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Development of Tanggamus Robusta Coffee (Socio-ecological Approach)

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Abstract. Coffee is very popular with Indonesian people. Indonesia itself is the fourth largest coffee¹⁸ producing country in the world. Lampung is also the largest coffee producer in Indonesia with robusta coffee. Coffee also has a relatively high economic value, so it plays an essential role in the Indonesian economy as a source of foreign exchange and income for coffee farmers in Indonesia. Tanggamus contributes 40% of the total coffee production in Lampung. Robusta coffee is the main coffee grown on the mountain. Tanggamus Robusta has characteristics compared to coffee in other regions. The reason is this is very dependent on the fertility of the soil in Tanggamus and its management using natural fertilizers. ⁹ Social ecology models emphasize different levels of influence (such as intrapersonal, interpersonal, organizational, community, and public policy) and the idea that behaviour shapes and are both shaped by the social environment. The application of the social ecology model to coffee focuses on several goals: to explain the interaction of individuals with the environment, to maintain human growth and development in a given environment, and to enhance the background so that they can support the individual. There are five levels in the social ecology model. They start from the individual or interpersonal group, The interpersonal. The organizational level. The level of society or community is the culture. And the level of public policy.

Keywords: management · socio-ecological · coffee

1 Introduction

Almost all people love coffee drinks. Drinking coffee has now become a culture for most people. The increasing demand for coffee has provoked the emergence of various brands, cafes, coffee shops in big cities, and coffee shops or restaurants in rural communities. In the modern era, the presentation of coffee is not just coffee and sugar but has been combined with various materials and technology, which creates a different taste. Coffee serving techniques may also vary greatly depending on culture and individuals.

Tanggamus contributes 40% of the total coffee production in Lampung. These coffee plantations are managed by coffee farmers, most of whom are immigrants from Java. Robusta coffee is the leading coffee grown on the mountain, a favorite of climbers in

Lampung. Tanggamus Robusta has characteristics compared to coffee in other regions. The reason is this is very dependent on the fertility of the soil in Tanggamus and its management using natural fertilizers. Geographical location also influences the characteristics of Tanggamus coffee. Robusta coffee can be grown 600 m above sea level (masl). If at an altitude of 100 masl to 200 masl, it tastes a bit bland. Even though it is famous for its robusta coffee, Lampung also has Arabica coffee, although the amount is tiny. So far, Arabica coffee has not been very successful in cultivating Lampung. Ulubelu Sub-district Head Suwarno assessed that coffee in his area has more significant potential. He is optimistic that his harvest will be close to the average coffee production per hectare of the second-largest coffee-producing country in the world, namely Vietnam. The Head of Ulubelu Subdistrict, Suwarno, assessed that coffee in his region has more significant potential. He is optimistic that his harvest will be close to the average coffee production per hectare of the second-largest coffee-producing country in the world, namely Vietnam. In 2012, the local government of Lampung and the supervisor of Lampung coffee farmers targeted Lampung's coffee production to increase to 1.5 t/ha. As has been explained in several articles, Lampung Province is one of the centers for Robusta coffee production in Indonesia. This is also evidenced by the large number of coffee entrepreneurs scattered in Lampung Province, both on a small and medium scale.

The West Lampung plantation area is the best example of plantations in Lampung Province in terms of increasing coffee production and quality. This area has also become a pilot coffee plantation area for Lampung Province and even at the National level. The coffee commodity has become the main livelihood for most people living in West Lampung. The data obtained show that the area of coffee plantations in West Lampung Regency has reached 59,357 ha, with dry beans per year reaching 59.37 t.

The social ecology model emphasizes different levels of influence (such as individual or intrapersonal, interpersonal, organizational, community, and public policy) and the idea that the social environment shapes behavior. Applying the social ecology model to coffee focuses on several goals: to explain the interaction of individuals with the environment, maintain human growth and development in a given environment, and improve the background so that they can support the individual. There are five levels in the social ecology model. Starting from the individual or interpersonal level includes knowledge, beliefs or beliefs, experiences, skills, and concepts related to individual. The interpersonal level consists of the individual's social relationships with other individuals, such as family, friends, and social networks. The organizational level includes places where individuals gather and facilitate individual behavior influenced by policies, such as schools, places of worship, and others. The level of society or community is the culture in

2 Discussion

Merriam-Webster Online Dictionary (2004) defines Social-Ecological System (SES) as an ecological system closely related to and influenced by one or more social systems. An ecological system can be loosely defined as an interdependent system of organisms or biological units. "Social" means "the tendency to form cooperative and interdependent relationships with others of one kind."

