

A pathway toward sustainability in the Indonesian smallholder coffee production system

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Abstract

Sustainability standards and certifications (SSC) have become a trademark of agricultural business and this trend will likely continue as major corporations are becoming increasingly interested in the sustainability agenda. At the bottom of the value chain, however, smallholder producers need to make sense of this trend, decide on how to react, given their preferences and social-economic opportunities. Based on the results of a four year research project on coffee smallholders and SSC in Indonesia, this paper particularly focusses on the problem perceptions and reactions to private SSC by smallholders, whom this paper regards the 'gatekeepers' of sustainability change as they need to change their practices first to induce meaningful effects in the coffee system. The general conclusion is that coffee smallholders respond positively to opportunities that enable them to participate in the global coffee supply chain through joining SSC, but they need relevant incentives such as financial and technical support services to innovate and participate successfully in dynamic and competitive markets. The pathway toward sustainability in coffee production in Indonesia requires a systemic perspective, which is explicated through 'building blocks' to better understand particular patterns or issues that need to address. The building blocks include an enabling environment, production and market characteristics, availability of alternative livelihoods, and the degree of competition among producers. The paper closes by discussing future study needs in this field.

Keywords: sustainability standards and certifications (SSC), coffee, sustainability pathway, smallholders, Indonesia

1. Introduction

Since the 1990s, small-scale producers of agricultural products in developing countries have been increasingly confronted with private sector-initiated Sustainability Standards and Certification (SSC). Most of these standards are initiated by non-governmental organizations (NGOs) and businesses from the North (the West), often in the form of partnerships between them. Although participation in the SSC scheme is voluntary, it is gradually becoming a prerequisite for farmers (mainly from developing countries of the South) to access global markets (Brandi et al., 2013; Loconto & Danker, 2014; Pierrot et al., 2010; Ponte, 2004). At the bottom of the value chain,

smallholders need to understand this SSC and its associated implications and must decide how to react, given their socioeconomic preferences and opportunities.

Sustainability standards are defined as documented agreements containing specific criteria to be used consistently as a rule, guideline or definition, to ensure that agricultural commodities are grown, produced, processed and traded by accommodating social, economic, and environmental (sustainability) issues. Certification is understood as a procedure by which a third party provides a written guarantee that a product and process conform to the standards of sustainability, as the primary instrument for regulating agricultural production (Liu, 2003). The basic idea underlines Sustainability Standards and Certification (SSC) formulation is the Theory of Change. This theory is based on the idea that better training in agricultural practices, and better farming organizations, can increase the quantity (volume) and quality (by considering the social, environmental, and economic aspects) of production. Thus, the value chain has a positive impact on sustainable development. It is assumed that more sustainable production will ultimately increase the income and welfare of small farmers (Blackman & Rivera, 2011; Pierrot et al., 2010).

Nonetheless, the impacts of SSC are still ambiguous and therefore much debated, especially in the coffee sector, which is the focus of this paper. Several studies have shown that SSC has positive (direct) impact on coffee farmers such as increasing market access, offering higher prices, and improving livelihood conditions. SSCs are also said to have positive side effects, such as increasing yields and quality of coffee production of community around certified plantations, by combining SSC projects with the community's activities financed by certification's premium benefits (Giovannucci & Ponte, 2005). Other studies show that the benefits of SSC are rather limited. Economic benefits for smallholders are statistically significant, but very small (i.e., only 6-8 percent of economic rent, while larger portions go to exporters and coffee roasters) and may not be enough for farmers to improve their living conditions (Astuti et al., 2015). According to van Rijsbergen et al. (2016), small farmers receive only 6-8 percent of consumer prices. Furthermore, SSCs can lead to higher costs, additional administrative tasks, and new dependency relationships, which undermine (partially) the benefits of certification (ITC, 2010; Neilson, 2008; Philpott et al., 2007). On a more general level, SSC is further described as a marketing tool for traders to convince consumers to buy their products at a higher price. This trend is likely to continue as large companies (e.g., Nestlé, Philip Morris/Kraft, and Sara Lee) are increasingly interested in certification (Kolk, 2013).

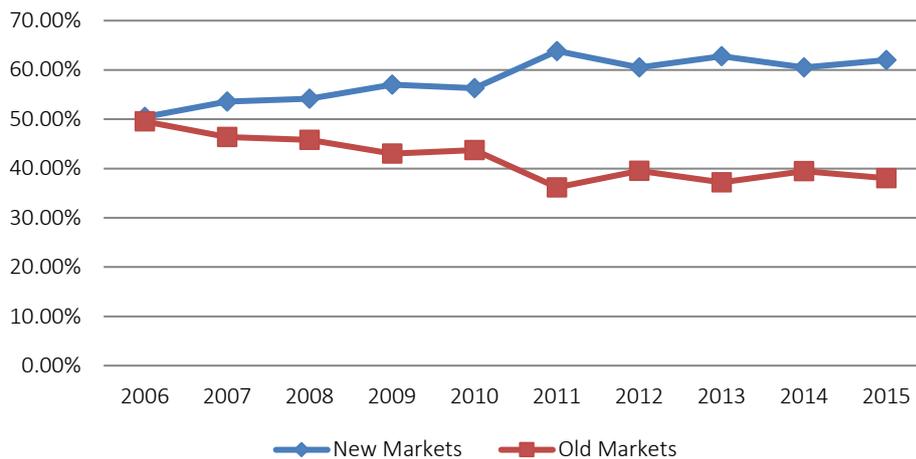
In Indonesia, smallholder farmers manage more than 96% of coffee plantations across the country and are likely to continue to do so, as large plantations have declined significantly (only a few left on Java) (Directorate General of Estate Crops, 2015). According to the Directorate General of Estate Crops (2014, 2015) and BPS-Indonesia (2013), there are approximately 1.96 million households growing coffee across Indonesia equivalent to about 5 million individuals depending on coffee farming in Indonesia. Farmers who seriously manage their coffee plantations are only 25% of these (SCP, 2014). On average, each smallholder household depends on 0.52 hectares of land where the family grows 942 coffee trees that produce 335.15 kilograms of coffee beans per year (BPS-Statistics Indonesia, 2013, SCP, 2014; the Directorate General of Estate Crops, 2014). The smallholders' average production cost is 68.90% of the selling price when they sell their coffee beans (the Indonesian Ministry of Agriculture, 2016).

