The perception of local cocoa farmers to the *swisscontact* program: economics, environment and social dimension

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**Abstract.** *Swisscontact* as a partner of local cocoa farmers in West Sulawesi plays an important role in improving the sustainability of cocoa farming, not only in the economy but also in the environment and social dimension. In addition, cocoa as a product has a strategic role in high impact for the regional and national economy of Indonesia. This research focused on measuring the satisfaction level of local farmers from the economic, environmental and social dimensions to extent the success of the program implemented both by *Swisscontact* as an International NGOs from Swiss and local cocoa farmers. This research was conducted in West Sulawesi, one of the largest cocoa producers nationally. The data were collected through interview to the 269 local cocoa farmers in Polewali, Mandar as one of the *Swisscontact* Partner by the Sustainable Cocoa Production Program (SSCP). The results showed that the economic dimension had a good performance as well as the environmental dimension. Meanwhile, social dimension showed a bad performance. Three of the dimensions are important for the local farmers to support in improving their income and also in producing high-quality cocoa product which is environmental and social friendly.

1. Introduction

Indonesia as one of the third largest cocoa producers in the world after Ghana and Ivory Coast, is spread over several regions. In 2017, total production area of 1,667,337 hectares had production achievements of 699,345 tons of cocoa. Indonesia's largest cocoa production center is mostly from Sulawesi Island; Central Sulawesi, Southeast Sulawesi, South Sulawesi and West Sulawesi [1]. In West Sulawesi, cocoa is a plantation commodity that contributes greatly to Gross Regional Domestic Product (GDRP) and also a potential employment provider. Increasing production for sustainable self-sufficiency is the main agenda apart from the others such as food diversification, increasing added value, competitiveness, exports and improving farmers' welfare [2]. The total area of cocoa plantations in West Sulawesi was 149,642 hectares with total production of 57,141 tons. The average production per hectare of local cocoa farmers reaches 2.5 tons. Since cocoa farmers have partnered with *Swisscontact* through the Sustainable Cocoa Production Program (SCPP) which was launched in 2012, cocoa production significantly increased. SCPP focuses on three aspects; people, profit and planet, or in other words focus on economics, environmental and social dimensions. The target program is to increase cocoa farmers'
income (economy), reduce greenhouse gas emissions (environment), and support local farmers in improving their standard of life (social) [3].

Generally, most of farmers in West Sulawesi only have an average of 1-2 hectares of cocoa land [4]. Additionally, various problems are often faced by the farmers in West Sulawesi, especially in the on-farm subsystem such as seeds that are still imported from outside, the scarcity and high price of fertilizers (NPK and Phonska), main pests [5], and disease [6]. Low cocoa production is caused by aging trees and limited organic matters [4].

Increasing the cocoa production in Sulawesi can be accomplished by developing tissue culture in cocoa seedling, farmers’ capacity building, agricultural practice in the field, and the cocoa bean quality improvement. Those might provide better avenues to advance the competitiveness of cocoa industry in the future [5]. In the off-farm subsystem, the most frequently complained problems are capital and policy as support systems. The presence of partners is expected to be a solution to overcome these problems in improving the quantity and quality of competitive cocoa in West Sulawesi [7]. Moreover, policy options to develop the performance of Indonesian cocoa, competitiveness and sustainability are important [5].

Sustainable agriculture is a complex and dynamic concept which includes a wide range of environment, resources based, economic and social issue [8]. This paper focused on the three-dimension; economics, environment and social by measuring a performance of partnership program between Swisscontact and local cocoa farmers that was already implemented the concept of sustainability. In fact, sustainability is the best evaluation toward a range of environment, economics and social goals by one of specific group, in this case, local cocoa farmers.

2. Methods
This research was conducted in West Sulawesi, in Polewali, Mandar Regency. The location was chosen deliberately with consideration. The region is a partner of Swisscontact through the Sustainable Cocoa Production Program (SSCP). The sample was selected purposively to the 269 local cocoa farmers. Primary data collection was gathered through interviews and questionnaires that are equipped with secondary data from related sources. This research was quantitative descriptive which described the research data. Thus, the analysis used was descriptive statistical analysis [7] presented in the form of graphs and tables based on the calculation of average performance of the economics, environment and social dimensions.

| Table 1. Perception Value, Performance Interval Value, and Performance Category |
|-------------------------------------------|
| Perceptions Value | Performance Interval Value | Performance Category |
| 1 | 1.00-2.5996 | Bad (D) |
| 2 | 2.60-3.064 | Bad enough (C) |
| 3 | 3,06440-3,532 | Good (B) |
| 4 | 3,5324-4.00 | Very good (A) |

3. Results and discussion

3.1. Economics
The Swisscontact performance score in the economic dimension is sorted from the highest to the lowest in the training attributes related to the increase of on-farm cocoa production with score 4.0 as the excellent performance or very good category, access to price information and learning by stakeholders. Score 3.5 is a good performance category, then training in access to the services and capital gets the same score with coaching the development of cocoa farming which is scored with 3.2. In on-farm system, one of the recommendations refers to the intensification of cocoa farming for the sustainability of cocoa production [6]. This is simultaneous to enhance the natural resource base [9]. In addition,
production variables [10] help the local cocoa farmers to increase their income. Good-quality cocoa production will affect export volume [11].

