EI-ADO Value Chain Growth Patterns Synthesis Report

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Introduction

This brief report on value chain growth patterns is one of a series of reports synthesizing the main findings across the ten commodity value chains studied as part of the Eastern Indonesia – Agribusiness Development Opportunities (EI-ADO) project. Other short synthesis reports in this series include an analysis of export and important patterns, chain structure, chain conduct and spatial patterns of the various commodities studied.

Growth Patterns

Seven of the 10 EI-ADO commodity sub-sectors have had a strong or very strong growth performance in recent years (see Table 1). Domestic production of maize, chilli, tomato, soybean, and mango expanded by 30% or more between 2007 and 2012. The cattle herd increased by nearly 40%. Shallot production experienced a more modest (but still significant) 20% growth. In contrast, potato production in 2012 was only 9% higher than in 2007, while the peanut and mungbean harvests were 10% and 12% lower, respectively. In Indonesia, potato and legume production is severely constrained by the poor quality of seed available to farmers (Wheatley *et al*, 2013; Cambon, S and Rachaputi, C.N. 2013).

Table 1: Growth (%) in the production of EI-ADO commodities in Indonesia, 2007-12

Commodities	Change in area (%) 2007-2012	Change in yield (%) 2007-12	Change in production (%) 2007-12	Average annual growth (%) 2007-12
Small chilli	26.3	23	55.4	11.1
Maize	9.3	33.5	45.9	9.2
Soybean	23.6	15.1	42.3	8.5
Big chilli	12	25.9	41	8.2
Tomato	10.1	27.7	40.6	8.1
Cattle	n.a.	n.a	38.8*	7.8*
Mango	7.7	21.6	30.7	6.1
Shallot	6.2	13.1	20.1	4
Potato	5.8	3	9	1.8
Peanut	(15.3)	6.6	(9.7)	(1.9)
Mungbean	(20)	10.2	(11.9)	(2.4)

* % change in the cattle head number

Source: Author's calculations based on BPS data

While recent growth figures for soybean may suggest that this is a special case amongst legume crops, it should be noted that in 2007 Indonesia had a very poor harvest and that production has been falling since 2009, despite a context of very high prices, partly as a result of rising purchases from China, which accounts for half of world imports, and partly as a result

of increased use of soybeans in the production of biofuels, especially in the United states, the world's second largest exporter. Soybean production in Indonesia peaked in the early 1990s, but has been in decline ever since. In 2012 Indonesia produced 843,000 tons, about half the total volume harvested three decades earlier (BPS, 2014). Mungbean and peanut production peaked in 2003 and 2004, respectively. A secular decline in soybean planted areas and recent reductions in peanut and mungbean cultivated areas are a strong indication that farmers have other, more profitable crop options.

Productivity gains were a major, often the main, source of growth in crop production (refer to Table 1). This provides strong evidence that the agricultural sector in Indonesia is undergoing a rapid process of commercialization and technical change, characterized by adoption of more productive varieties, increased use of other external inputs, and/or improvements in farm management practices. Yet, as discussed later in this report, not all regions or provinces have enjoyed strong productivity gains. Parts of Eastern Indonesia, for example, particularly NTT, have performed very poorly in this regard.

Favorable domestic demand conditions enabled significant growth in crop production. Consumer demand for food products such as meat, fruits and vegetables, and intermediate demand for maize, the main ingredient in poultry feed, has been rising rapidly as a result of economic growth, population growth, and urbanization.[1] Significant increases in the production of most EI-ADO crops could therefore be absorbed by the domestic market without major negative impacts on prices. This is important in a context where exports of these crops are insignificant (see *Synthesis Collection_ Export and Import Patterns*).

In Eastern Indonesia, growth in cattle numbers exceeded the national average (see Table 2). Government programs made a significant contribution to the expansion of cattle herds in the region through the distribution of large numbers of animals and the provision of financial incentives for pregnant females to farmers organized in groups (Waldron *et al*, 2013). Government also subsidizes credit for cattle purchases, but bank disbursement rates have been low. Cattle numbers have increased to such an extent that some researchers have started raising concerns about over-stocking, i.e. the ability of the local feed resource base to sustain the cattle population (Waldron *et al*, 2013). This has led to recommendations for greater emphasis on intensification of cattle production systems, a process that is associated with increased slaughter rates and animal weight, as a source of future growth (Waldron *et al,* 2013).

Maize production in Eastern Indonesia also increased at a faster pace than in the country as a whole (see Table 2). Large-scale distribution of free or subsidized seed by government has fueled this growth, particularly in NTB, where production increased fivefold in just five years. Part of this growth was at the expense of other crops, but part reflected the spreading of maize cultivation into grazing land and newly cleared forest areas, with negative environmental consequences (Flewelling *et al*, 2013). Questions should be raised, therefore, about the rationale for continued subsidization of maize seed in NTB.