In general, coffee farmers in Indonesia are quite vulnerable due to small land ownership, relatively unstable income, and limited access to extension services (Arifin, 2010; SCP, 2014; Wahyudi & Jati, 2012). Farmers are also linked to rural poverty, and limited access to markets and to better health facilities (Arifin, 2017). Because of their traditional cultivation methods, farmer productivity is rather low and is estimated to be less than 60% of their coffee plant potential (Wahyudi & Jati, 2012). The quality of the harvest is also somewhat low due to time pressure in peak season, and the use of outdated methods and processing machinery (Arifin, 2010; de Wolf, 2013). These challenges are further compounded by limited access to affordable credit, changes in weather patterns (e.g., rainfall, temperatures) that affect productivity, and poor infrastructure quality (e.g., delivery or transport systems) that limit access to affordable inputs.

Nevertheless, Indonesia is still regarded as the world's premier coffee producer (i.e., fourth rank) with an average production of 613,874.6 tons per year or 7.22% of the world production (ICO, 2017). The majority of coffee production (63.27%) can be exported, which means that the production that is not consumed locally can (theoretically) be exported. In practice, however, the realization of exports may differ (from exports) due to a lag between production and exports, for example because coffee collectors hold coffee beans for some time to wait for better prices. In recent years, the average domestic consumption has also continued to increase and potentially absorb most of the coffee production in the future. Although the current production increase is still higher than consumption, the risk of decreasing coffee supply is present due to high fluctuating production (depending on climatic conditions) worsened by declining productivity over time (due to significant coffee trees are old) (Directorate General of Estate Crops, 2014; 2015).

Indonesia exports coffee to countries in Europe, America, Asia, and Africa. While Europe and America are known as the 'old coffee market', Asia, Africa and some countries in the Pacific are considered a 'new coffee market' for Indonesian coffee. For Indonesia, the old coffee market has been a coffee-export destination since the era of colonialism (de Graaf, 1986). Since the 2000s, the new coffee market has surpassed the old ones and has been the main destination for Indonesian coffee exports (see Figure 1). The new coffee market is typically less interested in sustainable certified coffee than the old coffee market (SCP, 2014; Wijaya & Glasbergen, 2016).

Figure 1. Export markets for Indonesian coffee (BPS-Statistics Indonesia, 2016)



Indonesian coffee farmers are now faced with various SSC schemes, which differ in scope and history. The first coffee SSC in Indonesia was the Rainforest Alliance (RA) implemented in Aceh Province in 1993, followed by Fairtrade (FT) in the same province in 1997. UTZ was involved in the coffee sector in 2002, followed by 4C in 2006 (Arifin, 2010). RA aims to support farmers in creating a more sustainable livelihood, increasing agricultural productivity, and becoming more resilient to climate change. Therefore, SSC RA concentrates on how the plantations are managed, with SSC certificates awarded to plantations that meet the standards of the Sustainable Agriculture Network (SAN). FT focuses on realizing a better life for farming families in developing countries through direct trade, community development, environmental management, and guaranteed prices for their products. To further support the economic development of farmers, FT requires first coffee buyers (IE cooperatives) to provide pre-financing contracts and long-term contracts with farmers (FT, 2017). UTZ aims to create transparencies along the supply chain and reward responsible coffee producers (UTZ, 2017), while 4C aims to achieve global leadership as a preliminary initiative that improves economic, social and environmental production, processing and trade conditions for all actors who make a living in the coffee sector (GCP, 2017). With a base-line character, 4C is often regarded as a

less demanding SSC scheme. Nonetheless, the majority of Indonesian coffee farmers are still uncertified (about 93% in 2014) (Directorate General of Plantation, 2014, ICO, 2017, SCP, 2014).

In addition to the global SSC scheme, national-based certifications exist in Indonesia, such as Inofice (Certification of Organic Agriculture Indonesia), certifying coffee and agricultural products based on the criteria of SNI (Indonesian National Standard), geographical indication certificate (GI), and ISCoffee (Indonesian Standard Coffee). GI is regarded as intellectual property rights, which are governed by the national law of brand (UU No. 15, 2001), which aims to formally ensure that some agricultural commodities come from certain geographical environments and thereby provide assurance to consumers that the product comes from the natives and specific to the regions. Regarding ISCoffee, this certification was initiated by the Ministry of Agriculture of the Republic of Indonesia. ISCoffee is likely to be the first public SSC for coffee in the country (Media Perkebunan, 2013), although it has not been formally implemented yet.

This paper aims to contribute to the literature on SSC in a specific way. The paper argues that most studies of SSCs use a managerial approach, judging by the way they learn how SSC schemes operate in practice and how their performance can be improved. By adopting such an approach, researchers generally implicitly accept the 'definition' of agricultural issues formulated by the Northern-based SSC initiators. In this study, we focused on the perception of the problem, and the reaction to SSC by Indonesian coffee farmers. SSC schemes can create and monitor sustainable farming practices, but at the end of the story, it is not SSC, but smallholders who need to change their practices. Hence, smallholders must be willing and able to apply sustainable agriculture practices and internalize them into their daily activities in the plantations. Smallholders can therefore be regarded as 'gatekeepers' of sustainable change in the Indonesian coffee sector. Smallholders are at the heart of the coffee production system and their practice determines whether the concept of sustainable coffee production will be applied in the (bottom) value chain. Based on this view, the willingness and ability of smallholders to change is essential to induce significant sustainability effects in the coffee value chain as a whole.

This paper aims to understand the values attached to SSC schemes by coffee smallholders in their relevant contexts. To achieve this aim, we analyze what values smallholders pursue, how and to what extent these values correspond to the intervention logic of SSC, and what this implies for the process towards more sustainable coffee production in Indonesia. We therefore did not start our research with the problem definitions of the SSCs, but with the problems the smallholders are confronted with.

The paper is structured into five sections. After justification of the methodology of the research project (Section 2), Section 3 provides a summary of the empirical findings of the research, addressing the values that farmers attach to SSC reflected by their preferences for certification attributes, explanations for participation in certification, and farmers' perceived benefits related to the membership of different organizations and certification schemes, and the analysis of the implementation and problem-solving capacity of ISCoffee as a government initiative. Section 4 introduces a systemic perspective based on five building blocks to better understand and interpret the pathway towards more sustainable coffee production in Indonesia. Section 5 suggests future directions for research in this field.

