

On the Competitiveness and Sustainability of the Indonesian Agricultural Export Commodities

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[Submitted June 2013, Accepted September 2013]

Abstract. *The study examines the competitiveness and sustainability of key agricultural commodities in Indonesia, namely: coffee, cocoa, tea, cashew and mango. The study recommends policy options to improve the performance of these value chains in the future, both in terms of the competitiveness and sustainability. The study applies the revealed comparative advantage (RCA), complemented by in-depth interviews and discussions with competent resource persons and development partners. Because the stages of competitiveness and sustainability differ by commodities, the arguments presented in each commodity consist of at least two main entries: (i) strengthening competitiveness and sustainability of the commodities, covering the inclusiveness of smallholder farmers and small scale processors of respected commodities and (ii) limiting the impacts of commodity development on natural resources. Best practices of integrated commodity development and natural resource conservations implemented in Indonesia are also explored and examined more carefully in this paper. Among others, strategies for coffee is improving the mechanisms of certification schemes; for cocoa is expanding the SE (somatic embryogenesis) seedling and sustainability-based certification, for rubber is combining clonal-based development and forest protection, for cashew is introducing certification of origin and land rehabilitation, and finally for mango is promoting integrated horticulture development in upland areas.*

Keywords: *Competitiveness, sustainability, export commodities, policy strategies*

JEL Code: *Q01, Q17, Q18, Q38*

Introduction

The roles of agriculture in the Indonesian economy remain important even though the structural transformation process does not occur smoothly as outlined in the textbook of economic development. The share of agriculture in the country's Gross Domestic Products (GDP) has been declining to 15.7 percent in 2011, but the share of agricultural labor in the total labor force in 2011 was 42.5 percent. The slow declining rate in labor share is an indication of incomplete structural transformation in the Indonesian economy, including the slow absorption process in the industry and service sector. The Indonesian agricultural export commodities have high potentials to achieve a higher level of competitiveness and improve the sustainability for the future, despite several problems and issues of each individual commodity.

Limited efforts of value addition in the agricultural products and slow diversification in agricultural export base are among contributing factors of such imbalanced structural transformation. The strong primary export base and favorable production system of major agricultural commodity exports have not been utilizing in their full capacity, which might be at risk for the future of the Indonesian economy at large. There are also issues with the sustainability of this development, from an economic as well as social and environmental perspective, mostly because of the

differences in the degree of policy response and incentive system to major agricultural export commodities.

The performance of major agricultural commodities in the last decade has been quite good, showing increasing trend of production, except coffee and natural rubber in 2009. A decline in rubber production in 2009 is due to “adjustment process” in the world market after a record high price of oil and gas during the world economic crisis in 2008. The demand for synthetic rubber was back to normal in 2009, so that the price of rubber dropped significantly to record low of US\$ 1.61/kg. This low price level of rubber, couple with pressure to convert rubber trees to oil palm, contribute significantly to the decline in rubber production in 2009.

After the international price rebound to over US\$ 3 in 2010 and above US\$ 4/kg in 2011, the production of natural rubber increased steadily. Similarly, a sudden decline in coffee production in 2009 is also associated with the global crisis and price signals received by coffee farmers in producing countries. However, increasing world price of these commodities since 2010 has been responded by production increase since then. The strong world demand of coffee and increasing price that reached US\$ 2.25/kg for Robusta and US\$ 4.95/kg for Arabica coffee shall provide significant incentives for farmers to increase coffee production and productivity. Similarly, increasing price trend of natural rubber of US\$ 4/kg and a rebound of cocoa price of US\$ 2.36/kg, after a significant decline in 2011, would increase the production of agricultural export commodities this year. The price of rubber reaches US\$ 4.32/kg in the early 2012, a significant decline compared to the average US\$ 4.82/kg in 2011.

The Indonesian agricultural export commodities, however, remains facing various challenges, most of them are very structural in nature, such as low-yielding smallholder crop systems, sustainability pressures, low-quality of production, underinvestment, inadequate infrastructure, underdeveloped agricultural practices and restrictive government policies. The master-plan to accelerate and expand the Indonesia economy (MP3EI) proposed by the current administration of government is trying to overcome the above challenges. If the master plan is implementing as it should be, the domestic demand for coffee, cocoa, rubber, cashew nuts and mango will increase significantly in the near future. The roles of domestic demand for affordable food and agricultural products from the middle and lower income segments as well from the manufacturing sectors in the country might compete directly with the efforts of promoting exports of these agricultural products. In a fair setting of economic environment, the competitiveness of these products will increase significantly, hence the future of Indonesian agriculture at large.

In terms of improving the competitiveness and sustainability, the factor of world commodity price is only a factor that contributes to the production performance. High commodity prices are inadequate to encourage smallholders to invest in farms, especially in the estate crops where economic return periods are long. Investments in agriculture are required for management practices, land and technology development in order to produce better yields and replenish old plantations. The issues become more complicated because the majority of actors in these agricultural commodity markets are smallholders, with their own characteristics. Smallholders are sometime more concerned with farm-gate prices and immediate economic returns, instead of long focus to increase investment for better production in the future. For example, the export taxes to increase value addition in the country imposed on specific commodities such as cocoa (and palm oil) might not be viewed as profitable for farmers, because export taxes usually reduce farm-gate prices directly received by the farmers. This intervention could lower crop input application, hurting future production growth in such commodities at large.

Moreover, the sustainability issues imposed by the developed countries to the Indonesian agricultural export commodities might threaten the competitiveness of specific crops. For example, palm oil development has been accused as one of the main contributor to the green house gases and world carbon emission. Expansion of harvested area of palm oil is argued to occur at the expense of natural forest and peat-land area of conservations, particularly in Sumatra and Kalimantan. Also, coffee bean in Lampung is accused to contribute to deforestation, biodiversity damage and lost habitats of Sumatran tigers and elephant because some coffee farming practices take place inside the National Forest and conservation area of Sumatra. In this case, active coffee buyers in developed world are encouraged no to buy and receive Robusta coffee from Lampung or from other places with poor traceability, lack of certificate of origin, and unclear sources of the coffee beans.

The perspective of sustainability has somehow changed the structures and performance of supply chain of major agricultural export commodities in Indonesia. Therefore, the studies that identify and assess the competitiveness and sustainability of key agricultural export commodities are extremely important as the world market and domestic interests of these commodities have changed quite fast and more intensively in the last decade. Such studies will lead to the policy changes and action strategies to improve competitiveness and sustainability of important agricultural export commodities in Indonesia.

