

# The Ups and Downs of Cocoa Prices on Farmers' Welfare: A Sustainability Accounting Perspective

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## Abstract

This research aims to understand the factors that influence the ups and downs of cocoa prices, their impact on farmers' welfare, and explore the role of sustainability accounting in strengthening the economic resilience of cocoa farmers. Using a descriptive qualitative approach, this study explores the experiences and adaptive strategies developed in dealing with price dynamics and maintaining sustainable plantation practices. The findings show that cocoa price volatility is influenced by imbalances between demand and supply, climate change, and global market volatility. These price fluctuations have an impact on the socio-economic conditions of farmers: when prices rise, farmers' incomes increase which allows the fulfillment of basic needs and sustainability investments; On the contrary, falling prices create economic pressures and a decrease in quality of life. The implementation of sustainability accounting has been proven to help farmers manage risks, as well as maintain sustainable plantation business practices amid market uncertainty. These findings are expected to contribute to the formulation of policies that are in favor of improving the welfare of cocoa farmers and strengthening sustainable plantation development.

## 1. Introduction

Sustainability accounting is all accounting processes from recording, measuring, recognizing, disclosing and transparency that not only focus on economic transactions but also social events and environmental events that surround these transactions. In sustainability accounting reporting, it not only shows annual reports or financial statements but also sustainability accounting reports as evidence of the organization's social and environmental performance (Stuart O'Neill 2021). In this context, the application of sustainability accounting becomes very relevant to understand how sustainability accounting practices can be implemented in the cocoa plantation sector, in order to improve the welfare of farmers.

Sustainability accounting includes more than just recording and reporting, but it also assesses the impact of plantation practices on society and the environment. With the implementation of sustainability accounting, farmers can find and use ways to increase productivity while maintaining environmental

sustainability that can support sustainable and responsible growth (Scott, S. Scott, 2024).

In recent years, the cocoa plantation sector has experienced various challenges faced by farmers such as climate change, pest and disease attacks, competition in the global market, and price fluctuations are things that need to be considered because they can affect farmers' income (Elake, Riry, and Riry 2022). These various economic and financial problems often hinder the sustainable management of plantation businesses for farmers in Indonesia, especially in rural areas. Some of the main problems faced by farmers are as follows: (1) Price fluctuations; Currently, prices in plantation commodities experience ups and downs and price instability. (2) lack of access to financing; Farmers often face difficulties in obtaining the necessary capital for investment in supporting the sustainable development of plantations. (3) lack of knowledge about finance; Many farmers do not know how to record and manage their finances, which causes them to make inaccurate financial decisions. To overcome these problems, the implementation of sustainability accounting and increasing the

competence of human resources (HR) in the plantation sector is very important. In this case, sustainability accounting aims to incorporate environmental considerations in accounting and financial reporting (Pramukti et al. 2024).

The welfare of farmers is not only seen from the economic aspect, but it is necessary to look at it from a social and environmental perspective. Sustainability accounting can help measure, monitor, and report on socio-economic, and environmental impacts and aid decision-making (Maria Yovita R. Pandin et al., 2024). By understanding the concept of sustainability accounting, farmers can plan and manage their resources even better, thereby increasing their economic resilience. This shows that accounting is not only a management tool, but also a strategy in improving the welfare of cocoa farmers. Therefore, it is important to apply accounting principles in the management and development of cocoa plantation businesses.

This study aims to understand the causes of the fluctuations in cocoa prices and their impact on farmers' welfare. This includes (1) Factors that cause fluctuations in cocoa prices that can affect farmers' income and welfare. (2) The impact of the ups and downs of cocoa prices; Unstable cocoa prices can have an impact on farmers' incomes, access to education, and quality of life. (3) The application of sustainability accounting in the midst of the ups and downs of cocoa prices; Understand farmers' adaptation strategies amid fluctuations in cocoa prices, such as diversification of crops or other sources of income and innovations in sustainable plantation practices. This research aims to explore and understand the experiences and views of cocoa farmers and buyers regarding price fluctuations and their impact on their welfare. Thus, the results of this study can provide policy recommendations for stakeholders to be able to improve the welfare of cocoa farmers and can encourage the implementation of sustainable plantations.