2. Methodological Justification

This paper is based on and reflects on the results of the authors' four empirical studies that part of a PhD project on socioeconomic effects of coffee certification from southern perspective. These studies address specific subthemes, which together aim to answer the research questions (of this paper) above. The first subtheme is to investigate the Indonesian smallholders' preferences regarding coffee certification attributes and the characteristics of scheme most preferred by them. In this subtheme, the authors conducted research on *'farmer preferences for coffee certification: a conjoint analysis of the Indonesian smallholders'* (see Ibnu et al., 2015). As mentioned, most coffee certification schemes are developed by northern-based businesses and NGOs to regulate the

production of coffee in the south. It is uncertain whether these northern-driven standards correspond to the preferences of coffee farmers in the south. Understanding farmer preferences and taking them into account when developing or improving certification schemes is believed to lead to more internalized and therefore more effective standards. However, there is a lack of information on farmer's preferences, both in the academic literature and in the certification programs themselves. Based on conjoint analysis¹ and interviews, we investigate the preferences of smallholder coffee farmers in Indonesia. A total of 210 smallholders are surveyed in the Tanggamus and West Lampung Districts of Lampung Province, including farmers registered with global certification schemes (i.e., RA, UTZ, and 4C), a national-based certification scheme (Inofice), and uncertified coffee producers. The quantitative software SPSS (Statistical Package for the Social Sciences) was used for the conjoint analysis. In the research, a total of 210 smallholders were surveyed in the Tanggamus and West Lampung Districts of Lampung Province, including farmers registered with global certification schemes (i.e., RA, UTZ, and 4C), a local certification scheme (Inofice), and uncertified coffee producers. The quantitative software SPSS (Statistical Package for the Social Sciences) was used for conjoint analysis (Ibnu et al., 2015).

The second subtheme is to analyze explanations for smallholder participation in certifications. In this subtheme, the authors analyzed '*competing explanations for Indonesian smallholder participations in sustainability coffee certifications*' (Ibnu et al., 2016). The research aims to assess the relative importance of various explanations for farmer participation in certifications. The literature provides four competing explanations: sociodemographic, economic, attitudinal, and institutional. However, little is known about the relative importance of these explanations. Knowledge of the relative importance is believed to lead to a more effective implementation of standards and inclusion of smallholders. Up to now, researchers provide different explanations for participation; the research aims to contribute to the literature by bringing some order to the current explanations. To assess the importance of the explanations mentioned in the literature, questionnaire data were collected from Indonesian coffee smallholders in the producing provinces of Aceh and Lampung, including 160 coffee farmers certified with global certification schemes (i.e., RA, FT, UTZ, and 4C) and uncertified farmers (see Ibnu et al., 2016).

The third subtheme is to explore the different forms of farmer organizations, how they relate to certification, how differences in perceived benefits relate to the membership of different organizations and certification schemes, and what these findings imply for a more sustainable coffee production from a smallholders' point of view. To address the subtheme questions, the authors conducted a study on '*perceived impacts of certification and farmer organization: benefits from the Indonesian smallholders' point-of-view*' (Ibnu et al., 2018). The study analyzed different types of farmer organizations in the Indonesian coffee sector. Both certification and participation in farmer organizations are associated with economic and social benefits to farmers. However, there is limited knowledge of the potential differences in perceived benefits that result from participating in the different forms of organization and certification schemes. In the paper, three types of farmer organizations in the Indonesian coffee sector are distinguished: farmer groups, cooperatives, and KUBEs. The perceived benefits to farmers (including unorganized farmers) from these different forms of organization are compared, as well as the benefits resulting from participation in different certification schemes (i.e., FT, UTZ, RA, and 4C). We surveyed 160 coffee smallholders in the provinces of Aceh and Lampung. The statistical analyses applied were ordinal logistic regression to predict outcomes (i.e., perceived benefits) based on membership in an organization and/or participation in certification, and the Anova (analysis of variance) and t-test to analyze differences among respondent groups (Ibnu et al., 2018).

The fourth and final subtheme is to investigate barriers and opportunities in the process of implementing ISCoffee (Indonesian Standard Coffee), its potential contributions address generic problems in the coffee sector and whether this public regulation become an alternative to private

¹ Conjoint analysis is a multivariate technique that is useful to examine tradeoffs made by individual respondents when facing a range of options (Green et al., 1999).

certifications. To answer the subtheme questions, the authors examine *'the Indonesian Indonesian standard on sustainable coffee (ISCoffee): an exploration of its implementation capacity'* (Ibnu, 2017 Chapter 5). The study aims to analyze the implementation capacity of ISCoffee for as a public standard and certification initiated by the Indonesian government. The study specifically contributes to the literature on the emerging trend of southern-based SSC, which are perceived as a reaction to the northern-based private standards by businesses and NGOs. A qualitative analysis was applied, and the primary data were gathered through interviews. Respondents were selected based on convenience and snowball sampling approaches. In addition to the interviews, we analyzed a variety of written materials (printed and online), including scientific articles, published and unpublished documents from governmental and non-governmental institutions, news-articles from Indonesian media and magazines as well as presentation materials from a roundtable workshop on coffee in Indonesia.

3. Farmers' values regarding SSC schemes

The SSC schemes present in Indonesia (e.g., Fairtrade, UTZ, Rainforest Alliance, 4C, organic) are developed by, and based on, the preferences of Northern consumers and implemented through multinational roasting companies and/or exporting companies. While certified coffee is promoted to consumers because of environmental and social aspects of sustainability in production, our research (Ibnu et al., 2015) shows that Indonesian coffee farmers prefer a certification scheme that primarily offers economic benefits. Thus, certification, which is meant to be a tool to promote sustainability, becomes, when applied in the field and accepted by the farmers, an economic tool. This does not mean that the Indonesian coffee farmers do not value the environmental and social aspects of their production, but their preferences regarding the certification schemes differ. Moreover, we also found that even farmers who participate in a certification scheme prefer a loose relationship with traders, so that they can easily switch between certified and uncertified markets. This further implies that farmers display a great deal of opportunistic behavior (see Ibnu et al., 2015).

Moreover, as the research shows, farmers generally have little understanding of the philosophy behind the sustainability concept in agricultural production; they just follow the rules imposed on them (Ibnu et al., 2015). This finding is mirrored in our research on explanations for participation in certification schemes (Ibnu et al., 2016). Among the different explanatory factors that we analyzed, economic motivations are also by far the strongest. These findings should be interpreted in the context of some background disincentives for the uptake of the SSC and the transformation towards more sustainable coffee production. First, there is overproduction of certified coffee in the current market. This results in a situation where certified coffee is sold on the conventional market. Second, although our research shows that the prospect of a price premium is vitally important for a farmer's decision to participate, certified farmers do not always receive this premium for their certified coffee. Although farmers receive a price premium, the price differential with non-certified coffee is very small. This not only discourages uncertified farmers from joining, but also demotivates certified producers to stay in the programs (Ibnu et al., 2018). Third, this situation may be further exacerbated by new market trends. Indonesia exports its coffee to Northern (i.e. Western) and Southern (non-Western) markets, but in recent years the latter has surpassed the former as the main export destination for Indonesian coffee. These Southern markets, including the fast-growing domestic market, do not require coffee to be certified. A fourth contextual disincentive is declining interest of farmers in coffee production as other crops, like palm oil or cocoa, are perceived as a more profitable investment than coffee. This further decreases investment by the government and private actors in the coffee sector.

