengthening.

6. Informant: Representative of the Related Agency (Cooperative Service)

Question: What is the government's strategy in strengthening green cooperative institutions?

Answer: We are designing a green cooperative management training program, promoting supply chain digitalization, and providing fiscal incentives for cooperatives that successfully increase sustainable agricultural production.

7. Informant: Senior Farmer/Farmer Group

Question: Do you see a change in farmers' attitudes after the role of cooperatives in the green economy?

Answer: Yes, many were hesitant to abandon chemical fertilizers in the past, but now they're starting to realize the benefits of fertile soil and lower production costs in the long run. Cooperatives give farmers the confidence to try new methods.

According to several questions to informants, beyond financing, cooperatives also play a role in providing training and technical assistance to their members. Knowledge of organic farming techniques, waste management, and renewable energy use provides added value to improving farmers' green literacy. A study by Suryani (Suryani and Suci Iriani Sinuraya, 2024) confirmed that community-based sustainable agriculture education programs can raise collective awareness and create more consistent behavioral changes among farmers.

The integration of local wisdom into cooperative activities is one of the key aspects identified in this research. Traditional practices such as mutual cooperation in irrigation management, the use of natural fertilizers based on livestock manure, and the tradition of "tandur bareng" (joint planting) not only strengthen social solidarity but also positively impact the sustainability of agricultural ecosystems. This reinforces the argument that a green economy is not solely oriented towards modern technology but can also be rooted in long-standing cultural values practiced by communities. However, despite the important role cooperatives have played, this study also identified several challenges. Limited institutional capacity of cooperatives, particularly in financial management and market access, remains a barrier to scaling up the implementation of a green economy. Handayani (Handayani et al., 2020) highlighted that rural cooperatives often face a dilemma between maintaining family principles and the need for greater economic efficiency.

Limited policy support from the local government is also a hindering factor. To date, there are no specific regulations explicitly encouraging the development of green cooperatives in Nganjuk Regency. However, supportive public policies can strengthen the position of cooperatives as agents of transformation towards sustainable agriculture. This is consistent with Yufuai (Yufuai et al., 2021) findings, which state that the successful adoption of a green economy is highly dependent on consistent and integrated regulatory support. Furthermore, green literacy among farmers remains relatively low. Despite training provided by cooperatives, not all members are able to fully adopt sustainable agricultural practices. This is due to limited time and resources, as well as resistance to

change from established conventional practices. According to Wardiman (Wardiman, 2019), social resistance to environmentally friendly agricultural innovations often arises from cultural factors, inherited habits, and perceived economic risks.

Market factors also play a crucial role. Sustainable agricultural products, such as organic vegetables, often face challenges in access to distribution and fair pricing. Without strong supply chain support, green products tend to lose out to cheaper conventional products. Cooperatives are expected to address this challenge by building broader marketing networks, both offline and digital. (Pakpahan et al., 2023) emphasize that digitizing cooperative supply chains can be a strategic solution for expanding the market for green products. Furthermore, the potential for multi-stakeholder partnerships presents a significant opportunity to strengthen green cooperatives. Collaboration between cooperatives, local governments, educational institutions, and the private sector can generate stronger synergies in supporting sustainable agriculture. An international study by the (Tarigan, 2020) shows that inclusive partnership models can accelerate the adoption of sustainable agriculture while improving the welfare of smallholder farmers.

This study also highlights the important role of the younger generation in agricultural cooperatives. The participation of young people, especially those who are tech-savvy, can be a catalyst in accelerating the digital transformation of green cooperatives. They have the potential to integrate digital innovations such as e-commerce, blockchain for supply chains, and smart farm management applications. According to (Panjaitan et al., 2020), the involvement of young people in cooperatives can increase competitiveness while maintaining member regeneration. Overall, this discussion confirms that cooperatives in Nganjuk Regency function not only as economic platforms but also as social and cultural agents with significant potential in encouraging the implementation of a green economy. Despite challenges, cooperatives remain significant as nodes of transformation that integrate local economic, ecological, and cultural aspects. Therefore, cooperatives can be seen as a key pillar in a sustainable agricultural development strategy based on local wisdom.

Qualitative Analysis Using Thematic Analysis (NVivo)

1. Data Familiarization, the data analyzed were obtained from in-depth interviews, participant observation, and related documents concerning agricultural cooperatives in Nganjuk Regency. The primary focus of the analysis is the role of cooperatives in promoting a green economy based on local wisdom.

