

Reinvigorating Cambodian Agriculture: Transforming from Extensive to Intensive Agriculture*

Nith Kosal[†] Ly Singhong[‡]

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Abstract

In this paper we analysis to identify the factor constraining on Cambodian agriculture in transforming from extensive to intensive agriculture. The objective of this study was to examine the general situation of Cambodian agriculture by comparing with neighboring countries in Southeast Asia from a period of 22 years (1996 – 2018) through cultivate areas, technical using, technologies using, fertilizer using, agricultural infrastructure system, agricultural production cost, agricultural output, agricultural market and climate change. The results show that the Cambodian agriculture sector is still at a level where there is significant need to improve the capacity of farmers, the new technologies use and the prevention of climate change. However, the production cost is still high cost and agricultural output has been in low prices. It also causes for farmers to lose confidence in farming and they will be stop working in the sector. Moreover, we also have other policies to improve agriculture sector in Cambodia.

JEL classifications : F13, O13, Q13, Q16, Q18.

Keywords: Agricultural Development, Agricultural Policy, Agricultural Technology, Intensive Farming, Farmer Education.

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[†] Student of Economics and Management at Université Lumière Lyon 2, relocated to Royal University of Law and Economics. Email: kosal.nith@univ-lyon2.fr

[‡] Student of Economics and Management at Université Lumière Lyon 2, relocated to Royal University of Law and Economics. Email: singlong.ly@univ-lyon2.fr

1 Introduction

Cambodia is a post conflict country, newly emerging from two decades of war and civil strife (1970s and 1980s) and a decade of internal conflict and unstable politics (1990s). Many of the critical development issues currently facing Cambodia such as food security and poverty reduction challenges can be attributed to these three decades. Cambodia transformed from a centrally planned to an open market economy starting in 1989 (Chuon Naron, 2015). Land ownership was officially recognized in 1989; trade, industry and transport had also been liberalized and privatized by then. The free market economy policy was officially adopted in 1993 when the Royal Government of Cambodia was formally established. Since the government's first Legislature, a number of national strategies and development plans have been drawn up to execute the development of the country. The overarching priority of national development policies is to promote socio-economic development to lift the country's poor out of poverty and place the country on a path of sustainable economic growth (RGC, 2018). Following more than two decades of strong economic growth, Cambodia has attained lower middle-income status with gross national income (GNI) per capita reaching US\$1,230 in 2017¹, Cambodia has sustained an average growth rate of 7.7% between 1995 – 2017, the sixth fastest-growing economy in the world (Sodeth and Miguel, 2017). The tourism and agriculture sectors experienced initial recovery in the last few years after facing gradual moderation. Growth is projected to remain robust, expanding at 6.9 percent in 2018 (Sodeth and Miguel, 2018).² The agricultural sector holds immense potential where its productive gains could boost sustainable outputs – employment and income – to alleviate poverty. In this sense, all the government's development policies address the agricultural sector as an engine for economic growth, food security, and poverty reduction. In the recent years, there has been a growing concern about farmer distress, productivity in the agriculture sector amidst rising concerns over food security and sustainability in agriculture. Besides the crucial importance and significant contribution of agriculture in overall GDP of agriculture, the situation of farmer especially the small and marginal ones is still vulnerable. Both natural and manmade factors are responsible for such acts. The natural factors include loss of income due to natural calamities of flood, drought, crop failure due to prevalence of pests and diseases etc. which are not in control of mankind; whereas manmade factors can be controlled to an extent and include factors like burden of debt, low return for production due to inefficient marketing and unavailability of resources, higher cost of production due to use of outdated technologies in the production process.

The major objectives of this study are to explore the factor constraining the Cambodian agriculture in transforming from extensive³ to intensive⁴ agriculture. Our main contribution is to show how the appropriate policies for Cambodia's agricultural sector are to be developed. We examine the general situation of agriculture in Cambodia by comparing with neighboring countries in Southeast Asia from an econometric perspective using time series data spanning

¹ Ministry of Economy and Finance of Cambodia (MEF) the gross national income per capita reaching US\$1,429 in 2018.

² Ministry of Economy and Finance of Cambodia (MEF) the growth to remain robust, expanding at 7.6 percent in 2018 and gross national income per capita reaching US\$1,538 in 2018.

³ A way of farming which is characterized by a low level of inputs per unit of land (Encyclopaedia1970).

⁴ Involves various types of agriculture with higher levels of input and output per cubic unit of agricultural land area (FAO 2004).

a period of 22 years (1996 – 2018) through cultivate areas, technical using, technologies usage, fertilizer using, agricultural infrastructure system, agricultural production cost, agricultural output, agricultural market and climate change. The results show that the agricultural sector in Cambodia is at a level where there is significant need to improve the capacity of farmers, the new technologies use and the prevention of climate change. However, the production cost is high and products in low prices is also causes farmers to lose confidence in farming and they will stop working in the sector. We have also set some policies to address the problems in the sector.

The remainder of this paper is structured as follows: In the next section describes the literature review on the reinvigorating Cambodian agriculture. In Section 3 we look at the general context in Cambodian agriculture, including neighboring countries in Southeast Asia. Section 4 presents the results and discussions. In Section 5 concludes and outlines how the impact of automation reinforces the policy implications of our results.

2 Literature Review

Agriculture sector is a major contributor of GDP of agriculture-based economics as compared to other sectors of the economy. The study of relationship between economic growth and agricultural factors is not a new topic, there are a large number of theoretical and empirical studies. The economists have studied the reinvigorating Cambodian agriculture. Agricultural systems include the development and application of systems methodology, including system modelling, simulation and optimization; ecoregional analysis of agriculture and land use; studies on natural resource issues related to agriculture; impact and scenario analyses related to topics such as GMOs⁵, multifunctional land use and global change; the development and application of decision and discussion support systems; approaches to analyzing and improving farming systems; technology transfer in tropical and temperate agriculture; and the relationship between agricultural development issues and policy (Castalonge, 2008; Lei, 2018). Gorter and Swinnen, (2002) alternative frameworks are assessed to explain government policy including collective action and politician-voter interaction models. The policy coherence for agriculture and rural development study and a structured picture of 40 years of literature which uses welfare economic tools to judge agricultural policy (Bullock and Salhofer, 2003; Sothorn et al., 2011). The studies of Sckokai and Moro, (2006) the size of the insurance and wealth effects of a change in the Common Agricultural Policy (CAP)⁶ for arable crops is estimated. The paper of Liefert, (2006) a method for decomposing changes in agricultural producer prices. The studies of Sothy et al., (2017) to explore the implications of rice policy changes in Vietnam for rice production and rural, household incomes in eastern and southern Cambodia near the border with Vietnam; assess the potential of new rice production practices

⁵ A genetically modified organism (GMO) is any organism whose genetic material has been altered using genetic engineering techniques (i.e., a genetically engineered organism). GMOs are used to produce many medications and genetically modified foods and are widely used in scientific research and the production of other goods.

⁶ The agricultural policy of the European Union. It implements a system of agricultural subsidies and other programmes. It was introduced in 1962 and has undergone several changes since then to reduce the cost (from 71% of the EU budget in 1984 to 39% in 2013) and to also consider rural development in its aims. It has been criticized on the grounds of its cost, and its environmental and humanitarian impacts.

in response to changes in market demand; provide policy options to government to help rice producers avoid income shocks. The benefits, risks and costs of changing food production from flood recession to regulated, irrigated agriculture in Cambodia, considering food production, land, water, energy and livelihoods (Dary et al., 2017).

The growth effects over space arising from the adoption of new agricultural technology in a rural-urban setting and the effects of production risk on farm technology adoption among small holder farmers (Batabyal et al., 2018; Juma et al., 2009). Barlejt, (1980) must look beneath generalizations about food production, transfer of technology, rural instability, or economic development to see individual farmers, making choices. He finds that, how anthropological understandings of farmers' choices and the reasons for them are useful, not only to explain rural development trends, but also to devise policies to bring about an improving standard of living for the majority of the world's peoples. Cheng et al., (2018) explore the role of these mechanisms in a setting where the output of bioprospecting activities (i.e. a modern seed variety), competes with traditional agriculture, and the latter is necessary to conserve the genetic pool from which the multinational could extract the resources for developing new modern varieties in the future. Scenario analysis is used to evaluate the impact of mitigation and adaptation actions in five overlapping sectors — water, agriculture, energy, transport, and infrastructure — which are then integrated into the macroeconomic or economy-wide analysis (World Bank, 2014). The studies of Vuthy et al., (2014) to identify key constraints on the fertilizer market with a focus on both the demand and supply sides, to review the efficiency of fertilizer use and the role of fertilizer in agricultural transformation and food security, to identify possible policy options to enhance the role of fertilizer in the agricultural transformation and food security agenda in Cambodia.

The studies of Kimsun et al., (2011); Vutha and Vathana, (2009) attempts to define the factors which determine emigration and rice double cropping, i.e. rice cultivation on the same plot twice per year, by rural households in Cambodia, and investigates whether these decisions influence each other, cassava and rubber production and trade in GMS⁷ Countries and Laulanie, (2011) review article reports on the productivity and other impacts being observed for many different crops in half a dozen countries for increasing food crop yields with lower cost and input requirements as well as more resilience to adverse effects of climate change. However, the productivity of this sector is still a big challenge. In addition, agricultural export is still limited due mainly to lack of certified quality standard, finance, crops diversification, and market information (Siphana et al., 2011). Local knowledge and SRI⁸ practices in the Tonle Sap and Mekong delta agro-ecological zones. It looks at gaps in local practices and suggests ways of closing those gaps to enable farmers to cope with the effects of climate change (Sreymom and Chhuong, 2015) and the selecting the best capacity for an

⁷ The Greater Mekong Sub-region is a trans-national region of the Mekong River basin in Southeast Asia. The region is home to more than 300 million people. It came into being with the launch of a development program in 1992 by the Asian Development Bank that brought together the six states of Cambodia, China (specifically Yunnan Province and Guangxi Zhuang Autonomous Region), Laos, Myanmar, Thailand and Vietnam.

⁸ The System of Rice Intensification is a methodology aimed at increasing the yield of rice produced in farming. It is a low water, labor-intensive, method that uses younger seedlings singly spaced and typically hand weeded with special tools. It was developed in 1983 by the French Jesuit Father Henri de Laulanie in Madagascar. However full testing and spread of the system throughout the rice growing regions of the world did not occur until some years later with the help of Universities like Cornell.

unloading facility that has a line of trucks waiting, scheduling a many-faceted project to complete construction of a facility or a particular research project, using crop growth models to determine the best amount and timing for irrigation and fertilizer for various areas of a field with a yield map showing differences, all involve methods and tools that are the result of the latest computer technology (Peart and David Shoup, 2004).

The population growth, urbanization and market access on the intensification of farming systems (Alleyne and Baroni, 2011; Magnan and Thomas, 2011; Binswanger-M and Savastano, 2017). At the same, the studies of Timmer, (1988) the share of agriculture in a country's labor force and total output declines in both cross-section and timeseries samples as incomes per capita increase and labor movement from on-farm towards off-farm jobs, and uses investment in agricultural machinery as a proxy for farm mechanization and technical efficiency (Chhun et al., 2015; Yin and Wang, 2017). The estimated shape and position of the R&D opportunity curves provides a good starting point for assessing the widely shared perception that there is underinvestment in agricultural R&D, 2010 - 2011 to evaluate the influence of System of Crop Intensification (SCI)⁹ practices in green gram and factor substitutability agriculture (Roseboom, 2012; Kuttimani and Velayudham, 2016; Napasintuwong and Emerson, (2004)). Cunha and Richter, 2018 a model the impact of climate dynamics on wine production temporal cycles for the period 1933 to 2013 in the Douro wine region. A focus on the adequate management of all waters, and on the demand, supply and use of water, how economic principles can help society get the most out of our scarce natural resources — development, conservation, or preservation. (Gooch and Stalnacke, 2010; Shogren, 2013). The studies of Bhullar and Bhullar, (2013) presents the views of agricultural experts from across disciplinary and geographical boundaries, Thompson, (2007) explores the social performance of an innovative method of rice fertilization. The patterns of hunger and malnutrition problem in Cambodia and possible pathways the country could follow in the future (Ecker and Diao, 2011). The paper of Masters, (1993) analyzes potential biases in the ratio form of the PSE¹⁰ introduced by using actual domestic prices rather than social opportunity costs in the denominator (Masters, 1993). The recommendations of group discussions at the Cambodia food security and agricultural policy stocktaking (CDRI, 2011; Ratner, 2011).

Structural transformation is a defining characteristic of the development process, both the cause and effect of economic growth. According to Timmer and Akkus (2008), four quite relentless and interrelated processes define structural transformation: (i) a declining share of agriculture in GDP and employment; (ii) migration from rural to urban areas and a rapid process of urbanization; (iii) the rise of a modern industrial and service economy; and (iv) a demographic transition from high rates of birth and death (common in underserved rural areas)

⁹ In recent years, something called the system of crop intensification (SCI) has emerged in a number of Asian and African countries, raising the productivity of the land, water, seed, labor, and capital resources that farmers invest can for growing a wide range of crops. As noted below, this emergence is gaining recognition from major institutions such as the Ethiopian government's Agricultural Transformation Agency and the World Bank.

¹⁰ The Producer Subsidy Equivalent (The producer support estimate): is an indicator of the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

to low rates of birth and death (associated with better health standards in urban areas). The final outcome of structural transformation, already visible on the horizon in rich countries, is an economy and society where agriculture as an economic activity has no distinguishing characteristics from other sectors, at least in terms of the productivity of labor and capital or the location of poverty. Structural transformation clearly took place in Cambodia over the last decade.

The sustainable intensive farming practices have been developed slowly the deterioration of agricultural land and even regenerate soil health and ecosystem services, while still offering high yields. The increased use of fertilizers, plant growth regulators, pesticides, mechanized agriculture, controlled by increase, more detail analysis of growing conditions, including weather, soil, water, weeds, and pests.

3 Agricultural Situation in Cambodia

Cambodia have been achieving economic growth over the past decade before it was severely hit by the global economic crisis in 2009. Average GDP growth was 7% per annum for the period 1999–2017. In 2018, the GDP growth will continue to grow at 7.2% per year, increased 0.2% of 2017 (MEF, 2018). The highest economic growth of 13.3% was recorded in 2005. This growth was made possible by an open economy and a stable macroeconomic environment, increasing exports and foreign direct investment (FDI) and a low inflation rate of about 4%, except when inflation rose to about 12.3% in 2008 due to the sudden steep hike in food prices. However, growth has been narrowly based, with three key leading sectors: Services, Industry and Agriculture (Figure 1).

The agriculture sector's share of GDP has been decreasing over time, but it remains a crucial part of Cambodia's economy, accounting for about 19.1% of GDP in 2017 and the share of GDP will continue fall by about 1% for 2018 (MEF, 2018). Average growth rate was around 4% per annum over 1993–2018 (Figure 2, Figure 3 and Figure 4), contributing about 2% of GDP growth over that period.

3.1 Techniques and technologies

3.1.1 Crops

The Green Revolution transformed farming in many developing countries. It spread technologies that had already existed, but had not been widely used outside of industrialized nations. These technologies included miracle seeds, pesticides, irrigation, and synthetic nitrogen fertilizer.

Land Under Cereal Production Cambodia has achieved cereal crops at 2,882,286 hectares in 2016 about 16.33% of land area, the number decreased considerably compared to 2011, has achieved cereal crops at 3,222,987 hectares about 18.26% of land area. Other countries in Southeast Asia, achieving cereal crops are less volatile from year to year but excluding Thailand in 2011, achieved cereal crops 13,311,657 hectares, the number decreased by about 75.38% in 2016 to only at 10,033,740 hectares (Figure 8 and Figure 10). Cambodia has land area about 176,520 square kilometers, accounting for 98% of the total surface area about

181,035 square kilometers. Compared to the country in the region, Cambodia has the smallest surface area in Southeast Asia, Indonesia has the largest land area in region at about 1,811,570 square kilometers equal to 95% of the total surface area about 1,910,931 square kilometers (Figure 11). Total land preparation has decreased about 5% compared to 2015, but land preparation by agricultural machinery has increased 9% compared to 2015 from 2.9 million hectares to 3.2 million hectares to 2016.

Rice Production The cultivated area for rice production was recorded at 3 million hectares in 2012 and increased to 3.11 million in 2016 (Wet season rice was 2.6 million hectares; dry season rice was 0.51 million hectare). Rice cultivated area was increased 2.19% if compared to previous year 2015. Harvested area was 3.09 million hectares (Wet season rice was 2.58 million hectares; dry season rice 0.51 million hectares). The annual averaged yield from 2012-2016 increased from 3.11 tons in a hectare to 3.21 tons in a hectare, of which rice yield of wet and dry season were around 2.95 tons in a hectare and 4.46 tons in a hectare respectively. Total rice increased around 4% if compared to 2015. The production from 2012 to 2016 has increased from 9.29 million tons to 9.95 million tons, in which wet and dry season production were 7.63 million tons and 2.31 million tons respectively (The increase was around 6.6% if compared to 2015). The surplus of paddy was around 5.11 million tons equivalent to 3.27 million tons of white rice.

Significant achievement of improving rice productivity is derived from a number of factors such as the change to use high yielding varieties from research and development output, transfer of appropriate technologies, especially improvement of effective System Rice Intensification's demonstrations, improvement soil and nutrient management practices, improvement of rice seed research and development suitable to land and climate condition and selection of main varieties for market demand. In additional factors for the achievement, the mechanization is significantly played important role for response labor shortage in recent agricultural sector. In fact, 3.5 million hectare of rice production in 2016, land preparation by agricultural machinery has covered 92%. A total of 2.97 million of land preparation or about 91.35% in wet season has about 2.73 million hectares by agricultural machinery and about 258,640 hectare or about 8.65% by cattle and buffaloes has 517,390 hectares. Of 517,390 hectares in dry season, land preparation by agricultural machinery has 502,640 hectares about 97.14% and by cattle and buffaloes has 14,390 hectares or about 2.78%.

Subsidiary Crops The cultivation of subsidiary crops (maize, cassava, sweet potatoes, vegetables and moonbeam) has been significantly increased in last 5 years from 732,000 hectares in 2012 to 932,000 hectares in 2016. Production area is highly increased in 2016 about 9.85% compared to 2015. Production of subsidiary crops is rapidly increased from 9 million tons in 2012 to 16 million tons in 2016 (If compared with 2015 is increased about 4.78%).

Industry Crops Such as soybean, peanuts, sesame, sugar cane, jute and tobaccos has been currently varied and has been declined in last 2 years. Production area of industry crops has been declined from 180,920 hectares to 101,530 hectares (Declined of about 24.8% in 2016 if compared production in 2015), and production declined from 1.76 million tons in 2012

to 0.86 million tons in 2016 (Declined about 0.79% if compared to last year). Production areas of soybean, sesame and peanuts has been declined.

