

Global Sustainability Regulation and Coffee Supply Chains in Lampung Province, Indonesia

Bustanul Arifin

University of Lampung, Indonesia

E-mail: barifin@uwalumni.com

ABSTRACT

This paper examines the global sustainability regulation in agricultural trade by conducting an in-depth assessment of the economics of coffee-producing regions in Lampung Province, Indonesia.

A negative campaign blaming illegal coffee producers for the loss of tigers in the Bukit Barisan Selatan (BBS) National Park in the province further complicates the issue, as the current coffee supply chain could not guarantee the workability of price transparency and asymmetric structures of coffee markets, to name a few. In this region, community initiatives have been developed to foster forest conservation by adopting coffee multi-strata practices under the agroforestry system and community-based forestry management in the buffer zone outside the BBS National Park.

Based on research findings, buyer-driven regulation of environmental practices in the coffee industry, which characterize most global initiatives, have somehow restructured the supply chain in producing regions. Recent global sustainability standards require adequate organizational capacity of coffee-farmer groups and rural cooperatives involved in the supply chain. The paper recommends policy integration between bottom-up initiatives at farm level or institutional changes at supply-chain organizations, and top-down sustainability standards set by the private sector and non-government organizations.

INTRODUCTION

The rise of environmental governance in the coffee sector in particular and the global food sector in general has evolved since the early 1990s and developed more rapidly in this century. Sustainability perspectives and long-term consequences of coffee practices on natural ecosystems and social-economic dimensions of the livelihood sector have been discussed more widely by academics, government and private sectors, and civil society

or non-government organizations (NGOs). The emergence of sustainability standards and non-state regulations could not be separated from the growing significance of the global value chain (GVC) system, which generally disaggregates the structure of production, trade, and consumption of commodities by the level or network of activities controlled by firms.

In the coffee sector, global sustainability standards have been developed for the most part within voluntary initiatives, involving collective formulation by some stakeholders, outside the

framework of government bureaucracy. These groups share common interests in specific agenda, such as consumer awareness of public health, fertilizer and pesticide contamination, organic perspectives, and other interests to protect endangered species, biodiversity, and other functions of the natural environment. In the last decade or so, buyer-driven regulation of environmental practices, which characterize most global initiatives, have somehow restructured the supply chain in coffee-producing countries. The governance issues emerge when the key notions of entry barriers and chain coordination have influenced not only the flow of goods and services in the global trade, but also the degree of complexity in the expectation of income streams by the economic actors.

Certification and labeling systems are also expanding rapidly in the global food sector, including the coffee sector. Environmental and social standards in the coffee economy have serious and long-term implications on the sustainability of natural ecosystems in the tropics and the livelihood of coffee producers, who are mostly smallholder farmers. In the business community, recent trends also support strongly the shift toward a more ethical business image through corporate social responsibility (CSR) in the GVC in general. On the other hand, the emergence of third-party NGOs on sustainable coffee initiatives has created certification networks that might be comparable to the multinational corporate structures and possibly bypass the existing state regulations. Also, such NGOs somehow have their own belief system in administrative bureaucracy. In short, these large multinational NGOs are central in establishing and maintaining the legitimacy and effectiveness of international coffee certifications (Reynolds et al. 2007).

This paper examines the links between global sustainability regulation in agricultural trade and coffee supply chains by reviewing

the economics of coffee-producing regions in Lampung Province, Indonesia. Emphasis is given on the implications of buyer-driven regulation, focusing on four main aspects: (1) position of coffee smallholders in the GVC, (2) market structures and price transparency in the supply chain, (3) environmental service markets as entry points, (4) roles of the domestic market and increasing effective demand, and (5) quality issues in postharvest and coffee processing. Desk literature review and extensive field observations of coffee-producing regions were conducted for about a decade over three different studies, development activities, and empowerment programs of local stakeholders in the Sumberjaya sub-district of West Lampung, Indonesia.

This paper is organized into five sections. After this introduction, the rise of global sustainability regulation in the coffee sector, where the role of the voluntary regulatory system has evolved somehow into a process of restructuring the coffee supply chain to the farm-level organizations, is discussed. This is followed by an overview of coffee production in Indonesia, with special references to the dynamics of coffee-producing regions in Sumberjaya watersheds in Lampung Province, Sumatra-Indonesia. The analysis of the implication of the growing tendencies of global sustainability regulation in the coffee supply chain is then discussed. The last section summarizes the findings and suggests the bridge between bottom-up initiatives at farm level or institutional changes at supply chain organizations and top-down sustainability standards set by the private sector and NGOs to achieve better environmental governance in the coffee sector.

GLOBAL SUSTAINABILITY REGULATION

Global sustainability regulation is generally seen as an emerging paradigm and alternative

mechanism to reduce the distortion effects of direct state intervention in the commodity supply chain. In one extreme, non-state regulatory efforts are argued to democratize markets by increasing the role of civil society in regulating production and trade-related activities. On the other extreme, standard and certification institutions could serve simply as new vehicles of corporate control over global food production, trade, and consumption (Reynolds et al. 2007). In the literature, work have been done in synthesizing major global initiatives in the coffee sectors dealing with sustainability standards and environmental governance (Ponte 2004, Giovannucci and Ponte 2005; Muradian and Pelupessy 2005; Reynolds et al. 2007).

Based on the context of governance, there are at least four general categories of regulatory systems: (1) first party, (2) second party, (3) third party, and (4) fourth party “voluntary” regulatory systems.

First party generally refers to “Coffee-Sourcing Guidelines of Starbucks,” which set standards for good social and environmental performance. Later, the guidelines evolved into Coffee and Farmer Equity (CAFE) Practices, which are part of Starbucks’ preferred supplier program. Nevertheless, the monitoring process of CAFE Practices is conducted by third parties, and the costs to comply with this standard have to be paid by farmers. In return, farmers are supposed to obtain reasonable price premiums.

An example of second-party regulatory systems is the Sustainable Agriculture Information (SAI) Platform, which are composed of specific commodity guidelines for sustainable agriculture along the supply chain. The monitoring process would be conducted by the third party.

By its name, third-party certification involves private sectors or NGOs in setting the guidelines and monitoring the sustainability standards in the coffee industry. There are at least four major third-party certifications currently

operating in the coffee sector around the globe: Utz Kapeh, Organic, Fair Trade, and Shade-grown (monitored by Smithsonian Migratory Bird Center [SMBC] and the Rainforest Alliance). These third-party certifications have similar missions and objectives to improve socio-economic and environmental conditions of coffee production and trade.

Utz Kapeh originated as an initiative of Guatemalan coffee producers and the Dutch coffee company Ahold, which later became an independent Guatemalan-Dutch NGO. Utz Kapeh has developed a set of standards for third-party coffee certification, formally equivalent to the EurepGAP, a certification system for the sourcing of fruits and vegetables led by European retailers (Giovannucci and Ponte 2005).

Organic certifications generally set the following standards: (1) coffee is grown without the use of synthetic agro-chemicals for three years prior to certification, (2) farmers and processors keep detailed records of methods and materials used in coffee production and management plans, and (3) a third-party certifier annually inspects all methods and materials (Ponte 2004). Issues emerge in organic certification as there is a deficit in the international harmonization of organic standards, which could create non-fair market differentiations at the global level. Organic certification is viewed as one of the main challenges facing voluntary regulatory schemes in the coffee industry, as this could alter traditional governance practices in rural communities by imposing paper burdens and externally designed procedures. Organic coffee has been used as a marketing tool to attract new consumers, despite the significant price difference.

Fair Trade certification is initially based on the partnership between the Alternative Trade Organizations (ATOs)—such as Twin Trading, Oxfam Trading, and Equal Exchange—and

coffee producers. Fair Trade is probably the oldest certification in global trade; it began by purchasing products in developing countries directly from producers and selling them through networks of Third World Shops. In the 1980s, ATOs began labeling fair trade products through Fair Trade Labelling Organization (FLO), such as Max Havelaar and the Fairtrade Foundation. Though the total sales of certified Fair Trade coffee was only 13.6 percent of the total production of registered producers, the local impact of Fair Trade certification in producing countries is beneficial for producers in terms of income generation, organizational skills, capacity building, and resilience to external shocks (Muradian and Pelupessy 2005).

