International Journal of Multidisciplinary and Current Educational Research (IJMCER)
ISSN: 2581-7027 ||Volume|| 4 ||Issue|| 1 ||Pages 43-50 ||2022||

Interdisciplinary Diagnostic Study On Local Economic Through Sustainable Cocoa Development Program In East Java

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ABSTRACT : Cacao is the third most important agricultural export commodity in the world. The demand for cocoa is increasing every year. In an effort to increase national cocoa production all related institutions must actively and effectively participate in promoting productivity and strengthening domestic and international markets. This study aims to (1) Know the communication and cooperation between the Provincial Government, the Regional Government and related Associations in a professional, structured and sustainable manner in the development of cocoa production, trade, promotion and export from East Java. 2) Knowing the active role of the combined Indonesian Export Company in helping to improve the regional economy. This study uses an interview method using a questionnaire and is processed descriptively. Based on the results of the study showed positive results in the understanding, knowledge and cooperation of farmers in sustainable cocoa cultivation. The emergence of HR and UMKM in managing cocoa beans, can increase the added value of cocoa products, so that the role of SCDP is more evident especially in creating jobs and driving the regional economy in three regencies in East Java.

KEYWORD : Cocoa, Sustainability, Development, Creativity

I. INRODUCTION

Cacao is the third most important agricultural export commodity in the world and the second largest important commercial crop in the tropics. This is due to the high global demand for cocoa growing sharply over the past 15 years. Like other agricultural products, the growth in global demand for cocoa is mainly due to population and economic growth in Asian and African countries. The growing demand for cocoa is responded to in the form of efforts to increase cocoa production in producing countries, which is carried out in the form of land expansion and agricultural intensification (Nugraha et al., 2019) and supply variability, due to increased annual fluctuations in cocoa production caused by many factors, especially weather. The tight relationship between supply and long-term recession cycles has affected global markets and cocoa prices (François Ruf, 1995). The increase in cocoa prices has been more complete and faster transmitted to consumers than to decline, indicating the market power of chocolate traders and producers (Fountain & Hütz-Adams, 2012). Indonesia is one of the third largest cocoa producers after Ivory Coast and Ghana. According to this, Indonesia is currently working to increase national cocoa production, because in addition to meeting the high domestic demand, increasing production is also needed to boost cocoa exports. For this reason, the government seeks to make Indonesia the largest cocoa producer in the world and to make cocoa a mainstay of national export commodities in addition to palm oil and rubber. On the other hand, the development of Indonesian cocoa production has declined. Data from the Central Statistics Agency (BPS) shows that Indonesian cocoa production from 2010 to 2013 decreased by 14% Likewise Indonesia's cocoa exports in 2014 fell by 19.5% compared to 2013. The development of the cocoa sector in Indonesia presents important opportunities for advance social and economic goals, but also implies sacrifice with environmental goals and tensions among stakeholders, including small farmers, large-scale buyers and government agents (Mithöfer et al., 2017).

In an effort to increase national cocoa production, the Association of Indonesian Export Companies (GPEI) supported by the Indonesian Coffee and Cocoa Research Center, relevant Departments, Institutions and Associations will actively and effectively participate in encouraging Regional Economic Development through increasing productivity and the cocoa bean business which is strengthened by domestic and international markets in East Java. Because cocoa is one of the mainstay plantation commodities in East Java that also plays an important role as regional foreign exchange earners, providing employment and a source of income for farmers. In Indonesia, around 90% of cocoa is produced by small farmers. An estimated 60% of them live below the poverty line (Schaad & Fromm, 2018). This shows the importance of seeing cocoa farming as one part of the resilience of household income-producing strategies (Oomes et al., 2016).

The sustainable cocoa cultivation program was implemented in three districts in East Java, namely Pacitan, Trenggalek, and Blitar districts. This program was carried out on 1 February 2016 to 31 January 2020 and at this time the SCDP program has entered the fourth period which is deemed necessary for monitoring and evaluating activities so that they can be known related to the success and benefits of the program for all stakeholders involved in this program. The objectives of this implementation are 1) Knowing the communication and cooperation between the Provincial Government, the Regional Government and related Associations in a professional, structured and sustainable manner in the development of cocoa production, trade, promotion and export from East Java. 2) Knowing the active role of the combined Indonesian Export Companies supported by the Coffee and Cocoa PUSLIT and related Associations in helping to improve the regional economy.

