Vegetables

Priority statement

The sector offers a **MEDIUM to HIGH** potential for pro poor development. Vegetables produce higher seasonal returns than food crops such as maize and rice. Horticulture has led agricultural growth in revenue share (albeit from a low base of 7.3%) by 12.4% per year from 1999-2005. By way of comparison, food crops percentage share of agricultural revenue declined by nearly 10% over the same period, down to 51.8%.

There are major opportunities in EJ for increasing productivity across a large number of farmers. Greater challenges exist in NTT and NTB due to supply chain inefficiencies and inadequate cold chain infrastructure.

Table 1 below summarises vegetable production across the three project provinces. East Java produces a significant proportion of Indonesia's vegetables while NTT and NTB produce comparatively little but can leverage other advantages.

Table 1. Summary of production of select key vegetables in selected provinces in Indonesia

Cabbage	East Java	West Nusa Tengarra	East Nusa Tengarra	Indonesia
Area (Ha)	9,993	418	154	109,634
Production (tonnes)	181,344	9,726	854	1,048,934
Yield (t/Ha)	18.2	23.3	5.6	9.6
% of national production	17.3%	0.9%	0.08%	
Chilli	**East Java**	**West Nusa Tengarra**	**East Nusa Tengarra**	**Indonesia**
Area (Ha)	57,706	4,687	1,477	237,105
Production (tonnes)	213,674	18,870	5,968	1,328,864
Yield (t/Ha)	3.7	4.0	4.0	5.6
% of national production	16.1%	1.4%	0.45%	
Potato	**East Java**	**West Nusa Tengarra**	**East Nusa Tengarra**	**Indonesia**
Area (Ha)	8,561	367	129	66,531
Production (tonnes)	115,423	5,130	542	1,060,805
Yield (t/Ha)	13.5	14.0	4.2	15.9
% of national production	10.9%	0.5%	0.05%	
Shallot	**East Java**	**West Nusa Tengarra**	**East Nusa Tengarra**	**Indonesia**
Area (Ha)	26,507	10,159	923	67,531
Production (tonnes)	203,739	104,324	3,879	1,385,044
Yield (t/Ha)	7.69	10.3	4.2	20.5

% of national production	14.7%	7.5%	0.28%	
Tomato	**East Java**	**West Nusa Tengarra**	**East Nusa Tengarra**	**Indonesia**
Area (Ha)	4,439	1,335	870	61,154
Production (tonnes)	56,342	25,639	6,151	891,616
Yield (t/Ha)	12.69	19.2	7.1	14.6
% of national production	6.3%	2.9%	0.7%	

Source: Badan Pusat Statistik 2011

The Socio-Economic Review touches on other vegetables produced within the study regions.

Poverty and sustainability

Is there potential to reach large numbers of poor households in production and post-production?

- Yes. While no specific data for EJ, NTB and NTT exists, the agriculture sector accounts for up to 43% of total employment. Of this the food crop subsector employed about 27 million people, in the early 1990s. Many farmers in East Java and NTB grow vegetables as a part of a rotation with rice. The majority of the cropping is done in the dry season.
- The pattern of Indonesian agricultural production has increasingly shifted away from food crops. with a decline in revenue share of agricultural production of 9% from 1999 to 2005) still dominant share of agricultural production at 52%) and particularly towards horticulture and estate crop production. The bulk of agricultural production in Indonesia remains in food crops. Nonetheless, the bulk of agricultural production in Indonesia remains in food crops but their % revenue share has declined by 10% of the past 20 years.

What is the potential to increase income for producers?

- The supermarket trade consistently provides farmers with the highest returns when compared to selling through collectors and traders.
- By way of example, there is potential to increase per capita smallholder household income by around 80% by selling in modern chilli chains compared to traditional markets. Typical issues include:
  1. Low productivity;
  2. Benefiting from opportunities for value adding on the farm;
  3. No post-harvest or cold chain management;
  4. Market development opportunities and;
  5. Weak farmer bargaining power
- Prices for most vegetables show a higher seasonal variation compared to rice. Vegetables are expensive to produce but if input costs are managed the returns are favorable compared to food crops.

Does the chain/commodity fit with the focus of Government programs and priorities?

Yes, horticulture is a high priority for the Indonesian Government in terms of increasing productivity and achieving self-sufficiency.

- The 2010 horticulture bill placed greater restrictions on importation and applied favourable status to domestic production of vegetables.
- Trade and market liberalisation has encouraged diversification into higher-value export crops and increased government spending on agriculture services, irrigation, and research on specific high-value crops.

How project-crowded is the sector? (To what extent are sector needs addressed by the current donors?)

- Not excessively crowded. However a number of value chain studies have been recently completed looking at specific commodities in the vegetable sector such as chillies.
- ACIAR has multiple projects aimed at plant protection and enhancement of production with improved varieties.

What is the agro - ecological feasibility?

- Vegetables are well suited to being grown in rotation with staple crops, but management of water is a key issue in the dry season.
- Highly feasible if water is managed and provided in the dry-season.
- Indonesia has a wide geographic potential for vegetable production and generally benefits from higher altitudes than many other countries in the region.
- European and subtropical vegetables can be grown in areas with elevation particularly in East Java.
- However vegetables can be grown in three zones in Indonesia including highlands, medium altitudes and; lowland rain-fed areas.

Sustainability (economic and environmental)

- Economic sustainability is moderate to high because demand is growing in terms of consumption, while environmental sustainability is determined by the management of inputs.
- Economic potential is tempered by the continued high input costs of many commodities within the sector.
- High use of herbicide and pesticide chemicals is a major concern in the sector in terms of human health but also in terms of chemical residues polluting water sources.
- The vegetable sector also is a major user of inorganic fertilisers which has well known environmental problems in terms of water pollution.

External risks

- There is higher risk in vegetable production than staple crops due to higher input costs and increased management required during the growing season, but returns are also much higher.
- There is a perceived risk by small holder farmers. Food security issues are high for many farmers in NTB and NTT due to lower rainfall and the extended dry season.
- The variability in vegetable production is considered higher than staples such as rice or maize. Yield and area data can vary significantly from year to year which in turn leads to price instability and uncertainty by farmers.

Structure of the chain

Is there potential for post-harvest productivity/value-added?

- There is a high potential for post-harvest improvements. Reducing post-harvest losses, targeting production quality to consumer demand (organic or niche markets), supplying directly to supermarket chains are examples of opportunities to increase profitability for producers.
- Vegetables offer a wide range of product transformation opportunities. Processing is currently under capacity in Indonesia, with many processors importing dried vegetables for food processing to make up for lack of supply at certain times of year eg. Chillies.
- With regards to potatoes, there is an opportunity to make available good quality seed stock which could be further processed to saleable frozen French Fries.

What is the potential for improving market access?

- Vegetables are in high demand domestically and internationally. Improvements in post-harvest technologies to cater towards the rapidly expanding supermarket sector are a major opportunity for vegetable growers.

What is the scalability and transferability potential?

- Moderate to high potential. The vegetable sector is concentrated in Java with East Java a major supplier of chillies and shallots in particular.
- NTB and NTT have less productive capacity; however the production techniques and technology such as irrigation are scalable to these areas given the correct social context. e.g. lessons learned from embung constructions (water storage capture of wet season runoff).

Is there sufficient infrastructure availability?

- No. Cold storage infrastructure is a serious limitation to the sector as is other post-harvest facilities such as sorting and grading.
- Distance and low quality roads and ports are deficiencies that afflict many sectors including that of vegetables.