Cereal Yield Cambodia has achieved 3,459.9 kilogram of agriculture yield per hectare in 2016, this number has increased dramatically at 73.21% compared to 2006 that achieved 2,533.1 kilogram of agriculture yield per hectare. In particular, we look at other countries in the region, Indonesia has achieved 5,405.5 kilogram of agriculture yield per hectare, nearly the same as Vietnam has achieved 5,448 kilogram of agriculture yield per hectare in 2016. The scenario of Indonesia's agricultural output per hectare in the next few years will continue to increase but Vietnam output per hectare may fall in the next few years. Other countries, such as the Myanmar and Philippines have achieved similar agricultural yield per hectare of Cambodia but scenario of output per hectare the next few years will decrease. As Thailand have achieved only 3,031.8 kilogram of agriculture yield per hectare and Malaysia has achieved only 3,226.5 kilogram of agriculture yield per hectare (Figure 9).

Fertilizer Consumption Among the countries in Southeast Asia, Cambodia is a country at least fertilizer consumer. As of 2015, only 25.77 kilogram of fertilizer per a hectare, the number has increased sharply at 112.6% compared to 2010 when we used 12.12 kilogram of fertilizer per hectare. Malaysia and Vietnam lead in the largest use of fertilizer in the region. Malaysia uses about 1,539.30 kilogram of fertilizer per hectare in 2015, decreased about 75.94% compared to 2008, the year Indonesia used the most fertilizer. Vietnam uses 438.92 kilogram of fertilizer per hectare in 2015, the number increased 35.78% compared to 2010 the using fertilizer only at 323.35 kilogram of fertilizer per hectare. Other countries include Philippines, Thailand and Indonesia use the same fertilizer from 138.71 kilogram to 223 kilogram per hectare in 2015 (Figure 5). In average the Cambodian farmer uses Nutrient nitrogen N at 20.92 kilogram per hectare in 2015 it is increased 293.23% to 2010 that 5.32 kilogram per hectare, uses Nutrient phosphate P2O5 at 2.80 kilogram per hectare in 2015 it is decreased 3.25 kilogram compared to 2010 and used Nutrient potash K2O at 1.02 kilogram per hectare in 2015 it is increased 0.76 kilogram per hectare compared to 2010 (Figure 17.3, Figure 17.5, Figure 17.6 and Table 10).

Use of Agricultural Machinery The past 10 years witnessed a spectacular increase in the use of agricultural machinery in Cambodia. Changes were observed in land preparation, planting, and harvesting. Data from the Department of Agricultural Mechanization show that the number of combine harvesters increased three-fold from 2006 to 2010, and the number of threshers increased two-fold. The 2013 survey shows that increasingly more farmers used tractors (both 4WD tractors and hand power tillers) for land preparation for upland crops (i.e., cassava and maize) and they expected to continue to use this equipment in the next five years. For rice and vegetables, their current use was relatively low (10-20 percent) but farmers indicated that their use would increase. However, the use of agricultural machinery may be constrained by the low purchasing power of smallholders, the high cost of agricultural equipment, and the lack of well-trained operators and mechanics for agricultural machinery.

Farmers use different sets of equipment based on their farm size, their agricultural assets and equipment levels, and the availability of services. Manual tractors will continue to be common in rice and vegetable production despite the uptake of regular tractor use. Manual

tractors are an intermediate technology between draught animals and tractors, and are highly effective for puddling, preparatory tillage, and seed bed preparation for rice production. They are also the most efficient form of mechanization for fragmented and small land plots. However, farmers thought that the level of use of power tillers would decrease, except in vegetable production. Combines were often rented by farmers from business entrepreneurs, and the use of combines has taken off. The high purchase price of the machines makes renting the preferred option for small and medium-size farms. However, some farmers complained about the quality of rented combines and reported that their use brought additional work. With poor-quality harvesters and/or unskilled drivers, the harvested paddy grain is mixed with a lot of broken straw, requiring further cleaning processes. Others criticized the extra costs incurred due to inexperienced drivers, who spend too much time maneuvering at the end of the field while farmers pay for the equipment by the hour (Figure 19).

3.1.2 Livestock

Animal Production In 2016, the promotion of animal production which is the most important Goal's indicator is over achieved of its target with 3.51% increasingly compared with the year of 2015. The total animal is 40.3 million head and in 2016 increases up to 42.18 million head, increases in 0.12% buffaloes increases in 41%, pigs increases in 7.07% and poultry increases in 3.52%. Besides, the drought animal decreases in 7.11%, this is to show that the number of buffaloes has increasing its number in the first year after its diseasing several years continuously. However, some diseases were outreached but it was not infected seriously to the animal and this is because of the earlier preparedness for those outreached diseases. According to the efforts of implementation by roles and responsibilities with the supports from the government, development partners, private sector, and relevant institutions, the technical point in animal health and production (Figure 16, Table 8, Table 11 and Table 13).

Animal Waste Management In fact, animal raising is an important role, but meanwhile, when the animal production is developed, it will have negative impacts on the environment due emissions of greenhouse gas as CH₄, CO₂, N₂O and other gases. This cause an increase in heat water and air pollution, especially cause other infections. To prevent the adverse effects arising from the development of sector, the MAFF focused on advancing the waste management business in animal business, animal farms and slaughterhouse...etc. Besides, also advised and required to commercial frames to contract treatment pool of animal waste, to construct large scale of biodigesters and small scale for managing waste from agriculture and households, in other not only to manage the waste can still reduce the impact of emissions of greenhouse gases, it will have negative impacts to the environment. In 2016, this family built biodigesters has a total of 1,433 kilns of 12 provinces including Kampong Cham, Tboung Khmum, Svay Rieng, Prey Veng, Kandal, Takeo, Kampong Chhnang, Pursat, Kampong Thom, Kampot and Siem Reap Provinces.

3.2 Global agricultural trade

The variation in rice prices differs slightly from month to month and according to locations in Cambodia, between 2016 to 2018 the prices of rice varied by average of 1,800 Riel per kilogram.

By November 2018, the prices of rice in Kampong Chhnang province there are 2,200 Riel per kilogram, it was the most expensive if compared to the prices of rice in Phnom Penh, Banteay Meanchey and Battambang province. At the same time, the prices of rice in Bangkok has average of 11.5 Baht per kilogram et the prices of rice in An Giang, Viet Nam has average of 8,300 Dong per kilogram in 2018.

Export Promotion of Agricultural Products Have been rapidly and significantly increased in the last 4 years. In 2012, the export of agricultural products has reached to 680,457 tons and increased to 3,659,908 tons in 2013, to 3,445,123 tons in 2014, to 4,157,246 tons in 2015 and to 4,709,453 tons in 2016. The trend of rapid increasing is 5 times in 2013 compared with 2012, however the average at last years has increased only 13%. Main export commodities are milled rice, cassava chips, fresh cassava, black peppers and fresh mango. Official milled rice export has been significantly increased from 105,259 tons in 2010 to 25,717 tons in 2012 and increased to 542,144 tons in 2016. These increased amounts are five times compared to 2010 and twice times if compared to 2012. In fact, quantity of 542,144 tons of milled rice export is increased 0.7% compared to 2015 that it's 538,396 tons. Type of milled rice export in 2016 is 56.61% of fragrance rice, followed by 34.79% of white rice and 8.6% of parboiled rice. Destinations of Cambodian rice have been exported to 65 countries in the world and exported by 85 export companies. The top ten importing countries of Cambodian rice in 2016 are People's Republic of China 127,460 tons, France 78,329 tons, Czech Republic 22,815 tons, Italy 18,619 tons, United Kingdom 17,673 tons and Germany 16,616 tons (Figure 22).

Agricultural Foreign Direct Investment The index on foreign investment in agriculture has increased steadily since 1993 to 2017 but it is fluctuating and falling in different years. In fact, the foreign investment forecasts in 2013 were 2,068.47 million dollars but down to 1,822.8 million dollars by 2015 and increased to 2,784.37 million dollars in 2017. FDI outflow is very small if we compared to FDI inflow but the FDI inflow has been a sharp rise in 2017 (Figure 7).

Cooperation in Cambodian Agricultural Up to 2016 the data from MAFF, official number agricultural cooperatives (ACs) were officially registered and organized 857 ACs with total of 87,986 members including 53,136 women (about 60.39% of women), and total capital of 24,412,075,650 Riels. Provinces have been organized highest numbers of ACs include Takeo province 98 ACs, Battambang 77 ACs and Pursat organized 53 Acs by each provincial, Kep province has organized only 2 ACs and is lowest than other provinces in Cambodia (Figure 20).

Loans in Cambodian Agricultural Data from 2004 to 2017, the loan for agriculture has steadily increased due to the increasing demand for agricultural inputs and increases with the cost of gasoline, utilizing electricity, including using machinery. The value of loans is worth about 1,600 million dollars in 2017 if we look at the momentum of borrowing in 2014, less than a 1000 million dollars (Figure 17.4). Money trading on the market is a good sign of economics growth, but when a lot of money spent on farming it does not mean that agriculture will improve (Figure 23).

3.3 Challenges

3.3.1 Population growth and human resource development

In the framework of Cambodia economy, labor forces are divided into three main categories (1) Labor in Agriculture Sector; (2) Labor in Industrial Sector; and (3) Labor in Service Sector. It is observed that labor in agriculture sector has been remarkably decreased. It was 57.6% of the total labor in 2009 and downed to 54.2% in 2010. Particularly in 2011, it was increased up to 55.8% and decreased down to 48.7% in 2013. In 2014, this trend is shown decreasing to about 45.3% and decreased down to 36.4% in 2016. Trend of migration from rural to urban areas and oversea had increased. Labor in industrial sector is only at 16.9% in 2011 and increased 19.9% in 2013, and it increased to 24.3% in 2014. In 2016, this is increased to 26.6%. For the labor in service sector is 30.4% in 2014 and increased to 37% in 2016 (Figure 6, Table 1, Table 2 and Table 5).

Human Resources Management In 2016, there were 6,908 staff in total of which 1,520 or 22% female staff in MAFF 2,785 including 771 women equal 27% at national level and 4,123 including 749 women equal 18% at provincial level. In meantime, there were 139 retired staff, 237 on leave without payment and 52 staff out of the list of civil servants (release, region and death). The ministry has also recruited 333 personnel through examination (For status A 247 of which 84 women and B 86 of which 36 women and including 10 staff of which 2 female). To encourage staff for their effort to work, the ministry has nominated and transferred 301 staff of which 36 women and awards medal for good performance to 685 staff of which 113 women.¹¹

In respond to the priority setting “Human Capital” of RGC, MAFF has paid attention to strengthen the capacities building of staff through the local and overseas short-term and long-term training courses. As of 2016, MAFF has trained 3,176 staff of which 844 female staff. Two thousand five hundred and twenty-six staff of which 680 female staff had participated local short-term training courses. Separately, 650 staff of which 163 staff had participated training courses abroad, 613 staff of which 152 female staff for short-term training courses and 37 staff of which 11 female staff for long-term training courses in which 24 staff for PhD and 13 staff for Master degree. The Ministry of Agriculture, Forestry and Fisheries offer three higher education institutions such as RUA¹², PNSA¹³ and KCNSA¹⁴. In 2016, RUA has received 945 students included 364 of female enroll to study Bachelor of Science in Agriculture and 545 students included 187 of female graduated in bachelor and there are 37 students included 8 of female graduated in Mater of Science in Agriculture. The number of students graduated in bachelor has decreased down to 43.85% to 2015 (Table 3). The academic year 2015-2016, there are 258 students of which 85 females enrolled to study bachelor degree at PNSA and there are 288 students of which 108 females has graduated in bachelor degree (Table 4). In 2016, there are 329 students enrolled to study bachelor degree at KCNSA and there are 312 students of has graduated in bachelor degree. The three academic institutions have been working to revise or develop long-term strategic plan in order to implement their updated curricular for better

¹¹ MAFF Annual Report 2016-2017

¹² Royal University of Agriculture

¹³ Prek Leap National School of Agriculture

¹⁴ Kompong Cham National School of Agriculture

education research and extension in the context of ASEAN Economic Community and Globalization.

For International Cooperation, there are 13 international experts working in the institutions and from 58 different institutions through both bilateral and multilateral. Furthermore, Kampong Cham National School of Agriculture has received the support from KOICA¹⁵ to build up education programme for Saemaul Undong Movement Concept. Moreover, Royal University of Agriculture completed the microbiology laboratory building with two levels with well-equipped facility with the support from Trade Facilitation Project (SPS). For research work, the three institutions currently have 30 projects related to agronomy, animal science, veterinary, forestry, fishery, agroindustry, land management...etc. The main sources of finances are from Ministry of Education, Youth and Sport, Ministry of Environment, Australia, Canada, Czech Republic, European Community, Korea, Japan, the United States...etc. In addition, there are the three main research centers were organized at RUA such as CE SAIN¹⁶ with the support from USAID, Potato Research Center with the support from KOPIA¹⁷ and KOICA, and Biogas Technology and Information Center with the support from UNIDO¹⁸.

Agricultural Extension and Technology Transfer Agricultural extension services are implemented by government agencies and institutions, program or projects of development partners, private sectors, non-governmental organizations and local extension agents including commune and village extension workers. Refer to record of extension officers in both national and sub-national levels between 2010 to 2014, numbers of public extension officers have been declined, however in the last 2 years number extension officers at provincial and district are no changed about 800 Officers. A part public extension officers, in 2016 the total commune extension workers are 1,138 persons including 469 women (41% of women) and village extension workers are 9,276 persons (9% women). The main activities and approaches of agricultural education and extension are: (1) trainings in class and field training, or farmer field schools, field demonstrations, field days and exchange visits, (2) Extension Technology and broadcasting systems and ICT and (3) Extension material development, printing and dissemination. In 2016, the staffs of Department of Agricultural Extension and other technical Departments of MAFF have been trained of 10,655 persons including 4,086 women of extension officers and extension workers, and farmers. PDAFF¹⁹ has been providing the training 64,637 farmers including 41,388 women (64 % of women) in good seed using, crop or farm cultural techniques and practices, crop or farm management practices, pre and post-harvest technologies and good agricultural practices on rice, horticulture, cash crops, industry crops land classification and land use, management, operation and maintenance of machinery, equipment's and tools and Agricultural Cooperative management and development.

With these activities, the outreach of extension technology, information and knowledge have been taken by developing, printing and disseminating extension materials and messages to

¹⁵ Korea International Cooperation Agency

¹⁶ The Center of Excellence on Sustainable Agricultural Intensification and Nutrition

¹⁷ Korea Program International Agriculture

¹⁸ United Nations Industrial Development Organization

¹⁹ Provincial Department of Agriculture, Forestry and Fisheries

farmers and producers about 58,400 copies (booklets, posters, leaflets, agricultural note...etc.) and broadcasted through televisions and radio about 77 extension spots.

Up to 2016, official number agricultural cooperatives (ACS) were officially registered and organized 857 ACs with total of 87,986 members including 53,136 women (About 60.39 % of women), and total capital of 24,412,075,650 Kh Riels. Provinces have been organized highest numbers of ACs include Takeo province 98 ACs and Battambang 77 ACs, and Pursat organized 53 ACs by each provincial, and Kep province has organized only 2 ACs and is lowest than other provinces in Cambodia.

3.3.2 Environmental

Cambodia is situated between two global weather systems, which makes it vulnerable to the effects of climate change. There is some scientific evidence that climate changes will make northern and western parts of the country drier, with fewer floods and more droughts, while the opposite is expected to take place in the south and east. Agricultural growing seasons (reflecting the effect of a combination of rainfall and temperature on potential evapotranspiration) are expected to become markedly shorter in the next 50 years before returning to close to their current levels by 2080. This implies the need to adapt public expenditures in the agriculture sector to increase their effectiveness and efficiency in the future. In this chapter we evaluate the potential impact of various climate change parameters on agricultural production (particularly rice) in Cambodia and then we analyze the implications of various climate change scenarios for public expenditure patterns.

Projected Climate Change Impact on Agriculture Cambodian agriculture is extremely vulnerable to climate change (Mainuddin et al 2010, CISRO 2008, ACIAR 2009, MoE 2010). The specific threats of climate change for agriculture include: (1) Changes in rainfall patterns. Predictions suggest that wet seasons will be shorter, but with higher levels of rainfall, while dry seasons will be longer and drier. This will result in shifts in the distribution of rainfall between areas. The changes to the length of seasons, combined with the delayed onset of the wet season after a longer dry season, will affect traditional cropping practices. (2) Floods and droughts are major influences on rice production in Cambodia. MoE (2010) records areas of rice crop that have been affected by floods and drought in various years (see table below). Such events happen with some regularity, and floods and droughts can occur in the same year (for example, 1996 and 2002). The period 2000-2002 also saw three consecutive years of significant flooding. (3) Climate change will have significant impacts on poorer rural households, as well as the capacity to meet Government targets for increased rice production and export. (4) A recent economic analysis suggests that with a 1 0C rise in temperature, annual mean net revenue falls. The study also points out the main factor in agricultural productivity as being security of land tenure (Kala, Boret and Kurukulasuriya 2011, Johnston et al 2009, Peng et al 2004). Impact on rice yield is predicted to be significant. MoE (2010) shows rice yields will decrease under both high and low emission scenarios, and will continue to decrease within a range of 20-70 percent of current production based on different seasons and scenarios. (5) Current agricultural techniques may not be able to cope with increased salinity that is predicted for coastal areas. (6) Increased incidence of livestock disease, largely

associated with lack of water and grazing land and the long distance to water sources for livestock. Because larger livestock are an important investment and means of savings for farmers, these kinds of impacts can have serious consequences. They push people into debt and reduce their financial safety nets, which exposes them to an inability to access cash when faced with other crises. (7) Increased incidence of pests and disease. Changes in temperature, rainfall, seasonal patterns and changing length of the growing season (and ecological systems) have the potential to increase the threat to agriculture of pests and disease. Temperature increases may speed up growth rates of crop pathogens and increase reproductive generations per crop cycle, making the crop more vulnerable. Increased CO₂ levels could enhance the competitiveness of some weed species. (8) Cambodian capture fisheries are especially vulnerable to the changes in temperature and hydrological flows that are associated with climate change. Such changes could have significant impacts on migration, breeding and spawning patterns while also adding pressure to critical fisheries habitats – flooded forests in the Tonle Sap, floodplains and deep pools in the major river systems.