Shade-grown coffee certifications are also known as “bird-friendly coffee,” as the shade trees grown in the coffee farms provide an excellent ecosystem for migratory birds; hence, such certifications contribute to better biodiversity. The SMBC has developed a certification system for production, processing, and marketing of shade-grown organic coffee that is labeled as “bird-friendly.” According to Muradian and Pelupessy (2005), this bird-friendly label is the most rigorous environment certification scheme in the coffee sector, as it combines organic standards with shade cover and species richness. In addition, shade-grown coffee certification is also developed by the Sustainable Agriculture Network, which has its secretariat in the Rainforest Alliance, an environmental group based in the United States.

The Rainforest Alliance then produces the label of “Rainforest Alliance-Certified” coffee, which generally combines environmental and social criteria. Coffee has to be grown under the shade, although the shade criteria are less strict than in the Smithsonian certification because Rainforest Alliance aims to enlarge the actual impact of the scheme in the shortest

period of time (Ponte 2004; Muradian and Pelupessy 2005). The sustainability standards here also encourage coffee growers to comply with local laws and adopt good environmental practices. For example growers must not burn fuelwood and other waste wood from pruning of coffee trees, and new coffee farms should not be established on cleared forestland. These standards are similar to those of Starbucks, SAI code, and Utz Kapeh.

Finally, the fourth party certification refers to the initiatives by the multi-stakeholders voluntary scheme, which has been explained in the introduction as the Common Code for the Coffee Community (4C). This initiative is led by the German Development Cooperation Agency (GTZ) and German Coffee Association (DKV), in which the steering committee consists of major stakeholders in the coffee industry. The 4C codes also emphasize social and ethical principles, such as paying minimum wages to the laborers, avoiding child labor, allowing trade union membership, and complying with international environmental standards on pesticide and ground-water contamination. Monitoring and auditing are conducted by third-party organizations, and the costs of this certification are to be covered by coffee growers.

A simple mapping of each governance system is drawn under the frameworks of seven main dimensions of global sustainability regulation on the coffee economy. These are: (1) sustainability focus of environmental governance; (2) coordination type among farmers, traders, and roasters; (3) risk management and planning capabilities; (4) target group of coffee farmers (growers); (5) market access and networking; (6) expected price premium; and (7) compatibility with environmental services.

Table 1 was completed using information collected from the field, interviews with

prominent figures of farmers' associations, traders, exporters, and experts on coffee stakeholders. For example, under the dimension of sustainability focus of environmental governance, Starbucks' first-party governance system with coffee growers and traders, do not mention its focus specifically, although the CAFE framework encourages natural conservation. The second-party governance system emphasizes the principles of sustainable agriculture, using more organic input as the major interests of SAI schemes are adopted mostly in coffee-producing countries in the developing world. Likewise for the third-party governance of Utz Kapeh, Organic, Fair Trade, and Shade-grown certification systems, the sustainability focus of environmental governance is quite similar. Such governance covers a wide range of concerns, such as environmental conservation, biodiversity, organic input, and erosion resilience, to name a few. Finally, the 4C governance system advocates the conservation of water, soil, biodiversity, and energy, although its implementation in the field is not as simple as it is written. The other remaining dimensions of global sustainability regulation in the coffee economy are summarized in Table 1.

The progress of global sustainability regulation in Indonesia, albeit in its infancy stages, have shown encouraging performance, especially in the coffee-specialty regions in Sulawesi and Sumatra where global buyers have formed some networks with coffee growers and traders. By the end of 2008, 15 coffee-growing companies obtained Utz Kapeh certification, two companies attained Rainforest Alliance certification, and one company in Gayo acquired both Fair Trade and Organic certifications. It is vital to note that the certification system has developed very rapidly in the last decade, and the number of coffee-growing and trading companies has also increased in recent years. Empirical evidence on whether or not these

standards have achieved the above objectives is still inconclusive. However, some suggest that coffee farmers receive both direct and indirect benefits from sustainability standards (Giovanucci and Ponte 2005).

Similarly, the specific impact of these standards on biodiversity is still unclear, but there is speculation that these sustainability standards have become the necessary pre-conditions to preserve local biodiversity in coffee-producing regions. The most significant benefits of these sustainability standards are probably the potential to strengthen social capital and to improve community-cooperative governance structures in the producing regions, as these standards generally require the establishment of farmer organizations and a locally adopted code of conduct. However, many of these standards do not guarantee that direct benefits, particularly price premiums, would reach farm laborers or local communities in general (Giovannucci and Ponte 2005).

THE COFFEE PRODUCTION SYSTEM IN INDONESIA

Indonesia is the world's fourth largest coffee producer, after Brazil, Vietnam, and Columbia. In 2006, Indonesian coffee production was 406,200 tons, which was a significant decrease from 519,500 tons of production in 2005. The decline in the yield of coffee can be attributed to the phenomena of unpredicted wet seasons and long drought because of climate change, low yield and poor post-harvest practices, and some tenure problems. Coffee production in 2007 was estimated to increase slightly (411,000 tons), but the level of production was far below the potential had the best farming practices been applied properly. Coffee consumption in Indonesia remains low at about 120,000 tons per year, which results in coffee producers and traders targeting the international market.

Table 1. Sustainability regulations of the various certification systems in the Indonesian coffee sector

Important Dimension	Third Party				Fourth Party 4C		
	First Party Starbucks	Second Party SAI	Utz Kapeh	Rainforest		Fair Trade	Organic
Sustainability focus of environmental governance	Not specific, but natural conservation	Sustainable agriculture, organic input	Not specific, environmental conservation	Biodiversity, soil fertility, agro-ecology	Not specific, but close to organic input	Soil fertility, and erosion and resilience	Water, soil, biodiversity and energy.
Coordination type, among farmers, traders, roasters	Strong	Very weak, it is a market transaction	Very weak, it is a market transaction	Very weak, it is a market transaction	Strong	Weak, close to a market transaction	Very weak, it is a market transaction
Risk management and planning capabilities	Risk of single buyer, farmer equity issues	Reduction of external inputs	Reduced pest management, social risks	Reduced pest management, social risks	Personal and household needs	Reduced inputs, no monocropping	Economic viability, sustainable livelihood
Target group (growers)	High quality coffee only	Not specific	In practice, large estates	Large estates	Smallholders, cooperatives	Not specific	Not specific
Market access, networking	Single buyer, high buying power	Niche, well-established markets	Buyers are limited but increasing	Buyers are limited but increasing	Niche, well-established markets	Niche, well-established markets	Good network; although not operational
Expected price premium	Medium, flexible	Very low, flexible	Low, flexible	Low, flexible	High, fixed	Medium, flexible	Very low, flexible
Compatibility with environmental services	Very strong, captive buyer	Strong, need intermediary	Intermediary, buyers enter after success	Intermediary, buyers enter after success	Intermediary, public agency as buyer also	Intermediary, public agency as buyer also	Weak, unless intermediary agencies
Progress and performance in Indonesia so far	Pilot project in Sulawesi and Sumatra	Not available	15 companies have been certified	2 companies have been certified	One in Gayo	One in Gayo	Not available, just introduced in 2006-2007

Sources: Synthesized by the author from several sources, including Muradian and Pelupessy (2005) and Giovannucci and Ponte (2005)

Despite the decline of present coffee production compared to the 1980s and 1990s, the role of coffee export in the foreign reserve earnings of the Indonesian economy is unquestionable. In 2006, Indonesian coffee export was about 286,200 tons, which was very significantly different compared with the export quantity of 407,700 tons in 2005.¹ Most of the Indonesian coffee exports are Robusta (80%) and only a small portion is Arabica (20%). Coffee prices in the world market have increased significantly in 2007 because of limited amounts being traded and other factors contributing to the price surge of food and agricultural products. At the time of this writing, the Robusta price was USD 202.7 per kilogram (kg), while the Arabica price was USD 304.3 per kg (World Bank Commodity Review 2008).

In 2007, the area of coffee production in Indonesia was estimated at about 1.27 million hectares (ha), located mostly in Sumatra, Java, and Sulawesi. The provinces of Lampung, South Sumatra, and East Java, are Robusta coffee producers, while the highlands of Aceh, North Sumatra, South Sulawesi, and Bali are suitable for Arabica coffee. The national average of coffee yield is about 0.64 ton per ha, where the yield of Robusta coffee is slightly higher than that of Arabica. Increasing coffee prices in the global market would provide a significant incentive system to improve coffee yield and quality. In turn, this will increase foreign reserves from coffee exports. Some coffee producers and traders are currently developing specialty

coffee with strong aroma, such as Mandailing and Toraja coffee bean, because of increasing demand from the global market. The improved security situation in conflict-torn coffee regions like Aceh is expected to have positive impacts on the Indonesian coffee economy, as the share of Arabica specialty coffee in foreign reserve earnings has grown recently. Global buyers and large corporations (e.g., Starbucks) have developed their sustainability regulations in South Sulawesi and North Sumatra, known as CAFE practices, which might lead to a "preferred supplier scheme." This specific code is developed in conjunction with conservation practices for coffee production, with support from large-scale international chains of NGOs.