II. THEORETICAL BACKGROUND AND LITERATURE REVIEW

Agricultural Development : Agricultural Development is a process aimed at always increasing agricultural production to increase agricultural production for each consumer, which at the same time enhances the income and business productivity of each farmer by increasing capital and skills to increase human intervention in the growth-growth plants and animals. (Hadisapoetra, 1973) By A. T. Mosher in his book Getting Agriculture Moving, that agricultural development is an integral part of economic development and society in general (Sudalmi,2010). Broadly speaking, agricultural development is not only a process or activity to increase agricultural production but a process that produces social change in terms of values, norms, behavior, institutions, social and so on in order to achieve economic growth and improve the welfare of farmers and society better. Agriculture is the main sector producing food ingredients and industrial materials that can be processed into clothing, food and shelter that can be consumed or traded, therefore agricultural development is part of economic development.

Cacao : Theobroma cacao is the biological name given to the cacao tree by Linnaeus in 1753. The natural place of the genus Theobroma is in a part of tropical forest with a lot of rainfall, high humidity, and shade. Under these conditions, Theobroma cacao rarely bears fruit and produces only a few seeds. Cocoa plants consist of 2 (two) types which are distinguished based on the color of the seeds, the white color belongs to the Criollo group, while the seeds of the purple plant belong to the Forastero group. Cocoa beans are needed in various industries because of their unique characteristics, namely: (1) cocoa beans contain quite high fat (55%), where the fat has a unique characteristic that is frozen at room temperature but melts at body temperature, (2) the solid part of the cocoa beans contains components of flavor and coloring which are highly needed in the food industry.

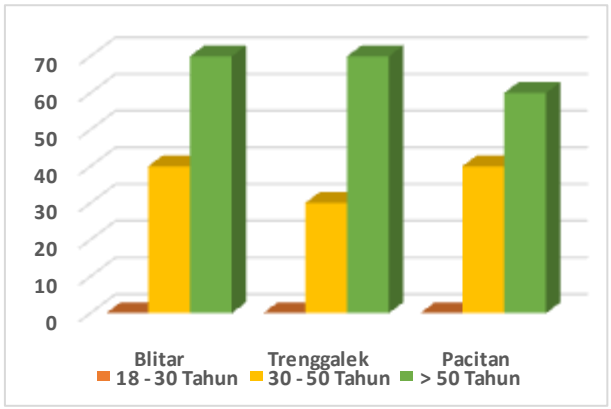
III. METODHS

The target locations of this study are in three districts of Pacitan, Trenggalek, and Blitar. Each of the Demonstration plot locations in each district is: Pacitan four locations, Trenggalek five locations, and Blitar seven locations, a total of 16 locations or consisting of 16 Farmer Groups. This research was conducted in February 2019 to January 2020.This research uses primary and secondary data types. Primary data consists of data on the results of activities that have been carried out related to various aspects of the Sustainable Cocoa Cultivation program. These aspects include land suitability, cocoa and saprotan cultivation, primary processing technology, waste treatment technology, institutions and markets as well as empowerment of social, economic and cultural potential. Empowerment aims to increase the ability or an uselessness to be useful (Ife, 1997).Data was collected by filling out questionnaires and direct interviews with respondents. The secondary data used include climate data (rainfall, water deficit / year and temperature), land use maps for cocoa plants, cocoa production The method used for sampling was carried out by a survey method which was to assign respondents randomly to 60 cocoa farmers from 20 Farmer Groups in each Regency. From each regency, four farmer groups were determined with their Cocoa Demonstration Plots. Then from each Farmer Group three farmers were taken as respondents with the provisions of an administrator and two members of the Farmer Group. The data processing obtained is grouped and classified according to the parameters used to determine the development of cocoa plants. As a first step in the study used a descriptive description. The results obtained are then interpreted using a bar chart. Data processing is performed using Microsoft Office Excel.