## 2. Reasearch Methods

This study uses a descriptive qualitative approach that aims to explore and understand in depth the factors that cause the fluctuations in cocoa prices and their impact on farmers' welfare, as well as explore the role of sustainability accounting in supporting farmers' economic resilience. This approach was chosen because it is able to reveal subjective experiences, adaptive strategies, and socio-economic dynamics of farmers that cannot be fully explained through a quantitative approach. In the data collection process, the researcher acts as an active observer and listener through in-depth interviews, participatory observations, and the collection of relevant documents. Direct interaction with farmers allows for rich and diverse data, providing a holistic understanding of the impact of cocoa price fluctuations on their livelihoods and business sustainability.

This research was carried out in Mensung Village, Mepanga District, Parigi Moutong Regency, Central Sulawesi Province, which was selected purposively with the consideration that the majority of the population works as cocoa farmers. Mensung Village is one of the significant cocoa production centers in the region and experiences fluctuating price dynamics, as well as various challenges in productivity that directly impact the welfare of farmers. In addition, the existence of cocoa bean buyer companies in these villages provides direct access to key players in the supply chain, which enriches the quality and relevance of the data collected.

The data in this study consists of primary data and secondary data. Primary data was obtained through direct on-the-ground observations and in-depth interviews with cocoa farmers and buyers, to explore their experiences in dealing with price fluctuations while maintaining the sustainability of plantation businesses. In addition, field documents such as production records, selling prices, and farmer group reports were collected to support empirical data. Meanwhile, secondary data is obtained from relevant literature in the form of scientific journals,

books, official reports, and policy documents, which are used to enrich the analysis and provide theoretical context for research findings.

The data analysis technique in this study uses a descriptive qualitative approach that aims to explore in depth the factors that cause the ups and downs of cocoa prices and their impact on farmers' welfare, as well as examine the role of sustainability accounting in this context. The analysis process begins from the data collection stage through in-depth interviews and participatory observation. The interviews were conducted to obtain direct narratives from farmers regarding their experiences, perceptions, and adaptive strategies in dealing with cocoa price dynamics. Meanwhile, participatory observation allows researchers to gain a contextual understanding of the realities of farmers' daily lives, as well as to identify sustainability practices implemented amid economic uncertainty.

After the data is collected, the next step is data reduction, which is the process of selecting, simplifying, and focusing information that is considered relevant to the research objectives. Data reduction is carried out continuously during the research process, taking into account the significance of field findings. The data that has been reduced is then categorized based on key themes, such as the causes of price fluctuations, the impact on farmers' welfare, and the application of sustainability accounting.

The next stage is the presentation of data, which is carried out in the form of a descriptive narrative that describes the relationships between thematic categories logically and deeply. This narrative not only presents empirical findings objectively, but also interprets the meaning from the perspective of the informant and explains the implications of the findings for the development of theory and practice. Through this approach, the data analysis not only answers the research questions, but also contributes to a broader understanding of the economic complexity of cocoa farmers and the transformative potential

of sustainability accounting.

**Figure 2**  
**Methodological Framework**



### 3. Results and Discussion

#### 3.1 Factors Influencing the Ups and Downs of Cocoa Prices

The main factor affecting the welfare of cocoa farmers is price changes, as a large part of farmers' income depends on the proceeds of the sale of cocoa beans. The fluctuations in cocoa prices are one of the problems that hinder the sustainability of cocoa farmers' plantation businesses. Cocoa prices, which experience ups and downs, have a direct impact on farmers' incomes, which can lead to farmers' inability to invest in cocoa plantation sustainability efforts to improve the production and quality of cocoa crops.

Global market conditions are the main factor that affects the ups and downs of cocoa prices. Changes in demand from major consumer countries and cocoa productivity from other countries as the world's largest supplier of cocoa beans also affect the ups and downs of cocoa prices.

Based on an interview with Mr. Janny Sunda as the owner of CV. Aromatika Mandiri, which is engaged in the purchase of cocoa beans, said that:

*"The ups and downs of cocoa prices depend on global market demand. The cause of the ups and downs of cocoa*

*prices is due to one, the failure of harvest in the world's main cocoa producing country, namely Ivory Coast, automatically the world's cocoa supply decreases so that cocoa prices rise. Second, changes in consumption that use cocoa as a raw material in food, drinks, and cosmetics."*

The results of the above interview can show that the ups and downs of cocoa prices are influenced by market demand. The abundant supply of cocoa production does not guarantee that cocoa prices will rise as a result of declining market demand. Conversely, if cocoa production is limited and demand increases, prices will rise due to insufficient stock.

