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Perspektif Petani Dalam Menghadapi Risiko Ketidakberlanjutan Usahatani Kopi

Farmer's Perspective On Facing Unsustainable Risks Of Coffee Farming

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ABSTRACT

Coffee farmers face the risk of yield uncertainty due to the dynamics of natural, social and economic conditions. Identification of potential sources of risk in farming is needed to increase adaptability to sources of vulnerability and maintain sources of income. This study aims to analyze the perspective of farmers in facing the risk of unsustainable coffee farming and determine the factors that affect farmers' household income. The field survey is equipped with a questionnaire as a tool to determine the condition of farmers. The respondents involved 408 coffee farmers. The perspective analysis method uses Chi-square and multiple regression models for the farmer household income model. The results showed that the coffee farmer's perspective on risk was significantly different based on the level of education. Natural environmental risk conditions refer to land degradation, water quality degradation, and water shortages, loss of biodiversity, and climate change due to the impact of global warming. Economic risk refers to land security and yield reduction (crop failure). On the other hand, coffee farming income is determined by land area, number of coffee trees, land tenure, and participation in certification schemes.

Key words: coffee, income, risk, unsustainability, perspective

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INTRODUCTION

Coffee farming in Indonesia dominantly by smallholder's plantation, reached 94%. Smallholder coffee plantations mostly operated conventionally and dominantly located on sloping topography with an average age of plants are over 25 years (Hafif, 2019). Market disruption caused on coffee prices volatility. It can disturb farmer's incentive and motivation, then their coffee farming become vulnerable. Farmers really concerned with price stability. The "coffee crisis" in past two last decades, threatened the coffee farmers' livelihood. Coffee farming also face the risk of yield uncertainty due to the dynamics of natural, social and economic conditions. Identification of potential sources of risk in farming is needed to increase adaptability to sources of vulnerability and maintain sources of income.

Coffee farming play important role in regional economics. More than 2,3 million household involve in coffee chain business. Coffee trade worldwide since a century ago. As tradable good, coffee has strategic in contributing agricultural export commodities. Almost 70% of Indonesia coffee production has been exported. Indonesia is one of the fifth larger coffee producers, together with Brazil, Guatemala, Colombia,

and Vietnam. In the last decade, Indonesian coffee export performed expanded progressively. The main export destination countries also developed broadly. Unites States is the biggest coffee importer in the world, followed by Germany, Italy, Japan, and Belgium. Indonesian coffee market and global integrated with the market price in the London terminal. The changing in the international coffee price somehow correlated with Indonesian coffee market, although not fully (Fitriani et al., 2021)

Currently, multinational corporations are developing a global value chain (GVC) competitive strategy and requiring sustainability standards in their corporate business chain networks. Some schemes have known as certification of origin, global environmental governance, sustainability regulation, non-state regulation, corporate governance initiatives, and other schemes. GVC in coffee sector has been driven by several multinational companies. They organize certification scheme such as CAFE-Starbuck, Rainforest Alliance, and 4 C. GVC system could impact market distortion. Especially as has been caused by corporate domination in production, supply structure, demand, and trade networking in global level (Arifin, 2013). GVC system with certification requrement caused domestic coffee market disruption. Coffee farming producers have burden by some additional cost, complicated procedure requirements, and third-party involvement. Conversion time, preparation, and certification are costly and sometimes difficult. In some cases, standards can create new barrier to entry that threaten producers (particularly the poorest) with the challenges of additional costs, a steep learning curve of adaptation, and inadequate extension services. The process of certification can be a costly and sometimes lengthy exercise. Farmer organizations may find it difficult to maintain cohesion if the expected benefits do not materialize in the short-term (Muradian et al., 2015). Furthermore, no one of the certifications deals with all the aspects necessary for a grower to sustainably produce coffee. Ideally, growers should stand for the basic principles of all three – Organic, Fair Trade and Shade - in order to be sustainable (Giovannucci & Potts, 2008; Ibnu et al., 2016).

