

# Land Areas and Nutrient Demands for Important Crops in Southeast Asia

World population reached 7.3 billion in 2015, and is expected to grow to more than 9.5 billion in 2050 (World Bank, 2016). The world's population needs to eat. Global demand for food is rising. Worldwide, crop production needs to increase, either by exploiting new arable land, or by enhancing productivity on existing agricultural land through better management and improved genetic materials.

Southeast Asia will have a critical role to play – to provide for its own growing population, and people elsewhere, supplying some of the world's most important food and non-food agricultural commodities. These, amongst others, include rice, palm oil, as well as maize and cassava based products.

Agriculture is the principal economic activity in Southeast Asia. Every year, more land is being used for food production. New databases by the Food and Agriculture Organization of the United Nations (FAO) and the United States Department of Agriculture (USDA) provide insight into these global developments. Data of the FAO (2015) illustrate the trajectory of land dedicated to some important crops in Southeast Asia (Figure 1).

In 2013, the top 10 crops in area harvested in Southeast Asia were rice, oil palm, maize, coconut, cassava, beans, sugar cane, coffee, cocoa, and sesame. The data indicate significant land use changes with rice reaching almost 50 million ha, up from 31 million in 1970. Similarly, maize area grew by about a third from 6.5 million to 9.6 million ha over the same period, whereas cassava area doubled to 3.7 million ha. Oil palm, however, outgrew everything else from a mere 0.3 million ha in 1970 to more than 12 million ha in 2013.

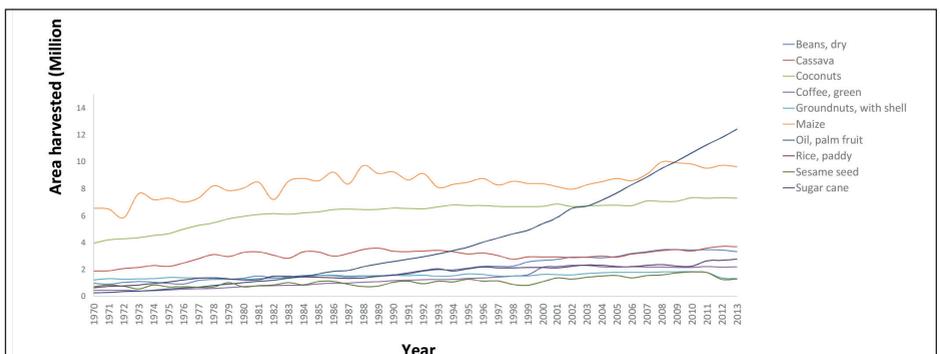


Figure 1: Trend in area harvested for the top 10 crops in Southeast Asia, 1970 to 2013 (FAOSTAT, 2015). Southeast Asian countries include Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Timor-Leste and Vietnam.

Total production for some of these commodities in Southeast Asia reached staggering values (Table 1): rice (grain) and oil palm (fresh fruit bunches) each comfortably breached 200 million tons in 2013. Maize production in Southeast Asian countries was close to 40 million tons in 2013, and that of dry cassava roots above 25 million tons.

Table 1 highlights the significant amounts of nutrients required to produce these crops. Rice grains extract more than 3 million tons of nitrogen and potassium from Southeast Asian soils, and about 0.6 million tons of phosphorus. The fresh fruit bunches of oil palm that grew in Southeast Asia in 2013 required 0.7 million tons of nitrogen and close to 0.9 million tons of potassium to grow. These values do not include those for other parts of the crops. A large part of these nutrients are being exported from where the crops grew, and hence are permanently removed. If not replaced by external supply of nutrients, the production of agricultural crops will contribute to soil degradation by nutrient mining. There are several crops that are today grown on large areas of land, and where sustainable nutrient management is not always part of the management process. These commodities amongst others include cassava, maize, cocoa, coffee, sugarcane or coconut. Farmers, commodity processors and the fertilizer industry need to engage constructively to avoid environmental consequences.

Table 1. *Total nutrients requirements for key crops in Southeast Asia. Southeast Asian countries include Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Timor-Leste and Vietnam.*

	Land, Million Ha		Production, Million Tons	Total Nutrient Use in Million Tons, 2013			Nutrient Use in Kg per Ha, 2013		
	1970	2013		N	P	K	N	P	K
Rice <sup>1</sup>	31.5	49.7	212.4	3.10	0.57	3.38	62	12	68
Maize <sup>2</sup>	6.5	9.6	39.9	0.72	0.10	0.69	75	11	72
Oil palm <sup>3</sup>	0.3	12.4	230.7	0.71	0.09	0.89	57	7	71
Cassava <sup>4</sup>	1.9	3.7	27.3	0.48	0.06	0.43	130.46	16.31	115.63

<sup>1</sup> Rice nutrient use values: Buresh *et al.*, 2010

<sup>2</sup> Maize nutrient use values: Setiyono *et al.*, 2010

<sup>3</sup> Oil palm fresh fruit bunch nutrient use values: Donough *et al.*, 2016

<sup>4</sup> Production as dry roots (36% dry matter content), nutrient use values: Byju *et al.*, 2012

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**References:**

Refer to the last printed page of this diary for sources.

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