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## 5 Socio Economic Review

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### 5.1 Introduction

This socio-economic review provides a summary of the social and economic characteristics, issues and trends in three provinces in Indonesia: Nusa Tenggara Timur (NTT), West Nusa Tenggara (NTB) and East Java (EJ), and in four districts within each of these provinces, which were selected by ACIAR as potential districts on which to focus their poverty alleviation efforts. The information in this review serves to compliment the Literature Review of Key Commodities to allow an informed selection of five commodities for value chain analysis in the 12 pre-selected districts.

The socio-economic review therefore provides an overview of demographic trends in Indonesia; poverty distribution and trends; agricultural production and markets; agribusiness infrastructure; macroeconomic, policy and political economy affecting the agricultural sector; emerging trends and constraints in smallholder commercialisation; and recent major policy and/or regulatory considerations affecting agricultural development, especially in Eastern Indonesia.

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### 5.2 Economic, social, agricultural and rural poverty context

Indonesia's 1.91 million square kilometres of land extends over 17,000 islands and it is the world's fourth most populated nation, with 237.6 million inhabitants in 2010. The population grew at 1.49 percent per annum between 2000 and 2010 (BPS, 2012). The average population density in Indonesia in 2011 was 124 people per km<sup>2</sup> (up from 107 people per km<sup>2</sup> in 2010) with large variations between provinces. The average size of household in the country is 3.9 (BPS, 2012).

The adult literacy rate in Indonesia in 2010 was 92.91 percent. This was 95.35 for men and 90.52 for women (BPS, 2012), with important differences between provinces.

In Indonesia life expectancy at birth (largely an outcome of health and nutrition) has been increasing in recent years, but important differences persist between provinces and between urban and rural areas. In 2010, life expectancy in the country was 70.9 years, compared to 70.4 in 2007 (BPS, 2010).

Indonesia's economy is well diversified and market-based, with a GNI per capita of US\$3,005 in 2010 (BPS, 2011). Growth in GDP in 2011 is estimated at 6.46 percent and averaged around 5.8 percent (5.7 - 6.5 percent) per annum between 2005 and 2011 (BPS, 2011). In 2010, industry generated approximately 48 percent of GDP; agriculture around 15 percent, and services 37 percent. Manufacturing dominates exports, with oil and gas accounting for around 20 percent of exports in 2011 (BPS, 2011).

The share of the agricultural sector in the overall economy declined from 41 percent of GDP in 1970 to around 15 percent of GDP in 2011. However, agriculture still contributes significantly to Indonesia's economic growth. For instance, it accounted for around 14 percent of GDP between 2007 and 2010 (BPS, 2012). It also employed 42.47 percent of the total work force in 2011 (BPS, 2012), making it the largest sector by employment in the economy.

Indonesian agricultural production is increasingly shifting away from food crops particularly towards horticulture and estate crop production. Nonetheless, the bulk of agricultural production in Indonesia remains in food crops (Rajah and McCulloch, 2012). This shift away from food crop production has been seen across all regions, leading to weak growth in food crops across Indonesia, particularly in Java and Eastern Indonesia, although Java still dominates national agricultural production.

The decrease in contribution from the food crops sub-sector to agriculture can be attributed to a number of factors, including limited land availability and poor land quality, deteriorating infrastructure, poor water management, inadequate knowledge sharing and training/extension services, poor post-harvest handling and processing, poor governance and rural institutional support, and inappropriate decentralisation policies.

Horticultural production, i.e. vegetable and fruits, has increased in recent years. However, product quality and its value-added processing still face many problems and need further improvements to meet client demand and to expand domestic and export market demand.

Such improvements are of high strategic priority as the vegetable and fruit consumption level in Indonesia is still lower than national dietary standards and FAO's recommendation. Local products have difficulties competing in quality, diversity and/or price with imported products, especially in supplying medium/high-level income consumers and modern supermarkets (GOI, et.al., 2009).