As said by Mr. Moh. Abdu as a cocoa farmer in Mensung Village said that:

*"The trigger for the rise and fall of cocoa prices mainly depends on the supply of cocoa. If there is a lack of cocoa supply, then the price will also increase overall. If the supply of cocoa has accumulated in the warehouse, finally when there is a buildup and a lot of stock, the price will also fall."*

The results of the above interview show that supply dynamics greatly affect price changes. When the supply of cocoa beans decreases, resulting from bad weather or production disruptions, prices will rise due to high demand. On the other hand, if there is an oversupply due to abundant harvests or a decrease in global demand, it will lead to a decrease in cocoa prices. This shows that the balance of supply and demand is very important to determine the price of cocoa beans.

Followed by an interview by Mr. Tonny Iskandar as the chairman of the beautiful cocoa farmers group who said that:

*"If the price problem sometimes affects the farmer, it is usually the weather, if usually during the harvest the weather may be like rain, that's why the farmers are a bit difficult to dry, it also affects the price."*

The results of the interview above can be concluded that price instability is not only

caused by demand factors due to changes in public consumption, but natural factors, namely climate or weather, are also the cause of cocoa price fluctuations. Cocoa plants are sensitive, climate change greatly impacts cocoa plantations, while the long dry season causes the death of cocoa plants, on the other hand, excess rainfall can lead to pest and fungal attacks.

### 3.2 The Impact of Cocoa Price Fluctuations on Farmers' Welfare

Cocoa plantation products are the main source of income for cocoa farmers. The ups and downs of cocoa prices have a significant effect on farmers' incomes. Cocoa price uncertainty can hinder farmers' ability to invest in the sustainability of cocoa plantation businesses as well as meeting their daily needs and children's education.

Based on an interview by Mr. Tony Iskandar as the Chairman of the Cocoa Farmers Group who said that:

*"If the price of cocoa increases, the welfare of farmers will automatically increase as well. For example, in previous years with the price reduction, of course, it had a great effect on the economic level of farmers, especially the purchase of fertilizer because the price was somewhat lower so that farmers found it difficult to carry out a sustainable cocoa plantation business and difficult to meet daily needs, especially education caused by economic problems. With this price increase, Alhamdulillah, farmers have easily obtained fertilizer which can then improve the economy, including school fees, at least all are greatly helped by this price increase."*

This was also said by Mr. Moh. Abdu as a cocoa farmer who said that:

*"The impact of the decline in cocoa prices is certainly the depletion of finances so that the need for fertilizers and medicines is limited so that their use is reduced, in a year we estimate that only twice is done every six months. But when the price of*

*cocoa rises, it can be easier to fertilize which can be done every 3 months."*

In line with what was conveyed by Mr. Berry Tanriono as a cocoa buyer who listened directly to various complaints from the impact of the ups and downs of cocoa prices felt by farmers, namely:

*"Farmers definitely want the best results so they force themselves to provide fertilizers, medicines and so on. When prices fall, inevitably their profits are smaller. It means that there is no empowerment for sustainability. But when he has good results, and the price is good, his enthusiasm must be more extraordinary in managing cocoa plantations. And also those who previously wanted to buy rice in one sack, needed 20-30 kg of cocoa prices. But at the current price, having only 4-5 kg of cocoa can buy one sack of rice."*

From the results of the interview above, it can be concluded that the ups and downs of cocoa prices have a great impact on the welfare of farmers. When there is an increase in cocoa prices, farmers' income will increase which will allow them to meet their living needs and invest in cocoa plantation sustainability efforts. On the other hand, when the price of cocoa decreases, they find it difficult to meet the living and education needs of their children which then negatively impacts their quality of life.

With the increase in cocoa prices, farmers can meet the needs of their plantation businesses by purchasing enough fertilizers, pesticides, and medicines to increase the productivity of their plantations. The increase in cocoa prices acts as a driver to improve the welfare of farmers by giving them the opportunity to improve their living conditions and future.

### 3.3 The Importance of Sustainability in the Face of Rising Cocoa Prices

Sustainability accounting not only focuses on economic aspects, but also pays attention to the social and environmental impact of cocoa plantation businesses. With the

application of sustainability accounting, cocoa farmers and buyers can adapt and survive in the midst of the ups and downs of cocoa prices while still doing sustainability in managing cocoa plantation businesses.

