

## Implementation of ESG in the Agricultural Sector to Support Sustainable Agriculture in Indonesia

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**Abstract:** This study aims to analyze the application of the Environmental, Social, and Governance (ESG) concept in the agricultural sector to support sustainable agriculture in Indonesia. The research is motivated by the increasing challenges in the agricultural sector such as climate change, environmental degradation, low farmer welfare, and weak agricultural governance that impact the sustainability of the national agricultural sector. The ESG concept is presented as a sustainable development approach that emphasizes the balance between environmental, social, and governance aspects in agricultural activities. The research method used is qualitative research with a descriptive approach. Data analysis techniques use the interactive model of Miles, Huberman, and Saldaña which includes data reduction, data presentation, and extraction. The results of the study indicate that the application of ESG in the agricultural sector in Indonesia has a significant influence in supporting sustainable agriculture. The environmental aspect influences natural resource management, environmental conservation, and reducing the negative impacts of agricultural activities on the ecosystem. The social aspect influences the improvement of farmer welfare and empowerment through training, institutional strengthening, and social protection. Meanwhile, the governance aspect influences transparency, accountability, and the effectiveness of agricultural sector governance. However, ESG implementation still faces various obstacles such as low farmer literacy, limited access to technology and financing, and suboptimal government policy support.

**Keywords:** ESG, Sustainable Agriculture, Environmental social governance, farmer welfare and the Indonesian agricultural sector

### Introduction

The agricultural sector is a strategic sector in Indonesia's economic development due to its crucial role in food supply, employment, poverty alleviation, and maintaining the socio-economic stability of rural communities. As an agricultural country, Indonesia remains heavily dependent on agricultural activities to support national food security and improve public welfare. However, amidst the development of globalization and economic modernization, the agricultural sector faces increasingly complex challenges, ranging from climate change, environmental degradation, limited access to technology, low farmer welfare, and weak sustainable agricultural governance. In recent years, sustainability issues have become a major international concern, including in the agricultural sector. Agricultural activities that do not pay attention to sustainability aspects can cause environmental damage such as declining soil quality, water pollution due to excessive use of chemical fertilizers and pesticides, and increased greenhouse gas emissions. Furthermore, conventional agricultural practices often fail to strike a balance between increasing production with environmental protection and community social welfare. This situation indicates that the agricultural sector requires a new approach that is more oriented towards the principles of sustainable development.

One approach currently developing globally is the application of the Environmental, Social, and Governance (ESG) concept. The ESG concept emphasizes the importance of balancing environmental,

social, and governance aspects in carrying out economic and business activities, including in the agricultural sector. The environmental aspect of ESG emphasizes the wise and environmentally friendly management of natural resources. The social aspect relates to the protection of workers' rights, community empowerment, and improving farmer welfare. Meanwhile, the governance aspect focuses on transparency, accountability, and ethical and sustainable business management. The application of ESG in the agricultural sector is considered to have significant potential in creating a more sustainable and competitive agricultural system. Through the implementation of ESG, the agricultural sector is not only oriented towards increasing production and economic profits but also considers long-term social and environmental impacts. Furthermore, the implementation of ESG has become a global market demand, especially for agricultural products entering international markets. Many countries and investors are beginning to consider sustainability standards and ESG practices as requirements for trade and investment cooperation.

However, the implementation of ESG in the agricultural sector in Indonesia still faces various obstacles. Most farmers, especially smallholders, still have limited understanding of the ESG concept and the importance of sustainable agriculture. Low technological literacy, limited access to green financing, insufficient government assistance, and weak agricultural institutional governance are factors that hinder the optimal implementation of ESG. Furthermore, many agricultural practices still prioritize short-term production results without considering the resulting environmental and social impacts. Furthermore, the challenges of climate change further reinforce the urgency of implementing ESG in the agricultural sector. Extreme weather phenomena, changing seasonal patterns, floods, and droughts have impacted agricultural productivity in various regions in Indonesia. If not addressed with adaptive and sustainable agricultural systems, these conditions could threaten national food security and farmer welfare. Therefore, the implementation of ESG is seen as a strategy capable of increasing the resilience of the agricultural sector in facing various environmental and social risks in the future.

In the current era of digital transformation and the green economy, the implementation of ESG is also a crucial part of supporting modern agricultural development in Indonesia. The Indonesian government has promoted the sustainable development agenda through various policies, including a commitment to the Sustainable Development Goals (SDGs) and carbon emission reduction. In this context, the agricultural sector holds a strategic position to support the achievement of sustainable development through the implementation of more environmentally friendly, inclusive, and transparent agricultural practices. In recent years, the agricultural sector in Indonesia has faced increasingly complex and multidimensional challenges. On the one hand, the agricultural sector is required to increase food production to meet the growing needs of the population. However, on the other hand, agricultural activities also face significant pressures from climate change, environmental degradation, social inequality, and weak agricultural business governance. These conditions pose serious challenges to the creation of a sustainable agricultural system in Indonesia. One of the current phenomena is increasing environmental degradation due to less environmentally friendly agricultural practices.

The excessive use of chemical fertilizers and pesticides remains a common practice in agricultural activities in various regions. While this practice may increase yields in the short term, it can lead to decreased soil fertility, water pollution, and damage to agricultural ecosystems in the long term. Furthermore, the massive clearing of agricultural land contributes to deforestation and increased greenhouse gas emissions, which impact climate change. Climate change is also a real problem increasingly felt by farmers in Indonesia. Changing seasonal patterns, erratic rainfall, floods, droughts, and increasing

pest and disease attacks have led to instability in agricultural production. Many farmers experience crop failures or decreased yields due to unpredictable extreme weather conditions. This situation not only impacts agricultural productivity but also directly impacts the income and well-being of farmers, particularly smallholder farmers who rely heavily on their crops for their daily needs.