Climate Change is Intensifying Challenges for the Agriculture Sector Climate change is exacerbating the challenges faced by the agriculture sector. Climate change-induced increases in temperatures, rainfall variation and the frequency and intensity of extreme weather events are adding to pressure on the global agriculture system – which is already struggling to respond to rising demands for food and renewable energy. The changing climate is also contributing to resource problems beyond food security, such as water scarcity, pollution and soil degradation. As resource scarcity and environmental quality problems emerge, so does the urgency of addressing these challenges. Climate change is expected to negatively affect both crop and livestock production systems in most regions, although some countries may actually benefit from the changing conditions. Overall, productivity levels are expected to be lower than without climate change – due to changes in temperatures, crop water requirements and water availability and quality. Presents projected changes in yields for maize, wheat, and rice in 2050 under a climate change scenario (calculated by two different models) as compared to potential 2050 yields under a scenario without climate change after 2005. Impacts on agricultural production will vary among regions and will depend not only on the intensity of the changes in temperatures and water but also on how these factors interact.

Climate change is exacerbating the challenges faced by the agriculture sector, negatively affecting both crop and livestock systems in most regions. Agriculture is also contributing a significant share of the GHG²⁰ emissions that are causing climate change – 17% directly through agricultural activities and an additional 7% to 14% through land use changes. Technical solutions exist and underscore the potential of the agriculture sector to be part of climate change mitigation and adaptation solutions. Without consistent policy signals, autonomous efforts by farmers are unlikely to be sufficient to create a sustainable, productive and resilient agriculture sector. This note highlights three pillars of reform that can help governments to achieve sustainable productivity growth without sacrificing climate change mitigation and adaptation objectives: (1) At the national level, the signals sent by the wider

²⁰ The Greenhouse Gas

social, economic and environmental policy settings should support the objectives of a sustainable, climate friendly, resilient and productive agriculture sector. (2) At the sector level, governments should strengthen consistency and get the incentives right within the overall agriculture policy set by removing policies which generate unsustainable production systems and exacerbate climate change. (3) At the farmer level: emphasis should be on incentives to enhance farmer capacity to adopt practices that contribute to sustainable productivity growth while also responding to climate change (Figure 9).

4 Discussion

The productivity is rose gradually from year to year but it is not lasting sustainable when the labor force is limited, limited agricultural technical material and agriculture structure has limited. It is important and time consuming to think about the transforming from extensive to intensive agriculture in Cambodia.

Fertilizer will play a vital role in raising crop yields and in sustaining the natural resources of farming land. Furthermore, the fertilizer industry in Cambodia has evolved rapidly in response to farmer demand, and the overwhelming majority of rice and vegetable farmers use fertilizer. Smallholder farmers are more productive than large farmers, given that all available inputs are applied to their small piece of farmland. This result indicates a positive development of the fertilizer industry and adoption of fertilizer use in this country. Consequently, a subsidy policy to support the fertilizer industry may be irrelevant. However, the key constraints affecting fertilizer demand and supply should be addressed in order to strengthen trade competition and widen market operations, which, in turn, would bring down prices and increase the quality of products delivered to farmers.

The total amount of investment in agriculture was small, at around 6 percent between 2000 and June 2010, the countries who invested in Cambodia. Such as Thailand, China, Vietnam, Korea, Singapore, Japan, Malaysia, Canada, America, India, France, the UK, the USA and Denmark. Investors engage mainly in crops, namely rubber, cassava, maize, sugarcane and cashew nuts, and forestry, such as teak and acacia. The dramatic rise in interest in more recent years has sparked concern from various stakeholders as to the potential effects of foreign ELC projects on community livelihoods, local environment quality and national food security.

Using off-farm employment and investment in agricultural machinery as proxies for labour movement and farm mechanization, respectively, ivtobit regression analysis of the relationship between labour movement and agricultural farm mechanization reveals that an increase in off-farm employment significantly raises farmers' investment in agricultural machinery. In other words, the movement of labour in Cambodia induces farmers to purchase or invest in more agricultural machinery, which in turn leads to further mechanization of agriculture. Interestingly, the study also confirms a positive association between the number of migrant household members and the level of investment in agricultural machinery the more

migrant members a household has, the greater the investment in agricultural machinery. While studies in some countries found an association between agricultural mechanization and an increase in labour productivity, which triggers movement into off-farm activities (labour outmigration), our empirical findings confirm that the opposite is true for Cambodia.

There are substantial benefits to be gained from the development of new crop varieties that are adapted to new climate conditions. The order of magnitude of these benefits can be illustrated by what would happen if public expenditures were support the development of varieties that would be able to survive one additional day of drought or flood. This would reduce average losses from drought from about 5.5 percent to about 5 percent of total crop production, which would be worth about \$8 million if all farmers were able to benefit from these seeds. Given the current unit cost of developing crop varieties is about \$1 million per varietal, the returns to developing more drought and flood-resistant crop varieties could be high, provided they are widely adopted by farmers. However, in practice, it is likely that these varieties will only be adopted gradually. Increasing the efficiency of extension services can accelerate this process. Extension agents can also help farmers to adapt to climate change, particularly by changing their cultivation practices and cropping choices.

The net impact of climate change to agricultural production in Cambodia will be complex and is expected to vary considerably from one region to another. The strongest will be probably the reduced and more variable growing seasons, which will require farmers to invest in water storage and the development of new crop varieties and farming techniques that are more resilient to unpredictable growing seasons. This is expected to result in significant increases in returns to public expenditures on research and extension and in water storage and management.

The marginal likely increase in the frequency of flood events will increase the need for major repairs and to designing rural roads to survive floods, which may add additional costs to rural road rehabilitation. However, it expected that the effects of climate change factors on rural roads will be smaller than its effects on research, extension, and irrigation. Current priorities for climate change activities are defined in the NAPA²¹ and will soon be further elaborated for the PPCR²². The NAPA contains 16 non-health priorities, of which seven are associated with investments in agricultural water management. This is consistent with the analysis in this chapter, which stresses the importance of irrigation in preparing for climate change. The NAPA includes a priority on supporting integrated farming systems. However, it does not put a sufficiently high priority on funding research and extension on adapting crop varieties and practices. In a country like Cambodia where the pattern of climate change is both more mixed and more uncertain than in other countries, it is prudent that public expenditure priorities should focus on “low regret” investments that combine standard national planning goals with climate adaptation. These would be public investments that would result in “low regrets” or opportunity costs (such as the increased use of improved seeds and better farming techniques, including water and soil management) if the more negative climate change

²¹ The National Adaptation Plan of Action

²² The Pilot Program for Climate Resilience

effects as currently projected do not materialize. Investing in increasing agricultural productivity would qualify as one such “low regret” option.

Returns to irrigation are expected to increase substantially as a result of the increased need to store water to protect against increased drought and flood frequency and a shorter wet season and growing period. The shortened rainy season is likely to be the feature of climate change that has the most significant impact on agriculture and on the performance of public expenditures on agriculture. If irrigation were used to ensure the survival of a crop during a shortened rainy season, the benefits of this would be about double the benefits of standard wet season supplementary irrigation.

5 Concussion

The agricultural situation in Cambodia has been far better and has be improved from a year-to-year however there we still have some problems. Which we need pay attention on those issues. According to those type of problems it not yet to become an intensive farming. The technical of agriculture in Cambodia was increased dramatically, compared to the past. The price of raw materials is still expensive for farmer, so we should worry about it. In the last few year, the weather has been far better, so it won't effect on local cultivation.

In other to change Cambodian agriculture to the intensive, we have to promote education farmer, crops and livestock, technology. Improve existed infrastructure to make opportunities that every farmer. The main solution of agriculture is the market which can provide the farmer to meet demand. Investments and policy are the main factors that can develop our agriculture in our country. Moreover, we should spend more time.

Agricultural Policies Recommendations

The government plays an important role in transforming from extensive to intensive agriculture. We have reviewed some of the policies that are in line with Cambodian context in agricultural development, those policies include:

- 1) **Community Technical Experts** The government must to have a policy to distribute agricultural experts to each community. At least one commune has four specialists, two specialists in crops and two other specialists in livestock. They have to work actively with farmers to teach modern farming cultivate techniques and livestock modernize to farmers, has role to monitoring the crops growth and the animal's growth. The have to work together well to research, meeting and find the solutions to farmers. In addition, the government must to have a budget for they learn more about new agricultural techniques in country or other countries.
- 2) **Building Agricultural Infrastructure** In addition to repairing existing agricultural infrastructure, the government must build new agricultural infrastructure in areas where it is necessary though irrigation system and transportation system. Increase the effectiveness of irrigation investments: Public funding for new and rehabilitated irrigation schemes needs to be extended to secondary canals and associated infrastructure. The rehabilitation of tertiary canals using public funds is also justified provided that it includes arrangements the costs of operation and maintenance to be

recovered from the end users. There also a need for more selectivity in funding irrigation schemes. Increase the share of the budget designated for maintenance of irrigation and rural roads: In the case of irrigation, the optimal level of maintenance expenditure should be about 33 percent of total investment, and in the rural roads sector, an average of 45 percent is required for periodic and routine maintenance combined. This level of maintenance should ensure that the next major rehabilitation is not required for at least 10 years.

- 3) **Agricultural Research Group** In addition to NGO agricultural research, the government must have a national agricultural research team. They need to research and development on agriculture through a study of recent agricultural technique, impact on the agricultural sector and setting out appropriate policies for achieving higher yields in agriculture. They are tasked to call local technical team to discuss solutions for each farm area. Besides the technical researcher, there must be experts in agricultural market research and find good policies and strategy to export more agricultural products and get more expensive prices for international market.
- 4) **Set Prices for Agricultural Products** The specialist must analyze and evaluate agricultural products prices by the seasonal, by the crop type and livestock type. It's imperative to strengthen the free market economy so that all parties are able to compete fairly and fairly in doing business. All parties shall apply and comply with the adoption of the law on agricultural commodities according to the goods as determined by the national prices research team.
- 5) **Improve Good Relationship between Stakeholders** Maintain a private sector friendly policy environment, particularly reduce the regulatory burden in farm input sectors such as seed sand fertilizers. Increasing the broader environment for stakeholders to contribute to agricultural development in Cambodia through NGOs and international institution or international agricultural researcher.
- 6) **Environmental Sustainability** Strengthen the environmental sustainability of agricultural production. Maintain a good environment for managing the cultivated area with the correct quality and quantity of fertilizer and pesticide use. At the same time, be ready for short term, medium tern and long tern climate change.
- 7) **Collecting Farmers' Agricultural Outputs** When prices of agricultural commodities are declining, the government plays as a key role in solving this problem through a policy of collecting agricultural products directly from farmers for stocks to be sold as agricultural yields rise. The policy will be effective when the actual value of the agricultural products falls short or medium term.

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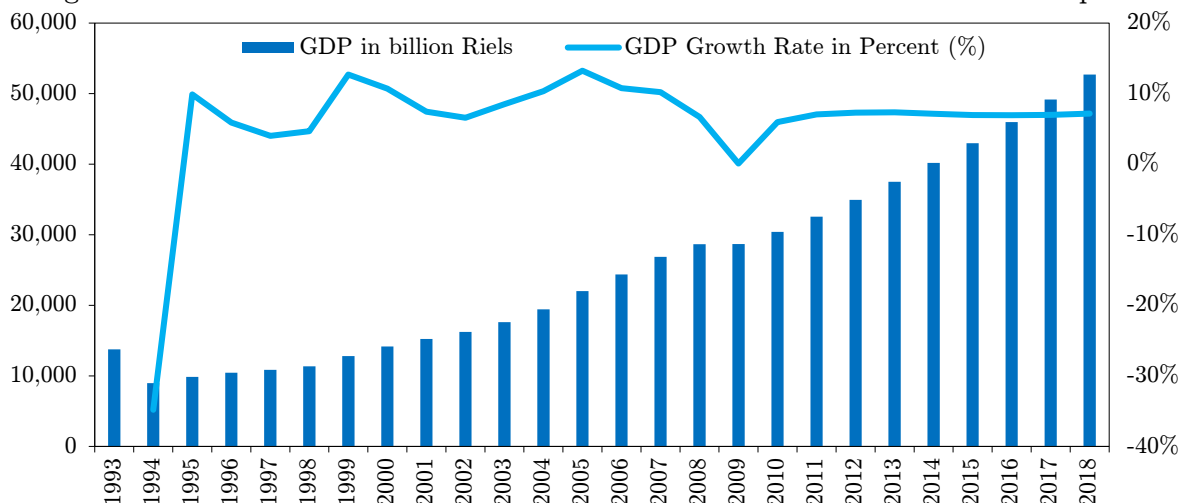
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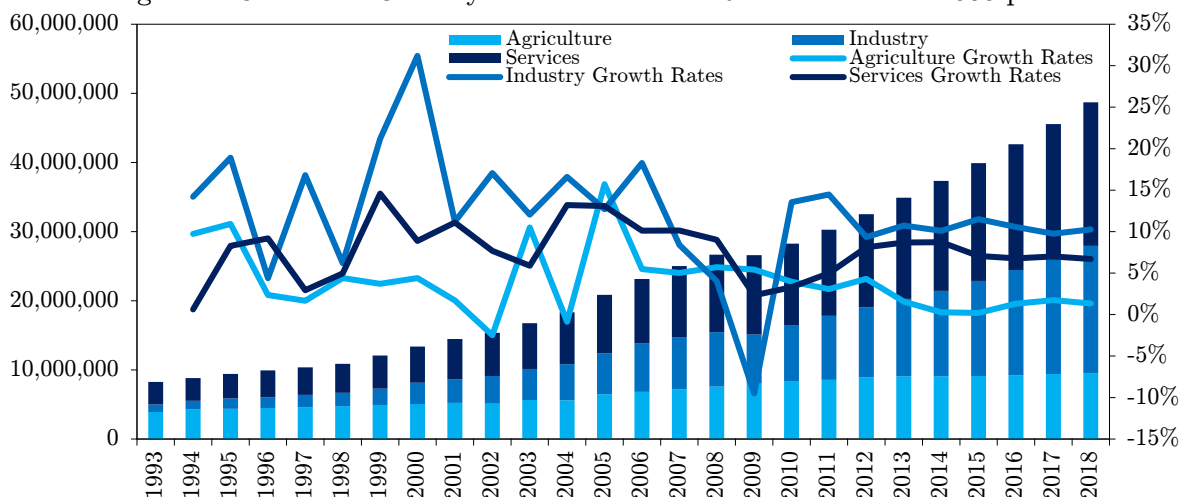
Appendices

Figure 1: Cambodia GDP Annual Growth Rate in billion Riels at constant 2000 prices



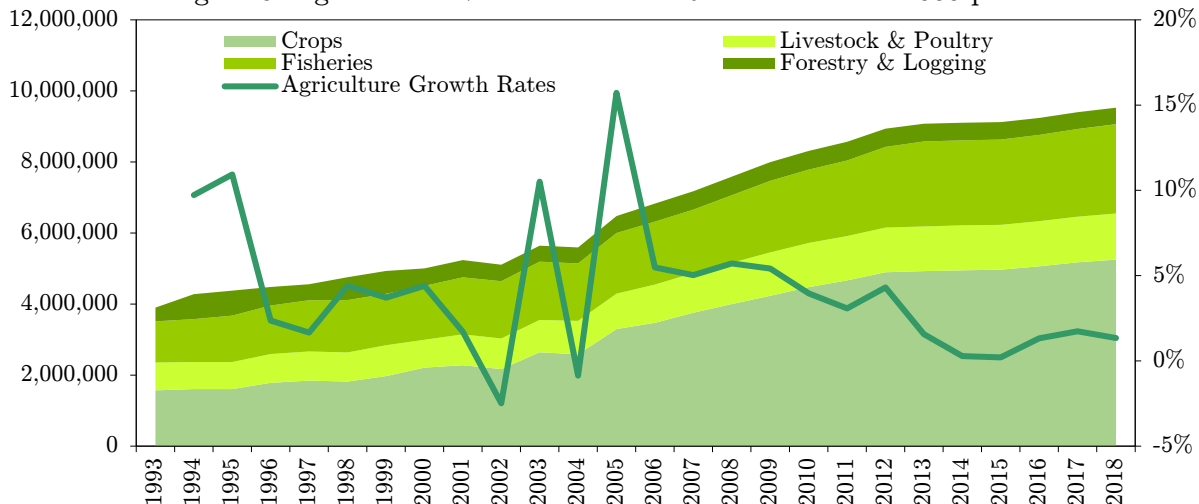
Source: Ministry of Economy and Finance 2018

Figure 2: Cambodia GDP by sector in Million Riels at constant 2000 prices



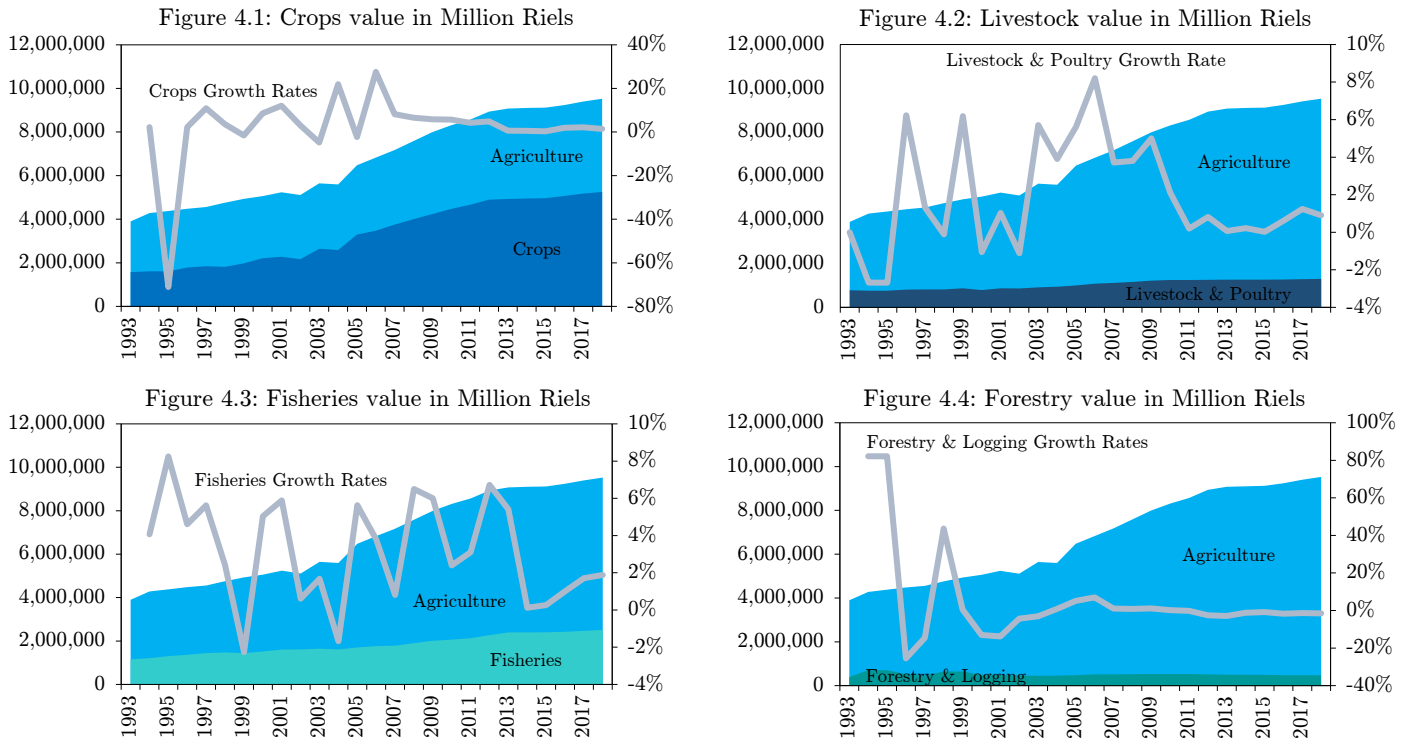
Source: Ministry of Economy and Finance 2018