Trade and market liberalisation has also encouraged diversification into higher-value export crops and government spending on agriculture services, irrigation, and research on specific high-value crops. Agricultural research investment in estate crops has been much higher than in food crops. Therefore, regions with estate crops have generally benefited from better government support to improvements in productivity.

By 2005, the largest land use category was estate crops (oil palm, cocoa, rubber, etc.). These products (including rubber, palm oil, shrimps, coffee, copra, cocoa and livestock) constituted 12 percent of total exports in 2006.

Agricultural value added per worker increased from about US\$450 in 1970 to over US\$700 in 2000 (1995 prices). However, nearly all the growth in productivity occurred between 1968 and 1992. By the mid-1990s, agricultural growth again relied almost entirely on bringing new land under cultivation (IFAD, 2007).

While actual potential yields will to some extent depend on the specific environmental conditions prevailing in each province, large gaps between high yield provinces and the rest suggest ample scope for raising Indonesia's agricultural productivity. If yields across Indonesian provinces converge towards the yields found in the best performing provinces for each crop, large gains in agricultural productivity could be realized.

Although Indonesian agriculture has diversified away from food crops, overall food security has improved. The hunger index score<sup>1</sup> for Indonesia has declined from a high of over 28 in 1981 to 13.2 in 2010 (IFPRI, 2010). According to Rada and Regmi (2010), if the current trends in food availability, agricultural trade, and economic development continue, the hunger index is expected to decline below 2 by 2020.

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<sup>1</sup> The hunger index is an equally weighted index of three measures: the proportion of undernourished population as a percentage of the total population; the prevalence of underweight children under the age of 5; and the under-5 mortality rate (IFPRI, 2010).

The total calorie share of starchy roots—a low-value product—has been consistently replaced by high-value foods, such as vegetable oils, meats, fish/seafood, and fruits and vegetables. Indonesians are also increasingly purchasing packaged food with some value added, rather than purchasing unprocessed products from local wet markets. In 1998, less than 22 percent of packaged food was sold in standardized retail outlets, such as supermarkets, hypermarkets, and discount and convenience stores, rather than in independent corner “mom-and-pop” stores. In 2008, over 34 percent of sales were through standardized stores (Rada and Regmi (2010)).

Indonesia’s agricultural exports have focused primarily on tropical perennial products in which it has comparative advantage, whereas its imports have included feed for its growing poultry sector (in response to greater consumer demand for meat) and food for its citizens.

Indonesia’s agricultural export value has grown on average almost 9 percent annually, from a base of nearly \$900 million in 1975 to nearly \$20 billion in 2009 (FAO, 2011). Growth has been driven by increases in tropical perennial crops, such as rubber, cocoa, coffee, and palm oil.

Despite growth in agricultural production, population and income growth have contributed to Indonesia’s agricultural import increases. The value of agricultural imports grew from over \$650 million in 1975 to nearly \$7 billion in 2009, an 8 percent average annual increase (FAO, 2011).

According to Rada and Regmi (2010) the emphasis of Indonesia’s agricultural policy has shifted from self-sufficiency on food (rice) towards an industrial export-oriented development strategy, since the mid-1980s, and trade liberalisation and a sharp currency devaluation after the Asian financial crisis of 1997 have increased the incentive of producers to focus on tropical perennial crops.

Rada and Regmi (2010) also suggest that research investments have benefited Indonesian agricultural development. Agricultural technology growth between 1985 and 2005 varied across subsectors, being greatest in perennial (export) crops (2.20 percent), followed by livestock (1.70 percent), and least in annual (food) crops (0.67 percent). This analysis suggests that policy reforms and currency devaluation created incentives for increased agricultural trade and generated growth in agricultural productivity. Furthermore, Rada et al. (2010) indicate that technology growth was driven more from private and other non-government sources than from public agricultural research investments.

Poor infrastructure remains an obstacle for rural development in Indonesia. There has been substantial progress in narrowing the gap in access to roads, water, and reliable lighting in the country. Despite this progress, considerable disparities remain between urban and rural sectors, and between rich and poor within each sector. Poor infrastructure in terms of rural roads and irrigation systems are binding constraints to rural development and geographical disadvantages can only be alleviated by the provision of adequate infrastructure.