In addition to environmental issues, social phenomena in the agricultural sector are also a significant concern. The welfare of farmers in Indonesia remains relatively low compared to other economic sectors. Many farmers have limited access to business capital, modern agricultural technology, market information, and capacity-building training. This situation slows agricultural productivity and makes it difficult to compete in the era of agricultural modernization. In fact, low farmer incomes also affect the interest of younger generations in working in the agricultural sector, creating problems with farmer regeneration in Indonesia. Another growing phenomenon is the increasing global market demand for agricultural products that are sustainable and socially and environmentally responsible. Currently, many countries and international companies are beginning to implement sustainability standards in agricultural supply chains. Agricultural products are not only assessed on the quality of their produce, but also on how the production process takes into account environmental aspects, worker welfare, and business governance. However, most agricultural business actors in Indonesia, especially smallholder farmers, still do not understand the importance of implementing sustainability principles, potentially reducing the competitiveness of Indonesian agricultural products in the global market.

In terms of governance, Indonesia's agricultural sector also continues to face various issues, such as weak transparency in the distribution of agricultural aid, inaccurate targeting of fertilizer subsidies, and poor coordination between relevant institutions. Suboptimal agricultural governance often results in various agricultural development programs being ineffective and unsustainable. Furthermore, the lack of oversight of environmentally damaging agricultural practices indicates that governance in the agricultural sector still needs to be strengthened. These phenomena demonstrate that Indonesia's agricultural sector faces not only food production issues but also sustainability challenges encompassing environmental, social, and governance aspects. Therefore, an approach is needed that can integrate these three aspects in a balanced manner within a modern agricultural system. One approach that is gaining attention is the application of the Environmental, Social, and Governance (ESG) concept to the agricultural sector.

The implementation of ESG is seen as a strategic solution to address various current agricultural challenges because it can encourage more environmentally friendly agricultural practices, improve social welfare, and strengthen transparent and sustainable agricultural business governance. However, ESG implementation in Indonesia's agricultural sector still faces various obstacles, such as low farmer understanding, limited access to green technology and financing, and suboptimal government policy support. This situation is an important and interesting phenomenon that deserves further research in efforts to realize sustainable agriculture in Indonesia.

### **Formulation of the problem**

Based on the background and problem phenomena that have been described, the problem formulation in this research is as follows:

1. How is the Environmental, Social, and Governance (ESG) concept applied to the agricultural sector in Indonesia?
2. What is the condition of sustainable agriculture in the agricultural sector in Indonesia?

3. What are the factors that influence the implementation of ESG in the agricultural sector in Indonesia?
4. How do environmental aspects of ESG influence the sustainability of the agricultural sector?
5. How do social aspects of ESG influence the welfare and empowerment of farmers?

## Relevant Concepts and Theories

### 2.1 Environmental, Social, and Governance (ESG) Theory

The concept of Environmental, Social, and Governance (ESG) is an approach used to assess the sustainability of an organization or business sector based on environmental, social, and governance aspects. ESG developed as part of the concept of sustainable development, which emphasizes the balance between economic profit, environmental sustainability, and social welfare. According to Environmental Social Governance Buallay (2021), ESG is an important indicator used to measure a company's sustainability performance through environmental management, social responsibility, and transparent organizational governance. The implementation of ESG focuses not only on economic profit but also considers the long-term impact on society and the environment.

Xia, Sun, and Cai (2023) explain that ESG is a crucial part of global sustainable development strategies because it can enhance organizational legitimacy and strengthen public and investor trust in business activities. In the agricultural sector, the ESG concept is beginning to be implemented as an effort to create a more environmentally friendly and sustainable agricultural system. The application of ESG in agriculture includes reducing carbon emissions, managing agricultural waste, protecting workers, empowering farmers, and providing transparency in agribusiness governance.

#### 2.1.1 Environmental

The environmental aspect of ESG relates to how the agricultural sector manages the environmental impacts of production activities. The primary focus of this aspect includes efficient use of natural resources, environmental pollution reduction, waste management, soil and water conservation, and greenhouse gas emission reduction. According to Fikriman, Prayetni, and Pitriani (2022), sustainable agriculture must maintain environmental quality through efficient use of natural resources without damaging agricultural ecosystems. Sustainable agriculture must also minimize the use of hazardous chemicals and maintain soil fertility for future generations.

Meanwhile, Mucharam et al. (2020) stated that environmental sustainability in agriculture is a crucial indicator for achieving the Sustainable Development Goals (SDGs), particularly those related to food security and environmental preservation. In the Indonesian context, environmental issues in the agricultural sector are increasingly important due to the phenomena of climate change, land degradation, and deforestation that impact national agricultural productivity.

#### 2.1.2 Social

The social aspect of ESG relates to the relationship between the agricultural sector and society, labor, and local communities. The social dimension encompasses farmer welfare, labor protection, workers' rights, village community empowerment, and improving the quality of life of farming communities. According to Jaya, Yusriana, and Fitria (2021), social sustainability in the agricultural sector can be achieved through the integration of economic, social, and environmental aspects within the agricultural supply chain. This approach is crucial for creating a balance between business profits and community well-being.

Buallay (2021) also explained that the social aspects of ESG influence business sustainability and organizational image, as society increasingly pays attention to socially responsible business practices. In Indonesia's agricultural sector, social aspects are a crucial issue due to the low level of farmer welfare, limited access to technology, and low regeneration of young farmers.

### 2.1.3 Governance

The governance aspect of ESG relates to a transparent, accountable, and ethical organizational governance system. Good governance encompasses regulatory compliance, transparent business management, internal oversight, and responsible decision-making. According to Saputra (2023), good governance in the implementation of ESG can improve organizational effectiveness and support long-term business sustainability. Good governance also plays a crucial role in enhancing investor and public trust in the organization. In the agricultural sector, good governance is necessary to ensure the distribution of agricultural aid is targeted, increase transparency in resource management, and strengthen farmer institutions.

## 2.2 Sustainable Agriculture Theory

Sustainable agriculture is an agricultural development concept that aims to meet current food needs without compromising the ability of future generations to meet their own needs. According to Fikriman et al. (2022), sustainable agriculture is an agricultural system that integrates economic, social, and ecological aspects in a balanced manner to maintain the sustainability of natural resources and the well-being of communities.