### 3.4 Economic Aspects

The economic aspect of cocoa plantations is the key to ensuring the welfare of farmers and sustainability in the cocoa plantation business. With the right practices, it is not only financially profitable but can also support long-term productivity, so that farmers can survive even difficult conditions.

Based on the results of the interview with Mr. Moh. Abdu as a cocoa farmer who said that:

*"We still maintain cocoa plants. Even though the price of cocoa has dropped, we still take care of it because it is our main source of income as farmers. The only alternative is monthly crops, such as rica, sweet potato, and so on."*

In line with the interview of Mr. Tony Iskandar as the chairman of the beautiful cocoa farmers group who said that:

*"If you stop planting cocoa or take care of it, I don't think so, it's just that when the price is below the farmers, most of them also switch functions, yes, for example, in the past years there were those who planted corn, there were also those who planted rica, and tomatoes. We still maintain it even though the price is lower, Alhamdulillah, especially with the current price of more than 100, farmers are still motivated again. In addition, we also record it so that we can find out how much our income is in one harvest cycle, then how much we spend. This is very necessary so that we can control our income and then be able to control our expenses so that the expenses do not exceed income or income."*



**Table 1**  
**Forms of financial recording carried out by farmers**

Yields	IDR 207,000,000
Expense:	
1. Fertilizer	IDR 175,000
2. Pesticides	IDR 390,000
3. Medicines	IDR 150,000
4. Fuel	IDR 300,000
5. Grass-Level Workforce	IDR 960,000
6. Fertilizing Labor	IDR 480,000
7. Harvest Workforce	IDR 8,640,000
	<u>IDR 11,095,000</u>
Advantage	IDR 195,905,000

The results of the above interviews can show that when there is instability in cocoa prices, farmers continue to maintain and care for their cocoa plants which are the main source of income. But they also do an alternative by planting other plants to support their daily needs. Recording finances can be the key to controlling income and expenditure in meeting the sustainability needs of the cocoa plantation business.

In supporting the sustainability of cocoa plantations, there needs to be a profitable and sustainable cooperation between farmers and cocoa buyers. As said by Mr. Janny Sunda as the owner of CV. Aromatics Independent:

*"We provide certification to farmers who are included in our fostered groups. The price of certified cocoa is different from the usual one, there is a difference of approximately Rp. 2,000. The bonus is saved and will be calculated the number of times the farmer enters the harvest and the number of cocoa scales according to the existing memorandum. Then the bonus will be distributed every 6 months."*

The results of the above interview can be concluded that, from an economic point of view, support for the sustainability of cocoa

plantation businesses is very necessary and has a positive impact on the lives of farmers. With the existence of CV. Aromatika Mandiri which provides bonuses as a form of loyalty to farmers who have routinely sold their cocoa bean harvest, this is not only to get profits but also can motivate farmers to continue to empower their cocoa plantations even in the midst of fluctuating cocoa prices.

### 3.5 Social Aspects

Sustainability is not only seen in terms of crop productivity, but the cooperative relationship between farmers and cocoa buyers can produce positive impacts that can realize sustainability in the cocoa plantation business.

Based on an interview with Mr. Janny Sunda as the owner of CV. Aromatika Mandiri which says that:

*"We not only provide certification bonuses, but also provide assistance and training. So we have special staff who make regular visits once a week to listen and provide advice on complaints about the productivity of cocoa farmers."*

In line with what was said by Mr. Tony Iskandar as the chairman of the beautiful cocoa group fostered by CV. Aromatika Mandiri which says that:

*"Alhamdulillah, we have participated in training on cocoa plantations several times. Alhamdulillah, with these trainings, the sustainability of this cocoa plant until now farmers continue to plant. Especially with price conditions like this. Farmers are still enthusiastic about planting, always filling the gardens that may have been many of which have died, then those that have opened new land. That's why the training is very helpful."*

The same thing was said by Mr. Moh. Abdu as a cocoa farmer who said that:

*"The extension requirement must have a farmer group, so we formed and joined a farmer group. From these trainings, the positive impact is very good. We practice*

*until now, thank God our chocolate production still survives, even though it is over 15 years old and productive enough for us to maintain."*

The results of the above interviews can show that with the training, mentoring, and regular visits provided, farmers not only gain knowledge in sustainable plantation practices such as techniques and advice on the use of medicinal drugs but also feel supported in facing the challenges of the ups and downs of cocoa prices.

