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5 Improving agricultural commodity supply-chain to promote economic activities in rural area

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Abstract. Long supply chain of agricultural commodities has become concern to governments particularly in large countries such as Indonesia as it causes high price disparity between farm-gate and retailer. Policies to overcome such problem are usually by shortening the chain, by which farmers sell the products directly to retailers. Using an action research in AEDEF (Aceh Economic Development Financing Facilities) Program, conducted in the province of Nangro Aceh Darussalam (NAD) Indonesia, the paper shows that shortening the commodity supply chain is not the best solution to such problem, as it causes loss of jobs in the villages. High price disparity between farm-gate and retailer is not necessary brought about by long supply-chain but by the efficiency of the chain instead. Efficiency of the chain can be improved by creating enabling business environment such that every actors and players work in a fair manner. This can be achieved by transparency in price and quality grade. With development achieved in Information and Communication Technology (ICT), having a good and reliable flow of such information is not difficult. In addition to information flow, the availability and quality of infrastructure to support flow of goods from farm-gate to end-user is of reasonably important.

1. Introduction

Most agricultural commodities in Indonesia have to pass long supply chain before they arrive to consumers. From farmer to consumers it may pass through collectors, village and district scale traders, wholesalers, distributors, retailers. Along the flow, goods or products may be cleaned, sorted, dried and undergone other simple processing, transported, and manufactured. As in the case of cocoa for example, before it get into consumer, cocoa beans and cocoa products have to pass through local collectors, local traders, in-country processors, in-country manufacturers, and exporters before they get into importers, regional and multinational processors, manufacturers, and chocolate – confectionary market. In Sulawesi alone there are more than 9,000 local collectors, more than 1,000 local traders, 10 – 20 small scale exporters, 6 – 8 medium and big scale exporters, 5 multinational affiliates, 13 local processors, and some local manufacturers serving about 400,000 small-holders farmers [1].

Typical supply-chain of vegetable in Indonesia involve collectors, trade wholesaler, supermarket – wholesaler, interisland trader, and food industries before it gets into supermarket and or traditional retailers. In South Sulawesi, 85% of chili produces go to collectors and only 10% go straight to local retailer and 5% to wholesaler. Half of chili at collectors are sold to wholesaler and another half to interisland traders. Those at wholesaler are distributed to interisland traders, dry chili wholesalers, food industries, traditional retailer and supermarket [2]. In East Java, 90% of chili produced by farmers goes to collectors, only 10% goes straight to traditional market, and none wholesaler. The produces then go to retailers, supermarkets, food industries, and interisland traders [2].



As of rice, the main staple food in Indonesia, the supply chain consist of collectors, rural cooperatives, millers, BULOG, wholesalers, provincial market, interisland traders, wholesaler market traders, and retail stores. Un-hulled rice are bought, dried, stored, milled and finally sold by tier 1 actors which are millers and rural cooperatives to wholesaler, BULOG and provincial markets before distributed to the inter-island traders, wholesaler market traders, retail stores and end consumers [3].

In general, supply chain of agricultural commodities in Indonesia is very long and complex involving many actors. Such a complex and long chain lead to a concern by government as it cause high price disparity between farm-gate and retailer. Policy to overcome such problem is by shortening the chain, by which farmers or farmer group sell the products directly to retailer or to consumers. Shortening the commodity supply chain, however, may not be the best solution to such problem as it causes loss of jobs or employment in the villages. Those live in the rural area or villages are not only farmers, but also traders, middle-man, collectors, and those who work on home-scale industries and other off-farm activities. As un-employment and poverty increasingly become a major problem in rural area, shortening the chain may even worsen the problem.

Poverty and unemployment are among main problems in rural area or villages. As per September 2016, there are 17.28 million people in rural area are poor or 13.96%, which is much higher than 10.49 million those in the cities or 7.73% [4]. Although the figure has significantly decreased by 4.53 million in the last ten years which was 24.81 million in 2006 [5], poverty still become a major problem in the village as the rate of decrease in poverty in rural area is much slower than that in urban. The decrease of poverty in rural area in the last ten years was from 21.81% in 2006 to 13.96% in 2016 (decrease by 36%), while in urban area was from 13.47% in 2006 to 7.73% in 2016 (decrease by 43%).

In 2016, un-employment rate in rural area is 4% [6]. For the last 20 years, un-employment in Indonesia has increased from only 2.5% in 1990 to 7.41 in 2010 [7]. In some cases, the increase of unemployment in rural area is brought about by failure of harvest due to climate [8].