The objectives of this study are to examine the competitiveness of key agricultural commodities. The study is also aimed at recommending a series of policy options to improve the performance of these value chains in the future, both in terms of the competitiveness and sustainability. After this introduction, Section 2 presents the overview of agricultural export commodities, but excluding CPO, as this commodity needs specific treatments to improve the competitiveness and sustainability. Section 3 presents briefly approach and methods of the study. Section 4 presents the findings and discussion of the study, presented in order of export commodities of coffee, cocoa, tea, rubber, cashew and mango. Section 5 is concluding remarks, outlining strategies to improve competitiveness and sustainability for each specific crop.

Overview of the Competitiveness of Agricultural Export Commodities

The Indonesian agricultural export commodities have different stages in competitiveness and sustainability. The level of competitiveness of crude palm oil (CPO) is the highest among all agricultural export, which is a logical consequence of the fast growing performance of production and export and the first position in the world. The CPO production in 2011 was about 24 million ton, growing at 5.1 percent per year, which is far away ahead of that of Malaysia of less than 20 million ton. However, the productivity gap between smallholders and large-scale plantations, induced land-conflicts in the fields and accusation of carbon emitter and declining natural forests have contributed to the sustainability challenges of the CPO industry in Indonesia. Some major palm oil businesses in Indonesia have been a member, Roundtable Sustainable Palm Oil (RSPO), a major certifying body of palm oil trade system. Interestingly, the Indonesian Palm Oil Association (IPOA or locally known as GAPKI) has withdrawn its membership in RSPO, but become co-promoter with the Indonesian Government of new and mandatory certification system of Indonesia Sustainable Palm Oil (ISPO).

Other agricultural export commodities are not as advanced as palm oil in terms of both competitiveness and sustainability principles. Coffee ranks the second in terms of export earnings from agriculture, but the growing coffee consumption and changing lifestyles among urban communities will shape different stages of competitiveness and

sustainability. Major buyers and actors of the world coffee supply chains have been aggressively promoting some new conducts of corporate environmental governance in the coffee industry. The rising concerns on the sustainability standards emerge very rapidly in the last two decades, probably because of the dynamics of private sectors and multinational corporations. Certification and labeling systems are also expanding rapidly in the global food sector as the environmental and social standards in the coffee economy have serious and long-term implications for the sustainability of natural ecosystems in the tropics and the livelihood of coffee producers who are mostly small-holder farmers. Supply chain verification schemes currently operating in Indonesian coffee trade include 'Organic', 'Fairtrade', 'Rainforest Alliance', 'Utz Kapeh', and 'Starbucks CAFÉ Practices', all of which attempt to address environmental (and social) concerns at sites of production through market signals sent by buyers along the supply chain. The latest certifying partnerships introduced to the Indonesian coffee sector is the 4C (Common Code for the Coffee Community), which intends to foster sustainability in the 'mainstream' green coffee chain and to increase the quantities of coffee meeting basic sustainability criteria of economics, environment, and social. Nevertheless, these global partnerships in the coffee sector are sometimes viewed as a competition among coffee partnership buyers in the North to ensure the sustained coffee supply from the producing countries in the South.

The Indonesian cocoa sector has been in the stages of revitalizing process to restore its major roles in export earnings for the small-scale cocoa farmers such as in the late 1990s. The National Movement (Gernas) to increase cocoa production, initiated in Sulawesi in 2009, by developing tissue culture for cocoa seedling, increasing the farmers' capacity building, improving agricultural practices in the field, and increasing the cocoa bean quality might provide better avenues to improve the competitiveness of the cocoa industry in the future. Sooner or later, the global certification partnerships cocoa will extend their operation in Indonesia as the market demand on cocoa would require higher sustainability standards and other requirements of global environmental governance. However, when the current administration of Indonesian government imposes export tax on cocoa to develop downstream processing industries domestically, the net outcome to improve the competitiveness might not be as good as the initial intention, mostly because of limited efforts to improve the marketing structures and domestic supply chains of cocoa markets.

The competitiveness of rubber economy has not developed as commonly required for the major source export earning and farmers' livelihood in Indonesia. Although it has been known by the academics and policy makers alike, the Indonesian rubber exports are dominated by primary products of latex and slab, taped directly from the rubber tree. These primary products suffer from the facts of low quality, sometimes mixed with sands and debris of woods, causing in the economic returns by rubber farmers are quite small. Domestically, the harvested area of rubber has been under pressure, partially due to land competition with fast-growing and more profitable crops such as palm oil. The Government has been trying to solve these quantity and quality problems of rubber production by providing subsidized credit for rubber replanting since 2007 and enforcing a quality control on rubber products since early 2000. However, after more than a decade of implementation, the product quality efforts are partially responded by farmers who have grown clonal rubber seedling, not by the majority of rubber farmers who have been dependent on traditional seedling. Efforts to increase the added value have not been quite successful as the development of rubber downstream industries have been hindered by the investment climate and business environment in general. These are also associated with the government policy strategies to promote investment in such prospective sectors and to contribute to the

industrial development in general. The rubber-based industrial development is obviously related to many segments of economic policy, including the technological advancement, information system and financial institutions and legal issues and enforcement structures in general.

The following Table 1 presents competitiveness level of Indonesia's agricultural export commodities, by calculating the revealed comparative advantage (RCA) of each commodity. RCA is a comparison between ratio of commodity export of a specific commodity in Indonesia to the total export of Indonesia **and** the ratio of commodity export of a specific in the world to the total export of the world. The higher the RCA value, the higher the competitiveness of such a particular commodity. Table 1 clearly shows that natural rubber has RCA value 36.6, far higher than the RCA of cocoa, cashew, coffee, tea, and let alone mango. As a comparison, the RCA of crude palm oil (CPO) is well above 40 (not shown in the table), implying that CPO has the most competitive agricultural export commodity in Indonesia. Conversely, the RCA of mango in 2009 was 0.12, indicating that competitiveness level of mango is also very small. Indonesia is not a big player of mango market in the world, even at Asia's level.