Mucharam et al. (2020) explain that sustainable agriculture is closely linked to achieving the SDGs because it plays a role in maintaining food security, poverty reduction, and environmental protection. Meanwhile, Oliveira et al. (2020) in their study of sustainable agricultural supply chains state that sustainable agriculture must simultaneously address economic efficiency, environmental protection, and social welfare to ensure long-term sustainability. The concept of sustainable agriculture is currently crucial in Indonesia given the increasing threat of climate change, land conversion, and environmental damage caused by unsustainable agricultural activities.

### 2.3 Sustainable Development Theory

Sustainable development is a development concept that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. According to Xia et al. (2023), sustainable development emphasizes the integration of economic growth, environmental protection, and social welfare in every development activity. In the agricultural context, sustainable development is the basis for implementing ESG because the agricultural sector is directly related to natural resources, food security, and the welfare of rural communities. The implementation of sustainable development in the agricultural sector in Indonesia is also in line with the Sustainable Development Goals (SDGs) agenda, specifically the goals of eradicating hunger, reducing poverty, and preserving the environment.

### 2.4 The Relationship between ESG and Sustainable Agriculture

The concept of ESG is closely related to sustainable agriculture because both emphasize a balance between economic, social, and environmental aspects. The environmental aspect of ESG supports sustainable agriculture through more environmentally friendly natural resource management. The social aspect supports improving the welfare of farmers and rural communities, while the governance aspect strengthens the transparency and effectiveness of agricultural governance.

According to Buallay (2021), implementing ESG can help organizations create more sustainable and adaptive business systems to global challenges. Furthermore, Jaya et al. (2021) state that integrating economic, social, and environmental aspects in the agricultural sector can increase the competitiveness and sustainability of agricultural supply chains. Therefore, implementing ESG in the agricultural sector can be a crucial strategy in supporting sustainable agricultural development in Indonesia.

## Implementation Method

### 3.1 Types and Approaches of Research

This study employed a qualitative research method with a descriptive approach. The qualitative approach was used because the study aimed to deeply understand the phenomenon of Environmental, Social, and Governance (ESG) implementation in the agricultural sector to support sustainable agriculture in Indonesia. Qualitative research focuses on understanding the social realities, behaviors, perceptions, and experiences of the research subjects in their natural state.

According to Creswell and Creswell (2023), qualitative research is an approach to exploring and understanding the meaning of social or humanitarian issues through in-depth data collection in natural settings. Meanwhile, Sugiyono (2022) explains that qualitative research methods are used to examine natural conditions, where the researcher acts as a key instrument in data collection, and data analysis is conducted inductively. The descriptive approach used in this study aims to systematically describe the current state of ESG implementation in the agricultural sector, implementation constraints, and efforts to support sustainable agriculture in Indonesia.

### 3.2 Location and Time of Research

This research was conducted in the agricultural sector in Indonesia, focusing on farmer groups, agribusiness actors, agricultural extension workers, and other stakeholders involved in ESG implementation in agricultural activities. The research was conducted in areas that have implemented sustainable agriculture concepts or environmentally friendly agricultural practices. The research locations were selected purposively based on specific considerations aligned with the research objectives. According to Sugiyono (2022), purposive sampling is a technique for determining data source samples based on specific considerations, such as selecting individuals deemed most knowledgeable about the research object. This research is planned to take place from January 2026 to April 2026.

### 3.3 Research Informants

In qualitative research, research subjects are called informants. Informants are individuals who are considered to understand and possess information about the phenomenon being studied. According to Moleong (2021), research informants are individuals used to provide information about the situation and conditions of the research setting.

The informants in this study consist of:

1. Farmers who practice sustainable agriculture.
2. Farmer groups.
3. Agricultural extension worker.
4. Agribusiness actors.
5. ESG academics or practitioners.
6. Government agencies related to the agricultural sector.

The technique for determining informants uses purposive sampling with the following criteria:

1. Understanding sustainable agricultural practices.
2. Understanding the application of ESG in the agricultural sector.
3. Willing to provide information openly.

### 3.4 Data Types and Sources

The type of data used in this study is qualitative data, consisting of interviews, observations, and documentation regarding ESG implementation in the agricultural sector. According to Creswell and Creswell (2023), qualitative data consists of words, actions, documents, and social phenomena obtained through direct interaction with research participants.

Data sources in the research consist of:

#### 3.4.1 Primary Data

Primary data was obtained directly from informants through in-depth interviews and field observations related to the application of ESG in agricultural activities.

#### 3.4.2 Secondary Data

Secondary data was obtained from:

1. scientific journals,
2. book,
3. sustainability report,
4. government documents,
5. scientific articles,
6. and reports related to ESG and sustainable agriculture.

According to Saputra (2023), secondary data in ESG research can come from sustainability reports, company annual reports, and policy documents related to environmental, social, and governance implementation.

### 3.5 Data Collection Techniques

Data collection techniques in this study were carried out using the following methods:

#### 3.5.1 In-Depth Interview

In-depth interviews were conducted to obtain detailed information regarding ESG implementation in the agricultural sector. According to Sugiyono (2022), interviews are used as a data collection technique when researchers want to conduct preliminary studies to identify research issues and gain more in-depth information from respondents. Semi-structured interviews allow informants to provide broader and more in-depth information.

#### 3.5.2 Observation

Observations were conducted by directly observing agricultural conditions, farmer activities, environmental management, and social and governance practices related to ESG. According to Moleong (2021), observation is a data collection technique conducted through direct observation of the phenomena being studied.

#### 3.5.3 Documentation

Documentation is carried out by collecting various documents related to the research such as:

1. activity photos,
2. agricultural reports,
3. policy documents,

4. agricultural production data,
5. and ESG implementation documents.

According to Creswell and Creswell (2023), documentation is an important source of data in qualitative research because it can strengthen the results of interviews and observations.