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[1] *In real terms, the per capita GDP in Indonesia increased, on average, by 4.5% per annum between 2007 and 2012 (author's calculations based on BPS data). The population expanded by nearly 1.5% per annum (BPS, 2013). And by 2010 49.8% of the Indonesian population was living in urban centres, compared to 41.9% in 2000 (BPS, 2011; BPS 2001).*

Table 2: Growth (%) in production of EI-ADO commodities in Eastern Indonesia, 2007-12

Commodities	East Java		NTB		NTT	
	Change in yield %	Change in production %	Change in yield %	Change in production %	Change in yield %	Change in production %
Small chilli	25.4	73.6	28.1	(19.7)	(31.3)	15.2
Maize	37.2	48	95.7	432.8	10.8	22.4
Soybean	29.8	43.6	(1.9)	8.4	1.2	78.2
Big chilli	(6.8)	35.1	16.6	69.2	(41.9)	(17.5)
Tomato	32.1	86.6	87.5	149.5	(52.2)	(17.6)
Cattle	n.a.	83.2*	n.a.	80.5*	n.a.	46.6*
Mango**	35.6	27.1	(19.7)	10.5	(23)	19.4
Shallot	9.3	(2.3)	(11.2)	12	(38.2)	(71.2)
Potato	26.1	79.3	52.9	255.5	(59.9)	(74.9)
Peanut	11.1	8.6	18.1	18.2	(5.1)	1
Mungbean	6.8	(16.8)	32	(16.6)	3.4	(44.8)

* % change in the number of cattle heads

** Data for mango is for the 2007-11 period

Source: Author's calculations based on BPS data

Recent growth trajectories for other EI-ADO crops varied considerably across Eastern Indonesia (refer Table 2). With some exceptions, vegetable production increased significantly in East Java and NTB, but contracted in NTT. There was strong growth in the soybean harvest in NTT and East Java, but not in NTB. However, unlike East Java or NTT, this province experienced robust growth in peanut production. Mungbean cultivation fell significantly in all three provinces.

During the period under analysis, NTT had a very poor productivity growth performance (see Table 2). The emerging picture is one of very little or no technical change at farm level. Indeed, there were significant declines in farm productivity for six of the ten crops under review. Productivity was largely stagnant for three other crops. Only in the case of maize was there some noticeable increase in farm yields, although to a much lesser extent than in East Java or NTB. The significant maize yield gap between NTT and other provinces widened as a result (see Table 3). In NTT maize is a food staple, a major reason why local farmers grow open-pollinated varieties. In East Java open-pollinated varieties are largely confined to Madura Island, where most production is also for human consumption, whereas in NTB they are being rapidly replaced by hybrids supplying the poultry feed industry (Flewelling *et al*, 2013).

As shown in Table 2, East Java achieved moderate to high productivity gains for all but one of the EI-ADO crops. NTB experienced considerable yield gains for seven crops. Maize and tomato yields in this province nearly doubled between 2007 and 2012. Farmers in East Java and NTB seem to enjoy a favourable environment for innovation, with high population densities and proximity to major consumption centres certainly playing an important role. The context in NTT is very different. Incentives for investment in productivity-enhancing technologies are undermined by long distances to major consumption centres. Input markets are also poorly

developed. This is partly a consequence of relatively low population densities, but also reflects the extensive nature of production systems and the limited ability of rural households to take risk and invest in farm production.

Despite an impressive productivity growth performance, East Java and NTB still have a much less productive fruit and vegetable sector than West Java, the most advanced horticultural production area in Indonesia. As shown in Table 3, for crops such as chilli, tomato, potato, and mango, farmers in those two provinces achieve considerably lower yields than those in West Java. Differences in the productivity of mango farms are particularly surprising because Eastern Indonesia enjoys much more favourable (i.e. drier) weather conditions. Clearly, much can be learned from West Java's horticultural development experience. Comparative production systems' research could shed much light on opportunities for improving the competitiveness of fruit and vegetable farms in eastern Indonesia through changes in variety portfolios, management practices, or both. Development agencies and programs should also take advantage of opportunities for exposing farmers and traders from Eastern Indonesia to intensification experiences in West Java.

Table 3: Average crop yields in East Java, NTB, NTT and Indonesia in 2010-12 (tons/ha)

Commodities	East Java	NTB	NTT	West Java	Indonesia
Maize	4.7	4.9	2.5	6.5	4.6
Small chilli	4	4.5	3.7	11.8	5.1
Big chilli	5.8	8.6	4.3	11.4	7.3
Shallot	10	8.2	2.8	10.1	9.7
Potato*	13.2	16.9	5.8	21.7	16.4
Tomato	13.3	19.4	7.4	28,6	15.7
Peanut	1.3	1.4	1.2	1.5	1.3
Soybean	1.5	1.1	1	1.6	1.4
Mungbean	1.2	1.1	0.9	1.1	1.1
Mango*	9.3	10.9	11.6	13.4	10.1

Source: BPS

All references are contained within the Synthesis Collection_References document.