Figure 3: Agricultural Value in Million Riels at constant 2000 prices



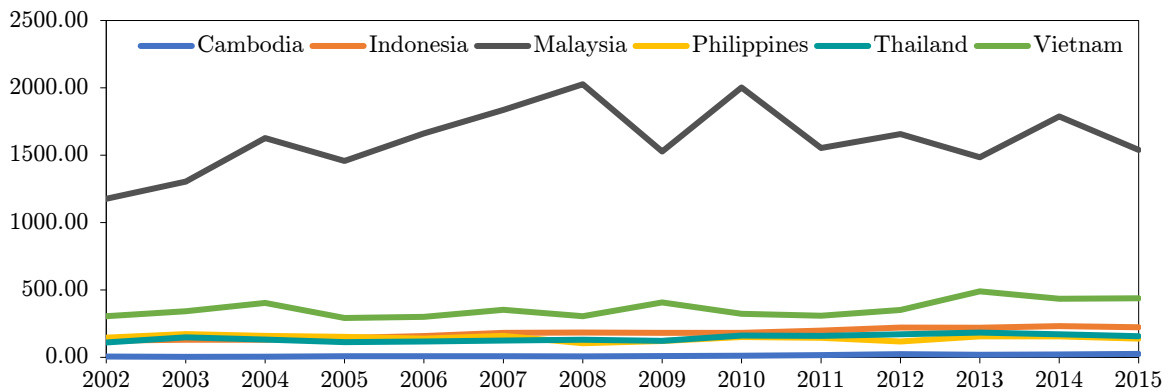
Source: Ministry of Economy and Finance 2018

Figure 4: Value in Million Riels and Growth Rates, in percent at constant 2000 prices



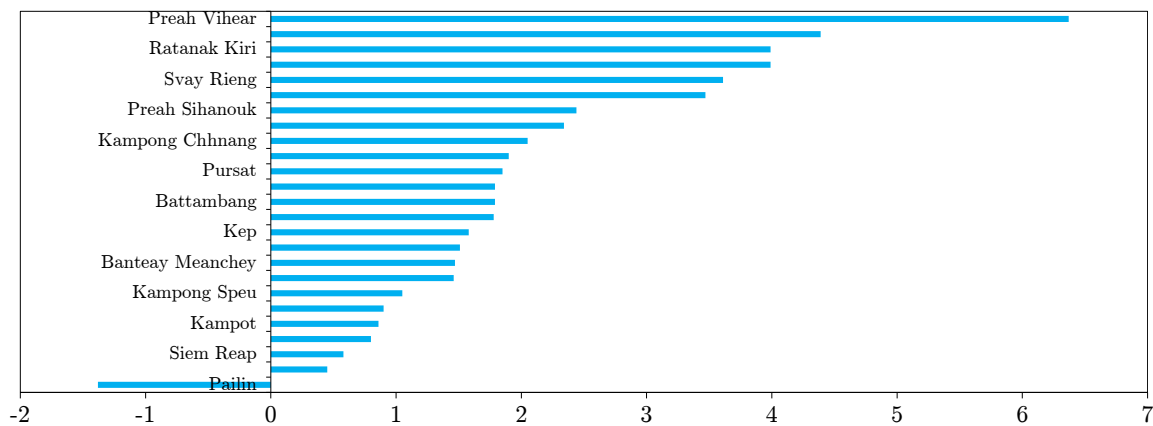
Source: Ministry of Economy and Finance 2018

Figure 5: Fertilizer consumption (kilograms per hectare of arable land)



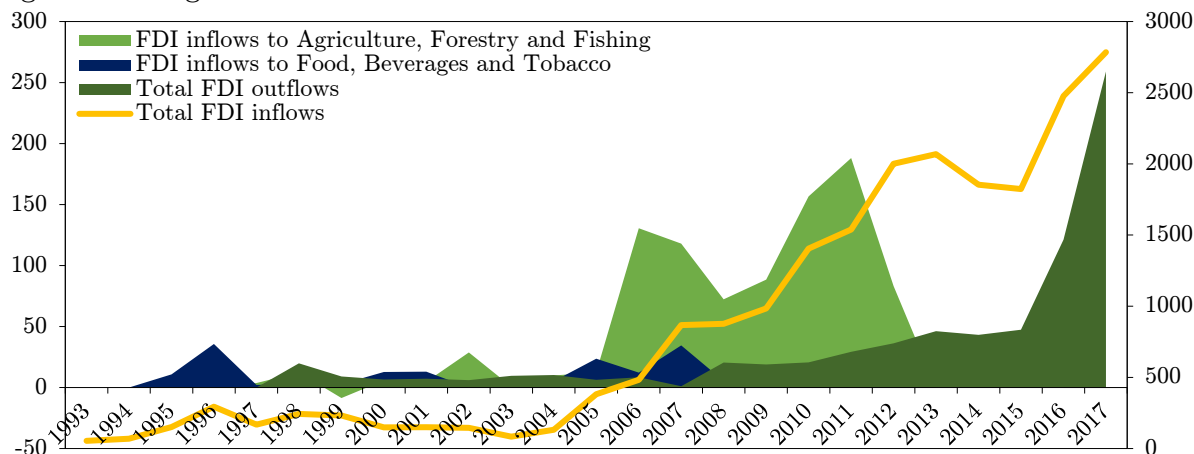
Source: World Development Indicators 2018

Figure 6: Annual population growth rate Percent - 2008-2013



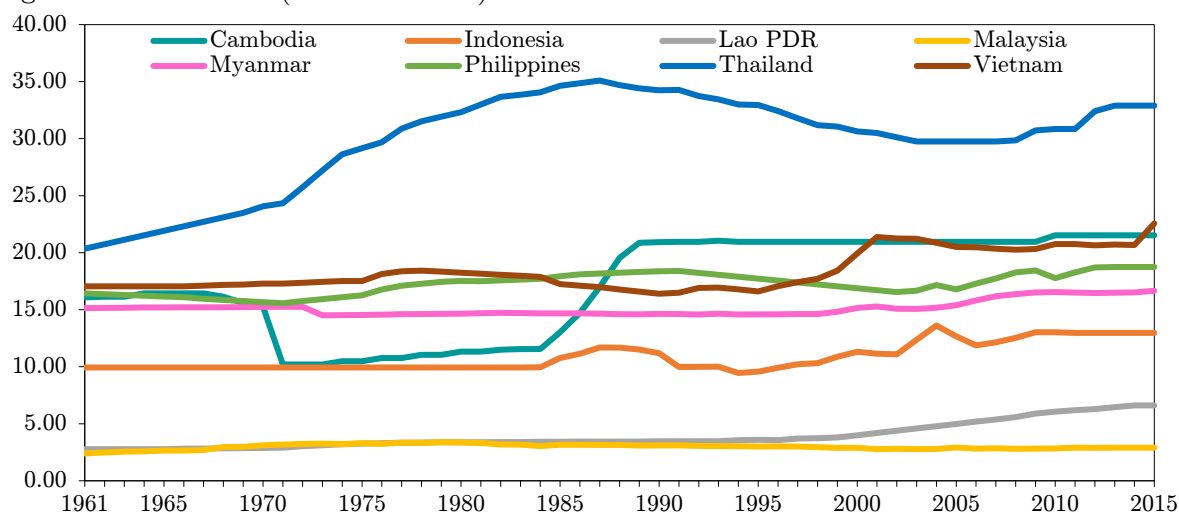
Source: MoP, NIS Cambodia Inter-Censal Population Survey of Cambodia 2013

Figure 7: Foreign Direct Investment in Cambodia



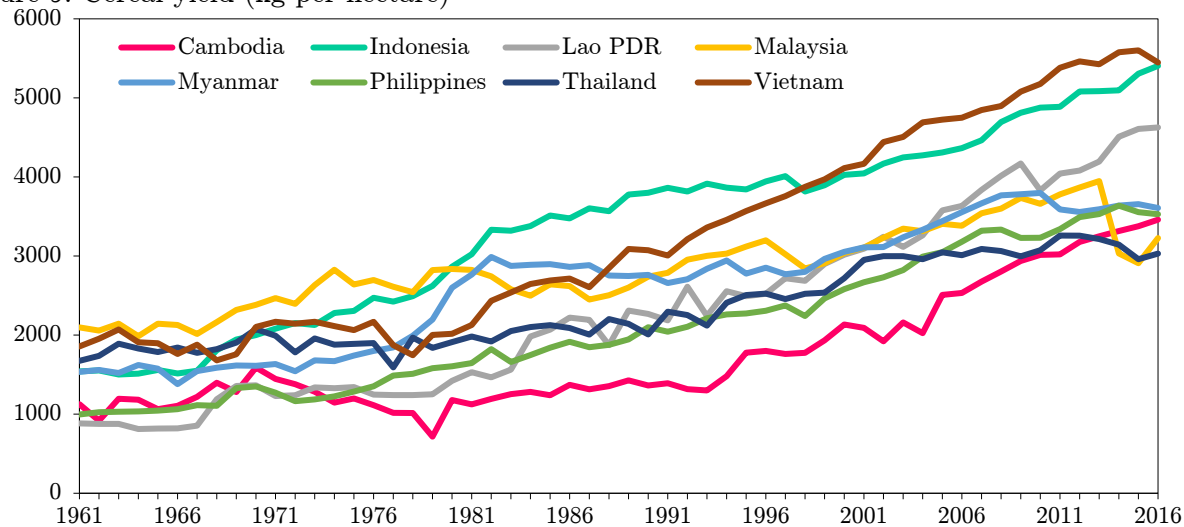
Source: World Development Indicators 2018

Figure 8: Arable land (% of land area)



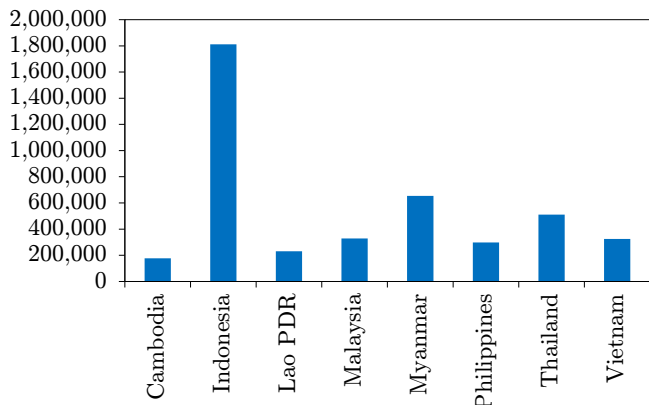
Source: World Development Indicators 2018

Figure 9: Cereal yield (kg per hectare)



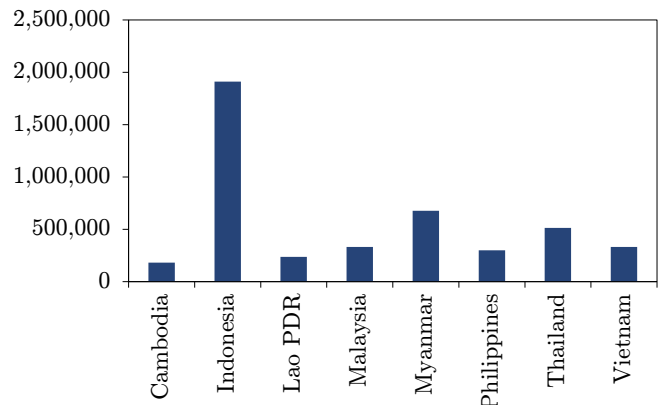
Source: World Development Indicators 2018

Figure 10: Land area (sq. km)



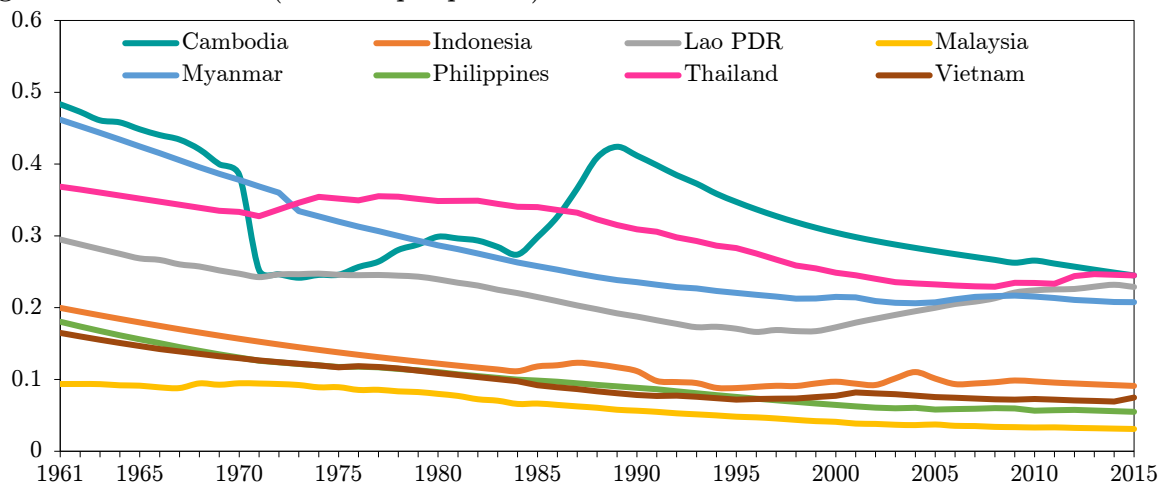
Source: World Development Indicators 2018

Figure 11: Surface area (sq. km)



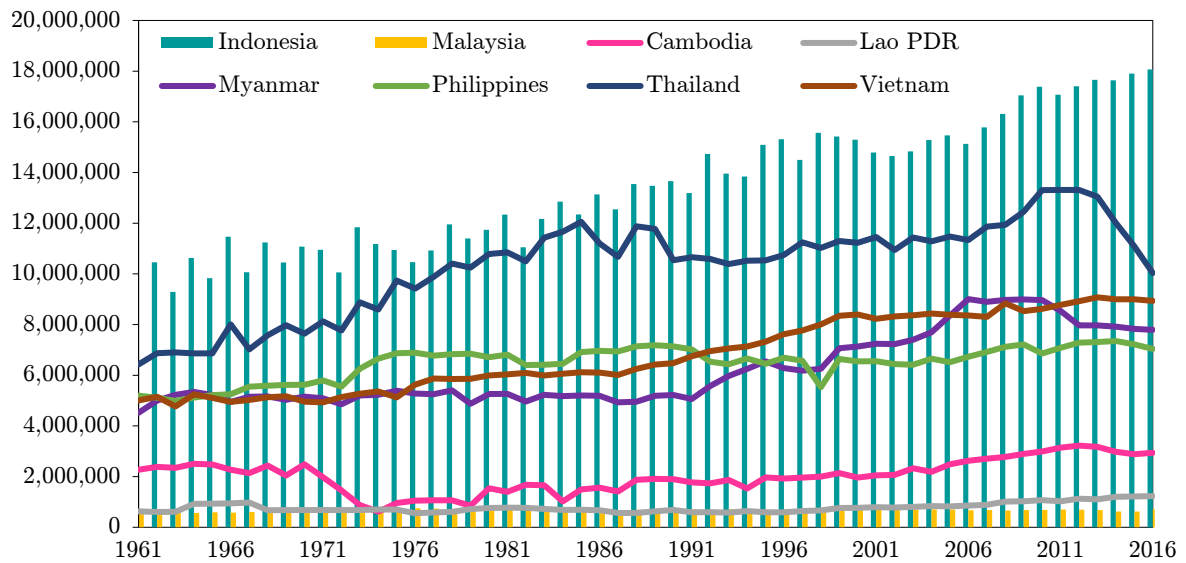
Source: World Development Indicators 2018

Figure 12: Arable land (hectares per person)



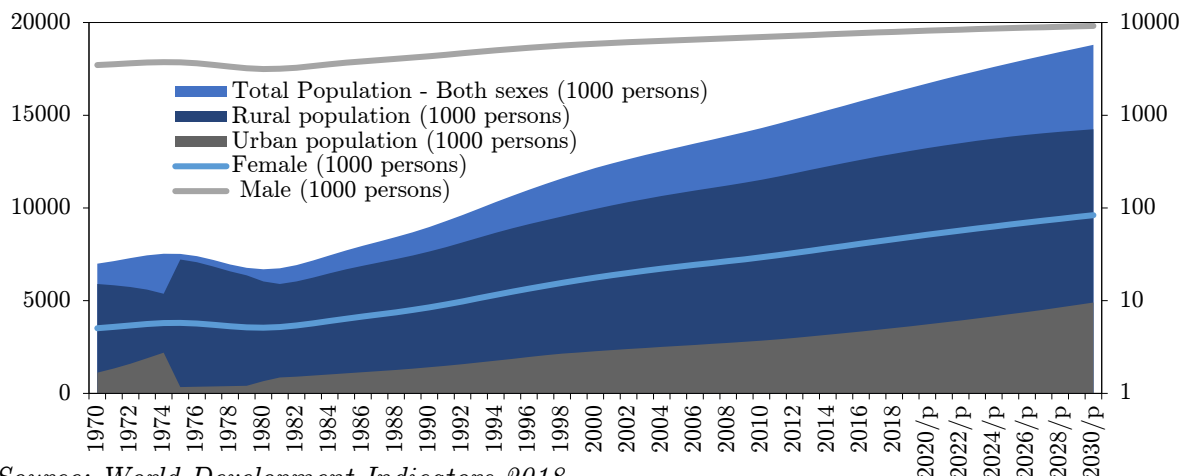
Source: World Development Indicators 2018

Figure 13: Land under cereal production (hectares)



