DETERMINANTS OF AGRICULTURAL OUTPUT IN CAMBODIA, 1993-2015

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DETERMINANTS OF AGRICULTURAL OUTPUT IN CAMBODIA, 1993-2015

by

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TABLE OF CONTENTS

CHAPTER 5: CONCLUSION

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
ADLI	Agriculture Demand-Led Industrialization
TVET	Technical and Vocational Education and Training
ADF	Augmented Dickey Fuller Test
ARDL	Autoregressive Distributed Lag Model
ECT	Error Correction Term
ECM	Error Correction Model

PENENTU OUTPUT PERTANIAN DI KEMBOJA, 1993-2015

ABSTRAK

Pertanian di Kemboja telah memainkan peranan penting terhadap pendapatan dan pengeluaran negara sejak beberapa dekad yang lalu. Walau bagaimanapun, kemerosotan berterusan dalam sumbangan KDNK hasil pertanian telah mencetuskan minat terhadap bagaimana cara untuk memperbaiki semula sumbangan sektor ini memandangkan hakikat bahawa Kemboja baru saja menyertai peringkat kumpulan berpendapatan menengah-rendah. Dipercayai bahawa sektor pertanian perlu diberi keutamaan bersama sektor perkilangan untuk beberapa dekad strategi pembangunan ekonomi di Kemboja akan datang. Untuk mengesahkan potensi ini, objektif pertama kajian ini adalah untuk menguji faktor-faktor yang mempengaruhi output pertanian; manakala objektif kedua ialah untuk mengkaji sama ada perindustrian adalah dipimpin oleh sektor pertanian. Model *Autoregressive distributed lag* (ARDL) dan Toda-Yamamoto causality digunakan untuk kajian bagi tempoh dari tahun 1993 hingga 2015. Dapatan kajian ini menunjukkan bahawa, pertamanya kesemua faktor memainkan peranan penting kepada output pertanian tetapi kesan negatif sektor pembuatan merupakan dapatan kajian yang paling menarik kerana ia bertentangan dengan jangkaan pengkaji. Ujian diteruskan basi melihat pertalian arah antara pertanian dan pembuatan, dan mendapati bahawa terdapat hubungan dua arah antara pembuatan dan pertanian. Ini menunjukkan bahawa kenaikan dalam pengeluaran pertanian dapat menyokong produk mentah output pembuatan. Pembuatan juga didapati menyokong pengeluaran sektor pertanian melalui permintaan produk pertanian. Walau bagaimanapun, pengeluaran sektor pembuatan mempunyai kesan negatif dan ketara terhadap pengeluaran pertanian. Penemuan ini agak mengejutkan,

memandangkan sektor perkilangan pada umumnya adalah berasaskan pertanian di Kemboja. Oleh itu, kerajaan harus merangka dasar-dasar yang boleh menggalakkan pengilang tempatan menggunakan lebih banyak kandungan tempatan dan memberikan lebih tumpuan kepada apa yang perlu dihasilkan oleh sektor pertanian supaya mereka yang sangat menuntut hasil pertanian dapat dibekalkan.

DETERMINANTS OF AGRICULTURAL OUTPUT IN CAMBODIA, 1993-2015

ABSTRACT

Agriculture in Cambodia has been playing an essential role in the national income and production for the past few decades. Nevertheless, the continuous decline in the level of GDP contribution of agricultural output has sparked interest on how to re-improve the contribution of this sector given the fact that Cambodia has just joined the lower-middle income group levels. We believe that the agricultural sector should still be given priority alongside the manufacturing sector for the next few decades of the economic development strategy in Cambodia. To confirm this potential, the first objective of this study has been to examine factors affecting the agriculture sector; and the second objective is to investigate whether or not manufacturing sector in Cambodia is agriculture-led. Autoregressive distributed lag (ARDL) model and Toda-Yamamoto causality test have been employed to study the case for the period from 1993 to 2015. The results, firstly demonstrate that all factors under study are crucial for agriculture output but the negative effect of manufacturing has been the most striking outcome that against my hypothesis. We further examine the causality between agriculture and manufacturing and observed that there are bi-directional causalities between manufacturing and agriculture. This implies that an increment in the agriculture output can further support the raw products of the manufacturing output. Conversely, manufacturing can support the production of the agriculture sector via the demand for agricultural products. However, manufacturing output had a negative and significant effect on agricultural output. This finding is rather surprising, considering that most of the manufacturing sector is agriculture-based in Cambodia. Therefore, the government

should design policies that could encourage local manufactures to use more local content and to be more focused on what agriculture should produce so that those highly demanded outputs of agriculture can be supplied.