IV. RESULTS AND DISCUSSION

Social aspects : One of the problems in the processed cocoa industry is the weak ability of human resources in the fields of production engineering, technology mastery and business management, so that the resulting quality is not optimal (Nurhadi et al., 2019). SCDP activities reach community cocoa centers in three districts including Pacitan, Trenggalek and Blitar districts. In the three districts, demonstration plots have been set up using superior cocoa seedlings from the Koka Research Center, namely MCC and Sulawesi clones. The results of

monitoring and evaluating the implementation of the Sustainable Cocoa Development program in East Java can be seen in Figure 1. below, namely how the age group distribution of cocoa farmers in East



Java.

Figure 1. Histogram of percentage distribution of age groups of cocoa farmers in three districts in East Java.

Looking at the histogram above, we are quite concerned because most active farmers in the three districts turned out to be in the age group above 50 years, meaning farmers who have started aging, despite the fact physically still strong. On the contrary, young farmers aged 18-30 years seem to have a relatively low percentage of less than 30%, this reflects that the younger generation is less interested in engaging in agriculture. Besides the age factor of farmers (human resources) that supports the development of agricultural development, the main thing is education. If the level of education is sufficient, insights and responses to technological developments will be easily absorbed, which in turn can improve performance in agricultural production systems. Figure 2 follows in the form of a portrait of the level of education of cocoa farmers

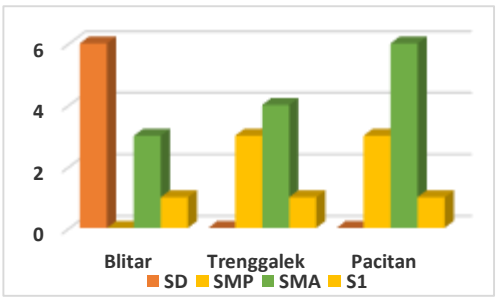


Figure 2. Histogram of percentage education level of cocoa Farmers in three districts in East Java.

From the picture above it can be seen that the average education of cocoa farmers in the three districts is mostly high school graduates followed by junior and elementary school graduates, while the strata 1 also exists although only about 10%. The thing that is proud of this aspect of farmer education, is that there are no more illiterate farmers or in other words all have gone to school. Therefore the SCDP program which was initiated in 2016 has shown encouraging results and fostering optimism.

Agroecological aspects : Agroecology is basically not just knowledge that comes from the past or traditional knowledge. Agroecology applies a holistic approach to the development of agricultural systems based on traditional knowledge, local experience, and farming methods enriched with modern scientific knowledge (Hariyono, 2016). One program that aims to improve the welfare of the community, especially cocoa farmers in East Java, is SCDP, through continuous cocoa cultivation. Growing cocoa is motivated primarily by the need for income security, land ownership, and general livelihood support (Muilerman et al., 2018). Referring to the land needs to support the success of SCDP, a portrait of the percentage of upland land ownership for cocoa in three regencies in East Java can be seen in Figure 3. below.

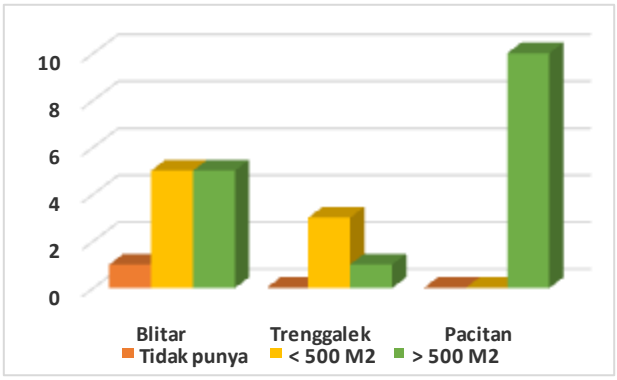


Figure 3. Percentage of average land ownership for cocoa in three districts in East Java.

The SCDP activity is basically an implementation of an agroecological strategy, which focuses on the cultivation of cocoa plants based on local wisdom, among others with the help of quality cocoa seedlings and is resistant to pest and disease infestation. The clones from seedlings distributed to cocoa farmers are superior clones namely MCC and Sulawesi with a potential yield of up to 2.5 tons / hectare. The number of seedlings and their distribution and survival in the demonstration plot in East Java can be seen in the following Figure 4.