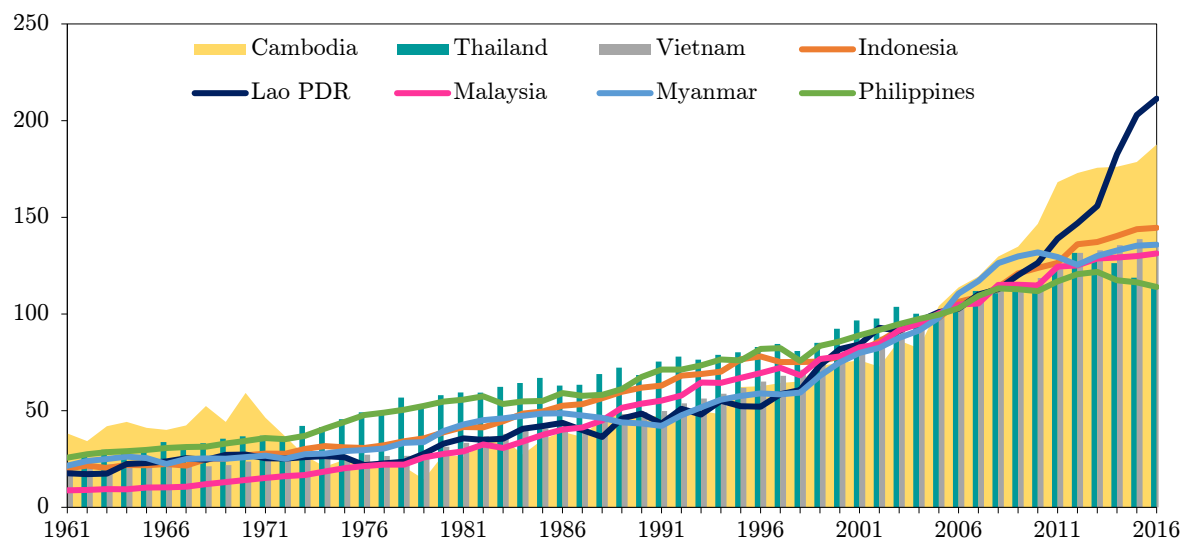
Source: World Development Indicators 2018

Figure 14: Population estimate of Cambodia 1970-2030



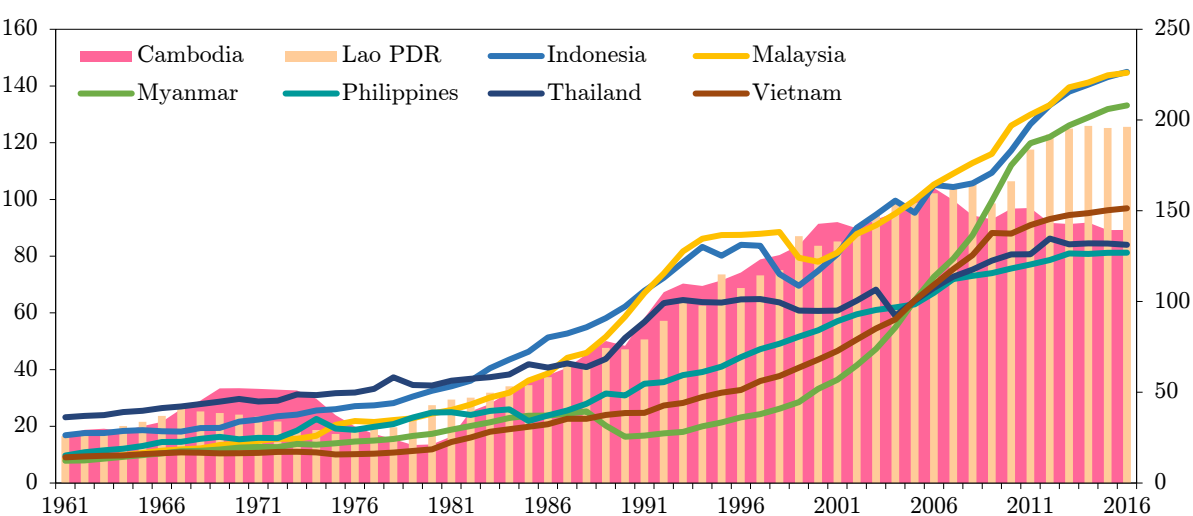
Source: World Development Indicators 2018

Figure 15: Food production index (2004-2006 = 100)



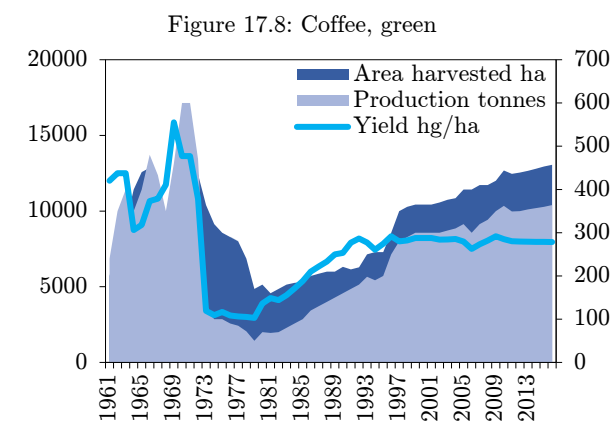
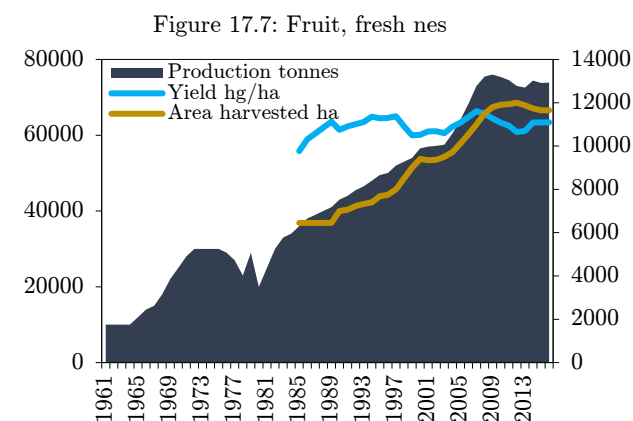
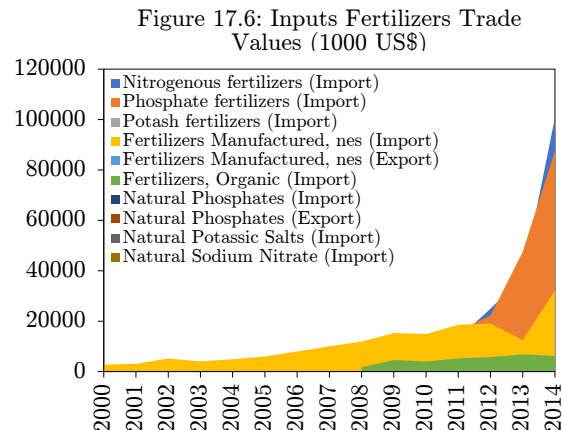
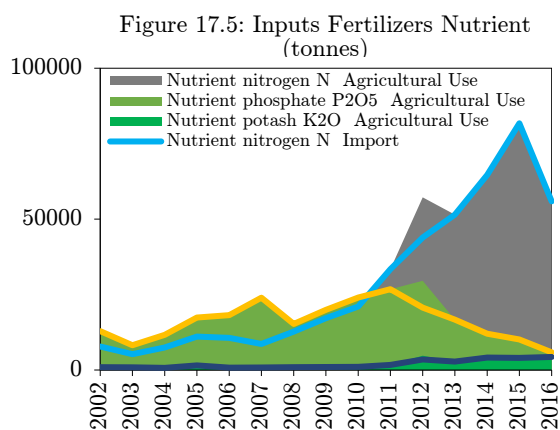
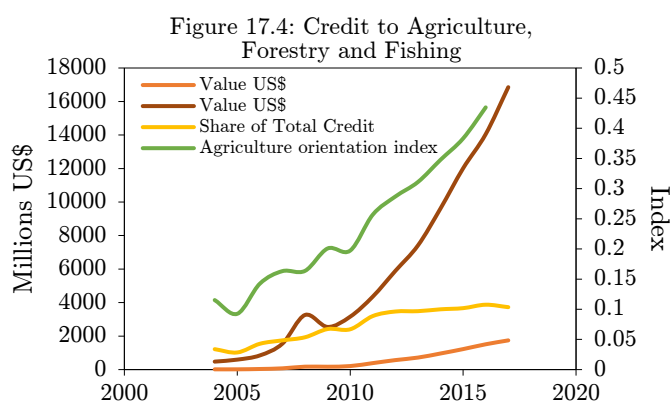
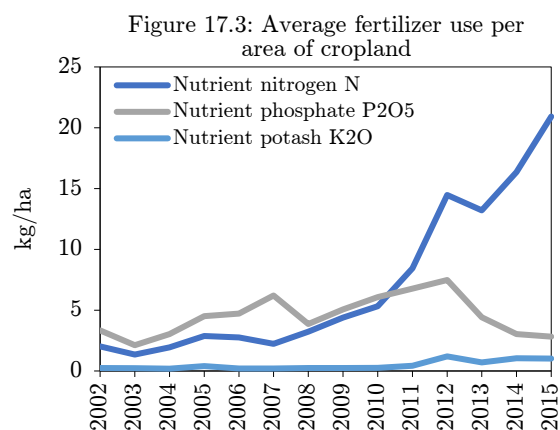
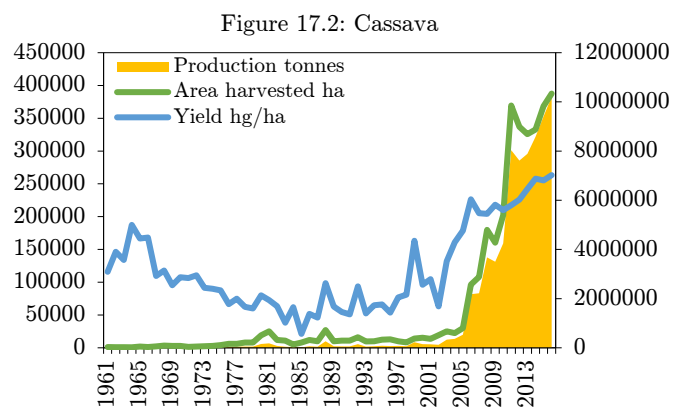
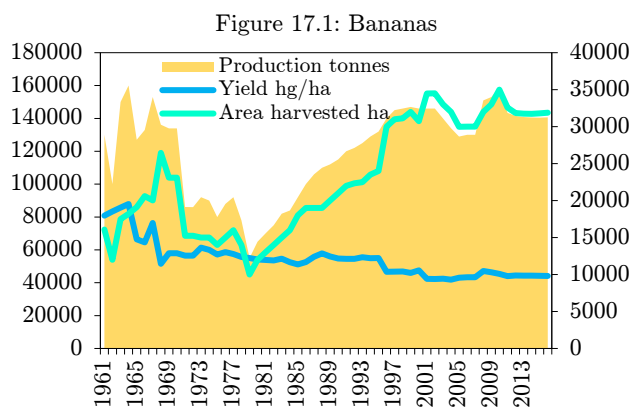
Source: World Development Indicators 2018

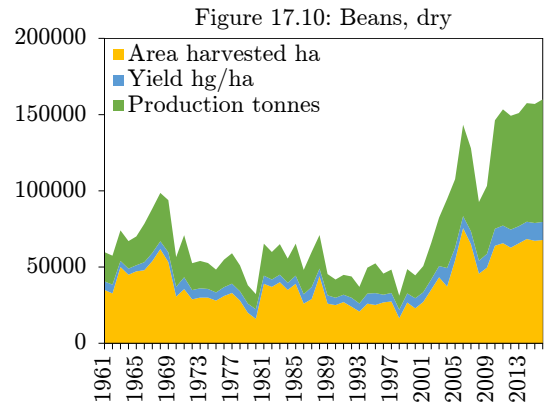
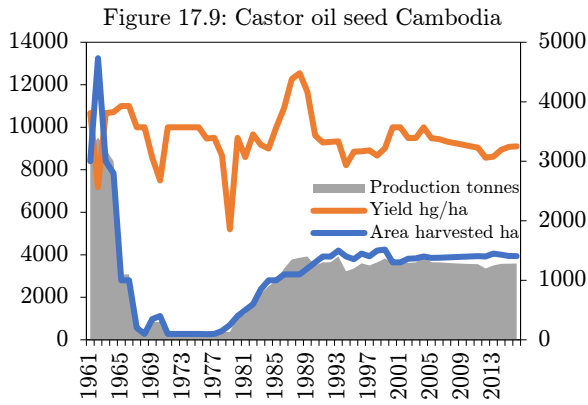
Figure 16: Livestock production index (2004-2006 = 100)



Source: World Development Indicators 2018

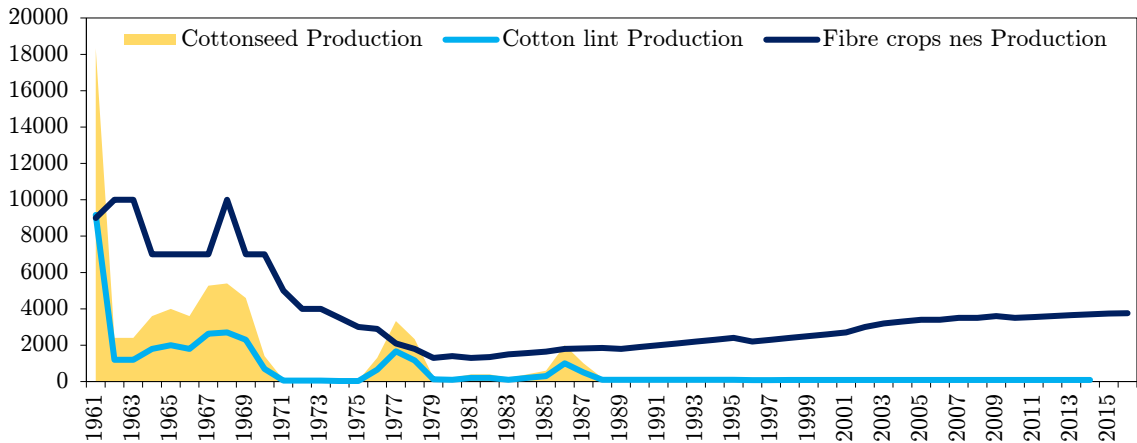
Figure 17: Value in Million Riels and Growth Rates, in percent at current prices





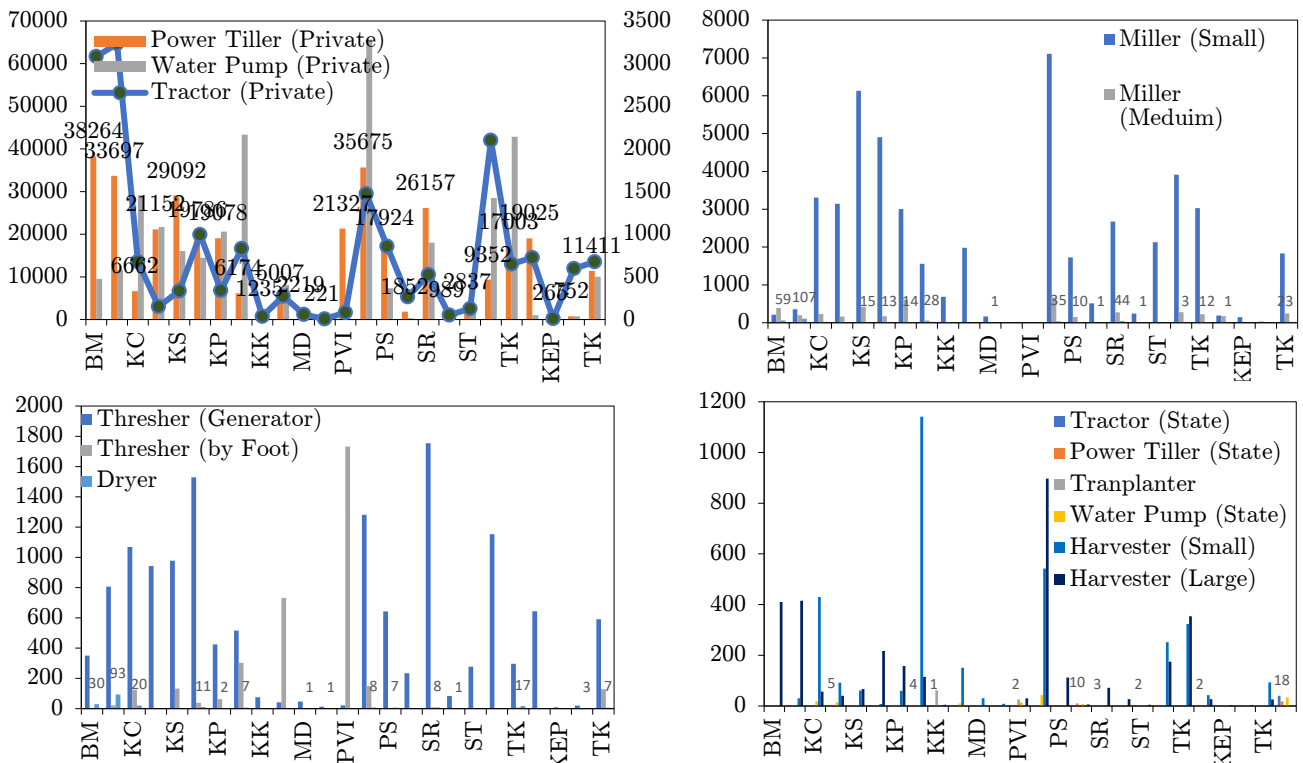
Source: World Development Indicators 2018

Figure 18: Production (Tonnes)



Source: World Development Indicators 2018

Figure 19: Farm Machines and Equipment 2016



Clarify: Rice miller small scale milling less than 55kg/h. Medium size milling 500-3000 Kg/h, Large size milling more than 3000Kg/h

Source: Ministry of Agriculture, Forestry and Fisheries

Figure 20: Number Agricultural Cooperative

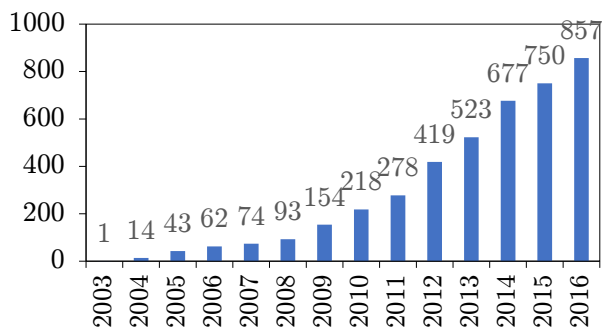


Figure 21: Cambodia rice

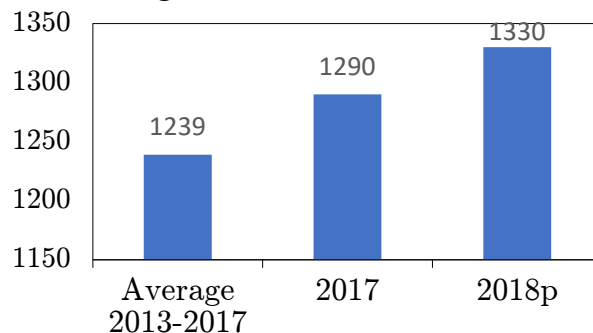
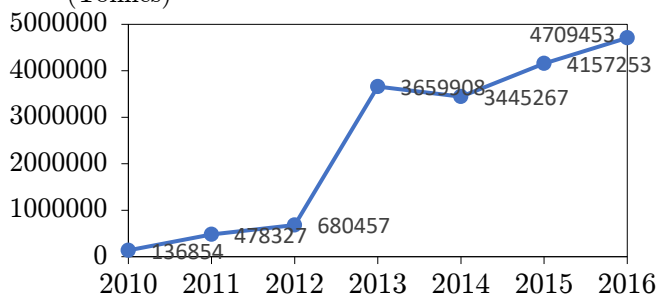
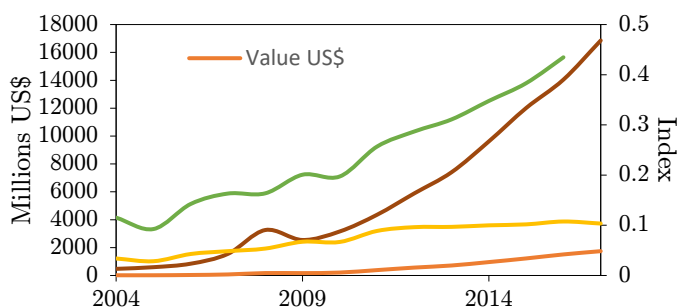