Table 2. Performance scores for the economic dimensions

| No | Name of Attributes                                      | Average |
|----|--------------------------------------------------------|---------|
| 1  | Training to increase cocoa production of on-farm       | 4.0     |
| 2  | Training to access the service and capital             | 3.2     |
| 3  | Coaching the development of cocoa farming              | 3.2     |
| 4  | Access of price information by stakeholders            | 3.5     |
|    | Average                                                | 3.5     |
|    | Performance Category                                   | B       |

Sustainability of cocoa production can be possibly achieved through the combination of adequate technologies, policy incentives and institutional reforms. Those are expected to bring local cocoa farmers with long-term regional sustainability criterion that aims to provide land use solution in balancing the livelihood of habitants and the growth requirements both regional and national policy makers [7,12,13] or stakeholders. Swisscontact as a cocoa stakeholder through the Sustainable Cocoa Production Program (SCPP) supposed that sustainability in the economic dimension could be reached by the training and coaching of the local cocoa farmers. It means human capital plays an important role to strengthen the economics dimension. Most of the local cocoa farmers, in this case, human capital, had low education and limited information to access not only about cocoa prices and also about how to access financial capital. There is no potential finance to support their cocoa farming. Generally, farmers have little knowledge of the requirement for the finance provider [14].

3.2. Environment

Table 3. Performance scores for the environment dimensions

| No | Name of Attributes                                      | Average |
|----|--------------------------------------------------------|---------|
| 1  | Understanding and applying related to the utilization of cocoa waste | 3.4     |
| 2  | Knowledge and applying the input of organic fertilizer in cocoa plants | 3.3     |
| 3  | Knowledge and applying of the use of eco-friendly cocoa farming equipment | 3.3     |
| 4  | Knowledge of the maintenance of eco-friendly cocoa     | 3.3     |
|    | Average                                                | 3.3     |
|    | Performance category                                   | B       |

The environment dimension was measured through 4 attributes. The Swisscontact performance scores on the dimensions were sorted from highest to lowest performance in each attribute is understanding and applying related to the utilization of cocoa waste with score 3.4, knowledge and application related to organic fertilizer in cocoa plants, knowledge and the application related to the use of eco-friendly cocoa farming equipment, knowledge and applications related to eco-friendly cocoa to maintain eco-friendly cocoa got the same score 3.2. The four attributes measured in the environment dimension showed good performance.

Increasing the use of chemical input in cocoa farming may ultimately decrease the economic security of small farmers [6]. Additionally, improving cocoa yields does not require the use of much
agrochemicals rather than increasing labor inputs. Regular pruning can reduce pests and increase yields [7,15]. In this case, to improve the economics dimension in cocoa farming, it is better to practice eco-friendly cocoa farming by reducing chemicals used in the on-farm subsystem.

Swisscontact program by the SCPP demonstrated any attribute to represent the environment dimensions on how local cocoa farmers understanding and applying related to utilization of cocoa waste, knowledge, and applying of the input of organic fertilizer in cocoa plants, knowledge and applying in using eco-friendly cocoa farming equipment, knowledge and applying of the organic fertilizer input in cocoa plants and lastly the knowledge on how to maintain eco-friendly cocoa. In West Sulawesi, one method to reduce the chemical used by the local cocoa farmers in protecting cocoa pods is using gloves to avoid pests and diseases that will attack the fruit.

3.3. Social

| No | Name of Attributes                                                                                     | Average |
|----|-------------------------------------------------------------------------------------------------------|---------|
| 1  | Helping overcome the problem of malnutrition in farm households by training and nutritious feeding   | 1.5     |
| 2  | Information about gender equality                                                                     | 2.0     |
| 3  | Access to education and training involving women, the marginalized people, and young generations      | 2.2     |
| 4  | The increasing ability of the local cocoa farmers to plan and encourage the development of social life in their area. | 2.1     |
|    | Average                                                                                               | 1.9     |

The social dimension was measured through 4 attributes. The Swisscontact performance score on the dimension was sorted from highest to the lowest. The attributes were access to education and training involving women, the marginalized people and young generations with score 2.2, increasing the ability of the local cocoa farmers to plan and encourage the development of social life in their area with score 2.1, information about gender equality with score 2.0, and helping overcome the problem of malnutrition in farm households by training and nutritious feeding with score 1.5. All attributes on the social dimension are perceived by the local cocoa farmers with a bad performance so far.

![Figure 1. Economics, environment and social dimension](image_url)

Based on the results of the Swisscontact performance index in the economics, environmental and social dimensions and the perception of local cocoa farmers in West Sulawesi, it can be concluded that the average value of the economics dimension was 3.5 and the environmental dimension was 3.3. It
showed that the application of its programs to the local cocoa farmers was good. However, the Swisscontact performance on the social dimension was unsatisfied with a value of 1.9. These dimensions become the issues to develop the sustainability of cocoa production, in this case, economics as well as the environment and social perspective [5].

4. Conclusion
Based on the perception of local cocoa farmers in West Sulawesi on the performance of the Swisscontact program, the conclusion of this study was its performance on economics and environment dimensions are satisfying while on the social dimension was poor in implementing the Sustainable Cocoa Production Program.

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