### 3.6 Data Analysis Techniques

The data analysis technique in this study uses an interactive analysis model.

According to Miles, Huberman, and Saldaña (2020), qualitative data analysis is conducted interactively and continuously until the data reaches saturation point. The stages of data analysis consist of data reduction, data presentation, and drawing conclusions.

The stages of data analysis in this study include:

#### 3.6.1 Data Reduction

Data reduction is carried out by selecting, focusing, simplifying, and organizing data from interviews, observations, and documentation to make it easier to analyze.

#### 3.6.2 Data Presentation

Data presentation is done in the form of descriptive narrative so that the relationship between data can be clearly understood.

#### 3.6.3 Drawing Conclusions

The final stage is carried out by drawing conclusions based on the results of data interpretation regarding the application of ESG in the agricultural sector to support sustainable agriculture.

### 3.7 Data Validity

In qualitative research, data validity is very important to ensure the validity of research results.

According to Sugiyono (2022), data validity tests in qualitative research include:

1. Credibility (credibility),
2. Transferability,
3. Dependability,
4. Confirmability.

The data validity techniques used in this study are source triangulation and technical triangulation.

#### 3.7.1 Source Triangulation

Source triangulation is carried out by comparing information obtained from various research informants.

#### 3.7.2 Engineering Triangulation

Technical triangulation is carried out by comparing the results of interviews, observations, and documentation to obtain valid and consistent data.

## Results and Discussion

### 4.1 Application of the Environmental, Social, and Governance (ESG) concept in the agricultural sector in Indonesia

The application of the Environmental, Social, and Governance (ESG) concept to the agricultural sector in Indonesia is a strategic step towards realizing a sustainable, inclusive, and competitive agricultural system. The ESG concept emerged as a response to the increasing global challenges related to climate change, environmental degradation, social inequality, and demands for more transparent and responsible

business governance. In the agricultural context, ESG is seen not only as a modern business concept but also as a development approach capable of maintaining a balance between agricultural productivity, community welfare, and environmental sustainability. From an environmental perspective, the implementation of ESG in Indonesia's agricultural sector is beginning to be seen through various environmentally friendly agricultural practices. Several farmers and agribusinesses have begun implementing the use of organic fertilizers, reducing chemical pesticides, adopting water-efficient irrigation systems, and even recycling-based agricultural waste management. These efforts aim to reduce the negative impacts of agricultural activities on the environment and maintain the sustainability of natural resources. According to Fikriman, Prayetni, and Pitriani (2022), sustainable agriculture must be able to manage natural resources efficiently without disrupting the balance of the ecosystem. Therefore, implementing environmental aspects within ESG is crucial for maintaining the long-term quality of soil, water, and the agricultural environment.

Furthermore, climate change is a major factor driving the adoption of environmental aspects within ESG. Extreme weather phenomena such as floods, droughts, and changing seasonal patterns have directly impacted agricultural productivity in Indonesia. These conditions are pushing the agricultural sector to be more adaptive through the adoption of environmentally friendly agricultural technologies and sustainable farming systems. In several regions, farmers have begun implementing the concept of climate-smart agriculture to increase production efficiency while reducing carbon emissions from agricultural activities. However, the implementation of environmental aspects in Indonesia's agricultural sector still faces various obstacles. Most smallholder farmers still rely on chemical fertilizers and pesticides because they are considered more practical and can quickly increase production. Furthermore, limited knowledge about organic farming and limited access to environmentally friendly technologies hinder the implementation of ESG-based agriculture. This indicates that the transformation towards sustainable agriculture requires stronger educational support, mentoring, and government policies.

From a social perspective, ESG implementation in the agricultural sector is closely linked to farmer welfare, labor protection, village community empowerment, and improving the quality of life of farming communities. In practice, the implementation of social aspects is carried out through increasing access to farmer training, empowering farmer groups, strengthening agricultural human resource capacity, and protecting workers' rights in the agribusiness sector. According to Jaya, Yusriana, and Fitria (2021), social sustainability in the agricultural sector can be achieved through the integration of economic, social, and environmental aspects that can create a balance between business profits and community well-being. The application of social aspects is also evident in the increasing attention paid to the regeneration of young farmers in Indonesia. Currently, the agricultural sector faces the challenge of declining interest among young people in working in agriculture due to low incomes and a perceived lack of promising farming practices. Therefore, various millennial farmer empowerment programs, digital farming training, and agribusiness entrepreneurship development programs have been implemented to attract young people to the modern agricultural sector.

However, the social conditions of farmers in Indonesia still face various challenges. Farmers' welfare is relatively low compared to other economic sectors. Many farmers experience limited access to business capital, technology, markets, and agricultural information. Furthermore, the unequal distribution of profits in the agricultural supply chain often results in farmers receiving only small profits compared to other

distribution actors. This phenomenon indicates that the implementation of social aspects in ESG still requires more serious improvements so that the agricultural sector can create social justice and equitable community welfare. Meanwhile, the governance aspect of ESG relates to transparent, accountable, and ethical agricultural management. The application of governance in the agricultural sector includes transparency in the distribution of agricultural aid, management of farmer institutions, compliance with environmental regulations, and oversight of agribusiness activities. Good governance is a crucial factor in creating an efficient and sustainable agricultural system. According to Saputra (2023), good governance in the implementation of ESG can increase organizational effectiveness and strengthen public trust in business activities.

In Indonesia, the implementation of governance in the agricultural sector still faces various challenges, such as weak oversight of fertilizer subsidy distribution, inaccurate targeting of agricultural aid, and low transparency in agricultural program management. Furthermore, agricultural business practices still fail to fully address sustainability principles and environmental regulations. These conditions demonstrate that governance remains a significant challenge in implementing ESG in Indonesia's agricultural sector. Although the implementation of ESG in Indonesia's agricultural sector still faces various obstacles, this concept holds significant potential in supporting sustainable agriculture. ESG can serve as a framework for modern agricultural development that focuses not only on increasing production but also on comprehensive social and environmental impacts. Furthermore, the implementation of ESG can also increase the competitiveness of Indonesian agricultural products in the global market, as more countries and investors are paying attention to sustainability standards in the agricultural supply chain.