Figure 22: Export of agricultural product (Tonnes)



Source: MAFF

Figure 23: Credit to Agriculture, Forestry and Fishing



Source: FAO 2018

Table 1: Education level of the labor force by age group 2016 (Number in Thousands and Percent)

Age group	None or only some education	Primary school not completed	Primary school completed	Lower secondary completed	Upper secondary completed	Post-secondary education	Total
Number							
15-19	32	229	493	197	35	4	992
20-24	44	301	514	286	177	127	1,450
25-34	163	693	712	433	231	305	2,538
35-44	185	614	392	183	104	93	1,571
45-54	250	572	274	150	66	42	1,354
55-64	162	373	109	53	17	6	720
Total (15-64)	836	2,783	2,494	1,303	630	577	8,624
Of which 15-24	76	530	1,007	483	212	131	2,442
Percent							
15-19	3.3	23.1	49.8	19.9	3.5	0.4	100
20-24	3.1	20.8	35.5	19.7	12.2	8.8	100
25-34	6.4	27.3	28.1	17.1	9.1	12.0	100
35-44	11.8	39.1	24.9	11.7	6.6	5.9	100
45-54	18.4	42.3	20.2	11.1	4.9	3.1	100
55-64	22.6	51.9	15.1	7.3	2.3	0.8	100
Total (15-64)	9.7	32.3	28.9	15.1	7.3	6.7	100
Of which 15-24	6.4	43.9	85.3	39.6	15.7	9.2	100

Source: National Institute of Statistics: Cambodia Socio-Economic Survey 2016

Table 2: Employed population aged (15-64 years) by industrial sector main occupation and sex, 2016 (Number in Thousands and Percent)

Industrial sector (main occupation)	Number			Percent		
	Women	Men	Both sexes	Women	Men	Both sexes
Employed population	4,167	4,441	8,608	78.8	89.2	83.9
Agriculture (Primary)	1,636	1,494	3,130	39.3	33.7	36.4
Industry (Secondary)	1,051	1,240	2,291	25.2	27.9	26.6
Service (Tertiary)	1,480	1,707	3,187	35.5	38.4	37.0
Total	4,167	4,441	8,608	100	100	100

Source: National Institute of Statistics: Cambodia Socio-Economic Survey 2016

Table 3: Student enrolment and graduate from Royal University of Agriculture

Student	2012		2013		2014		2015		2016	
	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female
Enrolled Student (BSc)	1018	237	1044	310	789	260	945	364	945	364
Graduated Student (BSc)	315	65	397	104	851	166	1243	313	545	187
Graduated Student (MSc)	17	3	54	7	31	7	41	4	37	8
Graduated Student (PhD)	2	0	1	0	0	0	1	1	0	0

Source: MAFF Annual Report 2016-2017

Table 4: Student's enrolment and graduate at Prek Leap National College of Agriculture

Academic Year	Enrolment				Graduated			
	Associate		Bachelor		Associate		Bachelor	
	Total	Female	Total	Female	Total	Female	Total	Female
2011-2012	164	46	438	120	197	68	269	75
2012-2013	162	55	473	140	157	44	259	78
2013-2014	81	16	360	106	123	39	403	128
2014-2015	140	31	161	41	396	15	378	111
2015-2016	170	50	258	85	104	24	288	108
Total	717	198	1690	492	977	190	1597	500

Source: MAFF Annual Report 2016-2017

Table 5: Employed population aged (15-64 years) by industrial sector and geographical domain, 2016 (Number in Thousands and Percent)

Industrial sector (main occupation)	Number				Percent			
	Cambodia	Phnom Penh	Other urban	Other rural	Cambodia	Phnom Penh	Other urban	Other rural
Employed population	8,608	1,080	1,074	6,454	83.9	78.6	80.4	85.4
Agriculture (Primary)	3,130	11	133	2,987	36.4	1.0	12.4	46.3
Industry (Secondary)	2,291	281	284	1,724	26.6	26.0	26.5	26.7
Services (Tertiary)	3,187	789	657	1,742	37.0	73.0	61.1	27.0
Total	8,608	1,080	1,074	6,454	100	100	100	100

Source: National Institute of Statistics: Cambodia Socio-Economic Survey 2016

Table 6: Top 24 Commodities Production in Cambodia 2006-2016 (Tonnes)

Item	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bananas	130,000	130,000	151,000	153,000	159,004	143,363	141,495	140,854	140,532	140,475	140,610
Beans, dry	59,899	54,490	38,600	44,614	71,220	76,196	74,677	74,144	77,795	78,117	80,355
Beer of barley	84,147	97,636	142,415	122,682	159,285	266,007	357,518	440,000	480,000	-	-
Cassava	2,182,043	2,215,000	3,676,232	3,497,306	4,247,419	8,033,843	7,613,697	7,886,604	8,584,605	9,410,691	10,206,514
Coconuts	70,000	71,000	70,900	61,350	65,500	65,600	66,940	70,580	62,090	64,983	69,585
Fruit, fresh nes	68,322	73,000	75,500	76,000	75,369	74,566	73,000	72,580	74,426	73,814	73,868
Groundnuts, with shell	-	-	-	-	-	-	-	-	-	28,571	28,571
Maize	376,938	523,000	611,865	924,026	773,269	717,000	950,909	927,000	550,000	400,000	351,361
Mangoes, mangos teens, guavas	48,000	51,000	53,000	55,000	57,124	59,579	59,974	61,731	63,488	65,244	67,001
Meat indigenous, cattle	60,240	60,720	62,400	64,680	62,880	63,120	63,600	63,600	-	-	-
Meat indigenous, pig	137,506	119,886	97,826	83,664	102,962	104,290	86,082	86,082	-	-	-
Meat, cattle	60,240	60,720	62,400	64,680	62,880	63,120	63,600	60,756	56,750	56,386	56,943
Meat, pig	138,500	120,000	112,500	115,000	105,000	110,000	98,500	103,504	111,650	110,537	111,114
Milk, whole fresh cow	185,653	188,735	194,312	199,892	194,378	190,250	191,670	191,702	194,510	169,579	169,988
Oil palm fruit	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000
Oil, palm	-	-	-	-	-	-	-	-	32,000	-	-
Oranges	65,000	63,000	64,000	65,000	65,210	64,826	64,661	64,759	64,857	64,956	65,054
Rice, paddy	6,264,123	6,727,000	7,175,473	7,585,870	8,245,320	8,779,000	9,290,940	9,390,000	9,324,000	9,335,000	9,827,001
Roots and tuberoses	-	-	-	-	-	-	-	-	38,181	39,116	40,031
Sesame seed	-	-	-	-	-	-	-	-	-	28,000	29,000
Soybeans	98,289	117,000	108,449	137,275	156,589	114,603	120,165	157,000	162,000	162,000	162,000
Sugar cane	141,704	286,811	385,238	350,155	365,555	468,738	573,771	645,473	531,127	578,706	610,878
Sweet potatoes	45,285	38,000	39,621	78,891	79,347	46,648	48,754	45,547	45,461	43,936	43,663
Vegetables, freshens	481,000	487,000	504,086	525,412	544,287	564,451	628,000	605,230	536,430	539,242	541,928
Total	10,856,889	11,643,998	13,785,817	14,364,497	15,752,598	20,165,200	20,727,953	21,247,146	21,289,902	21,549,353	22,835,465

Source: Food and Agriculture Organization 2018

Table 7: Inputs Land Use in Cambodia (1000 ha)

Item	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Country area	18104	18104	18104	18104	18104	18104	18104	18104	18104	18104	18104
Land area	17652	17652	17652	17652	17652	17652	17652	17652	17652	17652	17652
Agriculture	4580	4630	4770	5000	5230	5355	5355	5455	5455	5455	5455
Agricultural land	4580	4630	4770	5000	5230	5355	5355	5455	5455	5455	5455
Cropland	3830	3830	3840	3850	3850	3855	3855	3955	3955	3955	3955
Arable land	3700	3700	3700	3700	3700	3700	3700	3800	3800	3800	3800
Land under permanent crops	130	130	140	150	150	155	155	155	155	155	155
Land under perm. meadows and pastures	750	800	930	1150	1380	1500	1500	1500	1500	1500	1500
Forestry	12105.2	11825.6	11546	11220	10894	10603.6	10348.8	10094	9839.2	9584.4	9329.6
Forest land	12105.2	11825.6	11546	11220	10894	10603.6	10348.8	10094	9839.2	9584.4	9329.6
Primary Forest	580	518	456	402.4	348.8	322	322	322	322	322	-
Other naturally regenerated forest	11451	11231	11011	10740.6	10470.2	10208.6	9955.8	9703	9448.2	9193.4	-
Planted Forest	74.2	76.6	79	77	75	73	71	69	69	69	-
Other land	966.8	1196.4	1336	1432	1528	1693.4	1948.2	2103	2357.8	2612.6	2867.4
Inland waters	452	452	452	452	452	452	452	452	452	452	452
Land area equipped for irrigation	270	275	282	285	300	353.6	354	354	354	354	354
Agriculture area under organic agric.	-	-	-	-	-	1.5	8.8	8.08	9.06	9.89	9.72
Agriculture area certified organic	-	-	-	-	-	-	-	6.79	-	9.86	5.18

Source: Food and Agriculture Organization 2018

Table 8: Production Livestock of Cambodia

Item	Unit	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Buffaloes	Head	743928	693651	693631	625912	650572	724378	746207	702074	680000	680000	681980
Cattle	Head	2761800	2679940	2992640	2924457	3039945	3344612	3457787	3484601	2914974	2875000	2882660
Chickens	1000 Head	11412	13117	15249	16678	16034	15136	16928	17448	14447	13000	13250
Ducks	1000 Head	4200	4500	5500	6300	7000	7000	7000	7500	8200	8300	8343
Horses	Head	22000	23000	26000	27000	28000	28000	28000	28000	29000	30000	30025
Pigs	Head	2151097	2339168	1933930	2105435	2428566	2740745	2215641	2057431	2120000	2180000	2182494
Cattle and Buffaloes	Head	3505728	3373591	3686271	3550369	3690517	4068990	4203994	4186675	3594974	3555000	3564640
Poultry Birds	1000 Head	15612	17617	20749	22978	23034	22136	23928	24948	22647	21300	21593

Source: Food and Agriculture Organization 2018

Table 9: Environment Manure of Cambodia

Item	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Amount excreted in manure (N content in Kg)											
Buffaloes	33018500.35	30787005.98	30786118.3	27780478.21	28874987.65	32150793.15	33119651.49	31160852.42	30181120	30181120	30268984.87
Cattle, dairy	6784802.5	7085015	7205100	7205100	7325185	8033686.5	8405950	8405950	8285865	8405950	7342583.302
Cattle, non-dairy	104860429.5	101421824.5	113721785.1	111022563.3	115515314.9	127109304.4	131344220	132405729.9	109934569	108272906.5	109277268.4
Chickens, broilers	3184216.2	3728047.95	4426176.15	4798005.3	4529160.9	4163006.338	4713617.114	4461949.8	3341403.45	2818530	3571551.791
Chickens, layers	1400724	1508472	1616220	1831716	1885590	1947704.645	2092216.114	2747574	2801448	2801448	1813541.417
Ducks	3435453	3680842.5	4498807.5	5153179.5	5725755	5725755	5725755	6134737.5	6707313	6789109.5	6824354.378
Horses	879124.4	919084.6	1038965.2	1078925.4	1118885.6	1118885.6	1118885.6	1118885.6	1158845.8	1198806	1199804.913
Swine, breeding	527621.0722	573751.127	474354.3504	516421.0968	595678.6685	672249.9336	543452.4245	504646.6757	519993.6	534710.4	535322.1048
Swine, market	8310031.887	9036580.251	7471081.019	8133632.275	9381939.029	10587936.45	8559375.686	7948185.142	8189899.2	8421688.8	8431323.15
All Animals	162400902.9	158740623.9	171238607.6	167520021	174952496.7	191509322	195623123.4	194888511.1	171120457.1	169424269.2	169264734.3
Cattle	111645232	108506839.5	120926885.1	118227663.3	122840499.9	135142990.9	139750170	140811679.9	118220434	116678856.5	116619851.7
Chickens	4584940.2	5236519.95	6042396.15	6629721.3	6414750.9	6110710.983	6805833.228	7209523.8	6142851.45	5619978	5385093.208
Poultry Birds	8020393.2	8917362.45	10541203.65	11782900.8	12140505.9	11836465.98	12531588.23	13344261.3	12850164.45	12409087.5	12209447.59
Swine	8837652.959	9610331.378	7945435.369	8650053.371	9977617.697	11260186.39	9102828.11	8452831.818	8709892.8	8956399.2	8966645.255
Buffaloes	5415034.058	5049068.981	5048923.402	4555998.426	4735497.974	5272730.077	5431622.844	5110379.796	4949703.68	4949703.68	4964113.518
Cattle, dairy	1673132.297	1747164.699	1776777.66	1776777.66	1806390.621	1981107.091	2072907.27	2072907.27	2043294.309	2072907.27	1810681.042
Cattle, non-dairy	19294319.03	18661615.71	20924808.45	20428151.64	21254817.94	23388112	24167336.48	24362654.31	20227960.7	19922214.8	20107017.38
Chickens, broilers	24518.46474	28705.96922	34081.55636	36944.64081	34874.53893	32055.14881	36294.85178	34357.01346	25728.80657	21702.681	27500.94879
Chickens, layers	10785.5748	11615.2344	12444.894	14104.2132	14519.043	14997.32576	16110.06407	21156.3198	21571.1496	21571.1496	13964.26891
Ducks	26452.9881	28342.48725	34640.81775	39679.48215	44088.3135	44088.3135	44088.3135	47237.47875	51646.3101	52276.14315	52547.52871
Horses	0	0	0	0	0	0	0	0	0	0	0
Swine, breeding	101303.2459	110160.2164	91076.03528	99152.85059	114370.3043	129071.9873	104342.8655	96892.16173	99838.7712	102664.3968	102781.8441
Swine, market	1595526.122	1735023.408	1434447.556	1561657.397	1801332.293	2032883.799	1643400.132	1526051.547	1572460.646	1616964.25	1618814.045
All Animals	28141071.78	27371696.71	29357200.37	28512466.31	29805891.02	32895045.75	33516102.82	33271635.89	28992204.37	28760004.37	28697420.58
Cattle	20967451.33	20408780.41	22701586.11	22204929.3	23061208.56	25369219.1	26240243.75	26435561.58	22271255.01	21995122.07	21917698.43
Chickens	35304.03954	40321.20362	46526.45036	51048.85401	49393.58193	47052.47457	52404.91585	55513.33326	47299.95617	43273.8306	41465.2177
Poultry Birds	61757.02764	68663.69087	81167.26811	90728.33616	93481.89543	91140.78807	96493.22935	102750.812	98946.26627	95549.97375	94012.74641
Swine	1696829.368	1845183.625	1525523.591	1660810.247	1915702.598	2161955.786	1747742.997	1622943.709	1672299.418	1719628.646	1721595.889
Manure applied to soils (N content in Kg)											
Buffaloes	9443291.101	8805083.711	8804829.835	7945216.767	8258246.467	9195126.841	9472220.326	8912003.791	8631800.32	8631800.32	8656929.672
Cattle, dairy	3279773.529	3424896.251	3482945.34	3482945.34	3540994.429	3883484.054	4063436.23	4063436.23	4005387.141	4063436.23	3549404.768
Cattle, non-dairy	31038687.14	30020860.06	33661648.38	32862678.73	34192533.2	37624354.09	38877889.11	39192096.06	32540632.43	32048780.32	32346071.44