Berkes & Folke (1998) introduced the term social-ecological system (SES), which emphasizes the integration between humans and nature, where social and ecological systems are interrelated or 10 interconnected and integrated. Folke et al. (2003) integrate the ecological, economic, cultural, sociopolitical, and institutional dimensions of socioecological interactions in a coherent model/framework that includes holism and complexity and argues that this model provides excellent hope in achieving sustainability.

The socio-ecological system is an ecological system closely related to and affected by one or more social systems. Both of these systems, both social and ecological systems, have subsystems that also interact with each other. The term socio-ecological system describes the relationship between humans as social beings mediated by biophysical components and biological components other than humans.

When social and ecological systems are highly interconnected, they will create a complex, adaptive social-ecological system consisting of several subsystems that are also integrated with several larger systems (Anderies et al., 2004).

This model considers the complex interactions between individual factors, relationships, communities, and society. This allows us to understand the various factors that put people at risk of violence or protect them from experiencing or perpetrating violence. The overlapping rings in the model describe how factors at one level affect factors at another level.

As well as helping to clarify these factors, the model also suggests that to prevent violence, it is necessary to act simultaneously at multiple levels of the model.

A. *This approach is more likely to sustain prevention efforts over time and achieve population-level impact*

1) *Individual*

The first level identifies biological factors and personal history that increase the likelihood of being a victim or perpetrator of violence. Some factors are age, education, income, drug use, or history of abuse. Prevention strategies promote attitudes, beliefs, and behaviors that prevent violence at this level. Specific approaches may include conflict resolution and life skills training, socio-emotional learning, safe dating, and healthy relationship skills programs.

2) *Relationship*

The second level examines close relationships that can increase the risk of experiencing violence as a victim or perpetrator. A person's closest social circle—peers, partners, and family members—influences their behavior and problem-solving skills, and promote healthy relationships.

3) *Community*

The third level explores settings, such as school, work, and the environment in which social relationships occur, and seeks to identify characteristics of these settings that are associated with being a victim or perpetrator of violence. Prevention strategies at this level focus on improving the physical and social environment in these settings (e.g., by creating safe places where people live, study, work, and play) and addressing other conditions that give rise to violence in society (e.g., poverty environments), residential segregation, and unstable, high alcohol outlet density).

4) *Society*

The fourth level looks at societal-wide factors that help create a climate where violence is encouraged or discouraged. These factors include social and cultural norms that support violence as an acceptable way to resolve conflict. Other major social factors include health, economic, educational, and social policies that help maintain economic or social inequalities between social groups.

B. *Explanation of variables framework*

1) *Intrapersonal Level*

The socio-ecological framework's intrapersonal level considers an individual's beliefs, knowledge, and traits. Although this level is based on the individual at risk, it is strongly influenced by all other levels of the socio-ecological framework. Other intrinsic factors include physical characteristics such as gender, age, and health conditions. Cognitive aspects may consist of relevant knowledge and attitudes about factors associated with coffee consumption. For example, someone's knowledge about the positive effects of consuming robusta coffee will affect heart health, affecting one's confidence. Factors associated with the intrapersonal level are likely the product of interpersonal interactions and broader sociocultural influences. In addition, a person's "behavior" factor also influences this level. As previously explained, consuming coffee has become a habit that is carried out repeatedly in a day. This is one of the pieces of evidence that a person's beliefs, knowledge, and traditions influence the development of Tanggamus Robusta coffee. And also Individual Knowledge of Coffee. Coffee is often known as a drink that relieves sleepiness and maintains concentration and individual performance, although coffee can also have a negative impact if consumed in excess amounts. Consuming coffee in the recommended amount can affect the central nervous system, increase alertness and concentration, and increase stamina. In addition, it can also have a positive effect on mood so that it can increase feelings of happiness, energy, and social skills. Often individuals consume coffee without explicit knowledge of what dosage is recommended to get the desired effect. Consuming high doses of coffee can cause nausea, headaches, tremors, and trouble sleeping (Fig. 1).