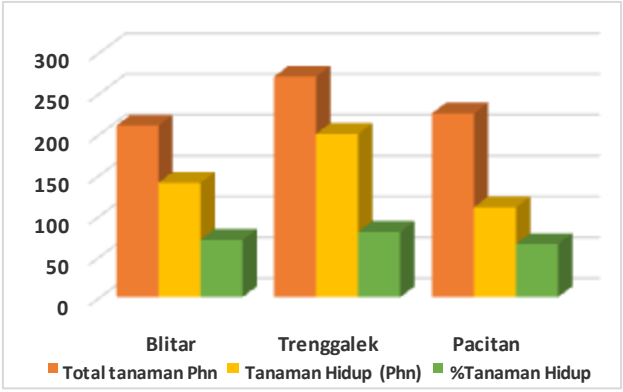


Figure 4. Average help of cacao seedlings from SCDP (trees / Farmers) and percentage of live cacao plants

Paying attention to the histogram above and after seeing the conditions on the ground we should be optimistic that the SCDP activities are going according to the desired plans and targets. First, the number of plants that lived from each aid was on average 77.4%. Interesting information, shows positive results, namely 1.5-year-old superior cocoa clones on demonstration plots in three districts in East Java have begun production, although they are still in the learning stage. SCDP has implemented a sustainable GAP, which minimizes the use of chemical fertilizers, chemical pesticides and environmentally friendly management methods. Fifty-four percent of farmers report using a mixture of both chemical and organic fertilizer (which generally consists of green manure and compost) (Wartenberg et al., 2018). To meet the needs of organic fertilizer, SCDP has provided goat livestock assistance to farmers whose whereabouts can now be seen in Figure 5 below.

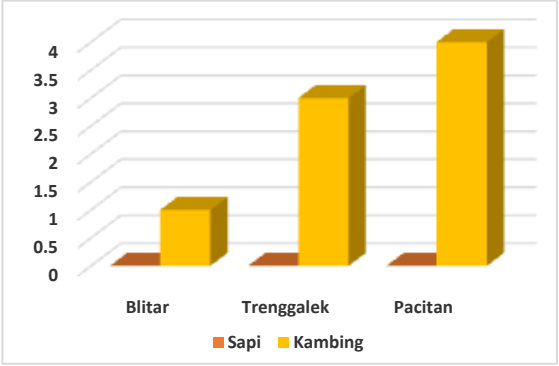


Figure 5. Histogram of farmer goat livestock ownership in three districts in East Java.

In the field, farmers generally have a place to process organic fertilizer, which is mixing rice husks and goat manure, so that it is not inconvenient if needed to fertilize plants. The need for organic fertilizer for cacao plants with a four-year age is around 5 kg / tree, and will increase according to the age of the plant. Referring to what is found in the field, the red thread can be drawn that what is the goal of the SCDP has indeed been embedded and is a guideline for cocoa farmers, namely applying agroecological-based cultivation.The pests found during monitoring and evaluation turned out to be only white flea infestation. The presence of lice is only found in a few fruits, bearing in mind that the superior clones namely MCC and Sulawesi are resistant plants. In addition to using organic fertilizer from goat manure, farmers are also trained to make pests based on plant-based pesticides (Pesnab). The solution can be used to control pests and not cause impacts on the environment.

Post Harvest Aspects : The post-harvest aspect is also important, because although the actions and yields of cocoa production in the field are good, the final solution is certainly certain that the value of products sold is usually in the form of dried ose beans which will be low, which in turn will not be optimal in terms of economic income. Anticipating these conditions, the SCDP has prepared a training program especially in handling post-harvest cocoa pods. In the second year after the assistance began, SCDP conducted training for cocoa farmers in post-harvest processing and intermediate products involving 953 people. Involving 485 senior male farmers, 286 young men and 182 female farmers (SCDP, 2018) In this regard, the proportion of farmers and their involvement in managing cocoa cultivation in three districts in East Java can be seen in Figure 6 below.