Facing high price disparity between farm-gate and consumer and complex agricultural commodity supply chain, government of Indonesia proposing to shorten the chain. For rice, farmers or farmer groups will sell the product directly to BULOG and BULOG will then distribute it to retailer or wholesaler, and so there is no middle man or collectors needed [9]. Such approach will certainly cause the loss of many jobs in rural area which in turns will increase poverty, hence shortening the supply chain may not be a good solution

High price disparity between farm-gate and retailer is not necessary brought about by long supply-chain but by the efficiency of the chain instead. Efficiency of the chain can be improved by creating enabling business environment such that every actors and players work in a fair manner. This can be achieved by transparency in price and quality of goods or services. Therefore, flow of information of price and quality of goods from end-user all the way along the chain to farmers occurs without any distortion. With development achieved in Information and Communication Technology (ICT), having a good and reliable flow of such information is not difficult. In addition to information flow, the availability and quality of infrastructure to support flow of goods from farm-gate to end-user such as transportation, telecommunication, electric power, is of reasonably important.

The purpose of this action research is to show that job absorption in rural area can be increased and so poverty is decreased by promoting economic activities in rural area trough improvement of agricultural supply chain, instead of shortening it

2. Methods

The action research is part of AEDEF (Aceh Economic Development Financing Facilities) Program, conducted in the province of Nangro Aceh Darussalam (NAD) Indonesia in 2009 – 2012 financed by Aceh Post Tsunami Multi-Donor Trust Fund for Aceh and Nias (MDTF), where I become a program leader. The program was implemented by eight Sub Implementing Entities (SIE), i.e. International NGO, each with one sub program with specific scope and objective [10]. In this paper, I choose two SIE, i.e Swisscontact that worked on *Peningkatan Ekonomi Kakao Aceh* (PEKA, Aceh Cocoa Economy Development) and International Organization for Migration (IOM) that worked on Sustainable

Economic Growth for Aceh (SEGA). The nature of these sub programs are basically improvement of agricultural commodities supply chain for cocoa by Swisscontact and for coffee by IOM.

10 The scope area of PEKA subprogram covers 5 districts in NAD province, i.e. Pidie Jaya, Bireun, Aceh Tamiang, Aceh Barat Daya and Aceh Tenggara district. These districts are central producing area of cocoa in the province. SEGA sub-program by IOM covers two districts, i.e Aceh Tengah and Bener Meriah district. These two districts are also central producing area of coffee in the province.

3. Improving Cocoa Supply Chain

Cocoa supply chain in Aceh involves farmers, farmer group, cooperatives, collectors, wholesaler, district wholesaler, processor, and exporters. Therefore, increasing economy in cocoa producing area cannot be achieved merely by working with farmers but instead working with all actors in cocoa supply chain.

As was discussed in the introduction, high price disparity between farm-gate and consumer is not brought merely by long supply chain but by fairness and equity of each actor in the chain. Hence, creating enabling business environment is vital to improve the quality of the supply chain. To create enabling business environment, two important activities were introduced in Aceh *i.e.* Establishment of Aceh Cocoa Forum, and Development of 5 District Based Cocoa Master Plans. With a cocoa forum, any unfairness arise among actors can be resolved. The forum also established internet website (<http://forumkakaoaaceh.or.id/>) and the SMS price information system. The SMS price information system will further promote a transparent and fair cocoa trade. District Based Cocoa Master Plans also cover policy, system and procedure, and regulation required for enabling business environment in cocoa. The needs for infrastructure and utilities development to guaranty a good flow of cocoa product from farm-gate to end-user are also identified.

Collectors, middleman, and other smallholders cocoa enterprise are also villagers, and hence shortening the supply chain will mean loss of jobs for them. What need to be done is to increase their efficiency with proper knowledge, information, skill, management, and access to finance. Therefore, 112 SCEs were organized and supported with 112 nurseries, compost choppers, and equipment as well as trained in management, marketing, and compost and seedling business. In addition, 58 traders (collectors and middleman) were trained and provided with trading equipment (moisture meters and digital scales) and office equipment. Noted that moisture meters and scales are two important trading equipment to guaranty a fair trade. Along with those interventions, 105 cocoa farmers, 16 traders, 13 government representatives and 7 bank staff participated in a discussion on marketing and access to finances/credit.

By nature, farmers are not entrepreneur. Instead of taking middleman roles to sell their product directly to retailers, farmers can increase their income by increasing productivity and quality of harvest. For this purpose, the sub-program trained 12,540 farmers in Farmer Field Schools (FFS). Along with this, 1.2 million cocoa trees in 1,516 hectares were rehabilitated through side grafting, and cocoa farmers were trained in farm evaluation and farm rehabilitation. In addition, 5 District Cocoa Clinics (DCC) along with Cocoa Clonal Garden were established.

4. Improved Cocoa Supply Chain

As a result of intervention made in improving cocoa supply chain, 116 small scale cocoa enterprises (SCEs) have been linked to regional and national cocoa buyers. In addition, 58 traders actively involved in cocoa value chain business. The engagement of SCEs to regional and national cocoa buyer has increase the quality of supply-chain, hence the flow of cocoa product from farm to national buyer become effective. Active involvement of traders in cocoa value chain business has stimulated economic activities in rural and increased community income that will in turn decreased poverty. About 76% of these 58 traders stated that their profit has increased, and 69% of their employees were benefitting from increased income.