CHAPTER 1

INTRODUCTION

1.0 Overview

The agriculture sector is acknowledged to be a long standing practice in the third world and developing countries. The vital importance of agricultural growth to socio-economic growth and development in numerous third world countries has been a powerful in their transition to economic wealth. Agriculture contributes to over one quarter of the Gross Domestic Product (GDP) in most developing countries of the world (Sertoglu *et al.,* 2017). The statistics are higher in the undeveloped nations (United Nations, 2007). Agriculture sector helps as an engine support for sources of food for the lives of more than 2.5 billion people worldwide. The agricultural sector absorbs an enormous number of the world's population directly or indirectly in the value chain (Sertoglu *et al.,* 2017).

Johnston and Mellor (1961) briefly suggested several propositions that can help improve agricultural output to increase economic growth. First, the development of economics is described by an increment in agricultural products for consumers, and the failure to increase food supplies with the development of the consumers for financial development: giving extended food supplies. Growth of the demand for food is of vital economic importance in a developing nation for several reasons. One example of this is that, the rates of the population growth of 1.5 to 3 percent now represent the majority of the world's undeveloped countries, so that the development

of the demand from this element alone is substantial. Also, the income from the demand for food in developing countries is mostly higher than in developed countries, which have well-paid wages. In developing countries, the wage is 0.6 percent or higher versus in Canada and Western Europe with wages of 0.2 or 0.3 percent. Subsequently, a given rate of increment in per capita income has a more significant effect on the demand for agricultural products than in advanced countries (Johnston and Mellor, 1961).

Second, the increment of exports in farming products is an encouraging method for expanding income and foreign exchange earnings. A profitable export crop can often be added to a prior cropping system; the capital requirements for such developments are frequently adequate and widely dependent on the direct, non-monetary investments by agriculturists (Johnston and Mellor, 1961). Third, the labor force working in the manufacturing sector extends segments of the economy which must be drawn mainly from agriculture: the workers move from agricultural to non-agricultural sectors. The Lewis two-model, with its assumption of a perfectly elastic supply of labor is related; it takes after the main-power for manufacturing and other quickly growing sectors that can be drawn effortlessly from agriculture. In the perspective of the potential that exists for expanding the agricultural output per person in the manufacturing and other industries in developing countries, it will not give the energetic endeavors which can improve the cultivation of the efficiency of the issue in labor supply (Johnston and Mellor, 1961).

Forth, agriculture, as the main sector of a developing country, can make a net contribution to the capital formation for investment and extension of the industry. The decline of the agriculture sector and the structural change in economy development emphasize the significant and inconvenient issue of capital accumulation in a developing country. The noteworthiness of Lewis' two-model shows that the rate of capital formation defines the rate that employment can be extended in the industries, i.e., the rate of the extension of employment in the industries sector. The labor force surplus in the agriculture sector is probably deducted from this and added to other industries, however, causing low productivity and earnings in rural areas (Johnston and Mellor, 1961).

Fifth, the increase in rural income can act as a stimulus to industrialization. Agriculture's contribution to the capital accumulation for general progression has a complementary affect in order to extend the purchasing of products as a boost to industrialization. The scope of the market is applicable to investment decisions in industries described by economies of scale so that a high volume of demand is required to justify the development of a modern factory. Yet, the change of household yield for imported manufactured products regularly contributes a significant growth to demand that does not rely on an expansion in consumer purchasing power (Johnston and Mellor, 1961).

1.1 Background of Study

The agriculture sector has been acknowledged as the key growth engine for developing countries, particularly in the less developing countries (Byerlee *et al*., 2009; Aker, 2011). Agriculture provides food security, employment and poverty reduction for developing countries, especially in Cambodia (Mund, 2011; Saing *et al*., 2012). Apart from that, agriculture provides the basic capital for industrial growth and also supplies raw products for industry (Tiffin and Irz, 2006). Cambodia's agriculture, especially rice cultivation, is the most significant sub-sector for social development and poverty reduction. The production of paddy rice has been growing and reached 10.4 million tons in 2017 (FAO, 2018).