Table 1 Revealed Comparative Advantage (RCA) of Major Agricultural Export Commodities in Indonesia, 2000-2009

Year	Coffee (Green)	Cocoa (Bean)	Tea	Rubber (Natural Dry)	Cashew (with shell)	Mango*
2000	3.80	10.84	7.43	26.81	7.98	0.11
2001	3.66	11.98	7.48	30.05	11.43	0.08
2002	4.85	14.83	7.14	31.03	13.99	0.77
2003	5.29	11.30	6.93	31.92	19.69	0.10
2004	5.17	10.95	7.88	37.83	19.73	0.46
2005	6.20	12.84	7.21	39.00	18.53	0.19
2006	6.05	15.55	6.94	42.03	15.39	0.18
2007	5.53	14.86	5.79	37.94	21.75	0.13
2008	7.29	16.70	6.21	46.93	10.79	0.20
2009	6.05	14.00	5.43	36.61	11.59	0.12

* = Mangoes, mangosteens, and guava

RCA is calculated using the following formula:

$(\text{Export Commodity } i \text{ Indonesia} / \text{Total Export Indonesia}) / (\text{Export Commodity } i \text{ World} / \text{Total Export World})$

Source: FAOSTAT, 2012 (www.fao.org)

The Indonesian experience in commercial cashew and its important in generating export earnings are quite new, although the crops have been grown for over hundred years. Cashew was initially developed as conservation trees, in conjunction of reforestation and rehabilitation of critical land, especially in dry upland areas in Eastern Indonesia. More than 60 percent of cashew production is exported to the world market, generating about US\$ 60 million. The cashew export tends to decrease steadily in recent years, more probably because the domestic market has also developed more significantly. In the world market of cashew, Indonesia is small player, supplying about 8 percent of the world in-shell cashew trade. The export volume and value has been increasing in the last decade, one of the sign of improving competitiveness in the cashew industry. Domestically, the cashew economy

contributes significantly to the rural economy of poor soil and dry areas, which are very potential as important tool to alleviate rural poverty. However, there is only limited shelling of cashews within Indonesia, implying ample opportunities to increase the added value of cashew that could generate additional income in rural areas. About 40 percent of the world cashew crop is shelled outside the country of origin. India and Vietnam are the major importers of in-shell cashew and use the imports to run their shelling plants throughout the year. If Indonesia could perform such simple post-harvest activities, together with sorting and grading, the competitiveness of cashew industry could increase to the next level.

The competitiveness of mango industry in Indonesia is quite low, mostly because mango production fluctuates depending on the seasonal patterns of production. Domestic demand for mango has increased significantly as many societal efforts to promote local fruits in recent years. In July 2011, some community and stakeholders of horticulture, pioneered by the Alumni of Bogor Agriculture University have declared that Friday as the “Day of Local Food” where the fellow citizens are encouraged to consume domestic fruits only. This declaration also endorsed by the Government which also encourages government officials to consume local food, including mango, at least every Friday. This movement somehow would increase the demand for local food, which may serve as incentive systems to improve the mango production – and other horticultural products. The uniqueness of horticultural products include that fresh fruits are more preferred than the processed foods, either extracted, dried, and fermented. Thus, efforts in upstream development, at farm level, are more relevant to improve the competitiveness of mango, rather than downstream development at manufacturing level. Nevertheless, value-adding activities at post-harvest level are necessary to prevent the decrease in economic value due to perishable nature of horticultural products as well as to anticipate a significant increase in mango production.

Approach and Methods of the Study

The approach and methods to conduct this study use the combination of desk study, data analysis, and in-depth interviews and discussions with development partners and resource persons competent to achieve the objectives of the study. First, basic data on socio-economic and relevant information on five commodities: coffee, cocoa, tea, rubber, cashew, and mango are collected and analyzed. Economic analysis and literature review on such commodities are also conducted to obtain a big picture and more specific focus of attention on particular details of the commodities. The study then examines the past and current policy strategies, project and initiatives on five strategic export commodities, particularly what has worked, what has not worked and what are the recommended approaches to solve the issues.

In-depth interviews, formal and informal discussions are conducted with key development partners, private sectors, associations of producers, processors, traders, and academics engaged in such commodities. This approach will cumulatively assess and build the current available knowledge on the issues of competitiveness and sustainability issues in coffee, cocoa, rubber, and mango. Further analysis and more advanced synthesis are conducted on the collected data and information, interview notes and previous studies available regarding the direction and policy changes to strengthen the competitiveness and sustainability of such export commodities. This study will suggest possible areas for future research and further analytical works as well as respected potential policy recommendations to improve development outcomes.

Findings on Competitiveness and Sustainability

The findings revealed from this study include that the Indonesian agricultural export commodities have different stages in competitiveness and sustainability and respected dynamic issues and problems surrounding each commodity. These key agricultural products are unique, where the production characteristics, supply chains and competitiveness issues are very specific, different from one crop to another, although there are some similarities in terms of general challenge on increasing production and productivity and facing sustainability criteria, global partnerships, certification standards, and other principles of global corporate governance. Structural problems in the upstream sectors remain central for all crops, the share of smallholders are very dominant with their respected issues of low yield, poor access to good agricultural practices, cropping techniques and modern technology. In the midstream sectors, the processing practices of these crops are very simple and traditional.

The supply chains and marketing systems are generally not efficient where the economic benefits are not received by farmers and small-scale actors who have contributed the most in the overall value chains. In the downstream sectors, these crops are really in the middle of transition whether to continue boosting the export markets with growing sophistication in terms of consumer preferences or to develop domestic markets, performing processing, manufacturing and other added value activities for domestic industrialization. These crops have similar challenges to comply with sustainability principles, either driven by national policies to apply recent spatial planning and conserve the environment or promoted by the international communities and growing significance of non-state regulation and corporate environmental governance.

Table 2 summarizes the main findings of the study on the competitiveness and sustainability of major agricultural export commodity in Indonesia.

Explanation about the competitiveness of each commodity is summarized as follows:

Coffee - Growing Concerns on Certification.

Indonesia is the fourth largest coffee producer, after Brazil, Vietnam, and Columbia, but the second largest Robusta coffee producer after Vietnam. Coffee production in 2010 was estimated to about 685 thousand tons, a significant decline from that in 2009, because of long rainy seasons in the country. The Indonesian coffee production is mostly shipped for the global market to generate export earnings of US\$ 1.16 million. Coffee prices in the world market have increased significantly in 2007 because of limited amount being traded and other factors contributing to the price surge of food and agricultural products. The total area of coffee farms in the Indonesia was estimated about 1.3 million hectares, spread from the most western Province of Aceh in the island of Sumatra, Java, Sulawesi, Bali and Nusa Tenggara, and the eastern island of Papua. Provinces of Lampung, South Sumatra, East Java, are producers of Robusta coffee, while the highlands of Aceh, North Sumatra, South Sulawesi, and Bali are suitable for Arabica coffee.

About 85 percent of coffee production in Indonesia is Robusta, which is mostly coming from the production centers in Lampung Province; while the remaining 15 percent is Arabica Coffee, produced in highland area of Aceh, North Sumatra, Toraja in South Sulawesi, Kintamani Highland of Bali and Bajawa regions of Flores islands. With the exception of a number of large government-owned estates (PTPNs) in East Java, coffee is predominately grown by smallholder farmers. The average coffee farmer cultivates the plot of ranging from 0.5 to 2 hectares, in an isolated region with poor access to social services, and with an income that causes them to oscillate either side of

the poverty line (depending on conditions in world commodity markets). Coffee farming performs an important social security function across Indonesia by injecting cash into many otherwise impoverished rural areas with few other employment options.