Geographical isolation will contribute to rural inequality, and less connected localities will have less access to sources of income (inputs, knowledge, markets) and will experience lower rates of growth.

Commercial banks, with a few exceptions, have largely been uninterested in providing finance to agriculture, agribusiness or rural SMEs, and trade-related money flows and trade-related financial products remain weak or non-existent.

In the absence of sufficient formal credit, finance may come either from within the sector itself, through advances between businesses, often in the form of inputs or product, or from financial service providers, ranging from moneylenders to MFIs, and to banks. Financial service providers have funding resources, but may not understand sectors well, and are constrained by legal frameworks and collateral issues. An objective of increasing access to finance to the value chains is to leverage the value chain relationships so that financial service providers can benefit from the advantages that value chain players have in extending credit to each other.

Poverty in Indonesia has been falling both in terms of the poverty rate and total numbers of the poor for the last few decades. Official figures show that poverty in Indonesia fell substantially from about 40 percent in 1976 to 11 percent in 1996 (ADB, 2009). The 1997-98 crisis pushed the poverty rate back up significantly. However, the return of robust economic growth since 2002, amid political and macroeconomic stability, has seen poverty reduction in Indonesia resume (Rajah and McCulloch, 2012).

In 2011 the official poverty rate stood at 12.5 percent, having come down from 23.4 percent in 1999. This means that the total number of the poor in Indonesia fell from 48 million in 2005 to about 30 million in 2011 (BPS, 2011). Despite the rapid urbanisation and the significant structural transformation of the Indonesian economy, the majority of the poor remain rural. They still primarily work in agriculture and derive the majority of their income from agriculture.

Poverty rates have fallen particularly sharply in Eastern Indonesia, Kalimantan and Java. However, the geographic distribution of the poor remains largely unchanged. Java is still home to 56 percent of the poor, including 67 percent of the urban poor and 50 percent of the rural poor in the country (Rajah and McCulloch, 2012).

Eight provinces saw double-digit percentage point reductions in rural poverty rates over the period 1999 to 2005. These were Jambi, East Kalimantan, West Kalimantan, Nusa Tenggara Barat (NTB), Nusa Tenggara Timur (NTT), Maluku and Papua. Of these, only two provinces (NTB and NTT) were able to achieve this without also recording strong growth in the quantity of agricultural production, thus growth in the quantity of agricultural production has been closely associated with reductions in rural poverty across provinces (Rajah and McCulloch 2012).

Rajah and McCulloch (2012) report that 63 percent of poor Indonesian workers were engaged in the agriculture sector in 2008. The importance of agriculture is even more pronounced amongst poor rural workers, of which 75 percent were primarily engaged in agriculture. Trading and industry contributed a further 15 percent of employment for poor rural workers.

Agriculture is therefore an important source of income for the poorest Indonesian households and remains important, although less so, for the near-poor. However agriculture is likely to be even more important as a source of income for poor households in rural areas. However, available data on the sources of income for poor households is less accessible and comprehensive.

Further evidence shows that both agricultural and non-agricultural sources of income are important for rural households in Indonesia, both poor and non-poor. For instance, agricultural income contributed 43 percent of rural households' income in 2002, with about 35 percent coming from self-employment and about 9 percent coming from wages. By contrast, non-agricultural sources provided about 43 percent of rural households' income, with 21 percent coming from self-employment and 22 percent coming from wages (Rajah and McCulloch, 2012).

Available data also shows that around 50 percent of farm income for rural households came from food crops in 2002. Estate crops provide about one-third of farm income for rural households. However, food crops appear to be more important for poor rural households compared to non-poor households. The pattern of income sources for rural Indonesian households has been remarkably stable over time. The largest change was by a sharp jump in the income share of estate crops in household income (Rajah and McCulloch, 2012).