Commodity prices disruption and certification requirement altered land-use decisions on farms, and the environmental services they provide (Haggar et al., 2013; Li, 2013). Land used change shifting productive land for agriculture utilization (Asnawi, et.al., 2014). Most of coffee farming are in surrounding forest and watersheds. An area with slope more than 30% and land cover by coffee plantation tend caused the erosion rates in the light to very heavy category in all ranges of slopes and soil types. Environmental risks occur across a wide range of fields including climate change (Bond & Mayers, 2010), extreme weather (Dulbari et al., 2018; Fitriani, 2017), water scarcity (Calder et al., 2008; Somura et al., 2018), deforestation, land degradation, loss of biodiversity (Jara-Rojas et al., 2020) ozone depletion, to chemical pollution (Buergelt & Paton, 2014; Naylor et al., 2007). Environmental stress disrupts production stability and has the potential to reduce people's income, including in coffee farming. Therefore, increasing the ability to adapt the difficulties or risk is needed (Kopnina, 2013; Rossberg, Matsuda, & Koike, 2005). Socio-economic and environmental risk management roadmap developed to strengthen capacity farmers face the threat of unsustainability is closely related to the adoption of technology for sustainable production (resilience). The resilience of farmers in upstream watersheds closely related to adaptation in changing facts. This condition has been risking for coffee farming. Then, the farmer's perspective in risk (environmental and farm-business) was conducted as a goal of this research. This study aims to analyze the coffee farmer's perspective in risk related to income household.

RESEARCH METHODS

Research locations choose purposively in Lampung upstream watersheds. It was upstream watershed that sources from Bukit Barisan Selatan National Park (BBSNP). There are lied two main rivers called Way Sekampung in Tanggamus Regency and Way Tulang Bawang from Way Besai sub-watersheds in West Lampung. Coffee production center was planting in the main upstream watersheds in Lampung. The research through the survey approached. Field survey conducted to explore the farmer condition through

questionaire. Respondent involved 408 coffee farmers. Sampling respondent chosen with the level of the certification participation. The method of analysis was Chi-square and regression model. Chi-square test was used to analyze the coffee farmer's perspective based their education level. The Chi-Square compared with other methods has better classification accuracy (Zhai wt al., 2018). Then, the multiple regression applied to traced the causality interaction between variables in model (Fitriani, 2015; Fitriani et al., 2018). The risk categorized as environmental risks and economic risks. Measurement level applied the Likerts' scale from very unimportant (1) to very important (4). Risks measurement as root cause the coffee farming vulnerability include: (a) the certentity of land property right, (b) yield failure, (c) land degradation, (d) water quality threaten, (e) water shortage, (f) biodiversity loss, and (g) global warming impact.

The farmers' income factors determined by regression model, with farmers' income as dependent variable (Y), and land area (X1), coffee trees (X2), land tenure (X3), education level (X4), MPTS (multi purposes tree species as shade trees) (X5), (X6) participation in certification scheme as dependent variables. Formula set as follows (Fitriani et al., 2018; Fitriani et al., 2021; Fitriani & Kuswadi, 2021; Kuswadi & Fitriani, 2021; Somura et al., 2018).

$$Y = \beta o + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \varepsilon$$

RESULT AND DISCUSSION

Based on the first designed survey, respondents' descriptions have been alienated in farmer's land area, education, experience in coffee cultivation, and age. Farmers in average cultivated 1.3 are coffee land area, in the length between 0.25 – 6 are. The grade of education of coffee farmers was elementary school, there still found uneducated farmer. Farmer experience in coffee farming reached 18,7 years in average, with the length 1 - 65 year. Based on education level background, coffee farming was mostly still run with traditional system. It was also reflected in farmer's age. They were 44.2 years old in average. The oldest was 90 years old which means too old to be a coffee farmer. The Figure1, describes the root cause of coffee farming threat based on environmental and economic aspect.

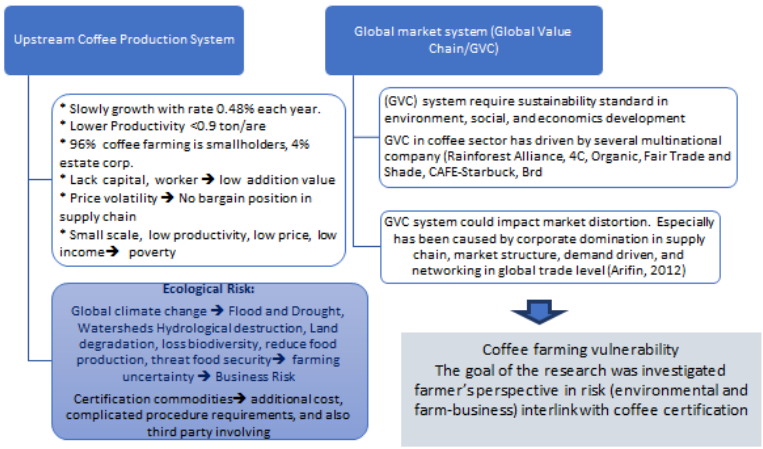

Figure 1. Environmental and economics root cause of coffee farming vulnerability

The farmers' response toward the kind of risk that treats coffee farming displayed in Figure 2. The highest scale rate was response on land property certainty. Coffee farmers assess that the certainty of land ownership is the most important thing in ensuring the sustainability of the coffee farming in the future. Assertion in land right to coffee cultivation was the most important aspect for farmer. Some coffee has been cultivated in the forest around their environment. Most farmers have license from forest ministry to occupy coffee production, but somehow there are many who still wait for the authorization. On the other hand,