2) *Interpersonal Level*

The interpersonal level of the socio-ecological framework includes the people around an individual. The behavior of consuming coffee is part of the lifestyle of some individuals. This is inseparable from social media, such as advertisements, the internet, etc. In addition, friends, co-workers, and even the family environment also affect coffee consumption behavior. The behavior of consuming coffee usually done by parents will be passed on to their children. For example, someone who consumes Tanggamus Robusta coffee initially receives a recommendation from family or relatives or receives information from a social network about the positive effects of consuming Robusta coffee. These interactions assist the development of the Tanggamus robusta coffee ecosystem because more interactions and recommendations from family or relatives will influence someone to drink robusta coffee with high demand. It will automatically have a positive

impact on the agricultural sector so that it can improve the surrounding community's economy and maintain the coffee plantation ecosystem in Tanggamus. The behavior of consuming coffee has become a habit or culture of the community. Several motives encourage people to consume coffee, namely, drinking coffee because they feel anxious. After all, there is a problem, as a reliever of boredom or fatigue, the desire to gather together and discuss or exchange opinions and enjoy the distinctive and unique aroma and taste of coffee.

In addition, there are also other meanings of consuming coffee, such as coffee can calm the mind, foster a sense of togetherness between friends, family, or coworkers, coffee can provide inspiration and appreciation, and can show social status.

3) *Institutional*

The institutional level in the socio-ecological framework includes an institution responsible for developing Robusta coffee in Tanggamus. Tanggamus Regency has a superior commodity in the form of robusta coffee. Coffee farmers manage the entire coffee plantation. And there is an institution responsible for maintaining the identity of Tanggamus robusta coffee. Developing and preserving Tanggamus robusta coffee through the involvement of relevant stakeholders due to limited local government budgets, among others using Corporate Social Responsibility (CSR) funds. Philosophically, CSR or Corporate Social Responsibility (CSR) is a form of solidarity because the company participates in enjoying regional resources, so there must be a mutually beneficial relationship between the company and the local community to realize justice and benefit.

4) *Community*

At the Community level, it is the relationship and communication between an organization and an institution or company. One form of the existence of the CSR/TJSLP Program is not a burden on the company because it has budgeted quite a large amount of funds, but must be seen as a reciprocal relationship, namely as a "reward" for the kindness of the region and its community in accepting the company's presence. Suppose the community around the company is prosperous. In that case, it will also positively impact the company, either buying its products or participating in maintaining environmental order and so on. In this program, two communities benefit from the community and the company that helps develop Tanggamus Robusta Coffee. And also, In 2010, the government of Lampung Province collected data on the distribution of the amount of Robusta coffee production. This is related to the spirit to develop Lampung coffee production, which supports national coffee production on a local and export scale. Tanggamus is the two largest coffee-producing district. The Lampung provincial government continues to focus on developing coffee processing systems to increase production, quality, and farmer participation. The initially conventional processing process is now being developed using machine tools, although not all areas use machines.

In West Lampung Region, as a center for coffee processing, the primary coffee processing process is still mainly carried out traditionally. One of the conventional coffee processing processes is a drying process that uses direct



Fig. 1. Intrapersonal Level

sunlight. Coffee beans picked from trees are dried or spread on the ground by relying on the sun's heat. This situation is not profitable. It will cause damage to the coffee fruit because it is contaminated by soil, dirt, and so on. Almost all districts in Lampung Province own and develop coffee plants as a superior local commodity. However, the districts of West Lampung, Way Kanan, Tanggamus, and North Lampung are the main coffee-producing areas. West Lampung Regency alone has a production capacity of 36.3% of the total Lampung coffee production.

Even for West Lampung and Tanggamus Regencies, Lampung robusta coffee production reaches 70% of the total coffee production. This shows that West Lampung Regency is the national center of Lampung coffee production to meet national and export coffee needs.

a) *Lampung Coffee Production Development Business*

Through the Department of Industry and Trade (Disperindag) of Lampung Province, the government has been fostering coffee cluster development efforts in West Lampung Regency since 2009. The model of coaching through coffee clusters is one of the productive businesses that individuals or groups of coffee farmers rarely carry out. The Lampung Provincial Government and the Lampung Regency Government have determined that the center of the coffee cluster in West Lampung is centered in Way Tenong District because the area has been producing quality ground coffee products for several years. In addition, the area in the Way Tenong area is a coffee plantation area

that stretches so that this area has excellent potential as a coffee center that is easily accessible to coffee farmers. Public policy was formulated to develop coffee in Indonesia to increase business competitiveness, added value, productivity, and product quality through the active participation of stakeholders and the application of an organizational structure based on knowledge and technology and supported by good governance. 5. Policy Finally, policies build on the outermost layers of the framework for effective policy implementation, all levels of the socio-ecological framework must be considered in the adoption and implementation strategy. Policies can also be used to set standards of practice directly. For example, the CSR program has been regulated through Law no. 40 of 2007 concerning Limited Liability Companies (UUPT) and Government Regulation no. 47 of 2012 regarding the Social and Environmental Responsibility of Limited Liability Companies, which requires all companies to participate in implementing CSR programs or their Social and Environmental Responsibility. And it is hoped that it can assist in developing Tanggamus Robusta Coffee and maintain the coffee plantation ecosystem in Tanggamus. Through the Department of Industry and Trade (Disperindag) of Lampung Province, the government has been fostering the development of coffee clusters in West Lampung Regency since 2009. The model of coaching through coffee clusters is one of the productive businesses that individuals or groups of coffee farmers rarely carry out.

