

学位論文要旨 Dissertation Abstract

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学位論文題目 : Supply Chain and Risk Analysis of Indonesian Tea: A Case
Study in Central Java Province
Title of Dissertation (インドネシア茶のサプライチェーンおよびリスク分析：
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The dynamic change in business environment has resulted on many uncertainties and increased vulnerability of tea agribusiness in Indonesia. The competitiveness of Indonesian tea is diminishing due to the oversupply in the global market and incapability to provide agile logistics and market-based tea quality. Moreover, tea smallholder and middleman are the most vulnerable stakeholders toward the implementation of pricing policy and profit distribution within the supply chain. Therefore, higher profit and value added can be promoted by understanding their logistics cost structure and profit distribution. To improve the sustainability of tea agribusiness and enhance the livelihood sustainability of smallholder, the evaluation of the current tea supply chain and understanding the risk event that may occur and disrupt the supply chain are eventually required to build the resilience of supply chain. This can be done by identifying the factors and issues that can impede sustainability and competitive advantage. This study aims to analyze and evaluate the supply chain of tea in Central Java Province for improving its practice and building the resilience of its supply chain through the risk assessment and evaluation of pricing policy.

This study mainly focused on the main production centers of tea in Central Java Province, Indonesia. Four regencies were chosen to represent tea supply chain actors in Central Java Province, including Batang, Pekalongan, Banjarnegara and Brebes regency. The surveys were conducted during October to December 2019 and September to December 2020. The in-depth interview using interview guideline and semi-structured questionnaire were used to enrich information about the current situation of tea supply chain. By using convenience and snowball sampling, a total of 224 respondents specifically have been observed in this study.

Based on the evaluation of current tea supply chain, the incoherent connection between demand from global market and supply of tea from smallholder, and dissatisfaction of smallholders on the tea price are two issues that hindering the sustainability of tea agribusiness. From the logistics cost analysis using activity-based costing (ABC) method, labor cost was accounted for the highest portion (more than 50%). It indicates

that tea agribusiness may promote the rural development through the labor absorption and financial growth of villagers. Meanwhile, transportation costs at the smallholder and middleman can be optimized by improving coordination on harvesting and transportation activities within group of farmer and middleman to meet full-capacity truckload. In addition, the prominent role of commercial plantation is described as an effort to support poverty alleviation and farmer empowerment. The three main roles of commercial tea plantations are 1) creating job opportunities, 2) giving particular educational support, and 3) supporting self-development of smallholder through training and assistance. Despite the role of commercial plantation, the role of farmer association also contributes to the farmer empowerment and strengthening farmer bargaining power. However, currently the role of each farmer association is very limited and it is deemed necessary for improvement. Farmer empowerment in terms of decision-making power and organizational strengthening can be continuously improved with the collaboration from other supply chain actors as well as support from the government.

The assessment on the livelihood sustainability were further conducted to understand and assess the contribution of existing supply chain system to the livelihood sustainability of tea smallholders in the rural area of Central Java Province. The adaption and elaboration between The Integration Definition for Function (IDEF0) model, sustainable livelihood framework (SLF) and livelihood assessment indicate that climate change and tea production have interconnected to decrease tea production in both quality and quantity. This study also found that tea smallholders in Central Java Province are still in the level of achieving basic livelihood outcomes, as for supporting their basic household needs. It implies that the current situation of tea smallholders has not yet accomplished economic sustainability, whereas a livelihood is sustainable when it is enabling to consider economic, social and environmental factor. In addition, financial and natural capitals were the most prominent livelihood assets for smallholder and those capitals have strong dependency on policymaker, while the physical capital greatly influenced the middleman. Further, special emphasis on risk management practice at the smallholder is needed because shock, trend and seasonality enhance their resilience on livelihood.

To accommodate the previous findings, the inherent risk in tea smallholder, middleman and commercial plantation were identified and assessed to develop the comprehensive analysis for building the resilience of tea supply chain. The risk management process from ISO 31000: 2018 and Rapid Agricultural Supply Chain Risk Assessment (RapAgRisk) concept are elaborated in this study. This study results the following findings: First, the risk of prolonged dry season has high expected loss on each stakeholder in tea supply chain. Second, this study presents that smallholder should anticipate blister blight disease because it reduces production by 40-60% and disrupts the supply of tea leaves to middlemen and commercial plantations. This definitely results on imbalance supply and demand of tea leaves in the upstream part of the supply chain. Moreover, the biological and environmental risk, weather-related risk, and financial risk are the common key risks faced by the smallholder and influence greatly to their resilience in the supply chain. The market risk begins to perceive at the middleman tier, while the risk of fluctuated global price initially perceives in commercial plantation tier. The role of local government in tea trade system is highlighted due to their insignificant contributions through the existing regulations, policies and interventions. The participation and support from the government in establishing profitable trade governance for commercial plantation, middleman and smallholders should therefore be immediately undertaken. The integrated framework of this study suggested that five broad factors should be considered to build the resilience of tea supply chain, including vulnerability analysis, assets assessment, collaborative supply chain, control mechanism from government and outcome evaluation.