farmers are also treated by uncertainties of income/profit from farming significantly. Likewise, the threat of a decline in crop yields is a risk in the economic aspect that gets the attention of farmers.

The survey found that mostly respondents have been following certification scheme. There were 259 farmers (63.5%) as members of certification scheme. Certifications were 4C scheme (39%), Rainforest Alliance (11.2%), CAFÉ-Starbucks (0.8%), and others (49%). Somehow, the farmer mostly uninformed about certification scheme they followed. Mostly, the reasons to join the certification scheme were related to improving coffee price and coffee quality, and broadening access to the coffee market.

Based on (Raynolds, 2009) the differences in certification standards among sustainability initiatives reveal that in coffee sector, Fair Trade has the strongest social justice standard, while Organic and Bird Friendly certifications have the strongest ecological standards. These three certifications establish standards that raise the bar, requiring sustainability conditions well above generally accepted norms. Sustainability standards are becoming increasingly important in governing defining the content of traded agro-food products. These standards become entry barriers, but they can also facilitate upgrading and increase value added to products exported from developing countries. Sustainable coffee initiatives have limited systems of monitoring and evaluation. In economic terms, resilience in farming has to do with the capacity of a coffee farming to survive from various risks and other shocks. The organic farming system was found to be some-what less economically sustainable than the conventional system, especially if the organic price premiums and the organic area payments were to be phased out. The results illustrate possible conflicts between pursuit of risk efficiency and economic sustainability (Lien, Hardaker, & Flaten, 2007). Farmer also had countenanced risk in estimation of profitability because uncertainty in land property right and coffee yield falling apart.

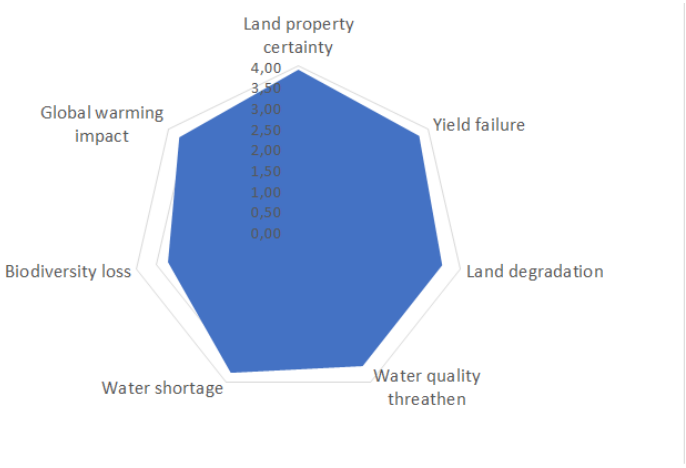

Figure 2. Farmers' response to environmental and economic risk attributes

Based on Figure 2, the most threatening environmental factors are water scarcity and global climate change, followed by land degradation, water quality degradation, and loss of biodiversity. Coffee farmer existences were integrated with natural resources. Natural resources are vital in agriculture sustainability. It links with environment services, such as water supply, land productiveness, biodiversity, weather, temperature, etc. Farmers need to respond them all for meet the farming sustainability.

Based on the Chi square analysis, the risk attribute, both environmental and economic aspect related to the education level. More than 49% farmers at the elementary level and 47% at the middle level. Education level as basic knowledge combine with the experience become fundamental consideration on farmers' response and decision-making process, especially in facing the external risk. Risk assessment correlated with uncertainty linked to natural phenomena disruption. It means that an outcome is unknown or not

established and is therefore still in question. Uncertainty due to incomplete knowledge make a severe threat in the coffee farming. Improving farmer response in risk will strengthen the existence of coffee farming.