The current policy on coffee industry development is to improve the coffee quality, both for export market and domestic consumption, and to promote the downstream coffee industries and encourage coffee industry clusters. At the upstream coffee farming, application of good agricultural practices, sustainable coffee production by growing shade trees, encouraging organic fertilizer, and chemical fertilizer only when necessary, and promoting agro-forestry for the plantation inside the protection forest and around the forest margin. At the downstream, domestic processing is also promoted as currently the industry is made up of many small players, with four established brands taking up about 46 percent of market share. The local coffee industry is trying to strengthen the domestic market by conducting intensive promotional campaigns and promoting the health benefits of drinking coffee. Availability of coffee is expected to improve due to rapid expansion of modern retailers and manufacturers' attempts to improve distribution through foodservice (Kumar, 2011)

Certification schemes in the coffee sector have emerged in conjunction with growing concerns of environmental governance since the early 1990s and developed more rapidly in this century. Sustainability perspective and long-term consequences of coffee practices on natural ecosystem and social-economic dimensions of the livelihood have been discussed more widely by academic, government, private sectors and civil society or non-governmental organizations (NGOs). As the new development paradigms tend to seek alternatives for distortion effects of direct state intervention in commodity supply chain, in one extreme, these governance 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.

Cocoa - Revitalizing the Industry

Indonesia is the third largest producer of cocoa in the world after Cote d'Ivoire and Ghana. The production of cocoa in 2010 was about 844 thousand tons, just reviving the trend after the cocoa price increase since 2009. Indonesia has targeted to achieve the production over 1 million ton of cocoa in 2014, especially after the launching of the national movement to revitalize cocoa farming in 2009. About 60 percent of cocoa farms are located in Sulawesi, but recently cocoa farms are expanding rapidly in Sumatra, mostly because of increasing cocoa price in the world market. Cocoa exports are currently valued at over US\$ 1 billion per year and provide the main source of income and livelihood for over a half million farmers and their families.

Cocoa production centers are in Sulawesi and Sumatra, mostly for markets in Europe and the United States of America (USA). The majority (95%) is smallholders, average land-holding size 1.5 ha, which is quite small for Outside Java standard, using local varieties. Cocoa farmers in Indonesia suffer from problems related to cocoa pests and diseases, decreasing farm productivity and contributing to poor quality cocoa beans. In additions, inappropriate farm management practices, poor tree and soil management and lack of quality related market signals in the supply chain are among other factors affecting the competitiveness of Indonesian cocoa industry.

Table 2 Summary of Competitiveness and Sustainability of Major Agricultural Export Commodities in Indonesia

Elements of Sustainability and Competitiveness	Coffee	Cocoa	Tea	Rubber	Cashew	Mango
Position in the world market	The Fourth after Brazil, Columbia and Vietnam	The Third after Cote d'Ivoire and Tanzania	The Seventh , contribute only 4 percent to the world market	The Second , after Thailand	Very Small , contribute only 8 percent to the world market	Very Small , in Asia far behind Philippines and Thailand
Level of competitiveness (RCA 2009 of agro-export)	Medium , RCA= 6.05	High , RCA= 14.00	Medium , RCA= 5.43	Very High , RCA= 36.61	High , RCA= 11.59	Very Small , RCA= 0.13
Major producing provinces	South Sumatra, Lampung, North Sumatra, East Java, Aceh, South Sulawesi	Cent. Sulawesi, South Sulawesi, S.E. Sulawesi, West Sulawesi, North Sumatra, West Sumatra	West Java, North Sumatra, Central Java, West Sumatra, East Java, Jambi	South Sumatra, North Sumatra, Riau, Jambi, WestKalimantan, CentKalimantan	E.Nusa Tenggara, S.E. Sulawesi, South Sulawesi, East Java, Central Java, Cent. Sulawesi	East Java, West Java, Central Java, South Sulawesi, W.Nusa Tenggara, E.Nusa Tenggara
Environmental governance of the world supply chain.	Most advanced Especially after 2004 Tsunami	Pilot projects Growing since the 2008 crisis	Pilot projects Attached with CSR strategies	Not specific , Agroforestry system adopted	Not specific , but initially for conservation	No major issues as tree crops are environment friendly
Sustainability certification currently implemented	Starbucks CAFE Utz Certified R.F. Alliance Fair Trade Organic 4C (on-going)	R.F. Alliance Utz Certified Organic	Utz Certified ETP Ethical-Tea Partnership	None	None	None
Current government policy to promote sustainability and competitiveness	Agroforestry, CBMF (HKm), Social forestry SE seedling, Processing Unit	Agroforestry, CBMF (HKm), GERNAS, SE seedling, Processing Unit	Agroforestry, GPATN,	Agroforestry, GNRHL, Social-forestry Envir-services Credit subsidy	SME Processing Unit, Gender program	KFK (Special Economic Area), KII (Industry Innovation Area)

Source: Synthesized by the auth

The Indonesian economic policy on cocoa industry is at the cross-roads between promoting export as an immediate effort to increase the foreign earnings and increasing the added value domestically by industrial deepening and downstream development. Most of the cocoa produced in Indonesia is exported, as the domestic market for cocoa beans is small due to a relatively underdeveloped cocoa processing industry. The issues of fermented cocoa vs. non-fermented cocoa are actually more complex than simply about the dimension of cocoa quality and farmers' unwillingness to do the fermentation. This relates to several dimensions such as the case of asymmetric information, competition among local traders to attract and to control the farmers to be dependent on specific marketing channels, disguised incentives to generate economic benefits from the quality differences, etc. Consequently, the farm-gate price of cocoa in most production centers in Indonesia is very low, leaving the farmers do not enjoy the decent economic returns from cocoa farming.

The government and Indonesian Cocoa Council (Dekaindo) is promoting domestic consumption of cocoa products. Domestic annual per capita consumption of cocoa is 0.2 kilogram per capita per year, far lower than the cocoa consumption in Europe of 10 kilograms per capita. Consumption of chocolate confectionary in countries such as China, India and Korea has grown at 20 percent per year on average, offering Indonesia an opportunity to tap into a growing market. Domestic consumption is argued to serve as main stimulant and incentive system to increased production in cocoa bean and cocoa butter. It is expected that the chocolate confectionary segment will grow above 3 percent per year in the next five years.

Tea - Removing Structural Problems

Indonesia is a small player of the world tea economy, contributing only 4 percent of the world production of tea, and producing only 150 thousand ton in 2010. Indonesia ranks number 7 in tea producing countries, far lower behind China (producing about 1.56 million ton), India (978 thousand ton), Kenya (514 thousand ton), Sri Lanka (290 thousand ton), Vietnam (250 thousand ton), and Turkey (200 thousand ton). This rank is a decline from the fifth rank in 2005, mostly due to the decline in tea production. In general, the declining of Indonesia's tea production about 1 percent per year in the last ten years is mostly due to declining harvested area of 1.9 percent per year. Harvested area of tea plantation has declined from 153 thousand hectares in 2000 to only 124 thousand hectares in 2010 (Table 10). Low farm-gate price and high demand for agricultural land and other uses have contributed to the structural problems of the tea economy in the last decade.