In 2006, coffee production in the Province of Lampung contributed to about 35 percent of national coffee production. The foreign reserve earnings from coffee export has contributed to more than 50 percent of total export earnings of this province, marking the significance of coffee in the provincial economy. Long periods of drought in Lampung have caused incomplete fruiting of the crops, hence reducing coffee production to 141,300 tons in 2006 from 143,100 tons in 2005. Export performance of Lampung coffee was 224,800 tons, generating USD 250.6 million of foreign reserves in 2006. These numbers were significantly lower than the coffee export performance in 2005, which recorded 329,300 tons or USD 271.3 million in foreign reserves.²

¹ The data on coffee area, production, export, and consumption are collected from several sources, such as the Directorate General of Estate Crops of the Ministry of Agriculture, Central Agency of Statistics (BPS), and the Association of Indonesian Coffee Exporters (AEKI). After decentralization in 2001, problems in data consistency have increased due to poor reporting procedures and performance from local governments to the central government. Coffee data published by the International Coffee Organization (ICO) could be used as a reference for checking consistency. ICO data are available using bag-unit equivalent to 60 kilograms. Conversion to a metric ton unit should be conducted by multiplying the published numbers by 0.06.

² These data were collected from the Provincial Services of Estate Crops in Lampung, which were then verified using the data from the AEKI Regional Office.

It should be noted that the total amount of coffee export from Lampung does not reflect the total coffee production in the province. The trade statistic is based on the total amount of coffee exported from the Port of Panjang in Lampung. This also includes coffee production from the Provinces of South Sumatra, Bengkulu, and even Jambi. All coffee producers in Lampung are small farmers who control an upland production system of 2 ha or less. Therefore, the general problems facing small farmers, such as limited access to new technology, market information, price structure, and best practices in farming systems, are also present among coffee farmers in the province. Interestingly, the large-scale processing companies (e.g., Nestle, Switzerland) and multinational coffee-trading companies (e.g., Ecom Agroindustrial, Switzerland; Olam, Singapore; Andhira, Netherlands; and Noble, Hongkong) are operating actively in Lampung. Moreover, some local coffee-processing companies, such as Bola Dunia, Sinar Dunia, Sinar Baru, Siger, and Jempol, have been around since the 1970s. These domestic companies sometimes serve as immediate buyers that could obviously determine the price structure and marketing system of Lampung coffee.

The production centers of Lampung coffee are mostly concentrated in the district of Tanggamus and West Lampung, which are adjacent to the Bukit Barisan Selatan (BBS) National Park. In 2006, the coffee area in Tanggamus was 49,300 ha (30% of total area in Lampung), which produced 24,100 tons (17% of total production in Lampung) of Robusta coffee. The sub-district of Pulau Panggung is the major producer of coffee in Tanggamus, contributing to about 34 percent of the total coffee area in the district. In West Lampung, the coffee area was

1,851 ha, which produced 113 tons of Robusta coffee. The sub-district of Sumberjaya is one of the major coffee producers in West Lampung, contributing about 24 percent to the total coffee area in the district³ (Figure 1).

Lampung's coffee history is clearly much shorter compared to when coffee was first introduced in Java in 1699 (McStocker 1987) by the well-known trading giants of the 17th century: the Dutch United East India Company VOC (*Verenigde Oostindische Compagnie*). Rapid coffee development in Java could be associated with the enactment of the Agrarian Law of 1870, which allowed individuals and companies to open up coffee plantations from smallholders to large-scale estates, specializing in Arabica. However, the infestation of leaf rust disease during the 1880s destroyed coffee plantations, affecting Arabica production significantly. The introduction of the disease-resistant Robusta species in the 1900s has somehow spread the dominance of smallholder coffee production to Sumatra and other places. Other than being resistant to diseases, Robusta coffee is more farmer-friendly and easily manageable since it does not require intensive farming practices.

As the flow of transmigration from Java to Lampung grew significantly in the 1950s, Way Besay Watershed in Sumberjaya became an attractive destination in addition to Way Sekampung watersheds in Central and South Lampung. This government-sponsored transmigration has changed immensely the culture, farming practices, and Lampung economy in general. As agricultural land in Java became more limited, waves of spontaneous migrants who came from Java considered Lampung as the "new land of opportunity". In the new land, the ethnic Javanese (from East and

³ These data were collected from Provincial Statistics of Lampung, as cited by Kompas, July 16, 2007.

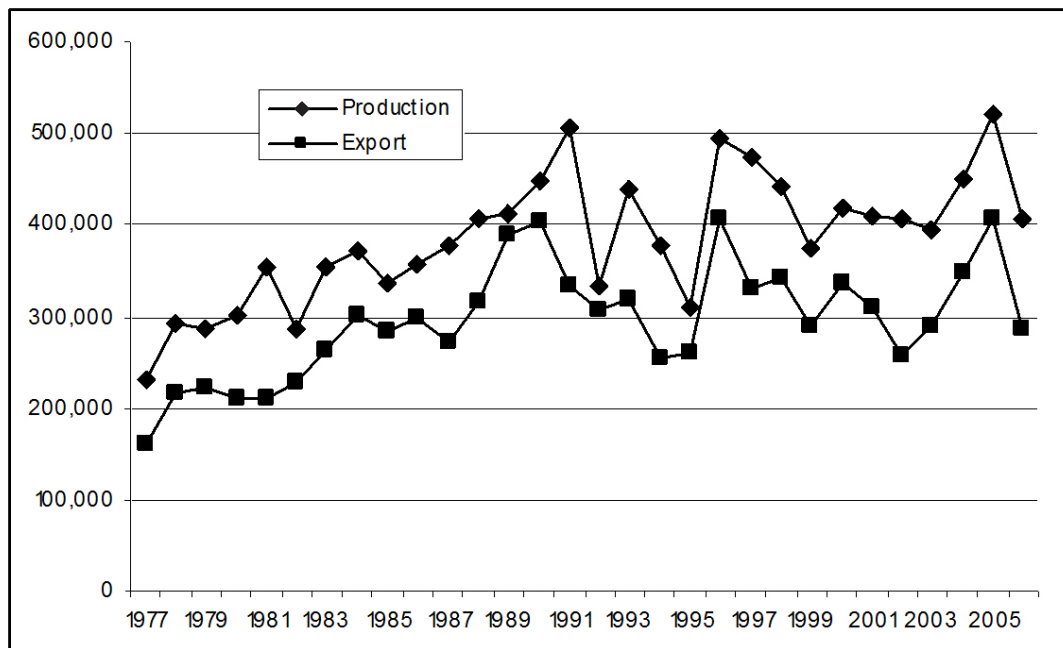
Central Java) and Sundanese (from West Java) brought the intensive rice cultivation system, while also adapting coffee cultivation from earlier Semendonese settlers. In a relatively short time, Javanese and Sundanese migrants outnumbered the first Semendonese settlers and changed the patterns of agricultural practices in the watershed. More permanent and intensive agricultural practices became more common in the area, as well as simple techniques of soil management, weed control, and agronomic practices such as pruning and grafting. In the 1970s and 1980s, as population pressure continued to increase and the demand for coffee land increased significantly, the migrants started to grow coffee in the forest margins, even in the state-owned protection forests and possibly the BBS National Park.

The cases of sustainability regulation, coffee supply chains, and environmental issues in Lampung coffee are drawn from the

data of three subsequent studies in the last seven years. First was a study on Partnership for Local Economic Development (PLED), supported by the United Nations Development Program (UNDP) (2001-2003); followed by a study on Rewarding Upland Poor for Environmental Services (RUPES), supported by the International Fund for Agricultural Development (IFAD) (2004-2005); then a study on Broadening Access and Strengthening Input System (BASIS), funded by the United States Agency for International Development (2006-2007). The PLED program was commissioned by the National Planning and Development Agency (Bappenas), while the RUPES and BASIS programs were commissioned by the World Agroforestry Center (ICRAF), Southeast Asia.