As for farmers, although they are not directly involved in trading as a middleman or they do not sell the product directly to retailer or consumer, their income has increased due to increase in cocoa yield and quality. Cocoa yield has increased 150%, from 400 kg ha⁻¹year⁻¹ to 1,000 kg ha⁻¹ year⁻¹.

5. Improving Coffee Supply Chain

Typical supply chains and or activities of coffee in Indonesia, including in Aceh are pulping, collectors, hulling, drying, warehouse, cupping test, roaster, and export. If the products are exported as beans, the supply chain include cherry parchment, cherry / parchment drying for dry process or washing / fermentation for wet process, dry or wet process green bean, and export, that involve farmers, collectors and middleman, processors, and exporters. Action to improve supply chain of coffee in Aceh in this sub-program, therefore, covers intervention on all actors and processes in the chain.

In relation to such complex supply chain in coffee, the intervention made in the sub-program include improving coffee processing business, establishing coffee Arabica network, strengthening linkages with buyers, stimulating coffee trading, and increasing coffee productivity and quality. Intervention made in improving coffee processing business were provision of matching grant to 78 SME's, 37 grantees Aceh Tengah district and 38 in Bener Meriah as well as trainings and technical assistance to 200 SMEs and cooperatives. The matching grants were mainly provided for construction such as drying floor, warehouse, fence, etc, as well as for transportation and machinery such as pulper and huller, roasting machine, coffee packaging/sachet, etc. The training and technical assistance covered business plan development, accounting, business ethics, and environmental aspects.

Establishment of coffee Arabica network were made through participation in socialization of Fair Trade USA Standards, participation in local, national, international exhibitions and conferences, strengthening MPKG (*Masyarakat Perlindungan Kopi Gayo / Gayo Coffee Protection Community*), one of the local organizations to protect coffee gayo brand name. In addition, a partnership with Specialty Coffee Association of Indonesia (SCAI) and the Aceh Coffee Forum was established to build a stronger network for Arabica Gayo on the national level and on the international level. Strengthening linkages with buyers covered establishment of auction market, and establishment of research nursery. A private managed auction platform fully registered with Bappepti and KBI, where Arabica Gayo was included in I-Pasar as an independent platform.

In stimulating coffee trading, the sub-program trained 36 cooperative agriculture workers in the area of administration, finance, coffee production, cooperative management, quality testing and fair tradestandards, and established a Warehouse Receipt System (WRS). The WRS is certified by SUCOFINDO and is the first one in Indonesia for Arabica Coffee. The warehouse provides storage capacity up to 800 MT. Within the premises a certified quality control laboratory was set up.

The activities of actors in the supply chain are very much affected by bean production and quality. Therefore, intervention made in increasing coffee productivity and quality, were intended not only to increase income of farmers but also to increase the size of coffee business and industry such that activities of all actors in the chain increase. To increase coffee productivity and quality, 50 Agricultural Extension Workers (AEWs) are trained to give Direct Support to Farmers, 50 Farmer Field Schools (FFS) were performed to trained 1,821 coffee farmers in land preparation, coffee production, pest & disease management, post-harvest management, quality testing, and the sale of products, 50 coffee nurseries were established and supported, and 36 Cooperative Agriculture Workers (CAWs) were trained in the area of administration, finance, coffee production, cooperative management, quality testing and Fair Trade standards.

6. Improved Coffee Supply Chain

As a result of intervention made in improving coffee supply chain, there have been additional of 193 job opportunities related to SMEs activities, a number that will continuously grow along with increase in coffee bean yield. In addition, Warehouse Receipt System (WRS) is on place preventing price fall, a private managed auction platform fully registered with Bappepti and KBI and has been working, and

the partnership agreement with and certification by Fair Trade US has increase coffee bean market globally.

Coffee seedling business has generated income in the amount of IDR 1,400 million along with significant increase in bean production. In addition, coffee bean quality has also increased as indicated by increase in the cup quality score from 77 to 83. Such increase in cup quality score mean significant increase in price. Increase in bean production and quality caused increase not only in farmers income but also the size of coffee industry. As the supply chain occurs in the village, and all actors in the business / chain are villagers economic activities in the village and income of the villagers increase. Although survey on poverty has not been undertaken, but increase in job opportunity and income will certainly decrease poverty.

7. Conclusion

Solution to long and complex agricultural supply chain is not by shortening the chain because it will cause loss of jobs of villagers that will in turn decreasing villagers income and increasing poverty in the village. An alternative solution to such problem is by improving quality of the supply chain by mean of working with all actors in the chain, creating enabling business environment, providing actors with training on technical skill and management, and facilitating actors in accessing credit and finance. By improving quality of supply chain, the size of business increase, the supply chain become effective more actors involve in the supply chain business, and economic activity in the village increase. These will in turn increase employment, increase village income, and reduce poverty.

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