### 3.6 Environmental Aspects

In the midst of the uncertainty of cocoa prices, doing sustainability efforts on cocoa plantations is a very important step, especially in paying attention to environmental aspects. Sustainable and environmentally friendly plantation practices can not only increase productivity but also maintain the health of the environment. This is in accordance with the principles of sustainability accounting that emphasize social and environmental responsibility in plantation practices.

Based on an interview with Mr. Tonny Iskandar who said that:

*"For cocoa trees that are 15 years old and above, rejuvenation is carried out as a side connection. It was replanted because it was considered that the age of the plant was a bit old. That's why rejuvenation is carried out through the side grafting technique. We also do the fruit rubbing technique, the first benefit is that it makes it very easy, the second does not affect small fruits. Then the flowers if we spray the system will automatically affect the fruits, flowers and flower pentil which can cause it to fall off, if you use a smear system where the fruit is a bit large, that's what the smear is done."*

Another thing was said by Mr. Moh. Abdu as a cocoa farmer who said that:

*"Money cocoa trees aged 15 years and above are actually still productive ages, but it depends on each care. As long as you*

*don't use herbicide sprays that kill the roots. It is enough to use incendiary sprays. Which means that if you use herbicides that are deadly until the roots cause trees that are 15 years old and above to be unproductive anymore. But Alhamdulillah, we as farmers have begun to realize and understand that we no longer use spraying dead herbicides until the roots are enough with just a burner so that the age of 15 years is still very, very productive."*

The results of the above interview can be concluded that environmentally friendly plantation practices accompanied by farmers' awareness can support the sustainability of cocoa plantation businesses. By replanting, farmers can extend the productive life of cocoa plants. As well as by avoiding the use of herbicides that kill the roots, it can contribute to the productivity and sustainability of cocoa plants. Thus, sustainable and environmentally friendly plantation practices can not only increase productivity but can also maintain the health of the environment. This is in accordance with the principles of sustainability accounting that emphasize social and environmental responsibility in plantation practices.

### 3.2 Discussion

#### a. Factors Influencing the Ups and Downs of Cocoa Prices

The ups and downs of cocoa prices are a major challenge felt by farmers, which has a direct impact on their income and welfare. This volatility in cocoa prices can interfere with farmers' ability to do financial planning and invest in the sustainability of their cocoa plantation business. In this case, there are several factors that can affect the ups and downs of cocoa prices. A deep understanding of the factors that affect the ups and downs of cocoa prices is essential to be able to formulate the right strategy in dealing with various challenges that occur.

Demand and supply are one of the main factors that affect the ups and downs of cocoa prices. The demand for cocoa can be influenced by the increasing consumption trend that uses

cocoa as a raw material, in addition to population growth and lifestyle are also the causes of the increase in demand. Meanwhile, cocoa supply is influenced by factors such as weather, pests and diseases, crop productivity, and production costs. When demand increases while supply is limited, cocoa prices tend to rise. Conversely, when supply exceeds demand, it can lead to a decline in cocoa prices (Pujiati 2020). The imbalance between demand and supply can affect the pricing of cocoa in the market (Citra Vita Yuningtyas & Dedi Budiman Hakim, 2020)

Climate change is also a factor that affects the ups and downs of cocoa prices. Climate change causes farmers to be unable to predict rainy and dry seasons, or variable rainfall, so crop yields can decrease and can increase production costs (Abdullah, Maryana, and Kalsum 2024). According to research (Idawati, Fatchiya, and Tjitropranoto 2018), climate change can have an impact on increasing pests and diseases, land degradation and decreased production in cocoa plants. Climate change can cause extreme weather such as floods or droughts, which can damage cocoa crops. As a result, climate change does not only affect farmers but also contributes to cocoa prices in the global market.

Global market dynamics play an important role in cocoa pricing. Global market dynamics can be influenced by factors such as recession and economic growth. When the global market is affected by a recession, this can reduce purchasing power which leads to a decrease in demand for cocoa. On the other hand, when the economy recovers, it can increase the demand for cocoa commodities. This increase in demand can be influenced by factors such as lifestyle, the use of cocoa as a raw material in drinks, food, and cosmetics. However, challenges such as price fluctuations and climate change have contributed to the volatility of cocoa prices in the global market. Therefore, market participants in cocoa commodities need to adapt in taking advantage of opportunities and managing emerging risks (Rezka Yoli Amanda & Firwan Tan, 2024).

