

Analysis of strategic programs in planning and developing cocoa agribusiness in Bantaeng Regency

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ABSTRACT

The fluctuation of production levels, low innovation adoption rates, and low cocoa prices at the farm level are important problems in cocoa agribusiness that cannot be allowed to prolong, especially in production centers such as Bantaeng Regency, South Sulawesi Province. The purpose of this research is to provide strategic program recommendations as a reference for policymakers in designing cocoa agribusiness planning and development. This research used Interpretative Structural Modeling (ISM) analysis to be able to formulate a complex policy structure based on elements and formulate a hierarchy of relationships between elements. The results show that there are five key programs in planning and developing cocoa agribusiness in Bantaeng Regency, namely effectiveness of extension in the field, capacity building of extension workers, the establishment of farming partnerships with companies, the establishment of specialized cocoa development team, and guarantee of price stability. These key programs need to be assisted by supporting programs such as institutional development programs, effective coordination between institutions, effective technology transfer to farmers, provision of organic technology, providing rewards for farmers, providing access to capital, strengthening digital marketing, and improving cocoa quality through fermentation. Based on the interpretation of this research, stakeholders need to have an understanding of the priorities and synergy between programs to ensure the development of cocoa agribusiness that is right on target and in accordance with the needs and conditions currently faced.

Keywords:

Cocoa agribusiness, Developing agriculture, Strategic programs

1. Introduction

The fluctuation of production levels is one of the important problems in the plantation sector that cannot be allowed to prolong. One of the cases of yield fluctuation in the last few decades is the cocoa commodity in Indonesia. The national production has been falling steadily from 767,400 tons in 2018 to 667,300 tons in 2022, a reduction of 100,100 tons in the last 5 years. In fact, cocoa is one of the national mainstay plantation products considering that its production is one of the highest in the world. In addition, international market demand for cocoa beans and its derivative products has also increased significantly, three times faster than population growth in the last decade [1]. This shows the importance of ensuring good planning and proper development to support cocoa agribusiness in various cocoa production centers, one of which is in South Sulawesi.

South Sulawesi Province is one of the national cocoa producers with production centers covering several districts namely North Luwu, Luwu, Wajo, Bone, Pinrang, and Bantaeng [2]. As national production fluctuates, the same thing happens at the



regency scale, including Bantaeng. In 2018, Bantaeng recorded a production of 2,896 tons and had recorded an increase in production in 2020 reaching 3,689 tons. However, the yield dropped again in 2022 with a total production of 2,361 tons. This shows the fluctuation and continuous decline of national cocoa production, especially in Bantaeng Regency. On a national scale, the government has shown its attention to the potential of the cocoa commodity by making various efforts to increase cocoa production starting from the expansion of the area, the export duty (BK) policy for planting, to the “Gernas Kakao” which was implemented in 25 provinces in 2009-2014 [3]. This activity targets the improvement of cocoa cultivation that is attacked by pests and diseases to increase the productivity and quality of national cocoa again by involving all stakeholders and existing resources [4]. The post-Gernas Cocoa results show that national cocoa production and quality have increased significantly. However, problems related to fluctuations in cocoa production have not been resolved since the discontinuation of the Gernas program in 2014 until now [5].

The phenomenon of fluctuating cocoa production is undeniably caused by several factors. One of the most basic is the lack of consistency of farmers in applying GAP (Good Agriculture Practices) such as fertilization, maintenance, pruning, and post-harvest handling [6]. For example, most farmers in Sulawesi rarely implement innovations in cocoa due to a lack of understanding of the correct techniques and use of inputs for cocoa cultivation [7]. In addition, there are also other problems in cocoa agribusiness such as the majority of cocoa is still bought by intermediary traders who control prices and the cocoa trade chain which is still inefficient [8]. Therefore, the adoption of this innovation is important so that the production is in line with market or consumer expectations, thereby increasing farmers' income.

Another problem is that cocoa is still one of the most promising plantation commodities despite its fluctuating production levels. But no strategic program has been carried out to improve the existing conditions. This shows an indication of institutions that should play a role but do not show a significant role. Based on the problems and conditions that occur in the field, the focus of this research is to provide strategic program recommendations as a reference for policymakers in designing planning and development of cocoa agribusiness in Bantaeng Regency.