Chickens, broilers	1726800.445	2021720.403	2400315.326	2601958.274	2456163.956	2257598.337	2556194.561	2419715.377	1812043.091	1528488.819	1936852.536
Chickens, layers	759612.6252	818044.3656	876476.106	993339.5868	1022555.457	1056240.229	1134608.798	1490009.38	1519225.25	1519225.25	983483.5104
Ducks	1863046.162	1996120.888	2439703.307	2794569.243	3105076.937	3105076.937	3105076.937	3326868.146	3637375.84	3681734.082	3700847.379
Horses	43956.22	45954.23	51948.26	53946.27	55944.28	55944.28	55944.28	55944.28	57942.29	59940.3	59990.24563
Swine, breeding	431594.037	469328.4219	388021.8586	422432.4572	487265.1508	549900.4457	444544.0832	412800.9807	425354.7648	437393.1072	437893.4817
Swine, market	6797606.083	7391922.645	6111344.273	6653311.201	7674426.125	8660932.02	7001569.311	6501615.446	6699337.546	6888941.438	6896822.337
All Animals	55384367.34	54993930.98	58217232.68	57810397.87	60793206	66388657.24	66711483.64	66374489.69	59329098.67	58859739.87	58568295.37
Cattle	34318460.67	33445756.31	37144593.72	36345624.07	37733527.63	41507838.15	42941325.34	43255532.29	36546019.57	36112216.55	35895476.21
Chickens	2486413.07	2839764.769	3276791.432	3595297.861	3478719.413	3313838.566	3690803.359	3909724.757	3331268.341	3047714.069	2920336.047
Poultry Birds	4349459.232	4835885.657	5716494.739	6389867.104	6583796.35	6418915.503	6795880.296	7236592.903	6968644.181	6729448.151	6621183.426
Swine	7229200.12	7861251.067	6499366.132	7075743.658	8161691.276	9210832.465	7446113.394	6914416.427	7124692.31	7326334.546	7334715.818
Buffaloes	17334712.68	16163178.14	16162712.11	14584751.06	15159368.52	16879166.4	17387817.03	16359447.52	15845088	15845088	15891217.06
Cattle, dairy	1594428.588	1664978.525	1693198.5	1693198.5	1721418.475	1887916.328	1975398.25	1975398.25	1947178.275	1975398.25	1725507.076
Cattle, non-dairy	53478819.06	51725130.51	57998110.38	56621507.27	58912810.58	64825745.23	66985552.19	67526922.26	56066630.2	55219182.32	55731406.88
Chickens, broilers	1416976.209	1658981.338	1969648.387	2135112.359	2015476.601	1852537.821	2097559.616	1985567.661	1486924.535	1254245.85	1589340.547
Chickens, layers	623322.18	671270.04	719217.9	815113.62	839087.55	866728.5669	931036.1705	1222670.43	1246644.36	1246644.36	807025.9306
Ducks	1528776.585	1637974.913	2001969.338	2293164.878	2547960.975	2547960.975	2547960.975	2729958.188	2984754.285	3021153.728	3036837.698
Horses	835168.18	873130.37	987016.94	1024979.13	1062941.32	1062941.32	1062941.32	1062941.32	1100903.51	1138865.7	1139814.667
Swine, breeding	0	0	0	0	0	0	0	0	0	0	0
Swine, market	0	0	0	0	0	0	0	0	0	0	0
All Animals	76812203.48	74394643.84	81531873.55	79167826.81	82259064.02	89922996.65	92988265.55	92862905.63	80678123.16	79700578.2	79921149.85
Cattle	55073247.64	53390109.03	59691308.88	58314705.77	60634229.06	66713661.56	68960950.44	69502320.51	58013808.47	57194580.57	57456913.95
Chickens	2040298.389	2330251.378	2688866.287	2950225.979	2854564.151	2719266.387	3028595.786	3208238.091	2733568.895	2500890.21	2396366.478
Poultry Birds	3569074.974	3968226.29	4690835.624	5243390.856	5402525.126	5267227.362	5576556.761	5938196.279	5718323.18	5522043.938	5433204.176
Swine	0	0	0	0	0	0	0	0	0	0	0
Manure treated (N content in Kg)											
Buffaloes	14858325.16	13854152.69	13853753.24	12501215.19	12993744.44	14467856.92	14903843.17	14022383.59	13581504	13581504	13621043.19
Cattle, dairy	4952905.825	5172060.95	5259723	5259723	5347385.05	5864591.145	6136343.5	6136343.5	6048681.45	6136343.5	5360085.81
Cattle, non-dairy	50333006.17	48682475.77	54586456.83	53290830.37	55447351.14	61012466.1	63045225.59	63554750.37	52768593.13	51970995.12	52453088.83
Chickens, broilers	1751318.91	2050426.373	2434396.883	2638902.915	2491038.495	2289653.486	2592489.413	2454072.39	1837771.898	1550191.5	1964353.485
Chickens, layers	770398.2	829659.6	888921	1007443.8	1037074.5	1071237.555	1150718.862	1511165.7	1540796.4	1540796.4	997447.7794
Ducks	1889499.15	2024463.375	2474344.125	2834248.725	3149165.25	3149165.25	3149165.25	3374105.625	3689022.15	3734010.225	3753394.908
Horses	43956.22	45954.23	51948.26	53946.27	55944.28	55944.28	55944.28	55944.28	57942.29	59940.3	59990.24563
Swine, breeding	532897.2829	579488.6383	479097.8939	521585.3078	601635.4552	678972.4329	548886.9487	509693.1424	525193.536	540057.504	540675.3258
Swine, market	8393132.205	9126946.053	7545791.829	8214968.597	9475758.419	10693815.82	8644969.442	8027666.993	8271798.192	8505905.688	8515636.382
All Animals	83525439.12	82365627.68	87574433.05	86322864.18	90599097.03	99283702.99	100227586.5	99646125.58	88321303.04	87619744.24	87265715.95

Cattle	55285911.99	53854536.72	59846179.83	58550553.37	60794736.19	66877057.24	69181569.09	69691093.87	58817274.58	58107338.62	57813174.64
Chickens	2521717.11	2880085.973	3323317.883	3646346.715	3528112.995	3360891.041	3743208.275	3965238.09	3378568.298	3090987.9	2961801.264
Poultry Birds	4411216.26	4904549.348	5797662.008	6480595.44	6677278.245	6510056.291	6892373.525	7339343.715	7067590.448	6824998.125	6715196.172
Swine	8926029.488	9706434.692	8024889.723	8736553.905	10077393.87	11372788.25	9193856.391	8537360.136	8796991.728	9045963.192	9056311.707
Stocks (Head)											
Buffaloes	743928	693651	693631	625912	650572	724378	746207	702074	680000	680000	681979.6518
Cattle, dairy	113000	118000	120000	120000	122000	133800	140000	140000	138000	140000	122289.7664
Cattle, non-dairy	2648800	2561940	2872640	2804457	2917945	3210812	3317787	3344601	2776974	2735000	2760370.426
Chickens, broilers	8812000	10317000	12249000	13278000	12534000	11520703.86	13044464.13	12348000	9247000	7800000	9883912.525
Chickens, layers	2600000	2800000	3000000	3400000	3500000	3615296.144	3883535.868	5100000	5200000	5200000	3366264.649
Ducks	4200000	4500000	5500000	6300000	7000000	7000000	7000000	7500000	8200000	8300000	8343088.491
Horses	22000	23000	26000	27000	28000	28000	28000	28000	29000	30000	30024.99769
Swine, breeding	215109.7	233916.8	193393	210543.5	242856.6	274074.5	221564.1	205743.1	212000	218000	218249.3904
Swine, market	1935987.3	2105251.2	1740537	1894891.5	2185709.4	2466670.5	1994076.9	1851687.9	1908000	1962000	1964244.514
Cattle	2761800	2679940	2992640	2924457	3039945	3344612	3457787	3484601	2914974	2875000	2882660.193
Chickens	11412000	13117000	15249000	16678000	16034000	15136000	16928000	17448000	14447000	13000000	13250177.17
Poultry Birds	15612000	17617000	20749000	22978000	23034000	22136000	23928000	24948000	22647000	21300000	21593265.67
Swine	2151097	2339168	1933930	2105435	2428566	2740745	2215641	2057431	2120000	2180000	2182493.904

Source: Food and Agriculture Organization 2018

Table 10: Inputs Pesticides Import of Cambodia

Item	Unit	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Pesticides (total)	1000 US\$	669	1042	1262	987	1087	2200	3243.089	6291.861	18567.616	35351.27	38037.029
Insecticides	1000 US\$	669	-	1174	858	988	-	-	-	-	-	-
Fungicides	1000 US\$	-	-	0	1	0	-	-	-	-	-	-
Herbicides	1000 US\$	-	-	54	67	38	-	-	-	-	-	-
Disinfectants,etc	1000 US\$	-	-	34	60	61	-	-	-	-	-	-
Hazardous pesticides	1000 US\$	-	-	-	-	-	-	581.223	2414.267	10179.54	27946.157	27792.194
Insecticides (excl. Haz. pest.)	1000 US\$	-	-	-	-	-	-	2209.618	3305.144	4835.398	4155.776	4931.016
Fungicides (excl. Haz. pest.)	1000 US\$	-	-	-	-	-	-	10.594	189.206	590.539	226.325	1163.246
Herbicides (excl. Haz. pest.)	1000 US\$	-	-	-	-	-	-	287.044	169.407	1974.749	2278.23	3936.894
Disinfectants, etc (excl. Haz. pest.)	1000 US\$	-	-	-	-	-	-	154.611	213.836	987.39	744.782	213.678
Mercury compounds etc. excl. amalgams	tonnes	-	-	-	-	-	-	-	0.001	0.128	36.896	2.413
Mercury compounds etc. excl. amalgams	1000 US\$	-	-	-	-	-	-	-	0.029	0.208	23.7	33.487
Ethylene dichloride	tonnes	-	-	-	-	-	-	-	-	-	-	-
Ethylene dichloride	1000 US\$	-	-	-	-	-	-	-	-	-	-	-

Ethylene dibromide (1,2-dibromoethane)	(1,2- tonnes	-	-	-	-	-	-	-	-	-	0.067	-	-
Ethylene dibromide (1,2-dibromoethane)	(1,2- 1000 US\$	-	-	-	-	-	-	-	-	-	0.081	-	-
Salts of Pentachlorophenol	tonnes	-	-	-	-	-	-	-	-	-	0.05	-	-
Salts of Pentachlorophenol	1000 US\$	-	-	-	-	-	-	-	-	-	0.697	-	-
DNOC and its salts	tonnes	-	-	-	-	-	-	-	-	-	-	-	-
DNOC and its salts	1000 US\$	-	-	-	-	-	-	-	-	-	-	-	-
Oxirane (ethylene oxide)	tonnes	-	-	-	-	-	-	-	-	-	-	-	7.2
Oxirane (ethylene oxide)	1000 US\$	-	-	-	-	-	-	-	-	-	-	-	19.958
Dinoseb acetate	tonnes	-	-	-	-	-	-	-	-	0.72	-	-	-
Dinoseb acetate	1000 US\$	-	-	-	-	-	-	-	-	0.283	-	-	-
Chlorobenzilate	tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	1000 US\$	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-T and its salts and esters	tonnes	-	-	-	-	-	-	-	27.191	-	-	-	-
2,4,5-T and its salts and esters	1000 US\$	-	-	-	-	-	-	-	21.336	-	-	-	-
Parathion & parathion-methyl	tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Parathion & parathion-methyl	1000 US\$	-	-	-	-	-	-	-	-	-	-	-	-
Captafol & methamidophos	tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Captafol & methamidophos	1000 US\$	-	-	-	-	-	-	-	-	-	-	-	-
Compounds of mercury chemically defined, excluding amalgams	tonnes	-	-	-	-	-	-	-	-	-	0.001	-	-
Compounds of mercury chemically defined, excluding amalgams	1000 US\$	-	-	-	-	-	-	-	-	-	0.02	-	-

Source: Food and Agriculture Organization 2018

Table 11: Trade Live Animals in Cambodia

Item	Unit	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Export Quantity												
Buffaloes	Head	0	52	85	1386	0	0	0	0	0	-	-
Cattle	Head	400	45	412	9256	8857	0	0	0	0	-	-
Chickens	1000 Head	-	-	0	-	0	0	0	0	0	-	56
Ducks	1000 Head	-	-	-	-	-	-	-	-	-	-	-
Pigs	Head	0	0	0	0	0	0	0	0	4029	-	35840
Bovine, Animals	Head	400	97	497	10642	8857	0	0	0	0	-	-
Export Value												

Animals live nes	1000 US\$	0	0	0	0	0	8	2	0	0	-	-
Animals, live, non-food	1000 US\$			15		7	3883	5129	98	80	64	45
Buffaloes	1000 US\$	0	10	4	281	0	0	0	0	0	-	-
Cattle	1000 US\$	59	5	29	1561	1149	0	0	0	0	-	-
Chickens	1000 US\$	0	0	0	0	0	0	0	0	0	-	264
Ducks	1000 US\$	-	-	-	-	-	-	-	-	-	-	-
Pigs	1000 US\$	0	0	0	0	0	0	0	0	356	-	2762
Agricult.Products,Total	1000 US\$	37970	26725	19748	36411	55174	59164	73810	185509	389118	502564	617006
Bovine, Animals	1000 US\$	59	15	33	1842	1149	0	0	0	0	-	-
Food Excl Fish	1000 US\$	3229	776	4831	3679	12977	13191	49755	79820	177480	293279	382427
Live Animals	1000 US\$	59	15	33	1842	1149	8	2	0	356	-	3027
Total Merchandise Trade	1000 US\$	600000	912900	1327100	1766000	2588900	3690300	4708000	5143216	7838101	-	-

Import Quantity

Cattle	Head	-	-	-	-	-	-	-	-	-	-	2771
Chickens	1000 Head	49	30	26	95	0	0	0	42	85	64	151
Ducks	1000 Head	-	-	-	-	-	-	-	-	-	-	0
Goats	Head	-	-	-	-	-	-	-	1	0	-	-
Horses	Head	-	-	-	-	-	-	-	-	0	-	-
Pigs	Head	241	517	300	1621	29772	19876	293485	384965	273227	16956	62089
Rabbits and hares	1000 Head	-	-	-	3	0	0	0	0	0	-	-
Bovine, Animals	Head	-	-	-	-	-	-	-	-	-	-	2771
Sheep and Goats	Head	-	-	-	-	-	-	-	1	0	-	-

Import Value

Animals live nes	1000 US\$	121	0	0	0	0	0	0	0	0	-	-
Animals, live, non-food	1000 US\$	-	-	16	39	88	3	0	8	7	6	-
Cattle	1000 US\$	-	-	-	-	-	-	-	-	-	-	3916
Chickens	1000 US\$	91	70	62	149	1	0	0	125	484	624	481
Ducks	1000 US\$	-	-	-	-	-	-	-	-	-	-	0
Goats	1000 US\$	-	-	-	-	-	-	-	0	0	-	-
Horses	1000 US\$	-	-	-	-	-	-	-	-	0	-	-
Pigs	1000 US\$	80	30	67	125	2330	1375	40444	35110	43483	2577	4857
Rabbits and hares	1000 US\$	-	-	-	0	0	0	0	0	0	-	-
Agricult.Products,Total	1000 US\$	349350	297523	158176	192784	206650	542259	788029	705953	810195	785437	1053966

Bovine, Animals	1000 US\$	-	-	-	-	-	-	-	-	-	-	3916
Food Excl Fish	1000 US\$	89080	75129	72850	107895	103716	245185	371293	432039	398832	285085	311776
Live Animals	1000 US\$	292	100	129	274	2331	1375	40444	35235	43967	3200	9254
Sheep and Goats	1000 US\$	-	-	-	-	-	-	-	0	0	-	-
Total Merchandise Trade	1000 US\$	466718	1073000	1536200	2360500	3269500	4737100	6508420	6790731	11000000	-	-

Source: Food and Agriculture Organization 2018

Table 12: Gross Production Value in Cambodia (constant 2004-2006 1000 Unit into 1\$)

Item	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Bananas	39428.34	41118.126	41118.126	41118.126	37738.554	36612.03	42526.281	44780.348	39849.436	39578.212	39600.203
Beans, dry	8273.9924	5508.7782	9081.0645	14388.375	27214.928	36022.959	23213.847	42831.352	44910.374	46785.317	48325.301
Cassava	7276.4747	6950.3412	15435.766	12745.948	37820.829	227942.76	384030.22	443698.13	795349.63	896773.56	1066203.1
Castor oil seed	501.84278	507.3302	507.3302	505.07236	546.3556	508.1637	501.87853	497.58148	468.3048	498.21446	499.81772
Chillies and peppers, dry	9624.2251	10187.48	10516.109	10844.737	10625.652	11501.994	12049.708	12605.343	13145.136	13321.083	13642.029
Coconuts	7325.4613	5639.223	6413.234	7740.11	7850.683	7740.11	7839.6257	7242.5315	7401.7566	6865.4776	7694.1868
Coffee, green	268.59	311.5644	322.308	322.69612	333.0516	322.308	354.5388	388.50989	376.30577	383.51295	390.72012
Cotton lint	118.62393	121.48234	124.34075	124.34075	124.34075	124.34075	124.34075	124.34075	124.34075	122.62711	122.62711
Cottonseed	55.116012	56.10612	57.096228	57.096228	57.096228	57.096228	57.096228	57.096228	57.096228	57.7563	57.7563
Eggs, hen, in shell	8667.1151	9537.9735	9703.8513	10947.935	11030.874	11586.306	12415.469	14597.246	15343.697	16587.78	10934.451
Eggs, other bird, in shell	8652.663	9085.2962	9373.7183	10094.774	10815.829	10815.829	10815.829	11825.306	11536.884	12109.62	12402.15
Fibre crops nes	1097.2126	1196.9592	1296.7058	1496.199	1645.8189	1695.6922	1745.5655	1745.5655	1795.4388	1842.2638	1875.4579
Fruit, fresh nes	17451.7	18498.802	19720.421	19957.819	21083.709	23846.837	26352.067	26306.48	25479.482	25977.116	25782.432
Grapefruit (inc. pomelos)	584.584	629.552	652.036	657.2775	679.24164	674.52	693.38899	700.14348	710.95042	721.75736	732.5643
Groundnuts, with shell	2797.0866	2982.9575	3379.0611	4393.2305	9718.9736	10742.166	11490.612	9905.7469	13669.182	11684.604	12889.607
Jute	254.8863	312.66053	50.97726	180.11965	249.22216	161.14478	83.829272	73.917027	78.207367	74.436559	68.543916
Lemons and limes	713.6658	872.2582	911.9063	941.63638	1008.2512	909.613	1017.2477	1050.569	1083.8904	1117.2118	1150.5331
Maize	9146.3174	6872.1692	22237.438	21093.494	36360.447	53398.922	86679.855	109545.15	134710.52	77915.75	49775.617
Mangoes, mangosteens, guavas	17975.01	20371.678	20970.845	23915.35	27561.682	28760.016	31755.851	34226.67	35934.582	38039.631	40144.68
Meat indigenous, buffalo	30147.454	30169.85	32337.452	24284.205	25194.658	27132.709	27994.065	26357.489	25840.675	25840.675	25840.675
Meat indigenous, cattle	110345.81	112824.05	153301.58	147253.95	150690.42	162730.89	168565.86	169862.52	171807.51	171807.51	171807.51
Meat indigenous, chicken	24145.123	26593.679	27738.902	26939.81	26066.648	24499.8	27063.733	27716.111	26942.658	24806.048	24806.048
Meat indigenous, duck	8155.4517	8896.8564	10873.936	12356.745	13592.42	13592.42	13592.42	14333.824	15075.229	15075.229	15075.229
Meat indigenous, pig	132184.2	153684.36	161387.25	164975.09	186254.27	211380.17	150381.75	158277.33	132328.63	132328.63	132328.63
Meat indigenous, total	304978	332169	385639	375810	401798	439336	387598	396547	371995	369858	369858
Meat, buffalo	169444.46	136456.5	135796.29	99981.894	114050.81	140256.08	202077.14	195027.57	219972.68	200434.6	188102.49