These structural problems provide a serious threat for 320 thousand workers involved in the tea industry, where about 1.3 million people dependent on the tea economy are really in critical livelihood condition. Should there be no policy actions in the years to come the amount of US\$ 110 million of annual contribution of foreign earnings of tea would disappear in a relatively short time. Similarly, the contribution of Rp 1.2 trillion of the tea economy to the Indonesia's Gross Domestic Product (GDP) would vanish, unless there are serious and systematic strategies to revitalize the tea economy, from upstream to downstream businesses. Under a relatively constant productivity, increasing the cost of tea production, economic revenue of tea farming and processing seem not in a high potential to boost the local economic development, let alone contributing to poverty alleviation in rural areas.

Different from coffee and cocoa, the share of smallholder farmers in tea plantation is only 44 percent, while the majority (56 percent) of tea farming is controlled by large-scale plantation. The share of state-owned enterprises (SOEs) in tea plantation is 31 percent of the total harvested area, while the share of private large scale plantation is

25 percent. Table 11 shows that all of these types of plantation are experiencing a pressure of land conversion, where the rate of decline in smallholder tea plantation is the highest (3.6% per year), followed by private large-scale plantation (1.6% per year) and state-owned enterprises (0.9% per year). The declines are due to conversion to mostly non-agricultural uses, infrastructures, housing and industrial real-estates, and other agricultural crops and land use system. Economic revenues of agro-ecotourism from tea plantation are also in a threat as the best land of tea plantation and located in a strategic area is usually taken first and converted to other uses. Palm oil, natural rubber, coffee and cocoa are among crops that substitutes for the tea plantation, mostly because the price level and stability of as well as expected economic returns from these crops are generally more favorable compared to those of tea. Incentive systems to implement the policies of replanting and new investment in tea plantation are really low, causing some uncertainties in the future of the Indonesian tea economy.

The development of downstream industry and tea processing sector in Indonesia has been quite slow partly due to poor investment incentives, value-added tax of 10 percent for any processing activities, lack of consistent governmental support. The VAT 10% discouraged the proper development of the downstream sector, to the effect that producers opted more for exporting bulk tea rather than processed/packaged tea. Although the VAT of 10 percent was revoked in January 2007, the distorted effects remain, because the Provincial Tax Offices have not issued the implementation guidance of the policy. Global economic crisis since 2008 has also contributed to the declining performance of Indonesian tea export. The average world price of tea declined from US\$ 2.92 per kilogram in 2011 to US\$ 2.69 per kilogram in 2012, although the price shows an increasing trend since March 2012. Factors affecting the performance of Indonesian tea export include the existing demand and supply of tea at the global market, the quality of tea products, trade barriers in the destination countries (Suprihatini, 2005; Kustanti and Widiyanti, 2007).

Rubber - Wave of Agroforestry

Indonesia is the second largest natural rubber producer behind Thailand, but ahead of Malaysia since the last decades. In 2010, the rubber production of Indonesian was over 2.6 million ton or about one million ton lower than the rubber production in Thailand. The growth of natural rubber production in Indonesia is about 6.2 percent per year, a slightly behind the rate of Malaysia, but higher than that of Thailand. The production estimate is not only because the growing demand of world market, hence the high rubber price in the last three years, but also because of growing attention on high yielding clonal rubber and positive externalities brought about by agroforestry system in natural rubber production.

The performance of rubber production in Indonesia is very much dependent on harvested area, which experienced an increase from 3.3 million hectare in 2003 to estimated 3.4 hectare in 2004. In 2003, about 90 percent of 1.8 million ton of rubber production is exported, generating foreign reserves US\$ 1.7 million. The production and export figures are expected to increase in 2004 and the following year 2005. Unless some changes in policy strategy to rejuvenate the old rubber trees and sharpening the area targeted for the intensive rubber production system, Indonesia could not fulfill the fast growing world demand of natural rubber and other rubber-based products.

Moreover, the quality of raw rubber materials from Indonesia is generally not as good as the natural rubber from Thailand and Malaysia. There are no incentive systems and quality controls for smallholder growers to produce good quality rubber. Rubber buyers such as traders and processing factories do not treat significant price

differences between good and bad quality rubber from rubber growers or share-tappers. These farmers often mix bark and other debris along with the latex to increase the weight of rubber slabs. After harvest, the rubber slabs are soaked in the water for many days, especially during dry season between May and September each year.

Similarly, there are growing concerns among the rubber community to develop domestic markets. Indonesia is really in needs to encourage downstream industry investment, deepening industrial strategy, and improving the rubber-product quality. The downstream industry development could face a very serious problem because the incentive systems and quality controls for smallholder growers to produce good quality rubber are very weak. The majority (about 84 percent) of rubber producers in Indonesia is small-holder growers and concentrated mostly (more than 72 percent) in five production centers: North Sumatra, Jambi, Riau, South Sumatra and West Kalimantan.

However, the concerns to develop downstream rubber-based agro-industry are not only about how to establish the mutual linkages between upstream production system and downstream industry, the location preferences of improving added value of the industry, but also related to how to promote investment in such prospective sectors and to contribute to the industrial development in general. The rubber-based industrial development is obviously related to many segments of economic policy, including the technological advancement, information system and financial institutions and legal issues and enforcement structures in general. Therefore, the development of domestic rubber industry needs more strategic approach and policy to better support a high quality of economic recovery in the country.

Cashew - From Conservation to Income Sources

Indonesia is a small player of the world cashew economy, contributing only 8 percent of the world export of over 1.6 million ton per year. Production of cashew has grown steadily in the last decade, expecting some increasing roles in the world market in the near future. In 2010, cashew production in Indonesia was over 145 thousand ton per year, a bit increase after a significant decline in 2009 due to a quite long-wet whether condition (Table 18). More than 70 percent of cashew production is exported to the world market, generating about US\$ 82 million. The export volume and value has been increasing in the last decade, one of the sign of improving competitiveness in the cashew industry.