2. Methods

This research was conducted in Bantaeng Regency, South Sulawesi for four months starting from March to June 2023. Bantaeng district was chosen as the research location with the consideration that the district is one of the cocoa commodity centers in South Sulawesi. This research is a descriptive with a qualitative approach.

The design type of this research is a case study since researchers explore a single unit or phenomenon that is limited by time and activity over a period. The description expected in this research is a clear and systematic description of the structure, hierarchy, and relationship between elements obtained based on expert judgment. The experts chosen in this research are The Head of Plantation Division of Agricultural Office in Bantaeng Regency, head of local cooperative, local extension worker, head of farmer group, and The Head of Self-help Agricultural and Rural Training Center (P4S). The instrument used in this research is a questionnaire in the

form of a list of questions given to experts to be filled in through the interview method.

This research used Interpretative Structural Modeling (ISM) analysis to be able to formulate complex policy structures based on elements, formulate a hierarchy of relationships between elements, and classify elements into 4 quadrants (autonomous, independent, dependent, and linkage) [9]. The ISM analysis is conducted with three main stages as follows:

- (1) Develop a Structural Self Interaction Matrix (SSIM) using the results from the questionnaire. This matrix represents respondents' responses expressed in four symbols, where:
 - V: If sub-element I has a contextual relationship to sub-element J and not vice versa.
 - A: If sub-element J has a contextual relationship to sub-element I and not vice versa.
 - X: If sub-element i and sub-element j have a contextual relationship with each other.
 - O: If sub-element i and sub-element j have no contextual relationship.
- (2) Convert the SSIM into an Initial Reachability Matrix by changing the symbols V, A, X, and O in the questionnaire into numbers 1 and 0 according to ISM rules. Then the matrix will be modified to show all direct and indirect relationships in the matrix to produce the Final Reachability Matrix.
- (3) The Final Matrix is then processed to obtain the Driver Power and Dependence (DP-D) value to produce a Directional Graph, which is a graph that shows the level of hierarchy and is classified into four quadrants.

The first quadrant is autonomous, sub-elements in this sector are generally not related to the system or may have little relationship. Sub-elements are in this sector if the DP value ≤ 0.5 and the D value ≤ 0.5 . Next, there is the dependent quadrant, sub-elements in this position are not free, highly dependent on other sub-elements. Sub-elements enter this sector if the DP value is ≤ 0.5 and the D value is > 0.5 . Then, there is the linkage quadrant, sub-elements in this sector are very important and need to be studied carefully because they have unstable relationships between sub-elements. Sub-elements enter this sector if the DP value > 0.5 and the D value > 0.5 . Fourth, the independent quadrant, the sub-elements in this sector are independent variables that have a major influence on other sub-elements. Sub-elements enter this sector if the DP value is > 0.5 and the D value is ≤ 0.5 [10].

3. Results and Discussion

3.1. Directional Graph for Strategic Programs

One of the outputs of ISM is the forming of directional graph (Figure 1) and level structure chart (Figure 2) of strategic programs of cocoa agribusiness planning and development in Bantaeng Regency. The results of the ISM analysis show that the thirteen strategic programs of cocoa planning and development are distributed in two

quadrants, namely linkage and dependent. Meanwhile, there are no strategic programs in the independent and autonomous quadrants. This shows that each strategic program needs to be implemented in cocoa development efforts.

There are ten sub-elements in the linkage quadrant, namely effectiveness of extension in the field, capacity building of extension workers, institutional development program, provision of organic technology, effective coordination between institutions, establishment of farming partnerships with companies, establishment of a specialized cocoa development team, guarantee of price stability, providing rewards for farmers, and effective technology transfer to farmers. The programs in this quadrant have an unstable relationship which means that actions taken from sub-elements in this quadrant can affect sub-elements in its own quadrant and other quadrants. Moreover, most strategic programs are in this quadrant which automatically indicates that consideration and depth of understanding of the consequences of program implementation on the success of other programs is required.