For poor agricultural workers, achieving productivity gains while remaining in agriculture has been the principal means of exiting poverty. It has also been shown that moving from rural agriculture to the rural non-farm economy is important. By contrast, rural-urban migration appears to play a relatively small role in explaining exits from poverty amongst poor rural agricultural workers. While the majority of the poor remain in rural agriculture, remaining in rural agriculture has also been the principal means of exiting poverty in Indonesia.

Women's participation in agricultural production in Indonesia is high, particularly in rice production where 75 percent of farm labour is provided by women (FAO, 2002). Despite women's considerable participation in the agricultural workforce they continue to be largely unrecognised as farmers, fishers, or livestock producers. As a result their work is invisible and they do not have control or power over essential decision making such as resources for production. They have little access to productivity producing inputs such as credit, fertilizer and extension opportunities. They also lack control over their produce (FAO, 2011).

Women have a major responsibility for farm management but little access to training because customarily male heads of households are invited to training sessions (FAO, 2004). Additionally in rural areas women's literacy rates are below those for men and further limit their access to agricultural learning opportunities (BPS, 2012).

The civil code in Indonesia impedes women from entering into contracts on their own behalf, requiring that husbands, by their presence or permission, assist women in formalising contracts. As a result, married women find it difficult to engage in formal financial activities such as accessing micro credit or opening a bank account. Furthermore under Indonesian tax regulation women are not entitled to separate tax numbers, presenting a further obstacle to individual formal agricultural business activities (ADB, 2006).

Female-headed households are particularly vulnerable to fluctuations in household incomes. As a result, women who are the sole income generators are more likely to accept lower rates of income as a trade-off for reliability of their income stream. In Indonesia, more rural female-headed households work than their urban counterparts. NTT has the highest rate of working rural female heads of households, which could identify them as candidates for targeted commodity selection (such as home gardens with fruits



and vegetables, or livestock that does not require them to be far from the household, i.e. chickens), allowing them to stay close to home to accommodate their domestic work burdens.

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### 5.3 Nusa Tenggara Timur

NTT has enjoyed substantial growth along with significant improvement in indicators of social development and poverty reduction over the last decade, although illiteracy and the incidence of poverty remain high, particularly in rural areas. Over the period 2004–2010, poverty rates fell from 27.86 to 20.48 percent. Furthermore, when the number of near poor is also taken into account, the number of people living under vulnerability increases considerably. There is also a relatively high variation in poverty between people living in urban and rural areas in NTT, with rural areas being substantially poorer. Almost half of households (575,943) in the province are poor.

NTT has a relatively small economy compared to other provinces in Indonesia and it is largely an agricultural province where large proportions of the population depend on agriculture for a living. Of the 2,061,229 people reported to be working in the province in 2010, 65 percent work in agriculture. Between 2000 and 2008, the share of agriculture in the provincial economy declined sharply, leading the trend for nearly all other sectors, shifting mainly to services, which increased by 7 percent. In NTT this likely reflects migration out of agriculture due to productivity at or below subsistence, and into services.

The average (per capita) income in the province has risen dramatically in recent years, from Rp 3,658,383 in 2006, to Rp 5,515,943 in 2010 (an increase of 50.8 percent). However, this is still considerably lower than the national average (per capita) income of Rp 23,975,197.

The food crop sub-sector of the agricultural sector is the largest contributor (21 percent) to RGDP in NTT, followed by livestock (10.6 percent), fisheries (4.3 percent), and estate crops (4.3 percent). Maize is considered by the Provincial Government the most important food crop, followed by rice, mungbeans and peanuts. Despite their high production levels, cassava and sweet potato remain out of the government's priority commodity list – both are regarded as an alternative buffer for local food stuff needs. Moreover, there is no established market for them due to the absence of food processing industries in NTT (SADI, 2010).

Most trade that takes place in NTT involves agricultural products, which are predominantly traded in small regional markets and onto larger markets in the main centres.