Cashew was initially developed as conservation trees in the 1980s, when Indonesia experienced a high rate of deforestation leading to increasing area of critical land, especially in Eastern Indonesia. Production of cashew in the provinces of East Java, Central Java and other provinces also comes from the dry part of the regions, such as in Madura Island in East Java, northern part of coastal area of Central Java, northern part of Bali, etc. Cashew is also growing importance in the province of West Nusa Tenggara, especially in the island of Sumbawa, the dry part of the province. Since the mid 1990s, the government and private sectors has made some efforts to add value the cashew production by providing a simple tool of cashew-shelling in the rural areas. These efforts contribute not only to added value to the commodity but also to provide employment opportunities for the rural woman in the shelling units or processing centers, and/or rural cooperatives that handle the cashew business. The private sectors in the cashew business have the benefit of securing the supply of nut for their own processing business to fulfill the domestic market and some for export market.

Unfortunately, what have been conducted by the private sectors of cashew business in the production centers of cashew is quite limited. The majority of cashew production is exported to the world market without shelling. This tendency also occurs

in other countries of cashew producers, where about 40 percent of the world cashew crop is shelled outside the country of origin. The added value of cashew economy is mostly captured by India and Vietnam, the two countries that import a large amount of cashew from Asian and African countries and perform shelling and other processing activities in their countries. However, if the business sectors have viewed that cashew shelling is a profitable business activity, sooner or later, the cashew industry in Indonesia will develop more properly, hence the competitiveness of the industry will increase significantly. The development of derivative products of shelled cashew also develop very quickly in Indonesia, as the development of food industries using cashew nuts as their inputs has been quite promising in recent years.

The Indonesian in-shell cashew nuts are well accepted internationally in a competitive market of many origins (see Fitzpatrick and Jaeger, 2007). There are a number of comparative advantages: firstly, the kernel yield (weight of kernels/weight of in-shell nuts) is good; secondly Indonesia has a good geographic position to serve the two main buyers, India and Vietnam, of in-shell nuts; and thirdly, the timing of the crop is ideal with no other competing producers able to supply buyers in the fourth quarter period when Indonesia typically harvests.

Mango - Challenges of Transition

Mango is among the horticulture crops that could grow in almost all agro-ecological zones in the country, even in the regions having sandy soils and a bit dry are the most suitable for mango farming. Mango production has grown fast in the last decade, from 876 thousand ton in 2000 to 2.24 million ton in 2009. The preliminary figure of mango production in 2010 was 1.3 million ton, over 40 percent decline from the previous year. The most reliable explanation regarding the decline is the long raining season in 2010, creating damages for mango flowers before becoming the mango fruits. Mango farms are mostly small-scale and less intensive compared to other cultivation practices of upland tree crops. In Indonesia, mango production is dependent on seasons, instead of technology application.

Since the mid 1990s, the government has launched many initiatives and programs to increase the production and productivity of horticultural products, such fruits, flower, medicinal plants, etc. Foreign agencies such as Japanese Bank for International Cooperation (JBIC), United States Agency for International Development (USAID), Australian Agency for International Development (AusAID), etc. are also contributing to the design and implementation of horticultural development programs. The following are some examples: Fruit Crops Production Center, Farm Operation in Special Area, Integrated Farm Operation in Marginal Area, Integrated Rural Agricultural Project, Integrated Horticulture Development in Upland Area, etc. For mango, the production increase occurred after 3-4 years from the initial planting, so that the production figures increased significantly after 2002. Harvested area of mango increased from 144 thousand hectares in 2000 to 215 thousand hectares in 2009, particularly in the locations of projects above such as in Java and Nusa Tenggara.

In addition, mango production is also triggered by increasing demand, especially in recent years, after the economy has grown above five percent. Mango and other fruits are not considered as basic staple foods, so that the demand for mango is determined mostly by the growth in income level and purchasing power of the consumers. The demand for mango is also determined by the rapid development of hotel and restaurants, and tourism sector as well as increasing awareness to consume fruits that contain vitamin C and A, especially among middle income class. Mango and other horticultural products also have unique characteristics where fresh fruits are more preferred than the processed foods either extracted dried, or fermented. Efforts

to increase production and productivity, at farm level, are more relevant to improve the competitiveness of mango, rather than downstream development at manufacturing level. However, processing and other post harvest activities for horticultural are necessary to anticipate the perishable nature of mango and to serve the consumer preference, to add-value for the products, and to maintain the nutrition contents.

Indonesia is a very small player in mango export, far behind the roles of Philippines and Thailand in the Southeast Asia region or far behind those of India, Mexico, and Brazil in the world market. The share of Indonesian mango export in the world market is quite small, only about 10 percent, with the exception in 2002 and 2004, including the export of mangosteen and guava. During these years, Indonesia was able to export mango as much as 1.6 million ton and 1.9 million respectively, generating foreign earnings as much as US\$ 2.7 million and US\$ 2 million respectively in 2002 and 2004. In these years, the share of export market is above 20 percent, a very significant jump from the export in 2001 and 2004 respectively. Export destinations of Indonesian mango are mostly among Asian countries such as Singapore, Malaysia, and some to Taiwan, Japan, and South Korea.

Stakeholders of mango industry in Indonesia have not conducted systematic marketing research regarding the preferences of mango consumers in the export destination countries. Information regarding such consumer preferences is very limited and not rigorously examined using standard econometric analysis. For example, Singaporean consumers prefer red and yellowish mango, similar to the character of the Philippines or Manila mango. Singaporeans generally do not prefer Manalagi mango from Indonesia which has dark green color of the fruit, although this mango is much sweeter compared to Manila and Pakistan mango. Actually, Indonesia has Gedong Gincu mango, similar to Manila mango in color, a bit dark-red, but very sweet. Should Indonesia also export this type of fruit, Indonesian mango might be able to compete head-to-head with Manila mango.

Conclusions and Policy Recommendations

This study has examined the competitiveness and sustainability of some key agricultural commodities in Indonesia, namely: coffee, cocoa, tea, rubber, cashew and mango. Assessments cover several dimensions, from production and farming practices, trading and supply chains, marketing and marketing, added value and industrialization strategies, growing domestic demand, business environment, consumer awareness, to environmental issues such as resource degradation and climate change. The order of competitiveness among five commodities is summarized as follows. The RCA value of natural rubber is 36.6, far higher than the RCA of cocoa of 14.0, cashew of 11.6, coffee of 6.1, tea of 5.4 and let alone mango. RCA value of mango is 0.12, indicating that competitiveness level of mango is also very small. Indonesia is not a big player of mango market in the world, even at Asia's level. In addition, competitive assessments on the specific crops have followed, but not strictly limited, and expand the arguments using the Porter Diamond Hypothesis to examine more in-depth the existing condition of farm production factors, structure of the cluster industry and marketing system, domestic and export markets, and supporting industries for added value creation.