2. Initial Coding, from the interview transcripts and observation results, several initial codes emerged:

- **Green financing:** access to low-interest capital and organic credit schemes.
- **Green training and literacy:** production of organic fertilizers, natural pest control, and water management practices.
- **Institutional innovation:** green cooperatives, digitalization, and partnerships with private sector actors.
- **Benefits for farmers:** improved soil fertility, healthier crop yields, and more stable income.
- **Adoption challenges:** high initial costs, limited market access, and farmer resistance to change.
- **Government support:** provision of organic seeds, certification processes, and management training.
- **Local wisdom:** mutual cooperation (*gotong royong*), traditional natural fertilizers, and collective planting traditions (*tandur bareng*).

- **Role of the younger generation:** supply chain digitalization, e-commerce utilization, and technological innovation.

3. Theme Development, the initial codes were then grouped into several major themes:

1. **Economic Role of Cooperatives:** Green financing (affordable capital); Marketing of organic products
2. **Educational Role:** Training in organic farming practices; Improvement of green literacy
3. **Socio-Cultural Role:** Mutual cooperation and local traditions; Collective planting (*tandur bareng*) as a form of community strengthening
4. **Innovation and Institutional Development:** Establishment of green cooperative units; Digitalization and private-sector partnerships
5. **External Support:** Role of local government; Regulatory and policy support
6. **Implementation Challenges:** High initial costs; Limited market access; Resistance to change

4. Reviewing Themes

The themes were subsequently reviewed to ensure coherence and relevance. The results were consistent with the research question regarding how cooperatives promote a green economy grounded in local wisdom.

5. Defining and Naming Themes

- **Economic Function:** cooperatives as providers of capital and market access.
- **Educational Function:** cooperatives as agents of green literacy and knowledge dissemination.
- **Socio-Cultural Function:** cooperatives as guardians of tradition and community solidarity.
- **Institutional Function:** innovation through green cooperative initiatives and digitalization.
- **Structural Function:** synergy with government institutions and regulatory frameworks.
- **Constraints and Challenges:** barriers to the adoption of green economy practices.

6. Development of the Thematic Narrative

The analysis indicates that cooperatives in Nganjuk function as transformation nodes that connect economic, social, cultural, and institutional dimensions.

- From an **economic perspective**, cooperatives provide green financing and access to organic product markets.
- From an **educational perspective**, cooperatives enhance farmers' skills through training and capacity-building programs.
- From a **socio-cultural perspective**, cooperatives integrate local wisdom such as *gotong royong* and traditional natural fertilizers into modern agricultural practices.
- From an **institutional perspective**, cooperatives promote innovation through the development of green cooperative models and digitalization.
- From a **structural perspective**, government involvement is crucial in supporting certification systems, policy frameworks, and regulatory assistance.
- Nevertheless, several challenges remain, including high initial investment costs, limited market access, and farmers' resistance to adopting new practices.