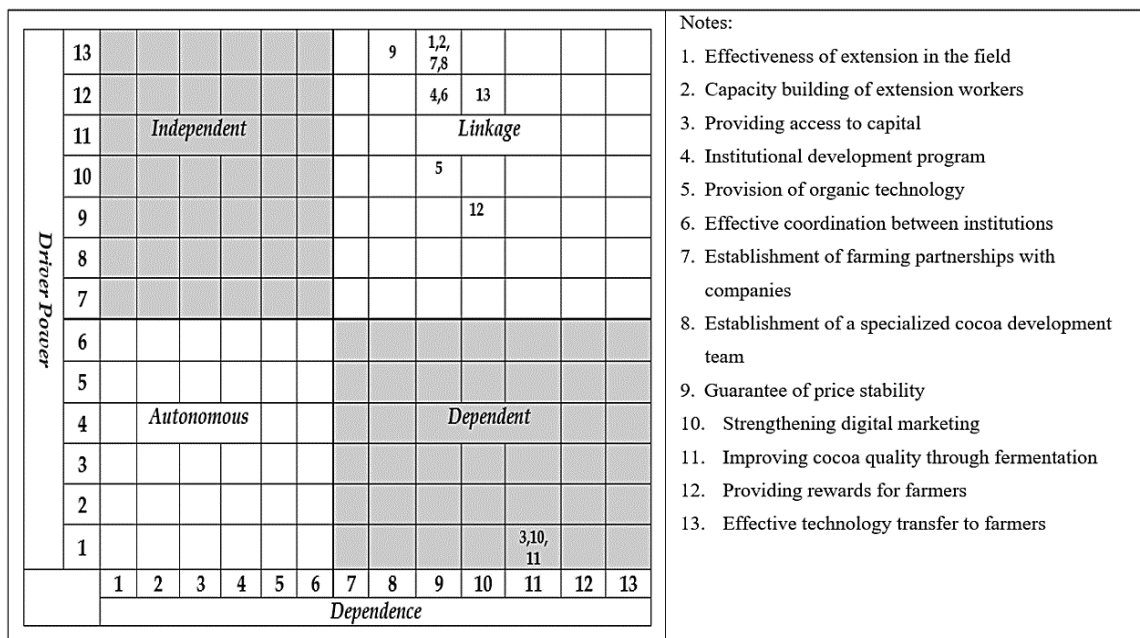


Figure 1. Directional graph for strategic programs

The three dependent programs are providing access to capital, strengthening digital marketing, and improving cocoa quality through fermentation. These three strategic programs are needed as support for the more prioritized programs that have been achieved. The three programs occupy the lowest position or level in this quadrant because the program has the lowest driver power, which means that the program does not have more influence than the strategic programs above it. However, these programs are expected to support the cocoa planning and development scheme in Bantaeng Regency.

3.2. Leveling Structure

The results showed that there are five levels of strategic programs for cocoa agribusiness development represented in Figure 2. Programs at the first level are key programs in agribusiness planning and development. Meanwhile, programs at level two to level five are programs that support programs at the top level.