The following policy recommendations are offered to suggest policy changes to achieve a higher level of competitiveness and sustainability of each agricultural export commodities:

Coffee - Improving the mechanisms of certification scheme

Improving the competitiveness of coffee should start at the very basic level of better farming practices to increase coffee production and productivity. Structural

problems facing the smallholder coffee farmers need to be solved by providing technical assistance, extension services and empowerment actions at the field level. The coffee quality could be increased by encouraging smallholder farmers to apply selected picking for red cherry and strip picking for more ripen fruits. These efforts require more labor and higher costs of crop farmers, so that these farmers have to be connected with the sources of financial capital and other cash money. The coffee quality could be increased by providing access for the coffee farmers to road pavement and concrete floors to ensure a better drying process for coffee bean.

The corporate environmental governance and global certification partnerships have changed the growing tendency of exporters and domestic roasters to encourage coffee producers to organize as a group, as the monitoring system and traceability principle could be ensured. The roles of intermediaries in ensuring the sustainability principles are very important in providing links between sellers (smallholder farmers) and buyers (roasting companies, research institute, civil society organizations or international agencies) of the services. These intermediaries could play important roles in increasing public awareness; serving as a clearinghouse for information; training; capacity building; negotiating; monitoring and evaluation; resolving conflicts; absorbing transaction costs etc.. Intermediaries have also helped generate collective action in linking smallholder farmers with broader market, providing support for weaker members of communities to better address poverty alleviation or ensure that the poor are not made worse off.

Special attention should be given to the potential miss-links between the development of environmental service markets and global buyer-driven initiatives on environmental governance in the coffee industry. The approach of environmental service markets is designed as an alternative perspective on sustainable resource management, while global buyer-driven initiatives which are mostly concerned with brand image, security and continuation of coffee supply to the global market. Even, when coffee buyers at global level roaster companies comply with the ethical base of corporate social responsibility (CSR) to empower direct and indirect stakeholders who are poor, this mechanism could not be considered as payment of environmental services. Therefore, economic valuation is a necessary first step to develop environmental service markets.

Cocoa - Expanding SE seedling and sustainability-based certification

The national movement (Gernas) to revitalize cocoa production and increase the yield is the most logical step to maintain the country status as an important cocoa producer in the world. Gernas has adopted the SE (*somatic embryogenesis*) technology of cocoa seedling to meet the immediate needs for rejuvenation of planting material and management of pests and disease, especially in Sulawesi where the farmers are struggling to practice regular pruning and grafting techniques. Since the outcome of cocoa Gernas on increased yield is quite small after nearly three years of implementation, two strategies have to be employed. First, the central government should formulate concrete actions to effectively strengthen the extension services and farmers' empowerment and capacity building programs. These programs shall connect with other initiative intensification practices addressed by provincial government and local government in the cocoa producing regions. Second, the SE technology seedling should be expanded to other cocoa producing regions across the country and to newly regions interested in cocoa development. Theoretically, this SE technology shall improve the cocoa yield significantly in the future, and contribute to the revival of cocoa industry in the country.

There has been a popular belief that farmers are not willing to improve the cocoa quality because of no incentives to perform cocoa fermentation and no price difference between fermented cocoa and non-fermented cocoa bean. Currently, this argument might not be convincing anymore as the development of cocoa supply chain is more sophisticated. The competition among middlemen and collector traders in securing the supply of cocoa bean from farmers in rural area is getting tougher. Cocoa competitiveness could be improved by providing more relevant market information for cocoa farmers, potential economic benefits of improving the quality, alternative market destinations as well as added-value potentials of industrial deepening and downstream development. Similarly, the introduction of value-added tax and export tax of processed cocoa products might have a counter-intuitive impact to the industry if the marketing system is not efficient. Therefore, Indonesia is really in need of greater investment in cocoa processing plants, particularly in the production centers, so that the deepening industrial strategy and added-value activities will also contribute to rural development of the country. The cocoa competitiveness will improve significantly in the near future if the cocoa cluster activities are formulated based on added value creation. In this case, the future cocoa export flows are based on the processed cocoa bean and some products of manufacturing cocoa industry.

Similar to coffee cluster, cocoa farming also strongly is encouraged to apply agroforestry system, where farmers are also adopting cocoa multi-strata practices and implement the government program of community-based forestry management (HKM) inside the protection forests. This mechanism could be seen a significant potential to develop micro-institutions at farm level which are compatible to sustainability standard and initiatives at global level. Such sustainability-based certification might also be compatible with the approach of environmental service markets, where poor cocoa and coffee farmers who have practicing multi-strata agroforestry as provider and whoever the potential buyers of watershed services in the cocoa producing regions. Both environmental service markets and sustainability regulations in the coffee economy require continuous monitoring the compliance mechanisms that could contribute to environmental governance in general. Policy recommendation that facilitates a bridging process is really crucial to link bottom-up initiatives of institutional changes at farm-level and distribution organizations with top-down sustainability standard set private sectors at global level. In this case, intermediaries such as academic institutions, government agencies, and NGOs could play effective roles in achieving more effective sustainable-base certification system.

Tea – Reviving the production and marketing system

The structural problems in the tea industry could be resolved by promoting consistent policy to revive the production and marketing system. Theoretically, the policy reforms should be easier and easily implemented as the majority (56 percent) of tea plantation is controlled by large scale plantation. The characteristics of tea plantation and the management style and corporate culture between the state-owned enterprise and private sector could be different. Therefore, the incentive systems in the proposed policies to revive the production and marketing system in these large-scale plantations should be adjusted to the needs of the state-owned enterprises and the private sectors. Similarly, the policy reforms to revive the production and marketing system for the small-scale tea farming should be tailor-made, depending on the degree of openness in respected provincial and local governments where the tea-farming is located. The declines in harvested area tea farming should be halted and new investment and replanting program in tea plantation should be promoted, otherwise the revival of production system could not be achieved.

The following policy recommendations might contribute to the revival of production and marketing system of the tea economy in Indonesia.

First, revitalizing tea marketing system. Strengthening the Jakarta Tea Auction (JTA) should be one of the priorities in the revitalization of tea marketing system in Indonesia. The main reason is because the price at JTA is the barometer of tea price for direct selling at the exporter level, at distributor, processor, trader and collector level tea, and farm-gate level of large-scale plantation and smallholder farmers. The Government of Indonesia and the Indonesian Tea Council (ITC) should improve the status of JTA, or at least the price level is comparable to, instead of far below than, the Colombo Tea Auction (CTA). The tea price in JTA is 55 – 60 percent lower than that in CTA, although the difference in cost, insurance and freights to London market is less than US \$ 9 cent per kilogram.

Second, promoting domestic tea consumption. The annual tea consumption in Indonesia as a tea producer of 360 gram/capita is very low compared to that in India of 630 gram/capita and Sri Lanka 1,300 gram/capita. The government and private sectors should improve the strategies of tea promotion and conduct more regularly in the forms of tea festival across the country, aggressively increase the advertisement budget, and branding development for some locally produced tea, etc. The tea festival that is generally held in Bandung of West Java should be upgraded to the high level comparable to the World Ocha (Green Tea) Festival in Japan, for example. A study by Suprihatini (2010) suggests that for every ton increase of domestic tea consumption will trigger the domestic price of tea in the following year by Rp 20 per ton.