One of the major coffee-producing regions in Lampung Province is Sumberjaya in West Lampung, which was previously administered

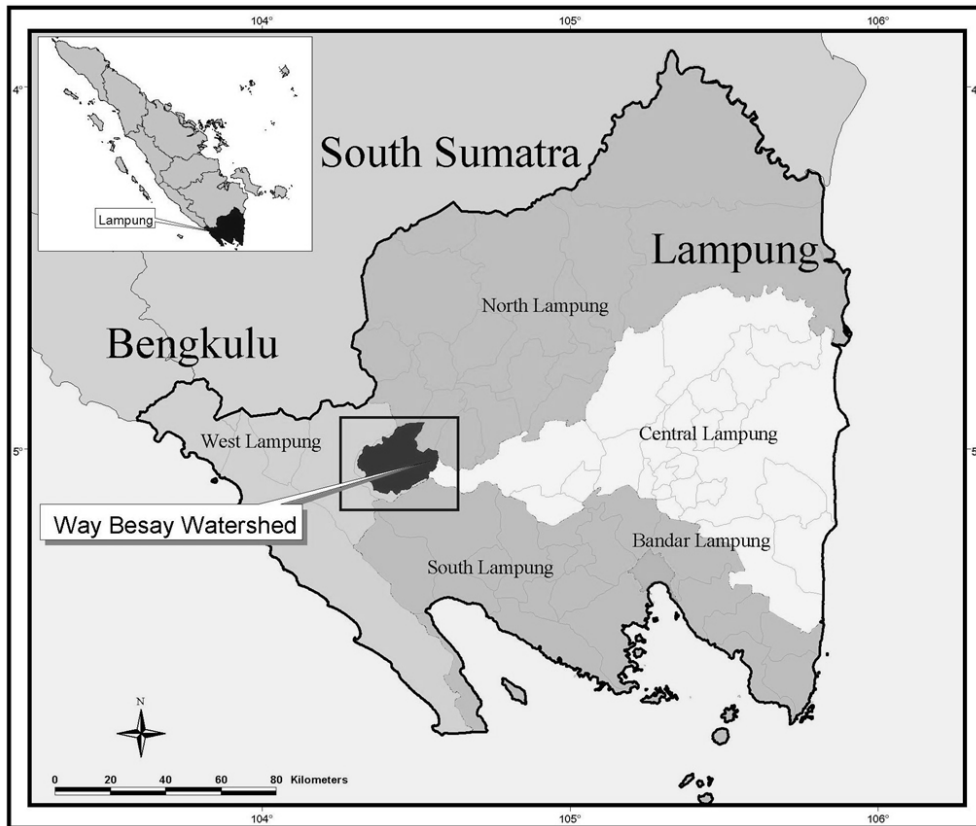
Figure 1. Growth of Indonesian coffee production and export, 1977-2006



Note: Data processed by the author

Source: International Coffee Organization 2007

Figure 2. Way Besay Watershed in Sumberjaya, Sumatra, Indonesia



Source: World Agroforestry Center (ICRAF) Southeast Asia 2006

by North Lampung (Figure 2). In 2000, Sumberjaya was divided into two sub-districts: Sumberjaya in the East, managing 15 villages; and Way Tenong in the West, managing 14 villages. The new Sumberjaya is only 35,646 ha, a significant decrease from the old Sumberjaya of 54,194 ha. Almost 90,000 people lived in the old, larger Sumberjaya; the new, smaller sub-district has about 50,000 people. Land in the upper watershed is mainly used for coffee plantations (44.6% of the total sub-district), with paddy rice on the lower portions (5.13%). The rest of the land is mostly protected forest, the ultimate function of the Way Besay sub-watershed. A coffee monoculture is grown in about 20.1 percent of the total watershed area,

and coffee-agroforest—also known as multi-strata or shaded coffee—is grown in about 24.5 percent.

In Sumberjaya, forest cover and agroforestry are very dynamic. The amount of forest in the area declined from about 60 percent in 1970 to 32 percent in 1978 to 10 percent in 1990 and 2000. Over the same period, the area covered by coffee-based agroforestry systems increased from about 8 percent in 1970 to 20 percent in 1978, to about 63 percent in 1990, and 70 percent in 2000 (Arifin et al. 2008). Coffee is grown in three production systems: monoculture coffee, shade coffee, and multi-strata agroforests. Shade coffee and multi-strata agroforests have been expanding since

1984 and now occupy about 36 percent of the area (Verbist et al. 2005). As mentioned previously, the rate of deforestation peaked in 1998-1999 when farmers took advantage of the fall of President Soeharto's government. There was a sudden increase in coffee price due to currency devaluation and the relative freedom of the early days of *Reformasi* expanded coffee production in the protection forests and national parks. Despite its higher conservation status under the New Forestry Law 41/1999, the rate of deforestation has been higher in the national parks than in the protection forests (Ekadinata et al. 2004). Van Noordwijk et al. (2000) and Verbist et al. (2005) have shown that well-managed multi-strata agroforestry systems can be consistent with good soil and watershed management. Finally, Suyanto et al. (2005) found that farmers with secure property rights are more likely to establish multi-strata agroforestry systems than monoculture coffee systems.

In the early 1990s, Sumberjaya was notoriously known for conflicts over land use. The "security approach" employed by authorities during the Soeharto administration led to mass evictions of thousands of families living in the area and prohibition of coffee farming in the protected forests. The government adopted the "rule of law," in which people are banned from making a living in the protected sub-watershed area, despite the inhabitants arguing that they had been practicing coffee farming for more than three decades. Meanwhile, the government was planning to build a hydroelectric power station (HEPP) using water from the Way Besay catchment, to increase energy supplies to southern Sumatra and surrounding areas. However, as the authority was only accustomed to a linear and command system, this state-owned enterprise used military power to remove people from the protected forest. Participatory planning in the development process was a

luxurious approach at that time, so there was no dialogue to resolve the conflict.

Conflicts over land and resource use grew significantly as the information and communication process did not flow very well among stakeholders involved. The conflicts escalated as land status and property rights were poorly defined and enforced. In one extreme, the Ministry of Home Affairs recognizes the existence of a village within the protection forest, in which coffee farmers and dwellers pay the property taxes, levies, and other retributions. On the other extreme, the Ministry of Forestry has never acknowledged any farming practices in the protection forest, let alone in the national parks. What has been observed so far is that the tendency towards more permanent coffee farming and unsustainable monoculture in coffee practices has caused serious land degradation in the area, and loss of forest cover in West Lampung and in Northern Lampung districts in general. A comparable figure is also suggested by Lumbanraja et al. (1999), claiming that in 1970, primary and secondary forests covered 57.4 percent and about 12 percent of the area, respectively. However, in 1990, primary and secondary forests covered only 12.3 percent and 18 percent, respectively. The majority of land use in the 1990s is smallholder coffee farming, locally known as *kebun* (60.4%). The remaining area was allocated for paddy fields, homegardens, and houses and buildings.