The West Lampung Regency Government is seeking coffee plantations in its area to become coffee clusters that can become an icon of Lampung 21 Province. This is to the Master Plan for the Expansion of Indonesian Economic Development 2011 ± 2025 (MP3EI) that Sumatra is the center of production and processing of products, and even the University of Lampung is the coordinator of the Sumatra corridor.

The Lampung Provincial Government and Lampung Regency Government have determined that the center of the coffee cluster in West Lampung is centered in Way Tenong District because the area has been producing quality ground coffee products for several years. In addition, the area in the Way Tenong area is a coffee plantation area that stretches so that this area has excellent potential as a coffee center that is easily accessible to coffee farmers. In addition to efforts to establish a cluster pattern by the Lampung Provincial Government, technological assistance has also been provided. Through the Ministry of Industry and Trade, the government provided a coffee processing machine unit to the Hulu Hilir farmer group in West Lampung Regency.

This coffee processing machine is a large-scale type, so its utilization is not optimal because the supply of raw materials is insufficient, the electrical power required to operate it is considerable, it is placed in one area, and there is no permanent operator. Public policy was formulated to develop coffee in Indonesia to increase business competitiveness, added value, productivity, and product quality through the active participation of stakeholders and the application of an organizational structure based on knowledge and technology and supported by good governance. The use of high electrical power causes operating costs to be too high. It is located far from most MSMEs, so it is already accessible. So the operation of the coffee processing machine is not continuous because it has to collect raw materials and prepare a large amount of electricity.

This public policy is supported by technical policies, namely coffee development, improvement of human resources, development of partnerships and institutions, increased business investment, and development of management information systems.

Implementing these policies and programs for robusta coffee improves plant productivity, while for arabica coffee, plant expansion is carried out.

3 Conclusion

- Socio-ecological Model considers the complex interactions between individual factors, relationships, communities, and society.
- The history of coffee in Indonesia also began with the Dutch occupation in 1696. The Dutch initially brought Arabica coffee from Malabar, India, to Java that year. The Company carried out the first coffee cultivation in Kedawung. In 1706, coffee beans grown on the island of Java achieved great success and became famous. The popularity of this sale then made the Dutch plant coffee beans on every island in Indonesia. This is where the emergence of various types of coffee in Indonesia began. Gayo Coffee, Aceh, Kintamani Coffee, Bali, Toraja Coffee, Sulawesi, Liberika Rangsang Meranti Coffee, Riau Bajawa Coffee, and Flores are the five types of coffee that are very popular in Indonesia, and the quality is unquestionable.
- According to data from the Association of Indonesian Coffee Exporters and Industry (AEKI) Lampung, Lampung Province is the largest robusta coffee producer in Indonesia, with an average of around 163 thousand tons/year with an area of about 163,436. The West Lampung Regency Government is seeking coffee plantations in their place to become coffee clusters that can become an icon of Lampung Province.
- Consuming coffee in the recommended amount can provide a stimulating effect on the central nervous system and can increase alertness and concentration, and increase stamina. Consuming coffee such as coffee can calm the mind, foster a sense of togetherness among friends, family, or coworkers, coffee can provide inspiration and appreciation, and can show social status
- The socio-ecological approach to the development of robusta coffee in Tanggamus is expected to have a positive impact on coffee plantations in the future
- The development of coffees in the regions must be paid more attention and developed so that they can be recognized by the wider community and compete with the world market. This can be achieved by improving the quality of coffee beans by planting superior seeds, facilitating modern technology, and expanding coffee marketing for local farmers.
- Then there is a need to provide education about the benefits of coffee and the correct way to consume coffee, considering that there are still many Indonesian people's understanding that there is no right to consume coffee, such as coffee that makes bloating or consuming coffee with other mixed ingredients.
- Many ways can be done, such as providing supporting facilities for farmers and providing convenience for them to distribute coffee locally, nationally, or multinationally. The government can also cooperate in the form of a sister city program (a collaboration between two cities in two different countries) to empower coffee farmers so that their products can compete in foreign markets, as one of how the Malabar Partner Cooperative has successfully exported coffee products from its members to Morocco through the sister city program.

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