The main agricultural products exported to other regions include cashew nuts, coffee, candlenut, seaweed, tamarind and cattle, most of which have relatively low added value, and are destined for Surabaya and to a lesser extent to South Sulawesi and Bali (ADB, 2009). Exports from NTT to other countries totalled only US\$17.4 million in 2005 (Barlow and Gondowarsito, 2007). Most products (agricultural, natural resources – especially manganese) from NTT are exported to Australia and other Asian countries. NTT has also been a traditional exporter of seaweed and fish to China and Japan, although in 2008 the export volume for both these commodities dropped significantly (SADI 2010).

There are a number of important constraints to agricultural and rural development in NTT province. At the social and cultural level there is a focus on subsistence farming, limited trust and implementation of the rule of law (theft of crops), and high levels of illiteracy

(Cervantes-Godoy and Dewbre 2010). There are also important gender inequalities due to traditional beliefs, a low status for agriculture and an increasing interest in other more profitable sectors.

Farmers are still regarded as having limited (modern) agricultural knowledge partly resulting from lack of access to formal education and vocational training for farmers, and a limited number of extension workers operating in the province. In 2010, NTT had a total of 1,392 agricultural extension workers, most of which (1,096) were men. Furthermore, farmers lack incentives (and support) to invest in practical technologies, which can improve quality and quantity of production.

Productivity levels for most commodities are still below the national average due to pests, crop age, poor soil fertility, and climatic problems. Productivity is further impacted by poor irrigation infrastructure; even when infrastructure does exist, it is mostly poorly maintained.

Physical infrastructure, such as roads, ports, and rural utilities (i.e. electricity, sanitation and safe water) is also limited, complicating access to retail markets where prices tend to be better.

In terms of marketing, there are weak links between different value chain actors, farmers have limited access to market information, there is a limited infrastructure to store, process, handle and transport products, and there is generally limited product certification. A reported lack of processing industries and large traders also limit market opportunities for small farmers.

Access to credit for farmers in NTT is limited due to the perceived high risk and lack of financial instruments to help farmer's access money. Only 1.3 percent of credit from the government and 1.4 percent of credit from private banks goes to the agricultural sector. There are also problems with land rights and titling, which creates obstacles for access to credit and undermines and discourages investment.

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## 5.4 West Nusa Tenggara

NTB has enjoyed substantial growth along with significant improvement in indicators of social development and poverty reduction over the last decade. In recent years, equity in access to education has improved, although completion rates are still low and gender disparities in access to education and completion persist. Literacy rates have improved, but at 81.05 percent are still lower than national rates.

While poverty rates in NTB have declined from 28.1 percent of the population in 2000 to 21.6 percent in 2010, the incidence of poverty remains high, particularly in rural areas. When the number of near poor is taken into account, the number of people living under vulnerability increases considerably to almost 60 percent.

The economy of NTB is dominated by the mining and quarrying sector, which contributes 36.3 percent of GDP. Second to this is the agricultural sector with a contribution of 19.9 percent of GDP. Industry accounts for only 5 percent of GDP. The growth of the economy of NTB province in 2010 was estimated at 6.3 percent (SADI, 2011).

Agriculture is clearly important to the economy of NTB. It is a major production sector, the largest employer, and the sector that the poor rely on most for subsistence. Over 47

percent of the population over the age of 15 works in agriculture, thus making it the largest employment sector in the province.

The NTB government's strategy to develop agriculture is to support the cultivation of rice as the principal commodity, and focus on three other commodities throughout the province, namely cattle, maize and seaweed (SADI 2010). However, productivity levels for most commodities in the province are still below the national average.

Of the 1,106,599 ha of potential agricultural area in NTB, only around half (497,893 ha) is used for agricultural purposes (SADI, 2011), suggesting an opportunity for expansion of farming activities. The average size of plots is 0.52 ha.

Most trade that takes place in NTB involves agricultural products, which are predominantly traded in small regional markets and onto larger markets in the main centres.

The main agricultural commodities exported by NTB are maize and cashews, according to SADI (2011). While maize is mainly marketed to Bali and East Java, some is also exported to Malaysia. In 2007, 3,000 tons of maize was exported to Malaysia from NTB. Prices fluctuate between 1,700 and 2,800/kg dry grain. SADI (2011) also reports that cashews are exported to India and Vietnam (for further processing), and to China (without information on volumes and/or values).