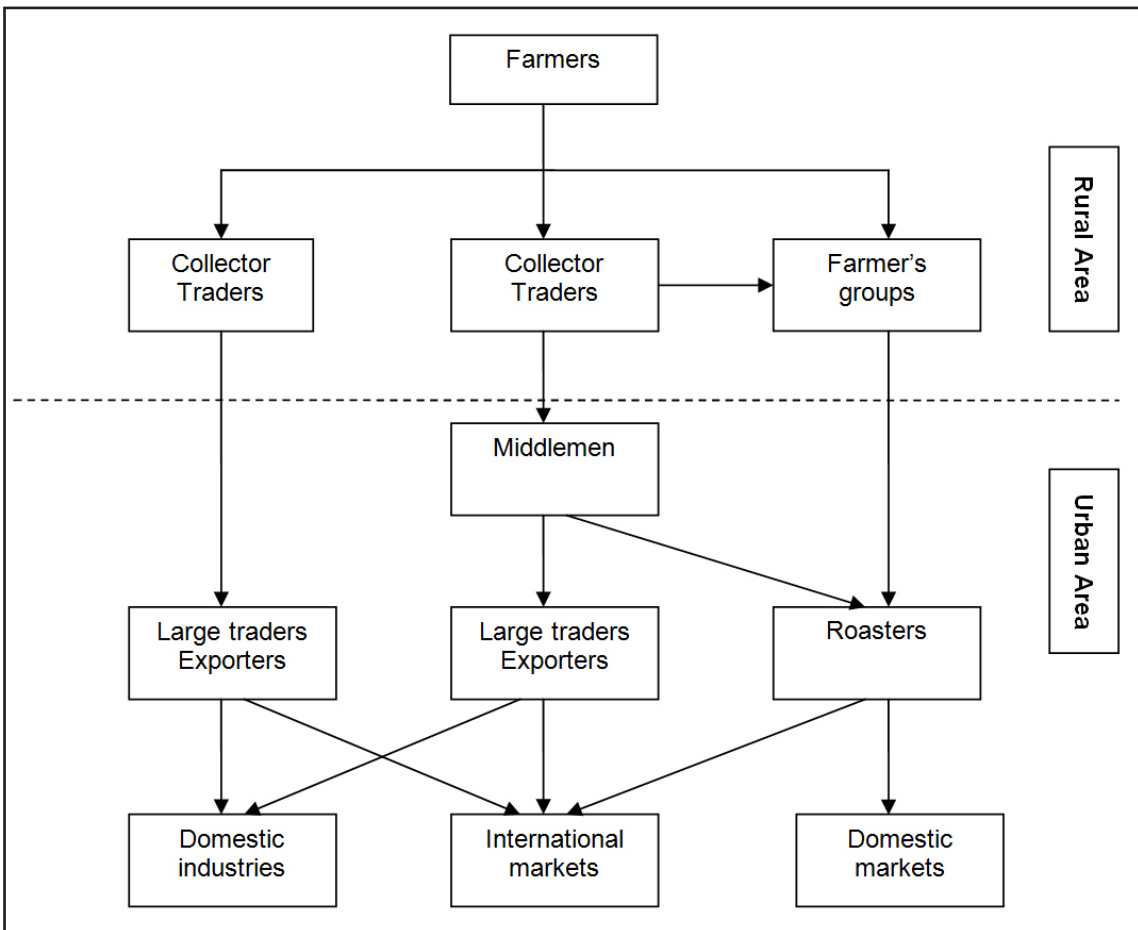
Coffee production from Sumberjaya is marketed to the nearby town of Fajar Bulan by collector traders (Figure 3). Fajar is considered the collection center of coffee for many sub-districts in West Lampung. The collector traders sometimes sell the coffee to the middlemen in Kotabumi, or directly to broker traders and/or exporters, located in the city of Bandar Lampung, the capital of Lampung Province, about 200 kilometers from Sumberjaya. These brokers or exporters are normally members of

the Association of Indonesian Coffee Exporters (AICE or AEKI), which is also a member of the International Coffee Organization (ICO). Nevertheless, exporters do not always market the coffee to international markets, especially if the quality does not meet the minimum standard of export requirements. Instead, coffee production from Sumberjaya and Tanggamus is sold to local coffee-processing companies to produce a typical fine-ground coffee with a strong flavor (*kopi kampung*) under locally well-known brands, such as Bola Dunia, Sinar Dunia, Sinar Baru, Siger, and Jempol. The final coffee products of these companies

are significantly different from instant coffee produced by modern processing brands such as Nescafe, Indocafe, and Torabika, to name a few.

In Lampung, coffee farmers generally have been in close relationship with collector traders, who often provide cash during the production process without the complicated procedures of money lending. In return, these farmers have to sell their products to these collector traders, leaving the smallholders with limited choices of marketing channels. This creates an interlocking trading system at the village level. Interestingly, these traders encourage farmers to harvest the coffee in *asalan* quality; hence,

Figure 3. Generalized supply-chain distribution systems of Lampung coffee



Source: Synthesized from previous studies by the author

the value added is accumulated among the collector traders. Given their high dependency on collector traders because of money-lending, coffee farmers have a very weak bargaining position. As a result, the market structure of the coffee marketing system at village level is relatively unfair due to the monopsonistic behavior of collector traders that distorts price transparency. Coffee farmers tend to listen to collector traders not only about economic decision making, but also regarding the level of trust, socio-psychological factors, and other social capital of the coffee economy. These are subject to a more detailed investigation in the micro-institutional setting and careful analysis of the roles of non-state regulation.

Similarly, at the global trade level, coffee exporters are fighting to obtain a fairer price from their partners overseas. Exporters that are affiliated directly with global roasting companies usually do not have such complicated procedures in business negotiations. In the growing GVC initiatives, buyers tend to establish subsidiary trading and roasting companies at coffee-producing regions in developing countries. These companies generally take care of certification costs to capture the interests of smallholder farmers who could not afford such extra costs. The history of coffee zone system (*rayonisasi*) in Indonesia—and other important commodities, such as tea, sugar, and fertilizer—reveals the tale of distortions in agribusiness-related commodities in Indonesia. Consequently, the small farmers are also inter-locking with such supply chain systems due to the influence of global buyers even at the farm level in rural areas.

The fear of a single-buyer system is probably the most notable concern of the Lampung coffee industry in the new global system of sustainability regulations. Currently, buyers of smallholder coffee productions include exporters, roasting companies, and local coffee factories, as shown in the distribution system

outlined previously. Major coffee exporters in Lampung include Aman Jaya Perdana, Indocafco, Andira Indonesia, Antara Saudara, and Indera Brothers, which absorb nearly 70 percent of total coffee production in Lampung. Major roasting coffee companies include Indocafco and Nestle, which recently have been more active in promoting sustainability standards of the GVC system. Theoretically, the fairer the competition among these buyers in setting the price discovery of coffee from rural areas, the better the market structure and price transparency, and the higher the price premium received by the farmers. However, when these farmers do not have the luxury of choosing collector traders, the marketing system tends to be inefficient because the buyers seem to have a single power in setting the farm gate price in rural areas.

IMPLICATIONS OF BUYER-DRIVEN REGULATION

The Government of Indonesia is highly concerned about improving coffee quality, especially from the smallholder producers in each coffee production center across the country. In this case, the government welcomes any governance mechanisms related to capacity building of smallholders, institutional development at the farm level, and strengthening competitiveness of domestic coffee industries. The new forms of global initiatives in coffee trade could strengthen the positions of coffee smallholders in the GVC and encourage restructuring mechanisms to improve market structures and price transparency. As the coffee farming activities have close links with ecologically sensitive land resources, an innovative paradigm in the environmental services markets could stimulate more open and transparent dialogue among coffee farmers practicing sustainable coffee as providers (sellers) and coffee roasters, consumers, and

the international community as beneficiaries (buyers) of the services.

Some of the major elements of the consequences of growing environmental governance and sustainability principles and of the Indonesian context of coffee economy are discussed below.

Positions of Coffee Smallholders in the GVC

Several important issues for smallholder coffee production system in the context of the GVC include low productivity, low quality of coffee bean, and low bargaining positions before the traders, coffee roasters, and exporters. Specific problems facing coffee smallholders in Lampung also include land tenure security and images of being encroachers of the protection forests and BBS National Park. Initiatives at the global level, such as sustainability principles and environmental governance, will not become positive incentive systems unless there are concerted efforts to solve the abovementioned problems. The principles on social, environmental, and economic dimensions laid out in the 4C Matrix Code; the requirements to obtain Utz Kapeh certification; and tree-shade criteria put forward by Bird-friendly and Forest Alliance could be burdensome for smallholder farmers to comply with although roaster companies and coffee exporters might be able to afford the certification costs and membership fees to become part of these global initiatives. However, opportunities for better market access, enhanced returns from production, and improved social conditions in the coffee producing industries would never come without serious efforts to establish them.

The argument to improve the bargaining positions of these smallholder farmers by forming farmer associations is well known and have been practiced in Indonesia. The level of group dynamics, maturity of group leaders, and relationship between leaders and

members differ significantly among coffee-farmer groups across Indonesia. These factors determine the degree of farmer groups' roles in solving problems and taking on challenges in coffee production and complying with global initiatives on sustainability regulations. Coffee-farmer organizations have been revived since 2001, especially when these groups were collectively negotiating their rights with the local government to utilize protection forests for coffee production activities. A more detailed explanation about tenure rights is discussed in the subsequent sub-heading on environmental services. These farmer groups have established well-defined codes of conduct and organizational mechanisms in taking care of their daily life problems, especially on coffee issues. This well-established institutional environment is an important element in empowering smallholder farmers to increase coffee yields through the introduction of more advanced techniques in best farming practices, crop maintenance, land care, and soil conservation, among others.