Finally, we observed that participation in certification is most difficult for the most vulnerable smallholders, who own very small plots and struggle to survive economically, and who live far away from hard-to-access cooperatives or KUBEs (Ibnu et al., 2018). Our study further shows that farmers are generally working with limited support from extension services, which leads to a limited understanding of good agricultural practices among farmers, weak farmer organizations, and

resistance to change. We argue that all of these deficiencies further results in smallholders' limited understanding of sustainability in coffee production, and that ISCoffee as a public initiative will likely be unable to address the problems mentioned. Overall, this shows that the current certification systems are weakly institutionalized in farmers' practices, which further contributes to the low rate of certification adoption by smallholders (only 7% of the exported Indonesian coffee was certified in 2014) (Ibnu et al., 2016). The implication is that the coffee sector may require not only standards and certification but also other instruments and/or strategies to lead to sustainability in coffee production.

Our research produced no indications of a transformation to a more sustainable coffee production in the short term. This also regards the uptake of ISCoffee (Indonesian Standards Coffee) that we analyzed (Ibnu, 2017 Chapter 5). The rise of public standards and certifications can be considered a new trend in Indonesia (such as for palm oil and cocoa as well). ISCoffee reflects Southern actors' attempts to establish a counter-initiative because they feel dissatisfied with, or disadvantaged by, the outcomes of the Northern standards and certifications. The Indonesian government uses the national standards and certification to assert the national identity and considers the regulation of the agricultural sector to be its own responsibility. In addition, through the national standards and certifications, the government tries to expand international market for agricultural commodities. However, doubts have arisen regarding ISCoffee's ability to become an accepted and viable certification in the international market. Some scholars argue that the Southern standards and certifications may gain relevance in their domestic markets, whereas Northern standards and certifications will be more demanding in international trade (Giovannucci *et al.*, 2014; Schouten & Bitzer, 2015). Our analysis of the implementation capacity of ISCoffee reveals that the implementation capacity of ISCoffee is low, mainly because of weak administrative structures and coordination deficiencies. It will consequently be difficult for ISCoffee to solve smallholder-related problems in the coffee sector, such as limited access to the market, low productivity and quality, and underdeveloped farmer organizations. We conclude that in the short term, ISCoffee will not become a viable alternative to Northern-based private standards and certifications (Ibnu, 2017 Chapter 5).

On the relevance of farmer organizations

Smallholders are embedded in the local economies because their production and consumption mostly take place locally. One of the problems observed is that smallholders often start selling their coffee within the first two weeks after harvest; they have several reasons, but the main reason is to obtain income to meet their basic needs. This implies that many smallholders are not linked to a more profitable market that balances between quality and price. Certification claims to address this issue, but requires smallholders to firstly organize themselves in farmer organizations. As our study shows, the manifestations of farmer organizations in Indonesia are diverse. Three types of farmer organizations play a role in the coffee sector: farmer groups (FGs), cooperatives, and *Kelompok Usaha Bersama* (KUBEs) (Ibnu et al., 2018). These organizations have different organizational characteristics since they are supported by different ministries, and are currently regulated by different sets of rules. Our analysis of perceived benefits of certification and farmer organizations from a smallholder's point of view shows that certification creates market opportunities and provides training that improves the farmers' skills and knowledge (capacity building). Trainings mostly take place in a group, which may further strengthen the feeling of belonging to a community and contribute to a higher perception of social benefits in the domain of networking. We found that organizations in which certified farmers participate often lead to more benefits than those of uncertified farmers. The latter are at best only involved in a single organizational structure (FGs), whereas the former have a dual organizational membership that either combines participation in FGs with KUBEs (FGKUBE) or with cooperatives (FGcooperative). Cooperatives are generally larger than KUBEs in terms of assets and/or financial capital. Farmers participating in FGcooperatives and FGKUBEs, however, do not significantly differ in their perceived

benefits, and therefore we conclude that these organizations' differences in (financial) assets and capital have no significant influence on farmers' perceived benefits (Ibnu et al., 2018).

The existing farmer organizations seem to perform relatively well in bringing benefits to the farmers and thus creating additional value for their members. The different types of organizations seem complimentary rather than overlapping or conflicting. FGs, for example, enhance farmers' knowledge and skills regarding the technical aspects of coffee production, whereas KUBEs and cooperatives link farmers to certified-coffee markets. FGs are more product oriented, and are valued as a social organization that strengthens communal relationships (among friends and neighbors). The unique value of a KUBE, which is more market oriented, is that it assists the FGs in complying with certification requirements and improving their management. In contrast, cooperatives work with individual farmers and assist them on an individual or cluster basis. Both KUBEs and cooperatives, however, connect farmers to buyers (e.g., exporters or multinational companies) and other farmers (outside their own FGs) (Ibnu et al., 2018).