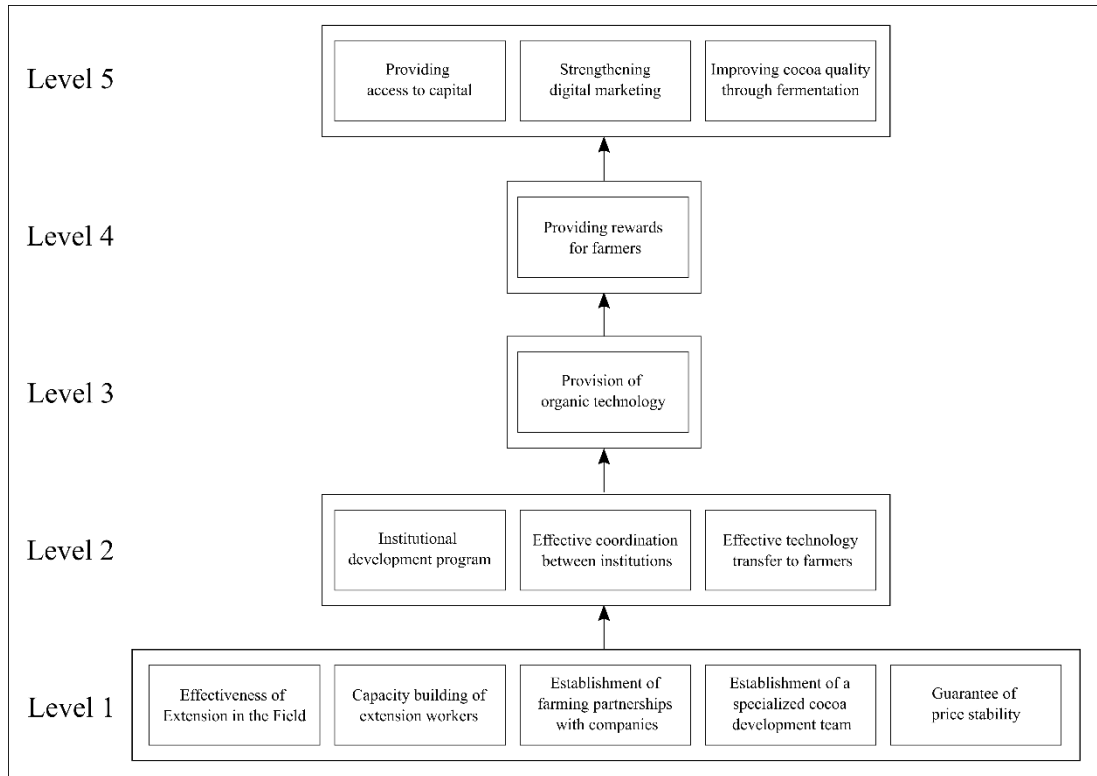


Figure 2. Cocoa agribusiness planning and development level

At the first level, there are five programs, namely the effectiveness of extension in the field, capacity building of extension workers, establishment of farming partnerships with companies, establishment of a specialized cocoa development team, and guarantee of price stability. The five strategic programs are key programs in the agribusiness development system. This means that they need to be prioritized or lead the way in improving agribusiness performance since they have the greatest driver power in the planning and development of cocoa agribusiness in Bantaeng Regency.

The effectiveness of extension programs in the field shows the importance of extension in agribusiness development. Extension is known as one of the methods to improve farmers' knowledge, skills, and attitudes in responding to new innovations and technologies. Through extension, farmers can absorb new information provided by experts and other supporting institutions. However, facts on the field show that the effectiveness of extension services has been decreasing over time in Bantaeng Regency. Institutional support is one of the reasons for the lack of implementation of extension at the farmer group level. In addition, financial constraints, and the absence of a dedicated program from the government to conduct extension services are also reasons for the decreasing frequency of extension services.

Extension at the farmer group level is usually conducted once or twice a month. The government also provides support in terms of facilitation of infrastructure, materials/resource persons, and financing. However, since the end of the Covid-19 pandemic, extension activities at the farmer group level have decreased. Currently, extension activities are usually carried out only if there are urgent matters to be conveyed. Meanwhile, related to the cost aspect, extension activities in the field are currently carried out using personal or operational costs of local extension workers and assisted by farmer group cash. This is done so that farmers can continue to receive information on new technologies (theory and practice) to improve their knowledge and skills. Not only that, extension activities at the farmer group level can also be a forum to control and evaluate cultivation activities carried out by farmers, although of course the intensity and effectiveness will be different if it is carried out on a scheduled and continuous basis and has the support of related institutions. Therefore, extension is the main program that must be implemented frequently so that the target of cocoa agribusiness planning and development can be achieved, observed the results, and evaluated for better planning in the future.

The next strategic program is to increase the capacity of extension workers. Extension workers are facilitators or connectors of the government to farmers, whether it is related to government programs, government assistance, or new technologies that can be adopted by farmers. Extension workers can be said to be the main spearhead of extension because they are located very close to the subject of agricultural extension, which is farmers. While conditions in the field have shown that there are new technologies that are ready to be disseminated to farmers, the theory and technical use of which have not been understood by extension workers equally in all regions in Indonesia. The reason for this limitation is that field instructors are rarely involved in capacity-building training. Consequently, it is necessary to provide skills or additional qualified knowledge to extension workers through education and training. Through education and training, extension workers can become qualified conveyors of information to farmers.

Capacity building of extension workers through education and training needs to be done continuously, both offline and online. Wonde et al. [11] describe that capacity building of extension workers through education and training needs to be done continuously, both offline and online. Not only that, the establishment and expansion of training and extension networks are needed to develop and enhance skills to increase productivity and income-generating capabilities [11,12]. Not only agricultural extension workers, but other human resources who also need capacity building are extension workers or instructors from other related institutions. Extension sometimes requires the role of instructors from agencies or institutions that are not only involved in agriculture but also in trade, cooperatives, or even finance. Therefore, it is also important for these institutions to assist agricultural extension officers in facilitating the transfer of knowledge and technology to farmers in accordance with their respective fields. For instance, an extension program that focuses on cocoa marketing should be explained by an agency such as the Cooperative, Trade and SMEs (Small and Medium Enterprises) Agency for the purpose of clarity and correctness.