Currently, there is a qualified forestry-extension agent residing in Sumberjaya, whose responsibility is mainly community forestry-related issues, and the management of the agroforestry system involving coffee crops, timber, and fruit trees in the watershed. By experience and practicing coffee farming, this agent is also very familiar with some issues in coffee production and distribution systems. These issues include initial capital to improve the coffee yield, harvest and post-harvest handling, boosting the quality of coffee bean, as well as increasing the bargaining positions of coffee farmers to enter into a "new culture" of global initiatives. In this case, smallholder coffee growers and small-scale roasters could set the strategy in a more competitive world of trading and GVC.

Recent trends show that global initiatives on sustainability and environmental governance have led coffee buyers to enforce traceability

principles, such as those demanded by buyers in international markets. These buyers could take advantage of production centers that have strong and dynamic farmer groups and rural cooperatives, such as in Sumberjaya, Lampung. Any information regarding quality standard, the pricing system of different grades of coffee, knowledge and technology transfer (e.g., new coffee varieties), and fertilizers are generally addressed through group leaders. The leaders then disseminate the information effectively to other group members using their own communication mechanism. Community gatherings, periodic informal meetings, and “word of mouth” are the information exchange methods among members of the group. Once the members see the direct benefits of becoming a part of farmer groups, the sense of belonging, code of conduct, and the programs could be strengthened. Hence, group sustainability is ensured.

Certainly, smallholder producers are pressured to improve coffee quality because certified products tend to dominate coffee trade in the future. However, not all small farmers and local roasting companies could afford to fulfill sustainability requirements and significant compliance costs set by the certification standards at global level. Global-scale buyers and large-scale coffee industries might argue that these common tendencies might be in favor of well-organized and more capitalized smallholder producers and roasters, instead of unorganized and marginalized small coffee farmers. This argument should be valid only under secular capitalist economic system; it is not easily acceptable in Indonesia where basic problems of poverty and unemployment remain important political issues. Moreover, the distribution issues of the GVC system and social dimension of multinational firms, which promote the creed of CSR, could be seen only as a greenwashing mask that carries a significant amount of empty shell.

In other regions where farmer groups or cooperatives were created for the sake of traceability requirements, the capacity building and institutional empowerment of these groups are generally very difficult. The top-down formation of rural cooperatives (KUD=*Koperasi Unit Desa*) and poor images of KUD during the Soeharto administration become serious challenges in bridging global initiatives with local interests. The existence of a national coffee-farmer association (APEKI=*Asosiasi Petani Kopi Indonesia*), which has a regional chapter in each province, is without exception. The difficulty to implement farm lobby at the level of policy decisions, such as improving farmers’ bargaining positions before the traders and international buyers, has made it difficult to acknowledge such an organization as a genuine representative of the farmers. Though most farmers are aware of the need to improve coffee quality, and increase market access, price transparency, and fairness, efforts to empower farmers through several groups or associations have to be handled with extra care. The short-term interests shown by local politicians—to take advantage of established groups—might be counterproductive to the objectives to establish effective traceability mechanisms on coffee trade. Moreover, different interests from private sectors and development agencies, both domestic and international, sometimes lead coffee farmers to object to development programs, which often operate in a single pathway to achieve its welfare objectives.

Compatibility with the Environmental Services Approach

The global initiatives on sustainability regulation and environmental governance can be compatible with the growing approach on environmental services, where small farmers living in the forest margins (as providers or sellers of the services) could perform

realistic, voluntary, but conditional economic transactions with fellow roasters, coffee consumers, and the international community (as beneficiaries or buyers of the services). As mentioned previously, coffee farmers practicing the agroforestry system using various types of tree shades in Sumberjaya watershed in Lampung Province are the sellers or providers of environmental services. Domestic and international roaster companies and coffee buyers could play important roles in encouraging a process of self-empowerment so that poor coffee farmers can make the necessary decisions to build a sustainable future based on their resources, on improved technology, and centuries of accumulated wisdom. In Sumberjaya, Lampung—and in two other benchmark areas in the province of Jambi and West Sumatra—the World Agroforestry Center (ICRAF) has commissioned RUPES to develop working models of best practice for successful environmental transfer agreements adapted to the Indonesian context in particular, and to the Asian context in general.

Potentially, buyers of such environmental services provided by coffee farmers practicing coffee multi-strata under the agroforestry system include coffee roasters, consumers, and the international community. However, as the general concept of environmental service markets is still relatively new in Indonesia and in Asia, these potential buyers of environmental services are not aware of the concept. Moreover, these buyers might be uncertain whether the payments or rewards would really lead to improved environmental services. In addition, as the institutions governing the

interactions among these stakeholders have not yet developed properly, establishing rewards or payment transfers for the sellers is fraught with serious complications. This is especially true where poor people are highly dependent on environmental resources. Under such institutional arrangements, the transaction costs of implementing rewards and payment transfers are extremely high (Arifin 2006). In Indonesia, where buyers have to pay various taxes to the national and local governments, exporter associations; and/or putting funds aside for community development activities aimed at social responsibility, the new environmental-services markets might be viewed as another unwelcome tax or fee, contributing to high-cost in the coffee value chain.

The approach to treat the “conditional” tenure security to utilize protection forest land as rewards for environmental services in Sumberjaya, Lampung is probably an innovative step to adapt the abstract concept of environmental service markets into more action in the field. By the time of this writing, out of 36 farmer groups in the Sumberjaya watershed, 23 farmer groups — having an average of 140 household members per group — have obtained permits to utilize state protection forests for a 5-year probationary period (Arifin et al. 2008). This probably coincides with the agenda of IndoCafco and Nestle, both operating in Lampung, to encourage partnership between the private sector and local farmer groups in Sumberjaya⁴, as required by sustainability principles from Global Initiatives such as Utz Kapeh, Shade/Bird-friendly, Rainforest Alliance, Fair Trade, which are also included

⁴ Actually, many organizations such as ICRAF, University of Lampung, and Watala have been involved in capacity building and institutional strengthening of partnership among farmers groups in Sumberjaya and private sectors and government agencies. In this partnership scheme, IndoCafco is responsible for ensuring market absorption, price guarantee, and marketing the coffee output from farmers in Sumberjaya (Kompas, August 9, 2006) while Nestle is responsible for providing technical guidance for best farming practices of coffee (Kompas, August 15, 2007). Further field verification is certainly required to give more accurate information on how the partnership mechanisms work and for how long.

in the 4C Code Matrix. Once these HKm (*Hutan Kemasyarakatan*) farmer groups have fulfilled the criteria and performance indicator of the community-based management, the tenure could be extended for another 25 years before being subjected to the next feasibility assessment. This step might also be seen as an *ad hoc* strategy to cope with the lack of property rights and land tenure security, these being a general problem of smallholders in developing countries.

Moreover, this approach could help develop and empower smallholder farmers living in the buffer zones of national parks, and to reduce direct pressures on the national parks. The types of farming practices become central factors in determining the degree of dependency of a household on the resources of the adjacent national parks. Research in Kerinci Seblat National Park, also in Sumatra, show that families with both riceland and mixed gardens depend less on park resources than do rice-only farmers, all other things being equal and farms with only mixed gardens have intermediate dependency on protected forest resources (Murniati et al. 2001). In short, the research results tend to corroborate the view that agroforest systems are a superior landuse system for buffer zones, as the systems might be expected to enhance the ecological integrity of a park in several ways. Moreover, sufficient income from coffee production and other marketable fruits and tree crops, for example, could alter the need for their harvest inside the park. Complex agroforestry systems may provide environmental services in the buffer zone itself such as soil and water conservation, and the extension of biodiversity habitat to the agricultural landscape in ways that are conducive to conserving the flora and fauna of the park (Murniati et al. 2001).

The approach of environmental services could be compatible with the global initiatives of environmental governance, as long as

intermediaries provide links between sellers (smallholder farmers) and buyers (roasting companies, research institute, civil society organizations, or international agencies) and ensure that sustainability principles are applied. At the least, intermediaries could contribute in increasing public awareness, serving as a clearinghouse for information, training, capacity building, negotiating, monitoring and evaluation, resolving conflicts, absorbing transaction costs, among others. Intermediaries have also helped generate collective action in linking smallholder farmers with the broader market, providing support for weaker members of communities to better address poverty alleviation or ensure that the plight of the poor is not worsened.

In this context, economic valuation of environmental services becomes central in ensuring the workability of “market transaction” between sellers and buyers. If not serving as a direct buyer, research organizations could step in and conduct priority research on environmental service valuation in coffee production centers adjacent to state protection forests and national parks. The most difficult challenge is how to promote environmental services that would effectively protect a park that has a long and complex boundary — a reputation of being an “open access” resource — and its own complex history. Managing the national parks is not only conserving the wildlife and biodiversity hotspots, but also managing the people living adjacent to the parks. Efforts on conservation would be more meaningful if they also provide significant economic and welfare benefits to local people.