## **b. The Impact of Price Fluctuations on Farmers' Welfare**

This study examines how the ups and downs of cocoa prices impact the livelihood of farmers, and how farmers manage their plantation businesses in conditions of cocoa price instability. As stated by (Anugrah 2024) That when the price of cocoa increases, farmers can feel an increase in income that can be used to meet their daily needs so that they can improve their quality of life and can make sustainability efforts in their cocoa plantation business. But on the contrary, the decline in cocoa prices has caused confusion and anxiety for farmers due to the disruption of their economic stability, forcing them to look for additional sources of income.

The increase in cocoa prices makes farmers feel calmer due to increased income. With increased income, it can make it easier for them to meet their living needs such as food, education, and health. In addition, the increase in cocoa prices allows farmers to invest their income in cocoa plantation business sustainability efforts, such as the purchase of fertilizers, pesticides, and plant medicines, as well as spur farmers' enthusiasm in the care and maintenance of crops so that crop yields are optimal. This shows that the increase in cocoa prices can provide opportunities for farmers to improve their quality of life and productivity of cocoa plants in order to produce quality cocoa and optimal crop yields.

However, behind the profits from the increase in cocoa prices, farmers are experiencing challenges in the form of increased production costs. The prices of fertilizers, pesticides, and plant medicines all increased as the price of cocoa increased, making the income earned not worth the expenses they had to bear. The contribution of the government and related institutions is very important to overcome this problem by providing support in the form of subsidies or assistance for production costs. In addition, training on cocoa plant care and maintenance techniques and financial management can also help farmers save money and increase crop yields.



### **c. The Importance of Sustainability in the Face of Rising Cocoa Prices**

In the midst of the ups and downs of cocoa prices, the implementation of sustainability accounting is very important. Sustainability accounting includes more than just financial recording and reporting, but it also assesses the impact of plantation practices on society and the environment. The ups and downs of cocoa prices can have a direct impact on the welfare of cocoa farmers who depend on income from cocoa plantations. With the implementation of sustainability accounting, farmers can find and use ways to survive and adapt amid the ups and downs of cocoa prices while still being sustainable in their cocoa plantation business.

### **d. Economic Aspects**

The economic aspect has an important role in the sustainability of cocoa plantations, especially when cocoa prices experience significant ups and downs. The ups and downs of cocoa prices not only affect farmers' income, but also the entire supply chain of cocoa commodities. Therefore, the implementation of sustainability accounting is very important to ensure that all parties involved in the cocoa commodity supply chain get balanced benefits. With a clear and open approach, all parties involved can more easily identify and design strategies to address the problems that arise due to the ups and downs of cocoa prices (Kumala Sriwana et al. 2021)

In the midst of cocoa price instability, farmers remain consistent in maintaining and caring for cocoa plants which are the main source of income for them. But when the price of cocoa decreased, farmers did an alternative by planting other crops to support their daily needs. Not only that, farmers also receive support from cocoa buyers in the sustainability of cocoa plantation businesses. By giving bonuses as a form of loyalty to farmers who routinely sell their crops, this can have a positive impact on the lives of farmers because farmers not only get benefits but can motivate farmers to continue to empower cocoa

plantations even in the midst of fluctuations in cocoa prices.

The application of sustainability accounting is very important for farmers in managing their finances. By doing simple financial records, farmers can understand their financial situation by recording the income from the sale of cocoa beans as well as expenses that cover all costs during the maintenance process until harvest. It can also help farmers in controlling their income and expenses in meeting the sustainability needs of cocoa plantation businesses. In addition, making financial records can make it easier for farmers to submit financing applications, because they can show clear and accurate financial records (Wahyuni et al. 2024). Thus, the implementation of sustainability accounting not only supports the sustainability of cocoa plantations, but can also improve the welfare of farmers.