Meat, cattle (current million SLC)	190128	217152	200026.26	207222.97	227733.32	286288.62	414120.18	427754.99	497751.51	446364.95	453428.92
Meat, chicken (current million SLC)	72080	88638	96960.825	173172.88	187839.87	264336.84	271263	275593.5	301131	278986.81	282911.08
Meat, duck (current million SLC)	17226	22032	25955.056	37980.337	48526.685	75797.774	71799.75	67059.6	85049.25	88422.793	89381.33
Meat, pig	498800	680800	488478.26	549607.83	717591.38	2368550.7	2568055.8	2456868.8	2651562.2	3020600.8	3043314
Milk, whole fresh cow	48854.942	51031.548	51913.15	51930.782	52813.26	57935.183	60637.323	60657.918	59812.635	60699.127	53046.529
Milk, Total	48855	51032	51913	51931	52813	57935	60637	60658	59813	60699	53047
Milk, Total	48855	51032	51913	51931	52813	57935	60637	60658	59813	60699	53047
Nuts, nes	3391.5662	4033.2138	4766.5254	5133.1812	5499.837	5866.4928	6049.8207	5933.6273	5774.8289	6126.9765	6179.4438
Oil, palm	-	-	-	-	-	-	-	-	8266.083	13921.824	13921.824
Oilcrops, Oil Equivalent	5093	4783	6389	7455	25653	19513	18043	20629	27996	36161	36635
Oilseeds nes	311.52	315.22285	244.67532	159.70503	155.76	155.76	233.64	227.05841	233.64	177.29582	190.06264
Oranges	11595.48	12175.254	12175.254	12175.254	12175.254	12561.77	12368.512	12602.353	12496.176	12534.185	12572.194
Palm kernels	-	-	-	-	-	-	-	-	1471.2783	2477.9424	2477.9424
Pepper (piper spp.)	3751.749	4377.0405	4585.471	4850.3932	5042.4019	5159.4373	5128.7387	5101.9944	5002.332	5244.3613	5265.1765
Pineapples	4275.69	4560.736	4560.736	4811.8765	5212.5813	5985.966	5843.443	6412.102	6512.615	6762.3058	7011.9966
Rice, paddy	948558.64	978060.65	1121910.8	1065180.4	1162091.3	1745560.5	1999517.3	2297640.9	2589013.3	2598225.8	2738392.1
Roots and tubers, nes	3420.22	3762.242	4446.286	4617.297	4770.4295	5017.1745	5450.6443	5826.5425	6241.9015	6529.3402	6845.6783
Roots and Tubers, Total	13569	13014	22010	19745	45245	236380	392473	455518	805274	906736	1076347
Rubber, natural	45753.4	46691.345	48464.289	37407.98	29803.765	24465.487	36232.117	47572.865	25358.212	21084.303	18429.039
Seed cotton (current million SLC)	327.445	360.7128	403.5408	578.9212	482.54786	425.67737	1036.269	815.40392	941.54644	932.25632	929.62386
Sesame seed	3723.093	3443.5226	6671.1057	6875.5374	37199.791	23655.856	18470.603	20250.918	18117.247	19630.854	19630.854
Silk-worm cocoons, reelable	598.3062	692.7756	850.2246	909.39351	976.1838	1007.6736	1039.1634	813.29878	525.87966	613.13726	592.98963
Soybeans	7762.2459	7600.4124	7710.6786	10642.881	30256	26960.083	29746.91	42951.423	32960.539	44435.628	44435.628
Sugar cane	5625.1423	4369.0614	5391.0473	6856.9895	4280.7298	4653.1342	12650.06	12003.73	18840.918	17440.621	20059.411
Sugar, raw	5625	4369	5391	6857	4281	4653	12650	12004	18841	17441	20059
Sweet potatoes	2872.4809	2301.7913	2128.228	2381.3978	2653.9029	3420.2855	2992.4949	5992.9202	3682.2921	3433.5708	3297.789
Tobacco, unmanufactured	15322.39	16156.998	12208.536	7473.2487	3948.462	22666.624	27720.465	23294.174	20916.56	21901.724	22875.306
Vegetables and Fruit Primary	177765	185851	189686	193087	196943	199991	215547	228645	240408	225816	229116
Vegetables, fresh nes	85740.655	87625.065	89576.471	89509.475	91483.852	90640.121	94990.423	102565.99	118340.95	101085.5	102121.42
Agriculture (PIN)	1636748.5	1700126.4	1935114.9	1868249.9	2092627.5	2938470.4	3360416.8	3808597.1	4447587.3	4502638.6	4779495.3
Cereals, Total	957704.96	984932.82	1144148.2	1086273.9	1198451.8	1798959.4	2086197.2	2407186	2723723.9	2676141.6	2788167.7
Crops (PIN)	1264997.4	1297610	1477634.9	1418557.2	1615192.9	2417789.4	2887911.1	3324156	3988373.5	4042770.8	4332661.1
Food (PIN)	1572833.2	1634135.3	1871290.2	1819830.8	2055000.3	2887518.9	3292614.9	3734086.8	4397944.1	4456118.3	4734640.8
Livestock (PIN)	371751.06	402516.39	457480.06	449692.68	477434.57	520680.98	472505.62	484441.05	459213.8	459867.76	446834.21
Non Food (PIN)	63915.251	65991.115	63824.712	48419.05	37627.2	50951.434	67801.898	74510.252	49643.249	46520.219	44854.501

Source: Food and Agriculture Organization 2018

Table 13: Production Livestock Primary in Cambodia

Item	Unit	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Laying												
Eggs, hen, in shell	1000 Head	2600	2800	3000	3400	3500	3615	3884	5100	5200	5200	3366
Eggs, other bird, in shell	1000 Head	600	630	650	700	750	750	750	820	800	851	850
Eggs Primary	1000 Head	3200	3430	3650	4100	4250	4365	4634	5920	6000	6051	4216
Milk Animals												
Milk, whole fresh cow	Head	113000	118000	120000	120000	122000	133800	140000	140000	138000	140000	122290
Milk, Total	Head	113000	118000	120000	120000	122000	133800	140000	140000	138000	140000	122290
Prod Populn												
Silk-worm cocoons, reelable	Head	-	-	-	-	-	-	-	-	-	-	-
Hides, buffalo, fresh	Head	70000	70000	75000	55000	58500	63000	65000	61200	60000	-	-
Hides, cattle, fresh	Head	340000	348000	472500	445000	456000	502000	520000	524000	530000	-	-
Meat, buffalo	Head	70000	70000	75000	55000	58500	63000	65000	61200	60000	54399	50427
Meat, cattle	Head	340000	348000	472500	445000	456000	502000	520000	524000	530000	472918	474528
Meat, chicken	1000 Head	17000	18700	19500	19008	18300	17200	19000	19500	19000	17515	17544
Meat, duck	1000 Head	3300	3600	4400	5000	5500	5500	5500	5800	6100	6310	6301
Meat, pig	Head	1720000	2000000	2100000	2148000	2453000	2770000	2250000	2100000	1970000	2233014	2222304
Beef and Buffalo Meat	Head	410000	418000	547500	500000	514500	565000	585000	585200	590000	527317	524955
Meat, Poultry	1000 Head	20300	22300	23900	24008	23800	22700	24500	25300	25100	23826	23845
Production												
Eggs, hen, in shell	tonnes	10450	11500	11700	13200	13300	13970	14969	17600	18500	20000	13184
Eggs, hen, in shell (number)	1000 No	267000	295000	300000	337000	340600	380000	430000	451000	474350	512800	338000
Eggs, other bird, in shell	tonnes	3000	3150	3250	3500	3750	3750	3750	4100	4000	4199	4300
Eggs, other bird, in shell (number)	1000 No	58000	62000	65500	70000	75000	90000	70000	82000	80000	80000	80000
Hides, buffalo, fresh	tonnes	2310	2310	2475	1815	1930	2079	2145	2020	1980	-	-
Hides, cattle, fresh	tonnes	10200	10440	14175	13350	13680	15060	15600	15720	15900	-	-
Meat indigenous, buffalo	Head	70000	70052	75085	56386	58500	63000	65000	61200	60000	-	-
Meat indigenous, buffalo	tonnes	11200	11208	12014	9022	9360	10080	10400	9792	9600	-	-
Meat indigenous, cattle	Head	340400	348045	472912	454256	464857	502000	520000	524000	530000	-	-
Meat indigenous, cattle	tonnes	40848	41765	56749	54511	55783	60240	62400	62880	63600	-	-

Meat indigenous, chicken	1000 Head	16951	18670	19474	18913	18300	17200	19000	19458	18915	-	-
Meat indigenous, chicken	tonnes	16951	18670	19474	18913	18300	17200	19000	19458	18915	-	-
Meat indigenous, duck	1000 Head	3300	3600	4400	5000	5500	5500	5500	5800	6100	-	-
Meat indigenous, duck	tonnes	4950	5400	6600	7500	8250	8250	8250	8700	9150	-	-
Meat indigenous, pig	Head	1719759	1999483	2099700	2146379	2423228	2750124	1956515	2059239	1721638	-	-
Meat indigenous, pig	tonnes	85988	99974	104985	107319	121161	137506	97826	102962	86082	-	-
Meat, buffalo	tonnes	11200	11200	12000	8800	9360	10080	10400	9792	9600	8704	8068
Meat, cattle	tonnes	40800	41760	56700	53400	54720	60240	62400	62880	63600	56750	56943
Meat, chicken	tonnes	17000	18700	19500	19008	18300	17200	19000	19500	19000	17515	17544
Meat, duck	tonnes	4950	5400	6600	7500	8250	8250	8250	8700	9150	9466	9451
Meat, pig	tonnes	86000	100000	105000	107400	122650	138500	112500	105000	98500	111650	111114
Milk, whole fresh cow	tonnes	156556	163531	166356	166412	169240	185653	194312	194378	191670	194510	169988
Silk-worm cocoons, reelable	tonnes	190	220	270	289	310	320	330	258	167	195	188
Beef and Buffalo Meat	tonnes	52000	52960	68700	62200	64080	70320	72800	72672	73200	65454	65012
Eggs Primary	tonnes	13450	14650	14950	16700	17050	17720	18719	21700	22500	24199	17484
Meat indigenous, poultry	1000 Head	20251	22270	23874	23913	23800	22700	24500	25258	25015	-	-
Meat indigenous, poultry	tonnes	21901	24070	26074	26413	26550	25450	27250	28158	28065	-	-
Meat indigenous, total	tonnes	159937	177018	199822	197264	212854	233276	197876	203792	187347	-	-
Meat, Poultry	tonnes	21950	24100	26100	26508	26550	25450	27250	28200	28150	26981	26996
Meat, Total	tonnes	159950	177060	199800	196108	213280	234270	212550	205872	199850	204085	203122
Milk,Total	tonnes	156556	163531	166356	166412	169240	185653	194312	194378	191670	194510	169988

Yield

Eggs, hen, in shell	100mg/An	40192	41071	39000	38824	38000	38641	38546	34510	35577	38462	39164
Eggs, other bird, in shell	100mg/An	50000	50000	50000	50000	50000	50000	50000	50000	50000	49308	50588
Hides, buffalo, fresh	hg/An	330	330	330	330	330	330	330	330	330	-	-
Hides, cattle, fresh	hg/An	300	300	300	300	300	300	300	300	300	-	-
Milk, whole fresh cow	hg/An	13854	13859	13863	13868	13872	13875	13879	13884	13889	13894	13900
Eggs Primary	100mg/An	42031	42711	40959	40732	40118	40592	40400	36655	37500	39988	41467
Milk,Total	hg/An	13854	13859	13863	13868	13872	13875	13879	13884	13889	13894	13900

Yield/Carcass Weight

Meat indigenous, buffalo	hg/An	1600	1600	1600	1600	1600	1600	1600	1600	1600	-	-
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Meat indigenous, cattle	hg/An	1200	1200	1200	1200	1200	1200	1200	1200	1200	-	-
Meat indigenous, chicken	0.1g/An	10000	10000	10000	10000	10000	10000	10000	10000	10000	-	-
Meat indigenous, duck	0.1g/An	15000	15000	15000	15000	15000	15000	15000	15000	15000	-	-
Meat indigenous, pig	hg/An	500	500	500	500	500	500	500	500	500	-	-
Meat, buffalo	hg/An	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Meat, cattle	hg/An	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Meat, chicken	0.1g/An	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Meat, duck	0.1g/An	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
Meat, pig	hg/An	500	500	500	500	500	500	500	500	500	500	500
Beef and Buffalo Meat	hg/An	1268	1267	1255	1244	1245	1245	1244	1242	1241	1241	1238
Meat, Poultry	0.1g/An	10813	10807	10921	11041	11155	11211	11122	11146	11215	11324	11321

Source: Food and Agriculture Organization 2018

Table 14: Environment Livestock Patter of Cambodia

Item	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Density of livestock in the agricultural area (LSU/ha)											
Buffaloes	0.11	0.1	0.1	0.09	0.09	0.09	0.1	0.09	0.09	0.09	0.09
Cattle	0.39	0.38	0.41	0.38	0.38	0.41	0.42	0.42	0.35	0.34	0.34
Chickens	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
Horses	0	0	0	0	0	0	0	0	0	0	0
Pigs	0.12	0.13	0.1	0.11	0.12	0.13	0.1	0.09	0.1	0.1	0.1
Cattle and Buffaloes	0.51	0.48	0.51	0.47	0.46	0.5	0.52	0.51	0.43	0.43	0.43
Equidae	0	0	0	0	0	0	0	0	0	0	0
Major livestock types	0.65	0.64	0.65	0.61	0.62	0.66	0.66	0.63	0.56	0.56	0.56
Share in total livestock (% of total LSU)											
Buffaloes	17.46	16.41	15.75	14.37	14.16	14.34	14.88	14.19	15.53	15.66	15.66
Cattle	60.2	58.88	63.08	62.33	61.42	61.49	64.01	65.4	61.84	61.49	61.46
Chickens	3.83	4.43	4.95	5.47	4.98	4.28	4.82	5.04	4.71	4.28	4.35
Horses	0.48	0.51	0.55	0.58	0.57	0.51	0.52	0.53	0.62	0.64	0.64
Pigs	18.03	19.77	15.68	17.26	18.87	19.38	15.78	14.85	17.3	17.93	17.9

Cattle and Buffaloes	77.66	75.29	78.83	76.7	75.58	75.83	78.89	79.59	77.37	77.15	77.12
Equidae	0.48	0.51	0.55	0.58	0.57	0.51	0.52	0.53	0.62	0.64	0.64
Major livestock types	100	100	100	100	100	100	100	100	100	100	100
Stocks (Livestock units LSU)											
Buffaloes	520749.6	485555.7	485541.7	438138.4	455400.4	507064.6	522344.9	491451.8	476000	476000	477385.8
Cattle	1795170	1741961	1945216	1900897	1975964	2173998	2247562	2264991	1894733	1868750	1873729
Chickens	114120	131170	152490	166780	160340	151360	169280	174480	144470	130000	132501.8
Horses	14300	14950	16900	17550	18200	18200	18200	18200	18850	19500	19516.25
Pigs	537774.3	584792	483482.5	526358.8	607141.5	685186.3	553910.3	514357.8	530000	545000	545623.5
Cattle and Buffaloes	2315920	2227517	2430758	2339035	2431365	2681062	2769906	2756442	2370733	2344750	2351115
Equidae	14300	14950	16900	17550	18200	18200	18200	18200	18850	19500	19516.25
Major livestock types	2982114	2958429	3083630	3049724	3217046	3535809	3511297	3463480	3064053	3039250	3048756

Source: Food and Agriculture Organization 2018

Table 15: Rice Production and Yied by Type for Wet Season 2016

No	Town-Province	Early rice				Medium rice				Late rice			
		Cult - Area	Harvt- Area	Yield	Productio	Cult - Area	Harvt- Area	Yield	Productio	Cult - Area	Harvt- Area	Yield	Productio
		(ha)	(ha)	(T/ha)	(Tons)	(ha)	(ha)	(T/ha)	(Tons)	(ha)	(ha)	(T/ha)	(Tons)
1	Banteay Mean Chey	53235	52720	3.920	206649	138772	138141	2.407	332463	44362	41296	2.933	121103
2	Battambang	73924	72577	4.174	302948	121758	115173	2.627	302525	88395	85597	2.837	242863
3	kampong Cham	26096	26096	3.079	96010	36616	36616	3.373	123490	26099	26099	3.466	90460
4	Kampong chhnang	7668	7668	2.706	20746	91224	91224	2.897	264305	25202	25157	3.685	92692
5	kampong Speu	13231	13231	2.922	38655	69084	68713	2.983	204995	32708	32292	3.156	101907
6	Kampong Thom	31300	31300	2.530	79195	101998	101998	2.673	272614	69542	69542	2.653	184490
7	Kompot	22651	22651	3.712	84079	67628	67628	3.095	209336	48101	48101	2.99	143824
8	Kandal	10831	10776	3.840	41383	13493	12913	2.784	35955	10767	10660	2.837	30246
9	Koh Kong	2237	2237	2.384	5332	6079	6079	2.538	15428	971	971	2.962	2876
10	Kratie	13091	13091	2.915	38162	17076	17076	2.699	46093	2728	2728	2.356	6426
11	Mondulhiri	3392	3392	2.596	8806	14471	14471	2.962	42868	3293	3293	3.16	10407

12	Phnom Phenh City	4232	3990	2.781	11097	4857	4390	2.893	12699	1202	904	3	2712
13	Preah Vihear	13499	13499	2.739	36969	45059	45059	3.013	135752	21028	21028	2.923	61474
14	Prey Veng	64832	64832	3.691	239314	153002	153002	2.814	430624	52277	52277	2.793	146031
15	Pursat	49186	49053	3.123	153193	39212	39212	3.336	130797	21014	21014	3.424	71959
16	Rotanakiri	2967	2967	2.685	7965	7752	7752	2.972	23042	4586	4586	2.877	13194
17	Siem Reap	39700	39700	2.512	99735	93790	93790	2.589	242802	42015	41825	2.716	113593
18	Preah Sihanouk	1500	1500	1.471	2207	10905	10905	2.136	23293	4200	4200	5.245	22029
19	Stueng Treng	10697	10697	2.679	28661	14030	14030	2.822	39598	1169	1169	3.459	4044
20	Svay Rieng	59117	58945	3.345	197194	100581	100581	2.553	256787	8830	8830	2.595	22913
21	Takeo	93333	93333	3.453	322288	96740	96727	3.201	309643	7371	7371	3.299	24314
22	Otdar Mean chey	20119	20119	2.357	47423	44724	44724	2.57	114953	20083	20083	2.75	55223
23	Kep	1109	1109	3.253	3608	1685	1685	3.212	5412	803	803	3.313	2660
24	Pailin	1660	1660	2.664	4422	4039	4039	2.984	12054	126	126	3.31	417
25	Tbaung Khmom	12901	12901	3.163	40808	31234	31234	3.268	102061	34175	34175	3.322	113528
	Total	632508	630044	3.36	2116849	1325809	1317162	2.801	3689589	571047	564127	2.981	1681385
	Last Year	585345	578491	3.116	1802346	1312843	1301285	2.72	3539707	580227	573807	2.878	1651623
	Comparison	47163	51553	0.244	314503	12966	15877	0.081	149882	-9180	-9680	0.103	29762

Source: MAFF 2017