Market Structure and Price Transparency

The pressure for more sustainability regulations and certification of origin in the coffee trade currently grows significantly in Lampung and other places in Indonesia. The

controversial study by the World Wildlife Fund (WWF), which claims that about 45 thousand ha of coffee area in Lampung is in the BBS National Park, suggests that certification and traceability are among the growing concerns within global coffee supply chains (WWF 2007). In the future, the certification of origin could become a requirement for market access and possibly develop into a non-trade barrier, which is counterproductive to the general welfare objectives. Major coffee buyers in Lampung, such as roaster companies Nestle and IndoCafco, have obtained Utz Kapeh certification and some exporters have complied with global sustainability standards. In other places in Indonesia, Starbucks has been implementing CAFE principles that require price transparency along their supply chain, e.g., the Arabica coffee system in Sulawesi. This traceability requirement has probably become an incentive system for growers and suppliers to develop a fairer and healthier relationship in the coffee trading system.

However, the presence of Starbucks in South Sulawesi coffee production centers seems to show the power of a real single buyer (Neilson 2008), which might not be found excessively in other places in Indonesia. When farmers are highly dependent on single buyers like Starbucks, coffee farmers and exporters are at risk of producing only commercial-specialty coffee based on the quality demanded by Starbucks. As this global company requires continuous supply and quality consistency throughout the years, the production process and postharvest activities would refer only to the Starbucks standard. On one hand, this could become an incentive system for small farmers and domestic coffee chains to improve coffee quality, expecting certainty, favorable price, and guarantee of market absorption. On the other hand, this could threaten the specific local quality of coffee, which also has a high number of potential local markets and loyal customers

(for *kopi kampung*). Such phenomenon has not yet occurred in Lampung, but sooner or later, it will happen and local roaster companies will have no choice but to buy only low-quality coffee and possibly with higher prices. In other words, these local roasters are at risk of going out of business due to their inability to compete head-to-head with giant global companies that have strong links with and even operate directly in rural areas.

Another dimension of global initiatives on sustainability regulations in the coffee sector is the governance and ownership issue of such initiatives. For example, the 4C Code Matrix and possibly other initiatives tend to represent corporate interests—which are mostly concerned with brand reputation—instead of making a positive contribution to improve social welfare in producing regions. The voice of coffee producers from developing countries might not be well represented in the initiatives, except probably the commitment to improve coffee quality to fulfill the sustainability requirements set by the buyers in developed countries. The governance system within the global initiatives and the ownership structures of such collective industry codes for coffee are subject to further investigations regarding, for example, the decision-making process to handle strategic but sensitive issues, such as price fluctuation, cases of retention, labor standards, and human rights, to name a few. More importantly, the global initiatives of sustainability regulations and environmental governance in the coffee trade could be counterproductive for fair trade principles if they evolve into a new dimension of non-tariff barriers in buyer countries, which are mostly developed nations.

Finally, the improvement of peace levels in conflict regions like Aceh and Poso of Central Sulawesi could also ensue from the development of the coffee economy and market structures in the coffee sectors. The surfacing of the domestic coffee industry is probably associated with

emerging younger generations involved in the coffee business, such as KSU (multi-purpose cooperatives) Arinagata in Takengon District of Aceh, which produce the Arvis Coffee Sumatra brand. Coffee production from these cooperatives has obtained certification from Utz Kapeh, USDA organic, Just Control Union of Certification, and Fair Trade. There is a sense of ownership among domestic traders and roasters in developing the trademarks for specific origins across Indonesia, such as Gayo Mountain Coffee, Toarco Toraja, Kintamani Bali, and potentially, Lampung Coffee and Java Coffee. Arabica specialty coffee has recently obtained more attention for a specific market segment, which should benefit the specialty coffee production centers in highland Aceh, Toraja, and Kintamani. Moreover, the development of unique qualities and specialized niche markets using combinations of variety, location, and processing technology would allow smaller traders and exporters to maintain wider market links with the GVC system.

POLICY IMPLICATIONS: RESPONSE AND THE WAY FORWARD

This case study on the Indonesian coffee economy reflects that sustainability regulation of global environmental practices in the coffee industry, which characterize most global initiatives, has somehow restructured the supply chain in producing countries. The first and foremost evidence in this process of change is the growing tendency of exporters and domestic roasters to encourage coffee producers to organize as a group. This way, the monitoring system and traceability principle could be ensured. Since the Government of Indonesia has not yet taken any position regarding the growing concerns on global initiatives, facilitating the adoption of such initiatives by individual coffee roasters and exporters across Indonesia might contribute to the restructuring process in the

coffee economy. Further, the public-private partnership consisting of the government, private sectors, research institutes, and NGOs should develop the national code of conduct and establish benchmarks for the adaptation of such initiatives into the domestic context of the Indonesian coffee. This new domestic standard of environmental sustainability to develop domestic markets could encourage effective demand of the society.

Major coffee buyers in Lampung have obtained Utz Kapeh certification, while some exporters have complied with global sustainability standards, including participating in the empowerment of coffee-farmer organizations, together with government agencies, academic institutions, and civil society organizations. Generally, coffee-farmer organizations in Sumberjaya have been revived since 2001, especially when the groups were collectively negotiating their rights with the local government to utilize protection forests for coffee-production activities. Farmers' groups in Sumberjaya have developed initiatives to foster conservation of the protection forest by adopting coffee multi-strata practices under the agroforestry system and implementing the government program of community-based forestry management (HKm). The coffee-production activities take place in the buffer zone outside the BBS National Park, where small farmers are granted temporary tenure rights to utilize the protection forest in exchange for practicing coffee multi-strata with tree crops and timber in an agroforestry system mosaic. This mechanism could be seen as a significant potential to develop micro-institutions at farm level, which are compatible with sustainability standards and initiatives at the global level. Other dimensions of environmental service markets are a promising approach between poor coffee farmers who have been practicing coffee agroforestry as provider, and whoever the potential buyers of watershed services in

the coffee-producing regions are. The role of intermediaries in ensuring that sustainability principles are followed is very important in providing links between sellers (smallholder farmers) and buyers (roasters, research institutes, civil society organizations, or international agencies) of the services.

The remaining issues then include whether the value-added creations should be focused on small-scale producers and/or allowing local and small-scale processors to comply with post-harvest handling, better processing, and probably modern equipment. It should be noted that farm-level processing, though

desirable, also involves significant quality risk. Meanwhile, large-scale milling would probably be more manageable in terms of quality control and prevent further retention problems at the border. Furthermore, it is relatively simple for buyers to identify gross processing defects, such as immature harvesting, delayed pulping, or mold by a visual inspection of parchment coffee. However, since the demand for freshness is also very high among traders coming from outside the region, which also means green coffee trading, assurance of geographical origins of Lampung coffee could be employed.