As in other provinces in Indonesia, the irrigation infrastructure in NTB is poor and has been poorly maintained. The physical infrastructure, such as roads, ports, and rural utilities (i.e. electricity, sanitation and safe water) is also limited, complicating access to retail markets where prices tend to be better. For instance, only 45.6 percent of roads are considered to be in good condition.

The processing industry needed to support the agricultural sector has been showing good performance, although agro-industries – important in an economy dominated by agricultural employment – are still a very small component of the agricultural sector.

There are a reported 208 branches of commercial banks and 112 branches of the rural bank scattered around NTB province. There are also 3,551 reported cooperatives operating in the province as well as 17 micro finance institutions. It is estimated that among these financial institutions they have provided credit for up to Rp 9.5 billion. However, it is unclear as to how much of this credit has been allocated to the agricultural sector and how.

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## 5.5 East Java

East Java has made important improvements in social and economic development in recent years, however it still lags behind in a number of key social and economic indicators. East Java ranks relatively low in most education attainment indicators compared to other provinces in Java and the national average. In 2008 the adult literacy rate of men and women in East Java was 92 percent and 83 percent, respectively, both lower than the national level of 95 percent and 89 percent.

Although East Java has almost universal access to primary education, access to secondary education is still low and a challenge for many districts. In 2009, the net enrolment rate in East Java was 95 percent for primary level, 70 percent for junior secondary, and 48 percent for senior secondary level.



East Java has the largest number of people living in poverty in Indonesia (BPS, 2011). In 2011, the poverty rate was 13.9 percent, ranking among the top ten poorest provinces in Indonesia, above the national poverty rate of 12.4 percent (BPS, 2012). In absolute terms, this figure represents about 5.2 million people in East Java who live below the poverty line, higher than any other province in Indonesia. Nevertheless, the poverty rate in East Java declined from 23 percent in 2000 to 17 percent in 2009 to the current 14 percent in 2011.

Poverty in East Java is a largely rural phenomenon. During the last decade, the poverty rate in rural areas has been consistently higher than in urban areas and the ratio of rural to urban poor was 1.7 in 2009. When the number of vulnerable people is considered, the near poor—defined here as the number of people under the official poverty line multiplied by a factor of 1.5—cause the rates of poverty in East Java to increase considerably to more than 50 percent.

East Java is the second largest contributor to Indonesia's economy. The largest contributor to the RGDP in East Java at current prices in 2010 were the trade, hotel and restaurant sector with 29.5 percent, followed by the manufacturing industry sector with 27.5 percent, and the agricultural sector with 15.8 percent. Economic growth in East Java in the last three years has been of 5.9 percent (2008), 5 percent (2009), and 6.7 percent (2010) (BPS, 2012).

There has been very little change to the economic structure of the province in the last decade and growth in agriculture and industry has been slow. Economic growth suffered a major set-back due to the Asian financial crisis in 1997. Despite this, the average annual income per capita of Rp 8.2 million (in 2008) has remained the second highest in Java and among the top ten in the country (World Bank, 2011).

Agriculture takes up about 74 percent of the land in East Java and there is limited opportunity to expand beyond this (World Bank, 2011). There is also a low land-labour ratio with too many farmers working the limited available land, resulting in a large number of smallholdings, with an average 0.4 ha per household with slight variations between districts (World Bank, 2011). Such relatively small plots are thus mainly focused on subsistence farming, with limited surplus produce for sale. Ninety percent of farmers who sell their products often face low prices and high production costs.

A recent report by the World Bank (2011) suggests that improvement in land to farmer ratio can only happen if the numbers of farmers are reduced by helping them move out to other non-farming employment. Interventions to achieve this may want to focus on facilitating diversification into higher value-added agriculture products such as horticulture, livestock breeding and organic farming; improving the skills through extension services and non-formal trainings; and providing greater access to credit (World Bank, 2011).