### **e. Social Aspects**

Social aspects are important in the development of the sustainability of cocoa plantations, especially through training and counseling provided to cocoa farmers. This aims to improve farmers' insights and skills about new techniques in plant care, pest and disease control, as well as fertilization techniques and the use of medicines. Through this program, it can help farmers in overcoming plant pests and diseases, and can encourage them to implement sustainable plantation practices. With better knowledge, farmers can improve the quality and productivity of their crops (Arhim et al. 2022)

### **f. Environmental Aspects**

Sustainable and environmentally friendly plantation practices are very important for farmers in the face of fluctuations in cocoa prices. By applying sustainability accounting principles that emphasize social and environmental responsibility, it can not only increase productivity but also can maintain the health of the environment. This means that they not only focus on financial gains but also

maintain environmental sustainability so that they can improve their welfare (Yasrawan et al., 2022)

Farmers' awareness of environmental health is the main key in the implementation of sustainable plantation practices. By avoiding the use of herbicides that can kill the roots, it can contribute to the productivity and sustainability of cocoa plants. As well as rejuvenating through side-grafting techniques and pruning water branches can grow sturdy new branches and can extend the productive life of cocoa plants.

Thus, sustainable and environmentally friendly plantation practices can not only increase productivity but can also maintain the health of the environment. This is in accordance with the principles of sustainability accounting that emphasize social and environmental responsibility in plantation practices.

## 4. Conclusion

### 4.1 Summary of Findings

This study concludes that fluctuations in cocoa prices have a significant impact on the welfare of cocoa farmers in Mensung Village, Parigi Moutong Regency. The volatility of prices is primarily influenced by three factors: global market dynamics, climate variability, and imbalances in supply and demand. Rising cocoa prices improve farmers' income, enabling them to meet basic needs, invest in agricultural inputs, and ensure the sustainability of their plantations. Conversely, price declines cause economic distress, reduce purchasing power, and hinder the continuity of plantation care.

The application of sustainability accounting plays a crucial role in helping farmers record, monitor, and evaluate their financial, social, and environmental performance. Through transparent and consistent financial recording, farmers are better able to manage income and expenses, plan sustainability initiatives, and make more rational economic decisions. In addition, the social and environmental dimensions of sustainability accounting—such as farmer training, cooperation with buyers, and

environmentally friendly cultivation practices—have strengthened resilience and long-term sustainability in the cocoa sector.

### 4.2 Theoretical Implications

This research contributes to the theoretical development of sustainability accounting by demonstrating its relevance at the microeconomic level, particularly among smallholder farmers. The findings confirm that sustainability accounting is not limited to corporate reporting frameworks but can also serve as an adaptive tool for individual farmers and cooperatives to achieve triple-bottom-line outcomes—economic viability, social welfare, and environmental protection.

Furthermore, the integration of sustainability accounting within the context of commodity price volatility supports stakeholder theory, which posits that sustainable value creation depends on balanced consideration of financial and non-financial interests. This study enriches existing literature by offering an empirical basis that links accounting practices, sustainability principles, and farmers' economic resilience in the face of market uncertainty.

### 4.3 Practical Implications

From a practical perspective, the findings highlight the importance of promoting financial literacy and sustainability-based recordkeeping among smallholder cocoa farmers. The implementation of sustainability accounting can enhance decision-making capacity, encourage responsible resource management, and provide accountability in both individual and group-based farming systems.

For cocoa buyers and agribusiness entities, establishing incentive-based collaborations—such as certification programs, bonuses, and capacity-building initiatives—can improve farmer motivation and product quality while ensuring supply chain transparency. Government institutions and cooperatives are encouraged to provide continuous training, access to financing, and technical assistance to strengthen the implementation of sustainability

accounting in the agricultural sector. These actions collectively can improve farmers' welfare and contribute to achieving Sustainable Development Goals (SDGs), particularly SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production).

#### 4.4 Recommendations for Future Research

Future studies are encouraged to expand this research by employing mixed methods or longitudinal designs to measure the long-term effects of sustainability accounting on farmers' welfare and environmental performance. Comparative studies between different agricultural commodities—such as coffee, palm oil, and rubber—can also provide broader insights into the adaptability of sustainability accounting frameworks in various agro-industrial contexts.

Additionally, future research should explore the role of digital accounting technologies and mobile-based applications in supporting real-time financial monitoring and sustainability reporting among smallholder farmers. The integration of digital innovations could enhance data accuracy, transparency, and traceability, thereby strengthening sustainable agricultural governance at the grassroots level.

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