Supporting ESG implementation requires collaboration between the government, farmers, agribusinesses, academics, and the public. The government plays a crucial role in providing regulations, incentives, and guidance related to sustainable agricultural practices. Meanwhile, the private sector can support this through green investment, the development of environmentally friendly technologies, and the implementation of transparent business governance. With this synergy, the implementation of ESG in Indonesia's agricultural sector is expected to create a more productive and sustainable agricultural system that will improve long-term public welfare.

#### 4.2 Conditions of sustainable agriculture in the agricultural sector in Indonesia

Sustainable agriculture is an agricultural development concept that aims to meet the food needs of today's population without compromising the ability of future generations to meet their own needs. This concept emphasizes a balance between economic, social, and environmental aspects in agricultural activities. In Indonesia, sustainable agriculture is becoming an increasingly important issue due to the increasing challenges of climate change, environmental degradation, population growth, and the increasing national food demand. In general, sustainable agriculture in Indonesia is still in the transition phase, moving from conventional farming systems to more environmentally friendly and long-term-oriented ones. Most agricultural activities in Indonesia are still dominated by traditional farming practices and the extensive use of chemicals such as synthetic fertilizers and pesticides to increase yields. While these practices can increase productivity in the short term, they have the potential to cause environmental damage in the long term, such as decreased soil fertility, water pollution, and disruption of the agricultural ecosystem.

According to Fikriman, Prayetni, and Pitriani (2022), sustainable agriculture is an agricultural system that integrates economic, social, and environmental aspects in a balanced manner to maintain the

sustainability of natural resources and community well-being. In the Indonesian context, the implementation of sustainable agriculture still faces challenges because many farmers focus more on increasing production yields than on environmental preservation. This situation is influenced by economic demands, technological limitations, and farmers' low understanding of the importance of sustainability in agricultural activities. From an environmental perspective, sustainable agriculture in Indonesia still faces various serious challenges. Agricultural land degradation, conversion of productive land, deforestation, and environmental pollution from the use of agrochemicals are major challenges in maintaining the sustainability of the agricultural sector. Furthermore, climate change is also having a significant impact on national agricultural productivity. Extreme weather phenomena such as droughts, floods, and changing seasonal patterns create uncertainty in agricultural activities and increase the risk of crop failure.

According to Mucharam et al. (2020), the sustainability of agriculture in Indonesia is greatly influenced by the agricultural sector's ability to maintain environmental quality and natural resources. Developing sustainable agriculture indicators is crucial for evaluating the extent to which agricultural development addresses environmental, social, and economic aspects in a sustainable manner. Therefore, implementing environmentally friendly agricultural practices such as the use of organic fertilizers, agricultural waste management, and soil conservation are crucial steps in supporting sustainable agriculture. From a social perspective, sustainable agriculture in Indonesia also faces various challenges. Farmer welfare remains relatively low compared to other economic sectors. Many smallholder farmers face limited access to capital, technology, education, and markets. Furthermore, low farmer regeneration is a serious problem, as younger generations tend to be less interested in working in the agricultural sector. This situation could threaten the future sustainability of the agricultural sector if not balanced with modernization and improvements in farmer welfare.

According to Jaya, Yusrina, and Fitria (2021), social sustainability in the agricultural sector can be achieved through farmer empowerment, human resource capacity building, and strengthening agricultural institutions. In recent years, the Indonesian government has begun promoting millennial farmer programs, digital farming training, and the development of modern agribusinesses in an effort to increase the attractiveness of the agricultural sector to the younger generation. These steps demonstrate efforts towards a more inclusive and socially sustainable agricultural system. From an economic perspective, the agricultural sector remains a key pillar of the rural economy in Indonesia. However, farmers' incomes tend to fluctuate and are influenced by market prices, production costs, and climate conditions. Many farmers face challenges such as high fertilizer prices, limited access to financing, and long distribution chains, which lead to low profits. These conditions indicate that the economic sustainability of the agricultural sector still requires more serious attention.

To support sustainable agriculture, the Indonesian government has developed various programs and policies, including organic farming, food estates, precision agriculture, smart farming, and green economy-based agricultural development. Furthermore, the implementation of the Sustainable Development Goals (SDGs) is also a crucial part of national agricultural sector development, particularly in supporting food security, poverty reduction, and environmental protection. Developments in digital technology are also beginning to positively impact sustainable agriculture in Indonesia. Technologies such as the Internet of Things (IoT), agricultural drones, digital agribusiness applications, and smart irrigation systems are being

implemented to increase production efficiency while reducing environmental impact. These technologies help farmers manage resources more effectively and support modern, sustainable agricultural systems.

However, the implementation of sustainable agriculture in Indonesia still faces various obstacles, such as low farmer technological literacy, limited agricultural infrastructure, limited access to green financing, and weak oversight of environmentally damaging agricultural practices. Furthermore, the lack of synergy between the government, the private sector, and communities is also a factor hampering the acceleration of the transformation towards sustainable agriculture. Overall, the state of sustainable agriculture in Indonesia demonstrates progress toward a more modern and environmentally friendly agricultural system, although it still faces various structural challenges. Sustainable agriculture requires not only increased productivity but also a shift in mindset, policy support, technological innovation, and the participation of all stakeholders. With consistent implementation of sustainability concepts, Indonesia's agricultural sector is expected to maintain national food security while improving community welfare and environmental sustainability in the long term.