REFERENCES

- Angelsen, A. 1995. Shifting Cultivation and Deforestation: A Study from Indonesia. *World Development* 23 (10): 1713-1729.
- Angelsen, A. 1999. Agricultural Expansion and Deforestation: Modeling the Impact of Population, Market Forces and Property Rights. *Journal of Development Economics* 58 (1): 185-218.
- Angelsen, A., E.F.K. Shitindi and J. Arrestad. 1999. Why Do Farmers Expand their Land into Forests?: Theories and Evidence from Tanzania. *Environment and Development Economics* 4 (3): 313-331.
- Arifin, B. 2005. Institutional Perspectives of Lifescapes Co-Management: Lessons Learned from RUPES Sites in Sumatra Indonesia. In *Carbon Forestry: Who will Benefit?* Edited by Daniel Murdiyarto and Hetty Herawati, 156-175. Bogor: Center for International Forestry Research (CIFOR)
- Arifin, B. 2006. Transaction Cost Analysis of Lowland-Upland Relations in Watershed Services: Lessons from Community-Based Forestry Management in Sumatra, Indonesia. *Quarterly Journal of International Agriculture* 45 (4): 361-375.
- Arifin, B., B. Swallow, Suyanto, and R. Coe. 2008. *A Conjoint Analysis of Farmer Preferences for Social Forestry Contracts in the Sumberjaya Watershed, Indonesia*. ICRAF Working Paper. Bogor: World Agroforestry Center (ICRAF).
- Common Code for the Coffee Community (4C). 2004. "Common Code for the Coffee Community". Accessed on December 20, 2007. <http://www.sustainable-coffee.net>
- Common Code for the Coffee Community (4C). 2006. "Summary Reports of the 4C Dissemination and Consultation Workshop, held in Bali, Indonesia, 22- 24 January 2006". Accessed on January 10, 2008 <http://www.sustainable-coffee.net>
- Ekadinata, A., D. Dewi, Prasetyo, and D.K. Nugroho. 2004. *Can Secure Tenure Help Reduce Deforestation?: Lessons Learnt from Sumberjaya Watershed, Lampung, Indonesia*. Bogor, Indonesia: World Agroforestry Centre.
- Fay, C. and G. Michon. 2005. Redressing Forestry Hegemony: When a Forestry Regulatory Framework is Best Replaced by an Agrarian One. *Forests, Trees and Livelihoods* 15 (2): 193-209.
- Budidarsono, Suseno, Susilo Adi Kuncoro and T.P. Tomich. 2000. *A Profitability Assessment of Robusta Coffee Systems in Sumberjaya Watershed, Lampung, Sumatra Indonesia*. ICRAF Working Paper. Bogor: World Agroforestry Centre.
- de Foresta H. and G. Michon. 1997. The Agroforestry Alternative to *Imperata* Grasslands: When Smallholder Agriculture and Forestry Reach Sustainability. *Agroforestry Systems* 36 (1-3): 105-120.
- Garrity, D.P., M. van Noordwijk, and T.P. Tomich. 1996. Buffer Zone Management and Agroforestry. Summary Report of a National Workshop. Bogor: International Centre for Research in Agroforestry (ICRAF).
- Geist, H.J. and E.F. Lambin. 2002. Proximate Causes and Underlying Driving Forces of Tropical Deforestation. *Bioscience* 52 (2): 143-150.
- Gereffi, G., J. Humprey and T. Sturgeon. 2005. The Governance of Global Value Chains. *Review of International Political Economy* 12 (1): 78-104.
- Gintings, A.N., M. Sirait, A. Sutanto, M. Yohanes, Mulyono, I. Tjitrajaya, Budiriyanto and Amrulah. 1999. Research Report on Coffee Cultivation in the National Parks and its Impacts on Forest Function in the Province of Lampung (Laporan Penelitian Budidaya Tanaman Kopi di dalam Kawasan Hutan dan Pengaruhnya terhadap Fungsi Hutan di Propinsi Daerah Tingkat I Lampung). Jakarta: Ministry of Forestry and Plantations.
- Giovannucci, D. and S. Ponte. 2005. Standards as New Form of Social Contract?: Sustainability Initiatives in the Coffee Industry. *Food Policy* 30 (3): 284-301.
- Graham, D. and N. Woods. 2006. Making Corporate Self-Regulation Effective in Developing Countries. *World Development* 34 (5): 868-883.

- Lewin, Bryan, D. Giovannucci, and P. Varangis. 2004. *Coffee Markets: New Paradigms in Global Supply and Demand*. Agriculture and Rural Development Discussion Paper 3. Washington, D.C.: The World Bank.
- Lumbanraja, J., T. Syam, H. Nishide, A.K. Mahi, M. Utomo, Sarno and M. Kimura. 1999. Deterioration of Soil Fertility from Land-Use Changes in South Sumatra, Indonesia (1970-1990). In *A Model for Land Use/Cover Change* edited by Masaru Kagatsume and Teitaro Kitamura, 163-174. Tokyo: The Luke Project.
- McStocker, R. 1987. The Indonesian Coffee Industry. *Bulletin of Indonesian Economic Studies* 23 (1): 40-69.
- Muradian, R. and W. Pelupessy. 2005. Governing the Coffee Chain: The Role of Voluntary Regulatory Systems. *World Development* 33 (12): 2029-2044.
- Murniati, D., P. Garrity and A.N. Gintings. 2001. The Contribution of Agroforestry Systems to Reducing Farmers' Dependence on the Resources of Adjacent National Parks: A case study from Sumatra, Indonesia. *Agroforestry Systems* 52 (3): 171-184.
- Neilson, Jeff. 2008. Global Private Regulation and Value-Chain Restructuring in Indonesian Smallholder Coffee Systems. *World Development* 36 (9): 1607-1622.
- Neilson, J. and B. Pritchard. 2007. Green Coffee: The Contradictions of Global Sustainability Initiatives from the Indian Perspective. *Development Policy Review* 25 (3): 311-331.
- Pagiola, S., J. Bishop, and N. Landell-Mills (Eds). 2002. *Selling Forest Environmental Services: Market-Based Mechanisms for Conservation and Development*. London: Earthscan.
- Ponte, S. 2002. The 'Latte Revolution'? Regulation, Markets and Consumption in the Global Coffee Chain. *World Development* 30 (7): 1099-1122.
- Ponte, S. 2004. *Standards and Sustainability in the Coffee Sector: A Global Value Chain Approach*. Winnipeg: International Institute for Sustainable Development.
- Reynolds, L., D. Murray and A. Heller. 2006. Regulating Sustainability in the Coffee Sector: A Comparative Analysis of Third-Party Environmental and Social Certification Initiatives. *Agriculture and Human Values* 24 (2): 147-163.
- Susila, W. 2006. Targeted Investigation of Robusta Coffee Processing and Marketing Chain in Lampung. Final Report on Enhancement of Coffee Quality through Prevention of Mould Formation. Jakarta: Food and Agricultural Organization (FAO) of the United Nations.
- Suyanto S. and K. Otsuka. 2001. From Deforestation to Development of Agroforests in Customary Land Tenure Areas of Sumatra. *Asian Economic Journal* 15 (1): 1-17.
- Suyanto, S., R. Permana, N. Khususiyah and L. Joshi. 2005. Land Tenure, Agroforestry Adoption, and Reduction of Fire Hazard in a Forest Zone: A Case Study from Lampung, Sumatra, Indonesia. *Agroforestry Systems* 65 (1): 1-11.
- Suyanto, S., N. Khususiyah, and B. Leimona. 2007. Poverty and Environmental Services: Case Study in Way Besay Watershed, Lampung Province, Indonesia. *Ecology and Society* 12 (2): 13 [online] URL: <http://www.ecologyandsociety.org/vol12/iss2/art13/>
- Utz Kapeh Foundation. 2006. "Utz Kapeh Certification Protocol, Version 2006". Accessed on January 7, 2008. <http://www.utzcertified.org>.
- Utz Kapeh Foundation. 2007. "Utz Kapeh. Good Inside: Specialty Coffee, Version 2007 ". Accessed on January 7, 2008. <http://www.utzcertified.org>
- Van Noordwijk, M., L. Beria, L. Emerton, T. Tomich, S. Velarde, M. Kallesoe, M. Sekher and B. Swallow. 2007. *Criteria and Indicators for Environmental Service Compensation and Reward Mechanisms: Realistic, Voluntary, Conditional and Pro-Poor*. ICRAF Working Paper No. 37. Nairobi, Kenya: World Agroforestry Centre.
- Verbist, B., A.E.D. Putra, and S. Budidarsono. 2005. Factors Driving Land Use Change: Effects on Watershed Functions in a Coffee Agroforestry System in Lampung, Sumatra. *Agricultural Systems* 85 (3): 254-270.

- Widianto, N. H., D. Suprayogo, R.H. Widodo, P. Purnomosidhi, and D. van Noordwijk M. 2002. "Forest Conversion to Agricultural Land: Could the Hydrological Function of Forests Be Replaced by Coffee Agroforestry System? (Konversi Hutan Menjadi Lahan Pertanian: Apakah fungsi hidrologis hutan dapat digantikan agroforestri berbasis kopi?) (Available in Bahasa Indonesia). Paper presented at the Annual Seminar of the Indonesian Soil Science Association (HITI) in Mataram, Indonesia, May 27-28.
- World Wildlife Fund for Nature (WWF). 2007. *Gone in Instant: How the Trade in Legally Grown Coffee is Driving the Destruction of Rhino, Tiger and Elephant Habitat in Bukit Barisan Selatan National Park, Sumatra, Indonesia*. Jakarta: WWF-Indonesia Programme.
- Wunder, S. 2005. *Payments for Environmental Services: Some Nuts and Bolts*. Occasional Paper No. 42. Bogor: Center for International Forestry Research (CIFOR).
- Wunder, S. 2007. Efficiency in Payment for Environmental Services in Tropical Conservation. *Conservation Biology* 21 (1): 48-58.