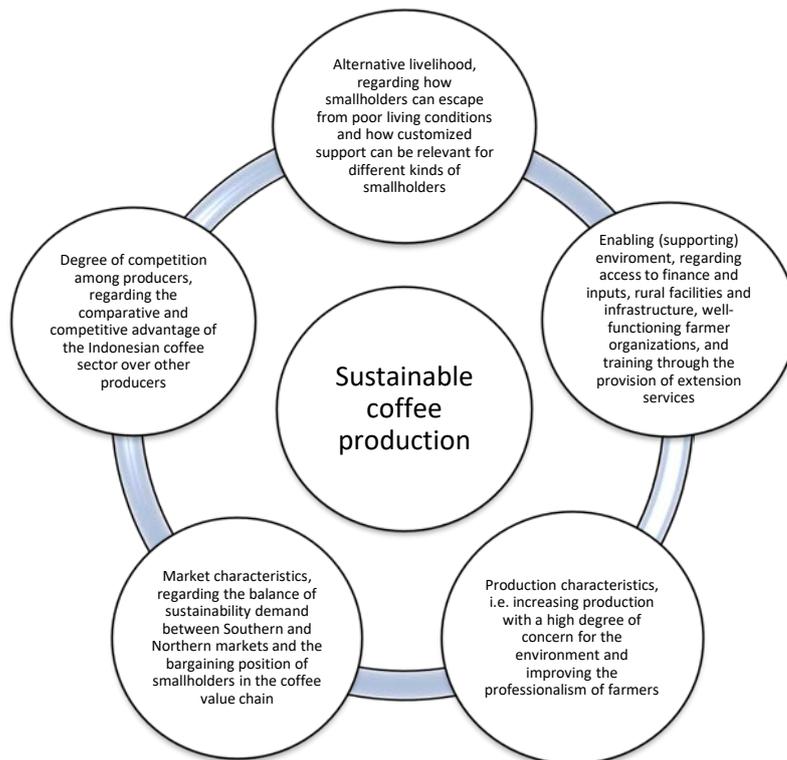
Our main findings on farmer organizations, however, do not change the main picture of a lack of well-functioning farmer organizations which hampers collective activities. As shown in our research (Ibnu et al., 2018), the problems of farmer organizations are rather difficult to address, due to a lack of attention to the causes of the problems such as incompetent leadership and a lack of motivation among farmers to organize. ISCoffee has the opportunity to improve the roles of farmer organizations, but the problem is that formal organizations such as farmer groups and cooperatives are unlikely to perform well unless they reach a certain level of maturity. In fact, many of them do not function well and may not achieve organizational maturity in the short term (Ibnu, 2017 Chapter 5). The top-down approach by the government in establishing formal organizations seems to rather ignore these problems.

4. A pathway toward sustainability in the Indonesian smallholder coffee production system

SSC, either private or public, do not improve sustainable coffee production and guarantee better living conditions for smallholders *per se*. One of the noticeable constraints for farmers to accept SSC relates to the lack of economic incentives. Our findings imply that economic sustainability should be the basis of sustainability in coffee production. There are, however, inherent links between the economic and the social and environmental dimensions of sustainability, which further implies that a systemic view is required to better understand essential factors leading to a more sustainable coffee production.

Below we identify these factors and categorize them. They include an enabling environment, availability of alternative livelihoods, production and market characteristics, and the degree of competition among coffee producers. We regard these factors as 'building blocks' of a more sustainable coffee production system in which smallholders – as gatekeepers of the system – play important roles (see Figure 2 below). A sustainability pathway, therefore, refers to the combination of building blocks to drive the current coffee production system towards a more sustainable one. We hypothesize that the smallholder coffee producing system has prospects for growth when the system is managed and coordinated with a focus on improvements in the five building blocks. This is, however, not likely to be the result of a single instrument, but a combination of various instruments to address requirements for each building block. Understanding the building blocks may provide stepping stones required to induce a sustainable change in the current coffee production system.

Figure 2. Five building blocks as a pathway for a more sustainable coffee production system.



These building blocks have different focuses, and therefore they should be coordinated to drive a systemic change in the coffee sector. Alternative livelihoods refer to opportunities available for smallholders to escape from poor economic conditions. These opportunities may further determine whether cultivating coffee is still attractive for farmers. Smallholders' profits from coffee vary over time, and even though, for example, *Arabica* farmers in Aceh usually receive higher prices than *Robusta* farmers in Lampung, this does not mean that their welfare is also higher. This implies that coffee earnings may fail to improve smallholders' welfare, and smallholders may further decide to shift to other crops, change their profession or migrate to the urban environment. If this trend continues, young people may prefer to find jobs in cities and consequently the coffee sector may be managed mostly by aging farmers, which in turn weakens the overall performance of the sector. In addition, without alternative livelihoods, smallholders may be unable to escape from poor living conditions, and they may sell their coffee at low prices which may further lead to oversupply of low-cost, low-quality coffee.

Livelihood conditions vary between smallholders from region to region, implying that smallholders may require customized supports. In the livelihood building block, some smallholders may need to build a more commercial farming operation through the combination of FGs, cooperatives and KUBEs. Other farmers, especially the poorest of the poor, may need to be helped to find alternative livelihoods through decent employment opportunities or through non-farming business activities. This further implies that defining smallholders as farmers who spend all their time producing coffee and fully depend on it as a source of income may not be relevant anymore, because it seems to ignore other realities smallholders are facing. Instead, support for farmers should take three types of smallholders into account. First, farmers who obtain their income through allocating most of their time and resources to on-farm activities (i.e., full-time coffee farmers). Second, farmers who obtain their income through dividing their time and resources equally between on-farm and off-farm activities (i.e., part-time coffee farmers). Third, farmers who obtain their income through relying more on off-farm activities (i.e., farmers who provide services to the coffee sector). The basic characteristics of the three types of farmers are, however, the same in the sense that their activities are mostly in rural areas and are still related to coffee production, though in different degrees. In addition, investment in public facilities in rural areas, especially schooling,

should be carefully designed to change the image of being a farmer (poor, limited choices of technology, market, etc.) and attract young people to coffee-farming activities. To show the opportunities offered by the coffee sector, schooling should include the introduction of better technologies in coffee cultivation and in coffee processing as well as discussion of potential markets for coffee products.

Enabling environment refers to the combination of institutions, policies, regulations and infrastructure that provide supports for improving sustainability in coffee production. In Indonesia, however, the enabling environment seems not to be very helpful, as support for the coffee sector is rather limited. For example, as noted in Ibnu (2017), the government gives priority to staple foods over coffee, which results in inactive policies (e.g., for extension services) and low investments in the coffee sector (e.g., infrastructure, rural facilities). Other issues are that while smallholders produce largely for the domestic and export markets, the productivity and the quality of the coffee produced are relatively low; and among the problems are low professionalism (knowledge and skills in production, processing and marketing) and limited access to finance and affordable inputs. Furthermore, difficult access to remote areas (because of the poor conditions of roads) and institutionalized social relationships to a large extent explain why many smallholders are poorly organized and rely on middlemen to market their coffee.

In the enabling environment building block, institutional changes are therefore needed to focus on instruments that still lacks, such as access to finance and inputs, rural facilities and infrastructure, well-functioning farmer organizations, and access to training through the provision of extension services. To address the limited access to finance and inputs, efforts should be directed to solve a common issue in the coffee sector, which is farmers' reluctance to deal with banks and/or input providers because of administrative requirements. The contrasting issue is that banks and/or credit providers are hesitant to provide credit because agriculture is perceived to be high risk, and consequently require farmers to provide security, which in turn discourages farmers from dealing with the financial providers. These issues seem to be related to each other and efforts to address them need to be backed up by a strong commitment of the government through policies and/or regulations. As the national budget for running programs in the coffee sector is limited, the government should extend partnerships with the private sector to address all of the issues that relate to smallholders and to further develop necessary facilities and infrastructure in rural areas.