The majority of agriculture employment in East Java consists of unskilled labour. In 2009, 94 percent of labour in the agricultural sector was unskilled (World Bank, 2011).

East Java has a total of 907,374 ha of irrigation, divided between small-scale irrigation within the district, inter-district irrigation and inter-province irrigation.

The province suffers from poor transport infrastructure. Overall, district roads remain in a worse condition than provincial or national roads, affecting farmers and many smaller rural businesses. Poor roads are a significant obstacle to the integration of producers to large wholesale and retail markets, where they can fetch better prices than at local village

markets or from collectors. The state of the infrastructure and transport links influences both the cost and length of time needed for transportation, thus directly affecting profitability and competitiveness.

East Java's ratio of credit to GDP is relatively low compared to other large provinces in Indonesia. At 19 percent of its GDP, credit in East Java is lower than the national average of 31 percent. Agriculture is still deemed as a risky investment sector by banks (94.7 percent of farmers never obtain credit). The share of credit allocated to the agriculture sector remains low at only 4 percent for the last three years. The low proportion of credit allocated to the agriculture sector is similar with trends in other provinces. The default risk in agriculture is perceived as high.

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## 5.6 Conclusion

Indonesia is still a youthful country, with more than 70 percent of its population under the age of 40. It is also a country growing at a relatively low rate of 1.49 percent per year, with average annual growth rates in rural areas only 0.77 percent over the last decade (UNDP, 2012). Despite important improvements in education, a large proportion of Indonesia's population is unskilled. Addressing this problem will require sustained efforts from the public and private sector in education and training. Furthermore, while gender gaps in primary and secondary education are beginning to close, women tend to receive less further education and vocational skills training, which prevents them from pursuing their own livelihoods. Women are also less likely than men to be reached by extension services to be able to increase the resilience of agricultural livelihoods.

Low levels of productivity are causing migration out of agriculture due to productivity at or below subsistence and into services or government employment. In some cases, this is highly gender-biased. However, overall rural to urban migration appears to play a relatively small role in explaining exits from poverty amongst poor rural agricultural workers. While the majority of the poor remain in rural agriculture, remaining in rural agriculture has also been the principal means of exiting poverty in Indonesia (Rajah and McCulloch, 2012).

Agriculture is increasingly consuming most of the land in some parts of the country, most notably in East Java, and soon there will be limited opportunity to expand beyond this. As more and more farmers work the limited available land, this will result in a larger number of smallholdings. Such relatively small plots, which are mainly focused on subsistence farming, have limited surplus produce for sale. These types of farmers who sell their products often face low prices and high production costs. Increasing production will depend more on increasing productivity and making better use of existing resources, which will only come about with better agricultural techniques, acquired through training and education.

Typically, non-farm activities are a way out of poverty. However, there seems to be very limited available and reliable information in this area, which therefore warrants further study. It is important to note, nonetheless, that adequate infrastructure is key for the development of non-farm activities, mainly rural SMEs. Reliable rural roads help rural populations access key services, including education and health, and improve opportunities for non-farm income generating activities. However, the infrastructure in Indonesia—including the three provinces under study—is limited and poor, especially in rural areas. The poor state of much infrastructure limits the potential of individuals to

access social services, such as schools and hospitals, and develop business opportunities. This also includes access to clean water, electricity and irrigation systems. Improving the populations' access to social services and better infrastructure will be key in poverty alleviation efforts.

The transportation infrastructure in Indonesia is also generally limited. The preferred method of transporting goods within and between islands in the selected provinces is trucks and ferries. When public transport is weak and receives relatively little investment, many families and individuals are tempted to buy (cheap) cars or motos. The rise in the number of private vehicles in Indonesia has been accompanied by a significant expansion in (poor quality) road networks, while rail networks in contrast have seen decreases. However, the quality of roads remains generally poor, particularly in rural areas, affecting the poorer families more. At the provincial level, this presents a stark picture. Few quality roads and the resultant high numbers of impassable roads, makes access to farm lands and markets difficult.