#### **4.3 What are the factors that influence the implementation of ESG in the agricultural sector in Indonesia**

The application of the Environmental, Social, and Governance (ESG) concept to the agricultural sector in Indonesia is influenced by various interrelated factors, both internal and external. These factors determine the extent to which ESG principles can be effectively applied to support sustainable agriculture. In practice, ESG implementation in the agricultural sector is not only related to technological and economic readiness but also influenced by social conditions, government policies, institutional governance, and the level of awareness of agricultural actors regarding the importance of environmental and social sustainability. One of the main factors influencing ESG implementation in the agricultural sector is farmers' level of awareness and understanding of the concept of sustainability. Most farmers in Indonesia are still focused on increasing production in the short term, so environmental and governance aspects are often not prioritized. Many farmers lack a comprehensive understanding of the importance of environmental management, resource efficiency, and environmentally friendly agricultural practices as part of ESG implementation. According to Fikriman, Prayetni, and Pitriani (2022), this low level of understanding of sustainable agriculture is one of the obstacles to implementing agricultural systems that balance economic, social, and environmental aspects.

Education and literacy also significantly influence ESG implementation in the agricultural sector. The relatively low level of farmer education limits their ability to adopt modern agricultural innovations and technologies. Furthermore, limited access to information on ESG, the green economy, and sustainable agriculture makes it difficult for some farmers to understand the long-term benefits of adopting sustainable agricultural practices. Therefore, education and training programs are crucial for improving human resource capacity in the agricultural sector. In addition to human resources, government policy support is also crucial for implementing ESG in the agricultural sector. The government plays a strategic role in creating regulations, incentives, and programs that support sustainable agriculture. Policies related to organic farming, carbon emission reduction, environmentally friendly fertilizer subsidies, and the development of smart farming are crucial in supporting ESG implementation. According to Mucharam et al. (2020), sustainable agricultural development requires policy support that comprehensively integrates environmental, social, and economic aspects.

However, the implementation of sustainable agriculture policies in Indonesia still faces various obstacles, such as weak oversight, inconsistent program implementation on the ground, and a lack of coordination between relevant institutions. Several government programs are not fully targeted, thus suboptimal ESG implementation in the agricultural sector. Furthermore, some agricultural practices continue to be less than fully aware of environmental impacts due to weak enforcement of environmental protection regulations. Economic factors are also a key determinant of ESG implementation in the agricultural sector. Many smallholder farmers face limited business capital, making it difficult to implement modern agricultural technologies and environmentally friendly practices, which are relatively costly. The use of organic fertilizers, water-efficient irrigation systems, or digital farming technologies often require significant initial investment. This situation leads some farmers to prefer conventional farming methods, which are perceived as cheaper and more practical in the short term.

According to Buallay (2021), ESG implementation requires adequate financial support because sustainable business practices require investments in environmental management, human resource development, and organizational governance. In the context of Indonesian agriculture, limited access to green finance and low support for sustainable investment are factors hindering the widespread adoption of ESG. Beyond economic factors, technological developments also influence the implementation of ESG in the agricultural sector. Advances in agricultural technology such as the Internet of Things (IoT), agricultural drones, smart irrigation systems, and digital agribusiness applications can help farmers increase production efficiency while reducing environmental impact. Digital technology can support more effective land management, reduce water and fertilizer use, and increase transparency in the agricultural supply chain.

However, technology adoption in Indonesia's agricultural sector still faces various obstacles, such as limited digital infrastructure, low farmer technological literacy, and high implementation costs. This has resulted in uneven adoption of smart farming and ESG-based technologies across Indonesia's agricultural regions, particularly in rural areas with limited access to technology. Social and cultural factors also influence ESG implementation in the agricultural sector. Some farmers still maintain traditional farming practices passed down through generations, making it difficult to embrace changes to modern and sustainable agricultural systems. Furthermore, the level of community participation in sustainable agriculture programs also varies depending on the socioeconomic conditions of each region.

According to Jaya, Yusriana, and Fitria (2021), the success of sustainable agriculture is greatly influenced by community participation and the strengthening of agricultural institutions. Therefore, collaboration between the government, farmer groups, academics, and the private sector is crucial in improving ESG implementation in the agricultural sector. Governance is also a crucial element in ESG implementation. Good governance includes transparency in the distribution of agricultural aid, accountability in government programs, oversight of resource use, and compliance with environmental regulations. According to Saputra (2023), good governance in ESG implementation can improve organizational effectiveness and create long-term business sustainability.

In Indonesia, agricultural sector governance still faces various challenges, such as complex bureaucracy, uneven aid distribution, and weak oversight of environmentally damaging agricultural practices. These conditions demonstrate that strengthening governance is a crucial factor in the successful implementation of ESG in the agricultural sector. In addition to internal factors, global market demands also influence the implementation of ESG in Indonesia's agricultural sector. Currently, the international

market is increasingly paying attention to agricultural product sustainability standards, including environmental and social aspects in the production process. Agricultural products that implement ESG principles tend to be more competitive in the global market because they are perceived as more responsible and environmentally friendly. This has encouraged agribusinesses and agricultural exporters to begin implementing sustainable practices in their supply chains. Overall, ESG implementation in the agricultural sector in Indonesia is influenced by various factors, such as farmer education and awareness levels, government policy support, economic conditions, technological developments, socio-cultural factors, institutional governance, and global market demands. These factors are interrelated and determine the success of ESG implementation in supporting sustainable agriculture. Therefore, synergy between the government, communities, academia, and the private sector is needed to create a more sustainable, inclusive, and competitive agricultural system in the future.

#### 4.4 The influence of environmental aspects in ESG on the sustainability of the agricultural sector

The environmental aspect of the Environmental, Social, and Governance (ESG) concept plays a crucial role in supporting the sustainability of the agricultural sector. This aspect emphasizes how agricultural activities can maintain environmental balance through efficient natural resource management, pollution reduction, land conservation, and controlling negative impacts on ecosystems. In the context of sustainable agriculture, the environmental aspect is a key foundation because the agricultural sector is highly dependent on environmental quality, including soil, water, air, and climate conditions. In Indonesia, the impact of environmental aspects on the sustainability of the agricultural sector is increasingly apparent, as various environmental problems resulting from conventional farming activities increase. Excessive use of chemical fertilizers and pesticides, uncontrolled land clearing, and the continued exploitation of natural resources have led to a decline in the quality of the agricultural environment. This situation directly impacts land productivity and the long-term sustainability of farming businesses.