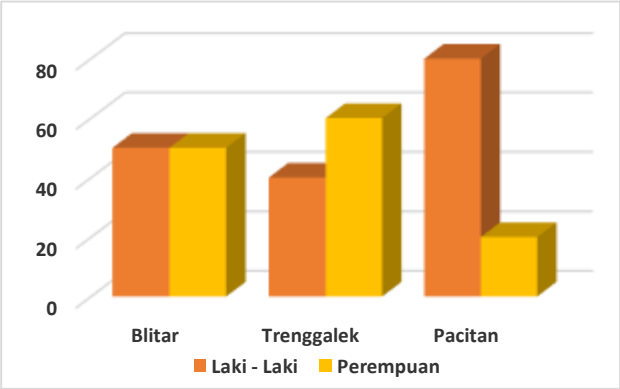


Figure 6. Histogram of the proportion of sex percentages of
Farmers in three districts in East Java

Looking at the histogram above it seems that the role and presence of female farmers is almost equal to that of male farmers. In the field, the role of women farmers, especially in the post-harvest process, was more dominant, as happened in the results of monitoring and evaluation. Although women are very involved in post-harvest work, they hardly participate in farmer groups or other public organizations (Wijaya et al., 2018).The results of the implementation of SCDP so far have shown a positive trend or trend towards the production of cocoa beans, in terms of products that can be traded, especially dried ose beans. In harmony with the use of MCC and Sulawesi superior seedlings, the quality of both the shape and size and weight of the cocoa beans is very different when compared to the cocoa hybrid clones that have long been known by farmers. For comparison, note in Figure 7 below, the cocoa bean products from SCDP assistance and old hybrid cocoa plants.

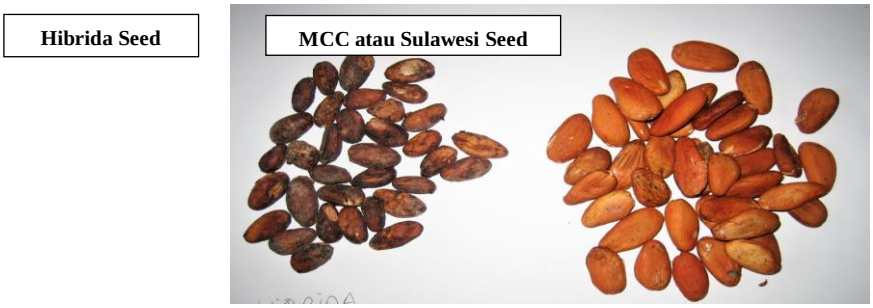


Figure 7. Comparison of the quality of production cocoa beans from Hybrid Clones and MCC / Sulawesi Clones

Noting the picture above, the monitoring and evaluation team felt more confident and logically supported that the SCDP that had been implemented could increase cocoa production both in quality and quantity. It turns out that the number of seeds in the cocoa fruit is affected by the weight of the fruit, the heavier the number of seeds also increases. For comparison of fruit weight and number of seeds can be considered in the following Table 1.

Table 1. Average fruit weight with the number of cocoa beans per grain

Average fruit weight (Ons)	Number of seeds
6-7	48
4-5.9	40
< 4	36

Mathematically estimated weight of cocoa fruit yields in October 2019 on average is 6,625 ounces / fruit. Wet seeds obtained while this is still around 1,875 ounces / fruit, so from these calculations it turns out the yield of wet seeds compared to fruit reaches 28%. Then for the calculation from fruit to dried ose seeds is around 200 kg of fruit into dried ose seeds around 7 kg, so the yield is around 3.5%. For more accurate calculations, further research is needed so that the data can be used in estimating or estimating the production of dried cocoa pods by calculating fruit production.The price of dried ose seeds is affected by the post-harvest management process, until October 2019. Farmers, especially female farmers, are very observant in observing this phenomenon so that the dried ose seed products are treated fermented with the aim of increasing the added value of dried ose seeds. Following in Figure 8. presented the proportion of post-harvest cocoa bean management processes in three districts in East Java.