While overall poverty levels in Indonesia, and the three provinces under study, have decreased, the geographic distribution of the poor remains largely unchanged. The majority remain in rural areas, where around half the country's population lives, still primarily working in agriculture and deriving the majority of their income from agriculture, despite the rapid urbanisation and significant structural transformation of the Indonesian economy.

Addressing poverty through smallholder commercialization is a big challenge as there are a number of determinants in commercializing smallholder agriculture. Consideration has to be given to both the input and output sides of production, together with the decision-making behaviour of farm households in production and marketing simultaneously. Production decisions of commercialized farmers are based on market signals and comparative advantages, whereas those of subsistence farmers are based on production feasibility and subsistence requirements, and selling only whatever surplus product is left after household consumption requirements are met (Jaleta, Gebremedhin et al. 2009).

Perceived financial and labour risks compel subsistence farmers to stick to the self-sufficiency objectives both in their production and consumption decisions. Furthermore, market and price fluctuations make market-oriented resource-allocation decisions of semi-subsistence farmers difficult, as cash income is increasingly important to guarantee household food security. Policy measures and focused interventions can play an important role in mitigating these risks. This can include improving the links between farmers and input sellers and buyers, to facilitating farmers' access to information and/or credit in kind.

Whether smallholder commercialization creates more employment opportunities depends on the nature of the commodities grown, the technologies used in the production process, and whether additional agricultural processing is involved. This review has found however, that for most food and estate crops the processing capability is limited.

Increasing market participation has a positive impact on value chain actors such as input suppliers, output traders, transporters, processors, financiers and others. These actors may change the forms of products via processing, storing or transporting from one point to another based on market demands.

The drive towards a higher level of commercialisation consistent with broad-based growth and increasing farmer incomes depends on several factors, including effective institutions;

improved infrastructure; knowledge management; adequate incentives; stakeholder's initiative; and finally, a conducive environment.

Institutions, both formal and informal, have an important impact on the economic performance of different sectors and in the facilitation or hindrance of a smallholder commercialization process. Values, norms, sanctions, taboos, cultures and traditions also strongly influence smallholder production and marketing decisions, including those related to input use. Socio-cultural and religious factors determine consumption preferences of households, which can be a motivating or demotivating factor for household commercialization (Jaleta, Gebremedhin et al. 2009).

Factors facilitating commercialization are mechanisms which will reduce transaction costs arising from activities such as exchange of goods and financial assets; enforcement of contracts; risk reduction; formation of organizations; and the acquisition and dissemination of information. Other important factors in increasing farm family incomes and agricultural commercialization include markets; contracts; farmer organizations and trade associations; standards; the formalisation of business transactions; monitoring and evaluation; research and extension; and credit and insurance.

Improved infrastructure facilitates the movement of commodities, people and information, enhancing both the process of finding new commercial opportunities and the gains from price difference over space and over time. Lower transportation and marketing costs contribute to increased demand resulting in larger volumes of production and smaller margins between farmer and consumer prices. The building of new infrastructure and the rehabilitation and proper maintenance of existing infrastructure are both essential (Purcell, Gent et al. 2008).

Finally, for commercialization to thrive there has to be cooperation among different stakeholders (in order to gain from improved access to technology, credit and markets) and the will to innovate (in order to stay abreast of competition from domestic and international markets). However, cooperation and innovation will not occur unless there are appropriate incentives and policies in place (Purcell, Gent et al. 2008).

As this review highlights, there are important data gaps among the three selected provinces, which is further accentuated at the district level. Whilst this may impede a clear assessment of the preferred commodities to select for this study, it provides clear guidance as to where further research needs to be done and areas where the upcoming value chain studies can contribute to data collection. This includes information on prices and the creation of value along the value chain; existing wholesale and retail markets at the district and provincial level; processors and processing facilities; the state of irrigation at the district level; the role of collectors and traders in marketing; and the different sources of income of poorer households in different districts and the proportion of each source of income to the total income.