Coffee farmers have considered the risk estimation and their perspective of it. The degrees and type of uncertainty are associated with the evidence. Coffee farming land located in upstream watersheds and bordered with forest land facing the uncertainty that is attributable to natural variability (land degradation, water shortage and poor water quality, biodiversity loss, and global warming impact). Farmer's response and perspective is an early step to manage environment risks and fulfill sustainability requirement. The changing in ecological support will disturb natural ecological services in keeping carbon, watershed conservation, land ability in water absorption, and biodiversity (Hope et al., 2005).

Taylor (2005) mentioned that one of the key lessons of forestry community has been that when people with a stake in a common pool resource have real access and genuine opportunities to participate in decision-making, they can be highly effective stewards of their resources. A corollary principal is that stakeholders should invest in sustainable management as well. As a stakeholder in the health of the global forest, the international community support of community forest stewards in the South can be viewed as a logical co-investment in sustainable management rather than as a subsidy. A Fair-Trade community forest certification could represent a potentially highly effective instrument for bringing together an unprecedented range of stakeholders across North–South boundaries in cooperative pursuit of sustainable solutions to global problems.

The estimation of farmer income organized in regression model. Descriptive statistic of coffee farming income and the factors displayed at Table 2.

Table 2. Descriptive statistic of coffee farming income and the determinant factors

	Mean	Std. Deviation
Income/year (IDR/ha)	$1.8785E^{7}$	$2.19817E^{7}$
Land area (ha)	1.34	0.89
Coffee trees (unit)	2.306	1,720.17
Land Tenure (private and tenant)	1.05	0.24
Education level (years)	2.80	1.03
MPTS shade trees (unit)	244.35	355.92
Certification membership	0.50	0.50

The good-fit of model represented in F value 58,143 and sig. 000 (α=0.5), and the R^2 value 46,5. Then the coefficients of variable could become predictor (Table 3).

Table 3. Regression model analysis result

Model		Unstandard Coef					Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-6,485,306.96	4,604,057.99		-1.409	0.160		
	Land area (ha)	4,534,511.89	1,482,199.91	0.185	3.059	0.002***	0.364	2.745
	Coffee trees	4,314	786	0.338	5.488	0.000***	0.352	2.839
	Land Tenure	54,955.70	30,117.47	0.001	0.017	0.987	0.962	1.040
	Education level	1,207,466.42	780,770.06	0.057	1.547	0.123*	0.991	1.010
	MPTS shade trees	19,002.88	2,451.35	0.308	7.752	0.000***	0.846	1.181
	Certification memb	2,276,500.09	1,644,642.28	0.052	1.384	0.167*	0.951	1.052

***) significant level with α5%
***) significant level with α20%

The farmers' income factors determined by regression model, with farmers' income as dependent varible (Y), and land area (X1), coffee trees (X2), land tenure (X3), education level (X4), MPTS (X5), (X6) participation in certification scheme as dependent variables. Formula set as follows.

$$Y = -6.485.306,96 + 4.534.511,89X1 + 4.314.87X2 + 54.955X3 + 1.207.466\ X4 + 19.002X5 + 2.276.500X6 + \varepsilon$$

Based on Table 3, land area, coffee trees, land tenure, and membership of certification scheme were become predictor to estimate the farmer income, because it significantly affects to the model. Economically, the other variables are still important to enter in the model because the coefficient positively affected the income. The diversity of income sources in upstream watershed could expand with implement the agroforestry system. The practice of agroforestry coffee is an adaptation of sustainable production in the upper watershed Sekampung. The pattern of agroforestry coffee production in the area around protected and watershed forests needs to be continuously developed.

CONCLUSION

The result showed that the coffee farmer's perspective in risks is significantly differ based on the education level of coffee farmers. Environment risk conditions referred to land degradation, decrease water quality, and water shortage, biodiversity loss, and global warming impact. The economics risk referred to land certainty and decrease of yield (failure). In the other side, the coffee farming income has determined by land area, number of coffee trees, land tenure, and the participation in certification scheme.

Information on the sources of risk faced by coffee farmers is needed to increase adaptability to sources of vulnerability and maintain farmers' sources of income. The level of education of farmers affects the perspective of farmers in reacting to risk. The farmer's perspective becomes the basis for making decisions on adaptive and prevention/mitigation steps. Efforts to increase the level of formal education of farmers are difficult to do. Therefore, efforts to improve informal education can be optimized through active involvement in farmer group/gapoktan activities, counseling, field schools, various climate adaptation school opportunities, as well as the application of soil and water conservation technology. Furthermore, the support and partisanship of various stakeholders involved in the coffee business chain to strengthen sustainable coffee production capacity is very much needed.

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