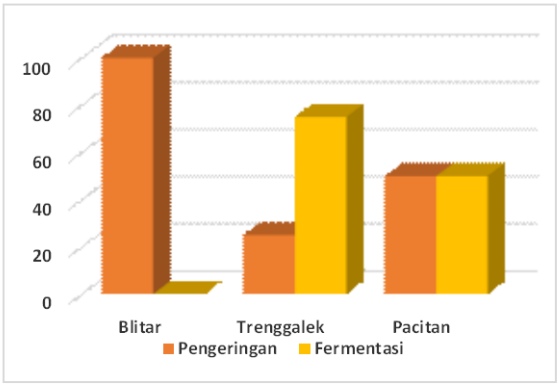


Figure 8. Histogram of the percentage of the process of managing cocoa beans to form dried ose seeds ready for sale

The fermentation process in managing cocoa beans there are still farmers who have not done it like in Blitar, most are still drying normally or non-fermenting, but most have done fermentation, especially in Trenggalek, most 85% have already fermented. The success of the SCDP is inseparable from the collaboration and active role of the district government along with the GPEI and the Koka Research Center, which together encourage and foster the development of cocoa cultivation. In real terms, cocoa products do not stop until the beans are dried but have gone further in the downstream products, such as candy, powder and various cocoa-based preparations, as the initial goal of driving the regional economy. The SCDP initiated the emergence of MSMEs and any type of cocoa-based business, including the establishment of the Chocolate House in Trenggalek which is fully supported by the Government of Trenggalek district.

Institutional Aspects : Whether it is recognized or not, the agricultural sector has always been constructed as a production sector regardless of the welfare of the perpetrators. Because when agricultural production increases sustainable food security, political stability and security are maintained. However, putting the welfare of farmers behind inhumanity and wrongdoing also makes production continuity unsustainable (Khudori, 2019). These institutional, economic and market changes and the restructuring of cocoa and chocolate have created space for innovation, especially new partnerships and sustainability initiatives (Ingram et al., 2018). Partnership has a goal for the sustainability of what has been done. Engaging interested parties and interests in the issues raised in joint work is a way to ensure that what has been done will not be in vain (Novianti et al., 2018). To go and make farmers independent, prosperous and independent is indeed a difficult struggle and requires continuity, especially the role of government, private institutions and concerned communities. One of them is SCDP which is based on the desire to improve the people's economy through the development of sustainable cocoa

cultivation. Concrete actions that have been and are being implemented include increasing the role of farmer groups as a social institution in cocoa producer centers. Among others, by providing both theoretical and practical training in the field, and assistance with seeds, fertilizers and pesticides and various aspects related to cocoa cultivation. To guard and maintain the stamina of the farmers, the task force team always monitors and accompanies the farmers' activities, before later after the institutions and human resources become independent, they are released to develop themselves.Because currently the independence of farmers is still lacking, especially in capital, and capital assistance still relies on the family system with the existence of savings and loan cooperatives. It is hoped that in the future farmer institutions such as the Farmers Group and the Farmers Group Association will be more reliable and independent, especially in providing cocoa crop production infrastructure. On the other hand, it is also able to manage product marketing and has a strong bargaining position so that the price of cocoa products can get a decent price. So that the goal is to improve the welfare of farmers can be achieved.

V. CONCLUSIONS

The social aspect shows positive results in terms of understanding and knowledge and cooperation of farmers in the cultivation of sustainable cocoa plants that has increased and has been implemented. This could happen because of the mutually supportive collaboration between the Provincial Government, Regency Government, GPEI, Koka Research Center and Gapoktan Farmers' interests, especially the younger generation in the agricultural sector, especially in cocoa cultivation began to be seen, and the role of women farmers in managing cocoa cultivation, especially the post-harvest process is crucial. This phenomenon can in turn increase the production of super quality cocoa beans. The goal of sustainable agriculture or concrete agroecological-based farming systems is already running by involving all stakeholders who each play an active role according to their capacity. The emergence of HR and MSME creativity in managing cocoa beans into a variety of foods and drinks, can increase the added value of cocoa products, so that the role of SCDP is increasingly evident, especially in creating jobs, reducing poverty and driving the regional economy in three districts in East Java.

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