FGs, cooperatives, and KUBEs are instruments of collective action, although even without these (formal) organizations collective action is still practicable, for example with informal groups. This further implies that the development of farmer organizations may not need to be standardized or formalized. Instead, a participatory approach should be prioritized in the sense that farmers should be given more opportunities to organize themselves in a way that they prefer. For example, in Indonesia, many informal organizations exist and function relatively well, developed based on local (community) initiatives such as *kelompok arisan* (community-gathering groups) and *paguyuban* (informal association). From a technical point of view, empowerment of farmer organizations may further require the unification of various small organizations to become large enough in economies of scale. Until now, however, the enthusiasm of the government in running extension services has not been satisfactory, and this contributes to the weak institutional transformation of extension services in the coffee sector. Extension services should therefore be improved through enhanced investments in the quality and quantity of government extension workers and through effective mechanisms for the inclusion of independent and private extension agents in the extension system.

Production characteristics relate to crop requirements, which have a very direct influence on farmer professionalism. Comparing *Robusta* and *Arabica* requirements, the former requires a lower level of processing² knowledge and skills than the latter (i.e., the latter is mostly produced as specialty coffee in Indonesia). Hence, coffee smallholders in Indonesia (and also in Vietnam with more than 80 % *Robusta* farmers) may have a lower level of professionalism (at least regarding

² *Arabica* requires a wet processing method, which is more complicated and requires more knowledge and skills than *Robusta*, with a mostly dry processing method (Wahyudi & Jati, 2012).

coffee processing) than *Arabica* farmers, for example in Brazil (with more than 80 % *Arabica*-producing farmers).

In the production building block, the challenge is to improve production through compliance with sustainability principles and criteria, for example by increasing yields without increased chemical inputs and deforestation. It seems that strategies for improving production are rather different between *Arabica* and *Robusta*. For *Arabica*, besides improving productivity, the challenge is to increase plantation areas. To enhance *Arabica* plantations, one plausible strategy is to shift production from *Robusta* to *Arabica* at certain altitudes. As *Arabica* is planted at an altitude of 1000–1500 meters and *Robusta* at 500–1100 meters, it seems that there are areas (between 800 and 1100 meters altitude) that are suitable for *Arabica* but are currently planted with *Robusta*.³ Such areas across the country should therefore be identified, and an effort should be made to persuade farmers to change their production from *Robusta* to *Arabica*. This change of production may further help enhance farmers' professionalism (at least regarding their processing method) in producing better-quality coffee. On the other hand, for *Robusta*, the priority may be to improve the productivity of smallholders' plantations through improved production techniques and rejuvenating old coffee trees. Significant numbers of coffee trees in farmers' plantations are old, and their productivity decreases over time. Farmers usually do what they call *stek*, which means joining the stem shoots of old coffee trees with the branches of another coffee tree to rejuvenate and increase fruit production of the old trees. This, however, may not result in optimal yields for farmers in the long term, and the old trees eventually need to be rejuvenated with better plantlets.

Among the observed challenges is that smallholders often prefer to use coffee plantlets nurtured in their backyards rather than to use coffee plantlets offered by, for example, the government. Farmers are rather skeptical whether the plantlets cloned in different regions, when planted in their plantations, will be able to adapt well to specific local conditions (soil, climate, etc.). In this case, it is therefore important to promote a new variety to farmers through, for example, demonstration plots or plantation models; if farmers see potential yield improvements, they are likely to adopt it. Another alternative for rejuvenating coffee trees is perhaps with plantlets produced locally by competent nurseries or with strains that can adapt to different geographical conditions, including poor soils. Overall, in line with efforts to improve productivity, concerns regarding the environment cannot be ignored by, for example, maintaining soil fertility through enhanced organic inputs, conserving water through protecting water sources and eliminating chemical waste, and enhancing biodiversity. The latter can be operationalized through an Agroforestry system (polyculture) that increases the types (or genetic) of trees in coffee plantations, which further allows farmers to diversify their incomes.

Market characteristics determine the quantity and quality of coffee demanded and the requirements for SSC. The differences between *Arabica* and *Robusta* influence not only the level of farming professionalism but also market values for the products, which further determine demand and prices. As *Robusta* is generally produced with relatively small differences in quality, it is often sold in bulk, and market demand may subsequently focus only on the lowest price. Northern markets tend to demand higher levels of food safety, better quality and impose more stringent sustainability requirements for tropical commodities than most Southern markets do (both for the domestic and export markets). In the market building block, the 'balance' between sustainability demands from Southern versus Northern markets is considered an important aspect determining the way coffee is grown in Indonesia. Other key determinants are the dynamics of demand (whether overall demand for coffee is growing or declining) and perceived pressures to secure a stable coffee supply.

The demand for coffee in Southern markets (both domestic and export) is growing. While there is pressure to increase production, sustainable coffee production will not be realized unless the demand for sustainable-certified coffee on the Southern market increases too. The argument is

³ *Robusta* productivity may not be fully achieved at an altitude higher than 800 meters above sea level (The Directorate General of Estate Crops, 2014).

that if demand for sustainable-certified coffee in this market remains low, the incentive to produce coffee in a sustainable way also remains low. To date, demand for sustainable-certified coffee has mostly come from the Northern market, but the portion of Indonesia's coffee exported to this market has gradually been decreasing.

In the market building block, the sustainability of coffee production can therefore be improved by promoting SSC in the Southern market and boosting demand for certified coffee from this market. ISCoffee potentially plays a role in this context, and therefore market players and NGOs, with their experience in the field of sustainability, should help improve the implementation capacity of ISCoffee to allow it to achieve its goal in the Southern domestic and export markets. Although ISCoffee has not yet been formally implemented, the central government has taken a further step by collaborating with several NGOs to formulate and launch a 'National Curriculum & Training Manual' for *Robusta* coffee. This curriculum was launched in 2016 and is intended to be a national reference document for providing training for smallholders to improve their knowledge and skills in good agricultural practices (GAPs) and post-harvest processing (Tabloidsinartani, 2016). The curriculum may strengthen the foundation of ISCoffee in the future, but as indicated earlier, extension services should be improved first. Furthermore, the bargaining position of farmers should be improved, because to some extent, farmers may perceive that they have a relatively better bargaining position when dealing with local traders and/or collectors (middlemen) rather than with multinational market players. This perception may further explain why many farmers, although they are certified, still practice side-selling to conventional coffee markets. The farmers' bargaining position can be improved by, for example, strengthening the capacity of farmer organizations to obtain the certificate for SSC.