Actually, the government has provided a solution for this, since the Covid-19 pandemic, the government has held learning programs to increase the capacity of extension workers and farmers via online such as Ngobras (Ngobrol Asik Penyuluhan), MSPP (Mentan Sapa Petani dan Penyuluh), BOC (Bertani on Cloud), and MAF (Millennial Agriculture Forum). These programs aimed to improve the knowledge and skills of field instructors and farmers. However, according to many extension workers, these through-screen activities can only be used to increase knowledge. Meanwhile, with hundreds to thousands of participants participating in this training, it is certainly very difficult to ask questions, discuss, and request to be explained in more detail about the technical skills. So, it is good for the government to be able to carry out direct training at the district or provincial level so that the capacity of field instructors can also increase.

Furthermore, it should be pointed out that, cocoa agribusiness is also closely related to corporate partnerships. Moreover, there are numerous major companies that use cocoa raw materials in South Sulawesi such as MARS, Barry Callebaut, Olam, and others. The ability to establish cooperation is expected to be emphasized more on the price and marketing aspects such as the commission program conducted by Barry Callebaut. The argument is that farmers no longer need to be under the shadow of intermediary traders who sometimes harm cocoa farmers through pricing manipulation. Until now, cocoa farmers in Bantaeng have been cooperating with big companies as mentioned earlier. However, information from the field shows that the farmers' partnership with Olam has ended in 2023. This could potentially hinder the development of the cocoa agribusiness ecosystem in the regency. Attipoe et al. [13] explained that external programs can help increase yields, which in turn affects the household income of cocoa farmers. In addition, Walton et al. [14] emphasize stakeholders to invest time at the beginning of the project to develop a trustful partnership. In addition, agreement on a communication strategy is also key to the sustainability of the partnership.

Then, in developing agribusiness, it is certainly inseparable from the need for a special team and appropriate research to determine the direction of cocoa agribusiness development. This needs to be done so that the planning can have a clear flow and realistic achievement targets according to the conditions of each region [15]. With the increasing vulnerability in the cocoa sector, Suh [1] suggested that there is a need to formulate a climate-smart cocoa production policy that considers sustainable farm management practices, information technology supporting farmer adaptation, institutional factors, and socio-economic factors to increase cocoa production [16,17]. For example, in Bantaeng Regency, there once a special team from private sector (researchers from India) assigned to research cocoa for three months in the region. From the results of the research, the company was able to provide more appropriate cocoa farming recommendations to the community. Meanwhile, the obstacle is that the company does not want to share the results of its research because there is no MoU that regulates their cooperation with the government yet. Thus, the company only entered legally to conduct research, but there was no reciprocal relationship between the local government and the company.

The last strategic program at the first level is the importance of farmers having price guarantees. Cocoa prices in Bantaeng fluctuate and have no standardized price, sometimes to the detriment of farmers. Cocoa is bought by intermediary traders or

small traders by looking and feeling the shape, texture, and wetness level without using proper measuring tools. In the past, the price of cocoa could reach IDR 20,000 per kg, but now the price at the farm level is only IDR 9,000 to IDR 11,000 per kg for wet or half-dry beans. Usually, intermediary traders also give different price ranges. This point needs to be a concern for stakeholders in developing cocoa agribusiness in Bantaeng. There should be a guaranteed buying and selling price of cocoa set by the government. As Fitriana et al. [18] emphasized the urgency of having a market with stable cocoa prices for farmers. For example, in the maize commodity, the price is guaranteed by government regulations by setting the lowest purchase price at the farm level at IDR 3,000 per kg, so that it is not unfavorable to farmers. Last but not least, companies can also play a role by coordinating with cooperatives so that they can determine a fair price for farmers and can provide the right profit for cooperative operations.

Then at level two, there are three strategic programs namely institutional development program, effective coordination between institutions, and effective technology transfer to farmers. Farmer institutional development program emphasizes the importance of group readiness in participating in cocoa agribusiness as well as programs implemented by the government and companies. This is done considering the program/activity implementation system is always done through farmer groups such as Field School (SL). A strong institution can help the success of program implementation, and vice versa [19]. Equally important, it is also necessary to develop groups of farm women to eliminate the gender-based participation gap while adding income generating activities for farm women [20].