According to Fikriman, Prayetni, and Pitriani (2022), sustainable agriculture must maintain environmental sustainability by utilizing natural resources wisely without disrupting the ecosystem's balance. Therefore, implementing environmental aspects within ESG is a strategic step to mitigate environmental damage while ensuring the sustainability of agricultural production in the future. One of the key influences of environmental aspects within ESG on the sustainability of the agricultural sector is maintaining soil quality and fertility. Soil is a key resource in agricultural activities, so sustainable production depends heavily on healthy and productive soil conditions. The implementation of environmentally friendly agricultural practices such as the use of organic fertilizers, crop rotation, and the reduction of chemical use can help maintain soil structure and naturally increase nutrient content. This way, agricultural productivity can be maintained in the long term without causing land degradation.

In addition to maintaining soil fertility, environmental aspects also influence water resource management in the agricultural sector. Agricultural activities are one of the sectors that use significant amounts of water, making efficient water use a crucial factor in agricultural sustainability. The implementation of water-efficient irrigation systems, smart irrigation technology, and agricultural waste management can help reduce water waste and prevent water resource pollution from the use of agricultural chemicals. According to Mucharam et al. (2020), agricultural sustainability is significantly influenced by the agricultural sector's ability to maintain environmental quality and natural resources. Sustainable water and land management are crucial indicators in supporting environmentally friendly agricultural

development. Therefore, implementing environmental aspects can increase the efficiency of resource use while maintaining the balance of the agricultural ecosystem.

The impact of environmental aspects is also evident in efforts to reduce greenhouse gas emissions and mitigate climate change. The agricultural sector is a major contributor to carbon emissions through the use of chemical fertilizers, land burning, and other production activities. Current climate change has had significant impacts on the agricultural sector, including shifting seasonal patterns, increased risks of flooding and drought, and decreased agricultural production. Through the implementation of environmental aspects within ESG, the agricultural sector is encouraged to adopt environmentally friendly practices such as organic farming, agroforestry, land conservation, and the use of renewable energy. These practices can help reduce carbon emissions while improving the agricultural sector's ability to adapt to climate change. This ensures agricultural sustainability despite increasingly complex global environmental challenges.

Furthermore, the implementation of environmental aspects also contributes to improving the quality of agricultural products. Agricultural products produced through environmentally friendly farming systems tend to have higher added value and competitiveness in the global market. Currently, many international consumers are starting to consider sustainability and environmental safety when choosing agricultural products. Organic and sustainable agricultural products are becoming increasingly popular due to their perceived health and environmental friendliness. According to Buallay (2021), implementing ESG can improve the reputation and competitiveness of business sectors, as the public and investors increasingly pay attention to environmentally responsible business practices. In the context of Indonesian agriculture, implementing environmental aspects can help increase agricultural export opportunities while strengthening Indonesia's position in the global sustainability market.

Despite its significant impact on the sustainability of the agricultural sector, the implementation of environmental aspects within ESG in Indonesia still faces various challenges. Many smallholder farmers still face limited access to environmentally friendly agricultural technologies, business capital, and training related to sustainable agriculture. Furthermore, the use of chemical fertilizers and pesticides remains high, perceived as more practical and quicker to increase yields. Farmers' limited understanding of the importance of environmental conservation also hinders the implementation of environmental aspects. Some farmers remain focused on short-term profits, neglecting the environmental impacts of their agricultural activities. This situation demonstrates that farmer education and mentoring are crucial factors in supporting ESG implementation in the agricultural sector.

On the other hand, government support also significantly influences the successful implementation of environmental aspects within ESG. The government plays a crucial role in creating environmental regulations, providing incentives for green farming, and encouraging the use of environmentally friendly technologies in the agricultural sector. The organic farming, green economy, and smart farming programs currently being developed by the government are efforts to support the sustainability of the environmentally-based agricultural sector. Technological developments also have a positive impact on the implementation of environmental aspects. The use of technologies such as the Internet of Things (IoT), agricultural drones, soil sensors, and digital irrigation systems can help farmers manage land more efficiently and environmentally friendly. These technologies can reduce excessive fertilizer and water use and increase agricultural production efficiency.

Overall, the environmental aspects of ESG have a significant impact on the sustainability of the agricultural sector in Indonesia. The implementation of environmental aspects can help maintain the quality of natural resources, increase production efficiency, mitigate the impact of climate change, and enhance the competitiveness of agricultural products. However, the successful implementation of environmental aspects requires support from various parties, including the government, farmers, academics, and the private sector. With optimal implementation of environmental aspects, the Indonesian agricultural sector is expected to develop sustainably and provide long-term economic, social, and environmental benefits.

#### **4.5 The influence of social aspects in ESG on the welfare and empowerment of farmers**

The social aspect of the Environmental, Social, and Governance (ESG) concept plays a crucial role in supporting the welfare and empowerment of farmers in the agricultural sector. The social aspect emphasizes the importance of harmonious relationships between business activities and the community, workforce, local communities, and other stakeholders. In the agricultural sector, the implementation of social aspects aims to create social justice, improve the quality of life for farmers, strengthen human resource capacity, and encourage more inclusive and sustainable rural community development. In Indonesia, farmers remain a vulnerable group to various social and economic challenges. Most smallholder farmers face limited access to capital, technology, education, market information, and adequate social protection. These conditions contribute to farmers' relatively low welfare compared to other economic sectors. Therefore, implementing social aspects within ESG is crucial for improving farmer welfare while strengthening the sustainability of the agricultural sector.

According to Jaya, Yusriana, and Fitria (2021), social sustainability in the agricultural sector can be achieved through strengthening social relations, empowering communities, and improving the quality of human resources in agricultural activities. By implementing social aspects, the agricultural sector is not solely focused on economic profit but also considers the well-being of the communities involved in the agricultural production chain. One of the key influences of the social aspects of ESG on farmer welfare is increased access to agricultural education and training. Through training, extension, and mentoring programs, farmers can gain knowledge about modern cultivation techniques, the use of agricultural technology, farm management, and agricultural marketing strategies. This knowledge helps farmers improve productivity and produce quality, positively impacting their income and well-being.