In the past couple of decades, we have witnessed a profound geographical expansion of coffee cultivation. This expansion of coffee production influences the degree of competition among producers, both regionally and globally. Indonesia has contributed to this expansion by increasing production and exporting coffee to various countries. The country has been a significant global coffee producer from 1885 (second after Brazil), but by the end of the 1990s it was surpassed by Vietnam, which expanded its *Robusta* production significantly. At the same time new *Robusta* producers emerged, such as Guyana (in Africa) and Lao People's Democratic Republic (in Asia) (ICO, 2017). On the one hand, this production trend reflects structural changes in the ways in which agriculture in developing countries confronts global markets. On the other hand, it implies that coffee production has become more globalized, with an increased number of producer countries and more intense competition among them. This, however, may result in a sustained decline of commodity prices.

In the degree of competition building block, the concern is how the Indonesian coffee sector can gain comparative and competitive advantage over other producers. As indicated earlier, the Indonesian coffee sector has not reached its full production capacity (i.e., only around 60% of potential production is realized). This implies that investment in the coffee sector may result in a significant increase in production compared to the same amount of investment in other coffee-producing countries that have nearly reached their full potential production. This can be considered a comparative advantage of the Indonesian coffee sector; therefore, the production capacity of farmers should be improved by applying better production methods that lead to increased productivity and efficiency. Furthermore, because of specific geographical climate conditions that influence, for example, coffee flavor, nearly all islands or regions in the country where coffee is grown could produce different types of specialty coffee (Wahyudi & Jati, 2012). Both *Arabica* and *Robusta* varieties with unique characteristics (e.g. in terms of taste or aroma) can be regarded as specialty coffee, which is appreciated for its high quality. Indonesian *Robusta* specialty coffee, for example, may be qualitatively differentiated compared with *Robusta* from other producers, which may also lead to higher prices. This can be considered a competitive advantage for Indonesian coffee that should be explored further. There are opportunities to develop this niche market further for both *Arabica* and *Robusta* specialty coffees. Potential opportunities include applying geographical

indication (GI), which attaches specific attributes (*terroir*,⁴ taste, production method) to coffee. The GI provides assurance for consumers that coffee with the label is a specialty. *Robusta* lags *Arabica* in terms of GI; consequently, solid collaboration between coffee stakeholders, especially relevant intermediaries, will be needed to identify markets for *Robusta* specialty coffee.

5. On future studies

Achieving sustainability in coffee production will require a combination of intervention strategies and/or instruments derived from all of the building blocks to realize a systemic change in the smallholder coffee production system. To develop more effective intervention strategies and/or instruments, we provide some recommendations for future studies based on our empirical research. First, SSC should be made more accessible to smallholders, and one way might be to work towards harmonization of standards, as the current situation is rather confusing for them. Very recently RA and UTZ decided to merge, and this may be one step in the right direction. Future research could look at how the harmonization of standards could lead to a single internationally agreed set of standards. Based on that set of standards, specialties could be further differentiated. Future studies also need to explore how national standards, such as ISCoffee, can provide a stepping stone towards globally accepted standards.

Second, the adoption of SSC by farmers is mainly driven by a combination of market access and price premium. As indicated earlier, however, SSC is operating in the context of oversupply or limited demand for certified coffee and uncertainty about price premiums. This implies that, to remain inclusive (i.e., provide benefits for farmers), future studies need to focus on how SSC can embrace business models that have, for example, greater economic relevance for farmers. Furthermore, future studies can increase their focus on production-related issues such as how farmers can cope with climate change (e.g., increased temperature, less rainfall, etc.) and mitigate the risks of crop failures, and how women's participation in the coffee value chain can be improved.

Third, organizing farmers is important to improve their agency and is required for certification. Despite their formal status, farmer organizations tend to lack effective management and resources, and they vary highly in terms of their organizational capacity. Future research may need to firstly identify and categorize producer organizations based on their capacity. Well-defined categories are useful to map the existing farmer organizations and if capacity development is necessary, the categories may be used to evaluate progress resulting from training and other learning processes.

Fourth, the quantity and quality of farmers' production should be improved, for example through better provision of extension services. Currently, extension services in the sector are rather scarce. Future studies may need to focus on the design of an extension system that makes it possible to effectively balance competing factors, for example between the environment and the economy.

Fifth, since market demand has a significant effect on the uptake of SSC, increasing this demand will be a crucial success factor for scaling up SSC and creating an incentive to produce more sustainable coffee. Future studies should therefore pay attention to opportunities to improve the marketing system that may lead to greater demand for sustainable products.

Finally, future studies may need to evaluate the interplay between SSC and other instruments in the building blocks, and their impacts on sustainability in coffee production. This may provide additional insights into the synergies between SSC and other instruments, for example between certification and government policies. In this way, future studies can further develop a framework for action based on a pathway toward a more sustainable coffee production system.

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⁴ *Terroir* is 'a concept with different definitions but essentially connotes a geographical area with certain special characteristics including natural conditions such as soils, vegetation and water quality, and particular cultures and production techniques that result in products with specially valued tastes and other attributes' (Blackmore et al., 2012).