Third, harmonizing the tea border policy. Currently, the tea border policy in Indonesia is not clear, where the import tariff of 5 percent is far below that of other tea producing countries such as Sri Lanka, Kenya, China, Japan, Turkey etc. The government should harmonize the import tariff of tea, at least comparable to other tea producing countries. The structural problems in declining harvested area and tea production could be removed by harmonizing the import tariff and downstream development of the tea industry in general. In addition, the government might require the imported tea to comply with the quality of SNI (Indonesian National Standard), halal certificates, and other requirements set by the Indonesian Tea Council (ITC).

Rubber - Combining clonal-based development and forest protection

Rubber has the highest competitiveness among all five agricultural commodities although the majority (84 percent) of rubber producers is small-scale farms. The level of competitiveness could be increased more significantly if these small growers are able to produce good quality rubber. At the field level, farmers using high quality seedling and intensive system are really in favor of the new regulation, but traditional farmers relying on jungle rubber of agroforestry systems have experienced a decrease in farm revenues because they traditionally have produced dirty slabs. In the near future, policy intervention to provide assistance for these small farmers should be sharpened in order to broaden the limited opportunities and capital constraints to improve the income level and the sustainability of natural rubber production system.

The development of downstream rubber-based agro-industry could follow the path of establishing the mutual linkages between upstream production system and downstream industry, the location preferences of improving added value of the industry, and investment promotion in such prospective sectors and to contribute to the industrial development in general. The rubber-based industrial development is obviously related to many segments of economic policy, including the technological advancement, information system and financial institutions and legal issues and enforcement structures in general. Therefore, the development of domestic rubber

industry needs more strategic approach and policy to better support a high quality of economic recovery in the country.

Rubber supply chain in Indonesia is very much determined at least by two important factors: (1) the industrial capacity of crumb rubber factories and (2) the efficiency level of marketing systems. When the production of rubber materials cannot fulfill the factory demands, the whole marketing system tend to have problems in its efficiency level. Academic communities and government agencies are now being challenged to formulate new schemes in financial policies and investment policies to encourage new investments in both upstream and downstream rubber-based industries. Otherwise, the high potentials for Indonesia to play major roles in the world market of natural rubbers that could at the same time bring prosperity to small-scale growers and protecting the environment would vanish in the short years to come.

In order to contribute to the positive environmental and social benefits, the major challenge for natural rubber production system in the future is how to integrate a high productivity promotion of new clonal rubber varieties and a decision for land use practices that satisfy sustainable resource management and ensure acceptable quality of environments in the forest margin. By the time of this writing, the old rubber trees under extensive system and jungle rubber agroforestry have not been able to solve the problems of low productivity or latex, poor quality of slabs, hence low income returns for rubber growers. However, a tendency in monoculture rubber of intensive system using clonal rubber variety could pose a threat to new dimensions of biodiversity issues, especially in the forest margins. Therefore, providing incentive systems and reasonable rewards for smallholder rubber growers who have contributed to the conservation of biological diversity services could be treated as a necessary step to develop a more sustainable practice of rubber production systems. The practice is expected to both improve the latex productivity and high quality rubber products and ensure adequate income level for the small-holder rubber growers and sharetappers, such as commonly found in Indonesia.

Cashew - Farm production and Added-Value Creation

As a small player in the world cashew market, Indonesia needs to invest in serious efforts to increase farm production and added-value creation of this prospective cashew cluster development. Indonesian cashew nuts are well accepted internationally in a competitive market of many origins because the kernel yield is quite large and the timing of cashew harvest in Indonesia differ from those in other cashew producing countries. Some actions to promote cashew farm production and added-value creation could be summarized as follows:

First step is to apply good agricultural practices in the existing production centers in Sulawesi and Nusa Tenggara, rehabilitate cashew areas that have shown declining production, and develop new regions for cashew production, such as in Sumatra and some parts of Java. Supporting action in this step is identifying data and information on bio-physical and socio-economic dimension of cashew farming practices is the most logical initial step towards increased cashew production and productivity.

Second is to stimulate the development of cashew shelling industry to shift the benefits and added-value creation currently captured by India and Vietnam. Supporting action in this step is examining the efficiency level of marketing system and cashew supply chain, estimating transaction costs and their changes in the marketing, and the distribution of benefits and marketing margins of cashew supply chain.

Third is to stimulate the domestic market by improving the direct demand for cashew kernels, and their derivative products used in the food industry. Supporting

action in this step is examining cashew consumer's behavior and choice attribute by the household consumers and industry consumers.

Fourth is to provide price incentives for farmers, who have produced a better quality cashew, and improving institutional arrangements for integrated upstream-downstream integration in the cashew industry. Supporting action in this step is examining and mapping the existing marketing systems, performing necessary efficiency analysis for each marketing system and overall supply chain.

Fifth is to provide adequate information regarding the cashew cluster for the production quantity and quality improvement and for processing and trading activities. Supporting action in this step is examining the existing and potential changes in business environment and customers' need and perception.

Mango - Integrated horticulture development in upland areas

Similar to cashew, Indonesia is a very small player in the global mango economy, as the share of mango export is far behind the Philippines, Thailand, India, Mexico, and Brazil. The demand for mango is mostly determined by the economic growth, especially the growth of hotel and restaurants, income level and purchasing power of the consumers. Because mango is consumed more in fresh than in processed products, some actions to increase production and productivity are much more relevant to increase macro competitiveness in Indonesia. Processing and other post harvest activities are necessary to anticipate the damage and economic loss due to perishable nature of the fruit.

Actions towards more integrated horticulture development in upland areas could start with increasing the production and productivity of mango, both by increasing the existing harvested area and expanding new mango farms. Facilitation, empowerment, and extension services are very crucial to increase farmers' awareness towards more commercial and market-oriented type of production. Such actions should be integrated with crop diversification and agroforestry systems in mango production centers, so that the strategy could also contribute to poverty alleviation and regional development.

Finally, action plans such as the integrated horticulture development in upland areas require close collaboration between government officials, private sectors, academic community and civil society organization. Understanding each role and position in mango cluster development is the first prerequisite to implement the action in a more coherent way. These actors generally have their own interests, value system, and code conducts. Common denominator and understanding to increase the competitiveness and sustainability of mango cluster development should be formulated. Therefore, the action should include any capacity building programs to increase the knowledge of small-scale mango farmers on market-oriented farming practices, simple business and economic principles to support the understanding and to contribute to overall agenda of improving competitiveness and sustainability for the future.

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