Furthermore, social aspects also influence farmer empowerment through strengthening agricultural institutions such as farmer groups, cooperatives, and agribusiness communities. Strong institutions can improve farmers' bargaining power in the agricultural distribution chain and expand access to business capital and markets. Cooperation among farmers makes production and marketing processes more effective, thus increasing the opportunity for better profits. According to Buallay (2021), the social aspect of ESG influences business sustainability because organizations that prioritize the well-being of communities and their workforce tend to have better social relationships and are able to create long-term business stability. In the agricultural context, improving farmer welfare will directly impact the sustainability of agricultural production, as farmers become more motivated to develop their farming businesses sustainably.

The implementation of social aspects also impacts the protection of labor rights in the agricultural sector. Agricultural activities often involve workers in vulnerable working conditions, particularly in the plantation and large-scale agribusiness sectors. Through the implementation of ESG, agricultural companies are encouraged to protect workers' rights, create a safe working environment, and provide fair

wages in accordance with labor standards. This social protection is a crucial factor in ensuring the overall well-being of the agricultural community. In addition to labor protection, the social aspect of ESG also promotes inclusivity in agricultural development. Empowering women, smallholder farmers, and the younger generation is a crucial part of implementing this social aspect. Currently, the Indonesian agricultural sector faces a farmer regeneration challenge due to low interest among younger generations in working in agriculture. Therefore, various programs for empowering millennial farmers, digital farming, and developing agripreneurs have been developed to attract the younger generation to modern agriculture.

The implementation of social aspects also influences increased community participation in sustainable agricultural development. Communities involved in decision-making and agricultural program development tend to have a stronger sense of responsibility for the sustainability of the agricultural sector. Active community participation can strengthen social solidarity and improve the effectiveness of agricultural program implementation at the local level. However, the implementation of social aspects of ESG in Indonesia's agricultural sector still faces various challenges. Poverty rates in rural areas remain relatively high, and some farmers struggle to access financing, technology, and education. Furthermore, the unequal distribution of profits in the agricultural supply chain often leaves farmers disadvantaged compared to other business actors. Many farmers earn only small profits despite being the primary actors in food production.

According to Fikriman, Prayetni, and Pitriani (2022), sustainable agricultural development must maintain a balance between economic growth and the social welfare of farming communities. Therefore, improving farmer welfare cannot be achieved solely through increased production; it also requires improvements in distribution systems, market access, and social protection. Cultural factors and societal mindsets also influence the implementation of social aspects in ESG. Some farmers still struggle to embrace new innovations due to their familiarity with traditional farming systems. Low technological literacy and limited access to information contribute to the relatively slow pace of the transformation to modern agriculture. This situation demonstrates the importance of education and mentoring in supporting farmer empowerment.

On the other hand, government support has a significant impact on improving the implementation of social aspects in the agricultural sector. The government can promote farmer empowerment programs through business capital assistance, training, agricultural subsidies, and strengthening farmer institutions. Furthermore, agricultural infrastructure development and digital access in rural areas are also crucial factors in supporting improved farmer welfare. Current digital technology developments also offer significant opportunities for farmer empowerment. Utilizing digital agribusiness platforms, agricultural marketplaces, and online extension applications helps farmers gain access to market information, technology, and broader business networks. These technologies can increase farming efficiency while strengthening farmers' position in the agricultural value chain.

Overall, the social aspects of ESG have a significant impact on the welfare and empowerment of farmers in Indonesia. Implementing social aspects can improve the quality of human resources, strengthen agricultural institutions, protect labor rights, and encourage community participation in sustainable agricultural development. However, successful implementation of social aspects requires government policy support, strengthened education and training, access to financing, and collaboration between various

parties. With optimal implementation of social aspects, the Indonesian agricultural sector is expected to be able to create more equitable and sustainable public welfare in the future.

## Conclusion

Based on research on the Application of Environmental, Social, and Governance (ESG) in the Agricultural Sector to Support Sustainable Agriculture in Indonesia, it can be concluded that the application of ESG concepts plays a crucial role in creating a sustainable, inclusive, and competitive agricultural system. ESG is not only oriented towards increasing agricultural production but also emphasizes the balance between environmental, social, and governance aspects in agricultural activities.

The implementation of environmental aspects within ESG has a positive impact on the sustainability of the agricultural sector through more efficient natural resource management, reduced chemical use, land conservation, and controlling the environmental impacts of agricultural activities. Environmentally friendly agricultural practices can maintain soil fertility, increase water efficiency, and help the agricultural sector adapt to climate change. However, the implementation of environmental aspects still faces various obstacles, such as farmers' low understanding of sustainable agriculture, limited access to environmentally friendly technologies, and high dependence on chemical fertilizers and pesticides.

From a social perspective, ESG implementation has an impact on improving farmer welfare and empowerment through strengthening human resource capacity, increasing access to training, protecting workers, and strengthening agricultural institutions. The implementation of social aspects also encourages community participation and the regeneration of young farmers in modern agricultural development. However, the social conditions of farmers in Indonesia still face challenges such as low incomes, limited access to capital and markets, and unequal distribution of profits in the agricultural supply chain.

Meanwhile, the governance aspect of ESG plays a role in creating more transparent, accountable, and sustainable agricultural governance. Good governance can increase the effectiveness of agricultural programs, strengthen farmer institutions, and enhance public trust in the agricultural sector. However, the implementation of governance in Indonesia's agricultural sector still faces challenges such as weak oversight of agricultural aid distribution, complex bureaucracy, and suboptimal enforcement of environmental regulations.

The research also shows that ESG implementation in the agricultural sector is influenced by various factors, such as farmer education and awareness, government policy support, economic conditions, technological developments, socio-cultural factors, and global market demand for sustainable agricultural products. Government support through regulations, training, subsidies, and agricultural technology development are crucial factors in accelerating ESG implementation in Indonesia.

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