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References

- Arifin, B. (2010). Global Sustainability Regulation and Coffee Supply Chains in Lampung Province, Indonesia. *Asian Journal of Agriculture and Development*. Southeast Asian Regional Center for Graduate Study and Research in Agriculture. Vol. 7(2), pages 67-89.
- Astuti, E. S, Offermans, A., Kemp, R., & Corvers, R. (2015). The Impact of Coffee Certification on the Economic Performance of Indonesian Actors. *Asian Journal of Agriculture and Development* , 12 (2), 1-15.
- Blackman, A., & Rivera, J. (2011). Producer-level benefits of sustainability certification. *Conservation Biology*, 25(6), 1176-1185. doi: 10.1111/j.1523-1739.2011.01774.x.
- Blackmore, E., Keeley, J., Pyburn, R., Mangnus, E., Chen, L., & Yuhui, Q. (2012). Assessing the benefits of sustainability certification for small-scale farmers in Asia. *IIED Natural Resource Issues, London: International Institute for Environment and Development*. Retrieved January 26, 2017 from <http://pubs.iied.org/pdfs/14604IIED.pdf>.
- BPS-statistics Indonesia (2013). *Jumlah rumah tangga usaha perkebunan dan luas tanamam/luas tanam menurut jenis tanaman*. Retrieved January 15, 2017 from <https://st2013.bps.go.id/dev2/index.php/site/tabel?tid=49&wid=0>.
- BPS-statistics Indonesia. (2016). *Negara-negara tujuan ekspor kopi Indonesia*. Retrieved January 21, 2017 from <https://www.bps.go.id/linkTabelStatis/view/id/1014>.
- Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2013). *Sustainability certification in the Indonesian palm oil sector: benefits and challenges for smallholders*. Bonn, Germany: The German Development Institute.
- FT. (2017). Aims of Fairtrade Standards. Retrieved, January 15, 2017 from <https://www.fairtrade.net/standards/aims-of-fairtrade-standards.html>.
- GCP. (2017). 4C Baseline common code v.2.1. Retrieved, January 15, 2017 from http://www.globalcoffeeplatform.org/assets/files/GCP_Doc_01_Baseline-Common-Code_v2.1_en.pdf.
- Giovannucci, D., & Ponte, S. (2005). Standards as a new form of social contract? Sustainability initiatives in the coffee industry. *Food policy*, 30(3), 284-301. doi: 10.1016/j.foodpol.2005.05.007.
- Green, P.E., Wind, J., and Rao, V. R. (1999). Conjoint Analysis: Methods and Applications, In Dorf, R. C. (Ed.) *Technology Management Handbook* (pp. 65-72). CRC Press.
- Ibnu, M., 2017. Gatekeepers of sustainability. In: *On Coffee Smallholders and Certifications in Indonesia*. Maastricht University (ISBN 978946159734).
- Ibnu, M., Glasbergen, P., Offermans, A., & Arifin, B. (2015). Farmer Preferences for Coffee Certification: A Conjoint Analysis of the Indonesian Smallholders. *Journal of Agricultural Science*, 7(6). doi: 10.5539/jas.v7n6p20.
- Ibnu, M., Offermans, A., & Glasbergen, P. (2018). Perceived impacts of certification and farmer organization: benefits from the Indonesian smallholders' point-of-view. Submitted to *Bulletin of Indonesian Economic Studies*. forthcoming
- Ibnu, M., Offermans, A., Glasbergen, P., & Ismono, H. (2016). Competing Explanations for Indonesian Smallholder Participations in Sustainability Coffee Certifications. *Journal of economics and sustainable development*, 7(24), 123-136.
- ICO. (2017). Trade Statistics. Retrieved January 19, 2017, from http://www.ico.org/trade_statistics.asp?section=Statistics.

- ITC. (2010). *Market Access, Transparency and Fairness in Global Trade: Export Impact For Good 2010*. Geneva: ITC, 2010. xi, 144 p. Retrieved March 20, 2013 from <http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/Market-access-transparency-fairness-in-global-trade-Export-Impact-for-Good-2010.pdf>.
- Kolk, A. (2013). Mainstreaming sustainable coffee. *Sustainable Development*, 21(5), 324-337. doi: 10.1002/sd.507.
- Liu, P. (2003). *Environmental and social standards, certification and labelling for cash crops* (Vol. 2): Food & Agriculture Org.
- Loconto, A., & Dankers, C. (2014). *Impact of international voluntary standards on smallholder market participation in developing countries*. FAO. Retrieved on June 14, 2015 from <http://www.fao.org/3/a-i3682e.pdf>.
- Media Perkebunan. (2013). *Indonesian Standart Coffee Segera Diterapkan*. Retrieved April 24, 2014, from http://www.mediaperkebunan.net/index.php?option=com_contentandview=articleandid=6
- Pierrot, J., Giovannucci, D., Kasterine, A. (2010). *Trends in the Trade of Certified Coffees*. International Trade Centre: Geneva.
- Ponte, S. (2004). *Standards and Sustainability in the Coffee Sector: A Global Value Chain Approach*. United Nations Conference on Trade and Development and the International Institute for Sustainable Development.
- RA. (2017). *Protecting against modern slavery in agricultural supply chains through SAN/Rainforest Alliance certification*. Retrieved February 25, 2017 from <http://www.rainforest-alliance.org/sites/default/files/2017-04/protecting-against-modern-slavery.pdf>
- Schouten, G., & Bitzer, V. (2015). The emergence of Southern standards in agricultural value chains: A new trend in sustainability governance? *Ecological Economics*, 120, 175-184. doi: 10.1016/j.ecolecon.2015.10.017.
- SCP. (2014). *Indonesia a business case for sustainable coffee production. Sustainable coffee program (SCP)*. Retrieved on May 24, 2015 from <http://www.sustainablecoffeeprogram.com/en/resources>
- Tabloidsinartani. (2016). *Kementan Luncurkan Kurikulum Nasional Pelatihan Kopi Robusta untuk Petani*. Retrieved February 18, 2017 from <http://tabloidsinartani.com/content/read/kementan-luncurkan-kurikulum-nasional-pelatihan-kopi-Robusta-untuk-petani/>.
- the Directorate General of Estate Crops. (2014). *Satistik Perkebunan Kopi Indonesia*. Jakarta, Indonesia. Retrieved January 18, 2016 from <http://ditjenbun.pertanian.go.id/tinymcpuk/gambar/file/statistik/2015/KOPI%202013%20-2015.pdf>.
- the Directorate General of Estate Crops. (2015). *Rencana strategis Direktorat Jenderal Tanaman Perkebunan tahun 2015-2019*. Retrieved November 01, 2015 from <http://ditjenbun.pertanian.go.id/tinymcpuk/gambar/file/info-publik/Rentra%20Ditjenbun%202015-2019.pdf>.
- the Indonesian Ministry of Agriculture. (2016). *Outlook kopi tahun 2016*. Pusat Data dan Sistem Informasi Pertanian. Kementerian Pertanian Republik Indonesia. Jakarta, Indonesia.
- UTZ. (2017). *The UTZ standard*. Retrieved February 21, 2017 from <https://UTZ.org/what-we-offer/certification/the-standard/>.
- UU RI No. 15 (2001). *Undang-undang Republik Indonesia nomor 15 tahun 2001 tentang merek*. Jakarta, Indonesia.
- Wahyudi, T. and M. Jati. (2012). *Challenges of Sustainable Coffee Certification in Indonesia*. Paper presented at the seminar on the Economic, Social and Environmental Impact of Certification on the Coffee Supply Chain, International Coffee Council 109th Session, London, United Kingdom 25th September 2012. Retrieved July 18, 2013, from http://www.ico.org/event_pdfs/seminar-certification/certification-iccri-paper.pdf.

Wijaya, A., & Glasbergen, P. (2016). Toward a new scenario in agricultural sustainability certification? The Response of the Indonesian national government to private certification. *The Journal of Environment & Development*, 25(2), 219-246. doi: 10.1177/1070496516640857.