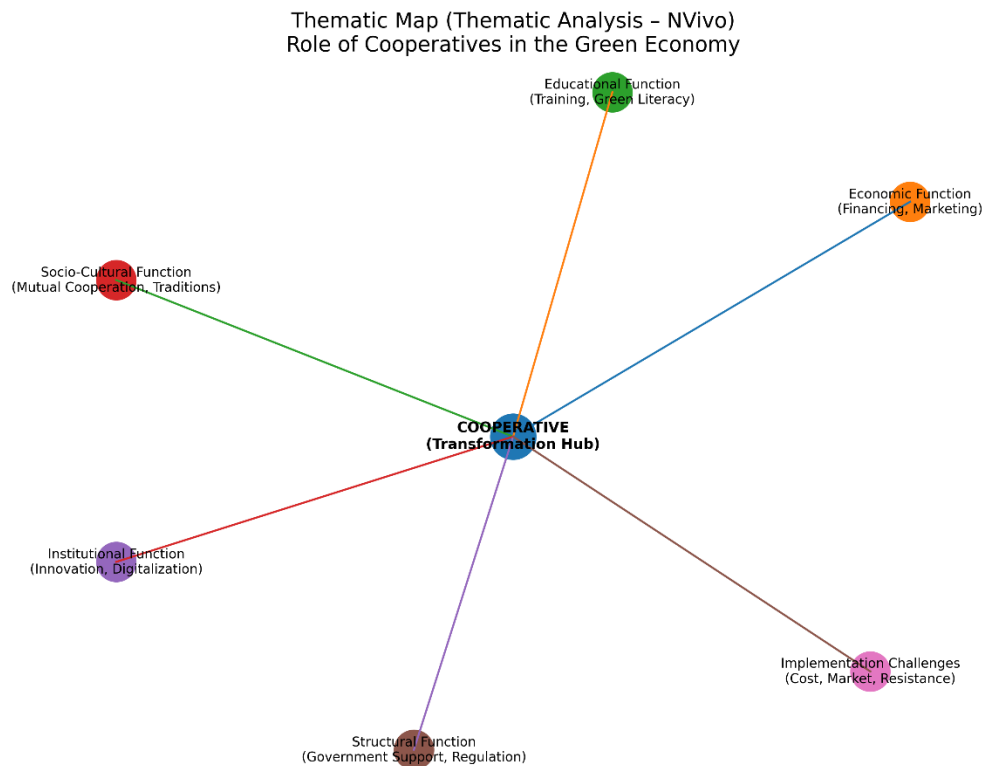


Figure 2 Thematic Map

DISCUSSION

Based on the research findings, the primary recommendation is for the Nganjuk Regency government to immediately formulate specific policies to support the development of green cooperatives. These policies could include providing fiscal incentives, facilitating access to green financing, and strengthening cooperative institutional capacity through ongoing training and mentoring programs. Clear regulatory support will provide stronger legitimacy for cooperatives in integrating local wisdom with sustainable agricultural practices. Furthermore, cooperatives themselves need to implement institutional innovation by improving green literacy and the managerial skills of their members. Digital technology-based training, supply chain management, and diversification of organic agricultural products should be a primary focus to enable cooperatives to adapt to global market changes. The role of the younger generation in this regard is crucial to ensure the sustainability of innovation and maintain the regeneration of cooperative members. The final recommendation is to encourage inclusive multi-stakeholder partnerships. Collaboration between cooperatives, the private sector, academia, and civil society can create a more robust green agriculture ecosystem. These partnerships not only support technical aspects but also strengthen the social and cultural legitimacy of adopting environmentally friendly practices. Therefore, this recommendation emphasizes the importance of cross-sector synergy in strengthening the role of cooperatives as the primary driver of green agriculture based on local wisdom.

CONCLUSION & IMPLICATION

This study concludes that cooperatives have a strategic role in promoting the implementation of a green economy in the agricultural sector based on local wisdom in Nganjuk Regency. The role of cooperatives extends beyond economic functions to encompass social and cultural functions that integrate traditional values into modern agricultural practices. These findings confirm that

cooperatives can serve as agents of change in reducing dependence on chemical inputs, preserving the environment, and improving farmer welfare. However, this study also identified significant challenges in the form of limited institutional capacity of cooperatives, low green literacy among farmers, and a lack of regional policy support. These factors could hinder the sustainable adoption of green agricultural practices if not promptly addressed through policy interventions and institutional innovation. Therefore, a more comprehensive and sustainable cooperative strengthening strategy is needed.

Considering the opportunities and challenges, cooperatives can be viewed as a key pillar in a sustainable agricultural development strategy based on local wisdom. Through policy support, institutional innovation, and multi-stakeholder partnerships, cooperatives have significant potential to become nodes of green economic transformation at the local level. These conclusions provide a foundation for further research and practical recommendations for stakeholders in strengthening the green agricultural ecosystem in Nganjuk Regency.

This study still suffers from limitations in terms of its regional scope and relatively limited number of informants. Therefore, it is recommended that future research expand its scope to other areas outside of Nganjuk Regency to obtain a more comprehensive picture of the role of cooperatives in implementing a green economy. Furthermore, the use of quantitative methods or a combination of methods (mixed methods) can be considered to provide more measurable data and enrich the qualitative analysis. Furthermore, future research should also pay special attention to the role of the younger generation in the development of green cooperatives and the use of digital technology to strengthen sustainable agricultural supply chains. A more in-depth analysis of public policy is also crucial to identify the extent to which regional and national regulations contribute to strengthening cooperative institutions. Thus, further research can make a more significant contribution, both academically and practically, in supporting the transformation of agriculture toward a green economy based on local wisdom.

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