In line with the institutional development program, the effective coordination between institutions program is expected to enable all cocoa agribusiness stakeholders to coordinate more effectively to achieve common goals. The implementation of ineffective coordination is still an important problem that needs to be addressed. Sometimes there is still miscommunication such as unclear which agency is supposed to carry out certain activities.

Furthermore, there is the effective technology transfer to farmers program, which ensures how technology and practical knowledge can reach farmers. However, there are two important points of concern, the first of which is land productivity that remains stagnant despite the application of the latest technology and a decline in income. Scudder et al. [21] explain the decline in hourly income as a result of inappropriate technology transfer that burdens labor and increases capital expenditure. One of the reasons for this is the lack of coordination from all stakeholders. This program is actually still closely related to other programs at level 2 because the process of transferring knowledge and technology has been carried out through inter-institutional interactions. So far, technology transfer is still dominantly carried out by agricultural extension officers in the plantation sector although with a frequency that is not as high as before. Therefore, to increase farmers' knowledge, it is necessary to involve other institutions in technology transfer. For example, knowledge related to post-harvest and marketing can be transferred by the industry and trade office or the food security office.

However, there is no cooperation between governments to subsidize organic inputs for farmers yet. Tennhardt et al. [22] identified that there are social, health, and environmental conservation benefits of cocoa produced in an environmentally

friendly manner without the use of chemicals, even though it requires investment and lowers the profitability of the farm. However, what is currently needed more is fertilization recommendations that are in accordance with the level of management and expected weather conditions [23]. Meanwhile, the program providing rewards for farmers at level 4 is a program that acts as an incentive for farmers to pursue production quantity. This program is not carried out by the government but by company that partner with farmers. In 2020, the company had implemented a program to give commissions to farmers for every kg sold, but the program has not continued since then.

Then, at the last level, there are three programs, namely providing access to capital, strengthening digital marketing, and improving cocoa quality through fermentation. Although considered to be in the system, the issue of farm capital is not a top priority in the cocoa agribusiness development planning in Bantaeng Regency. This is because of two reasons; 1) access to credit is limited and the requirements are difficult, and 2) the majority of farmers do not need capital because of the annual (once to twice a year) seed and fertilizer subsidies. In addition, the cocoa crop in Bantaeng is still in its productive age, so farmers do not need much capital to farm.

Furthermore, the fermentation program is still relatively difficult to implement in Bantaeng due to the lack of a market for fermented cocoa. Research by Raharto [24] shows that around 90% of Indonesian cocoa exports are still unfermented. In fact, improving cocoa quality is one of the priorities in the cocoa marketing subsystem in Sulawesi [25]. Collecting traders prefer to buy half-day dried cocoa because the price does not shrink too much, so they can play the price. This half-day cocoa is what they will sell to Makassar (KIMA, MARS, Olam, and other companies). This is in line with the findings of Hariyati [26] who explained that there is no price incentive for fermented cocoa in Blitar Regency so farmers prefer to sell their cocoa without going through the fermentation process, means that this issue persist in other region.

Finally, the digital marketing strengthening program is also difficult and not prioritized because the market is also difficult. The obstacle is the difficulty of shipping and handling because cocoa is generally sold in wet or half-dried form. In addition, digital marketing practices for cocoa farming are still not commonly practiced by the local community. Therefore, the weak driver power of these strategic programs shows that all three can still be implemented even though they are supporting programs at the top level.

4. Conclusion

Using ISM analysis, this study found that there are five strategic programs for cocoa agribusiness planning and development in Bantaeng Regency, namely effectiveness of extension in the field, capacity building of extension workers, establishment of farming partnerships with companies, establishment of a specialized cocoa development team, and guarantee of price stability. The five strategic programs are key programs that are prioritized in improving agribusiness performance considering that they have the greatest driver power in the system. Then, these key programs need to be assisted by supporting programs such as institutional development programs, effective coordination between institutions, effective technology transfer to farmers, provision of organic technology, providing rewards for farmers, providing access to capital, strengthening digital marketing, and improving cocoa quality through

fermentation. Based on the interpretation of this research, stakeholders need to understand the priorities and synergy between programs to ensure the development of cocoa agribusiness that is right on target and in accordance with the needs and conditions currently faced.

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