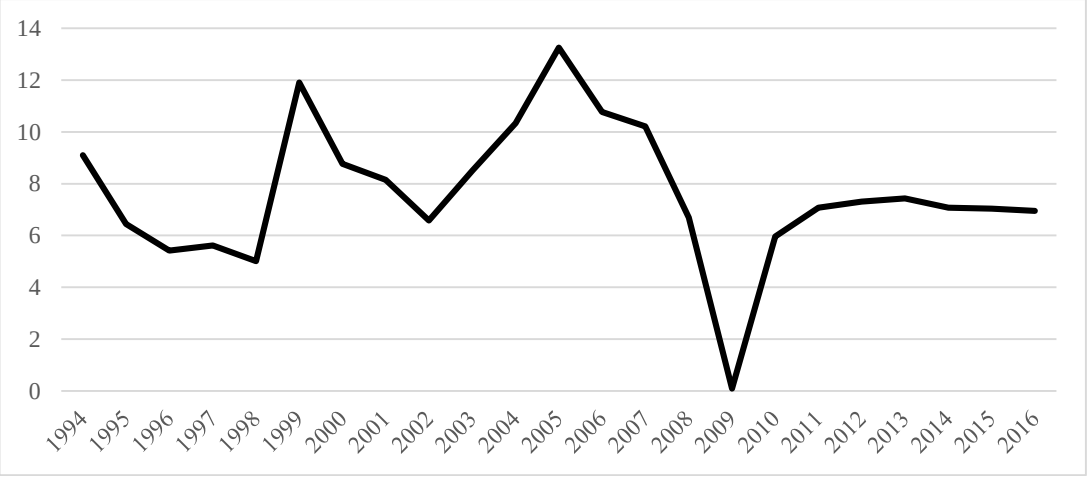


Figure 1.1: GDP growth (annual %).
Source: World Bank (2018).

Figure 1.1 showed that the Cambodian economy had a quick development with an average of 7.5 percent from 1994-2003, and sustained that to achieve the high growth of above 10 percent annually within the period of 2004 and 2007. Because of the global financial crisis of 2009, the pattern declined from 6.7 percent in 2008 to 0.1 percent in

2009. Nevertheless, the pattern has been positive since 2011. Cambodian experienced a rise in 2010 with 5.9 percent growth rates; and, a robust growth again of 7.1 percent annually until 2014. The Asian Development Bank (ADB) had prepared a plan for Cambodia that helped with its economic growth at 7.3 percent in 2015 and 7.5 percent in 2016, while sustaining a steady trade shortfall per GDP at around 13.7 percent in 2015 and coping with inflation for 2016 and 2017 to be within the range of between 3 to 5 percent. As predicted in its Industrial Development Policy 2015-2025, Cambodia has devoted to preserve its drive of growth until 2018 with a target of at least 7 percent per year (Council for the Development of Cambodia (CDC), 2018).

The implementation of this policy will develop productivity growth and effectiveness through regulatory improvement and investments in infrastructure, logistics and an extensive range of skills. The development of industry had a projected growth at a slightly higher rate of 10.8% in 2017, held by advanced growth in the main industrial countries and some diversification into products with higher value added, including garments, footwear, manufacturing and electronics. The agriculture sector is planned to grow by 1.8% (ADB, 2017a).

The graph in Figure 1.3 is about the land for agriculture in Cambodia from 1995 to 2015 within the statistics from the World Bank in 2018. The agricultural land had been spreading gradually to reach 26.2% in 1998 and then, kept growing sharply to 29.8% in 2004. In terms of the amount of land under the economic land concession (ELC), it had rapidly increased throughout 2001. The amount of land, however, decreased from 70 percent in 1993 to 57 percent in 2010, which has been linked to an increase in

agricultural land (Brickell and Springer, 2016). With no fluctuation, it increased to the peak point of nearly 31% in 2010 and remained stable until 2015. The wide spread increase of agricultural land has shown a positive image of this sector in Cambodia and has hooked up the Cambodian economic status (World Bank, 2018).

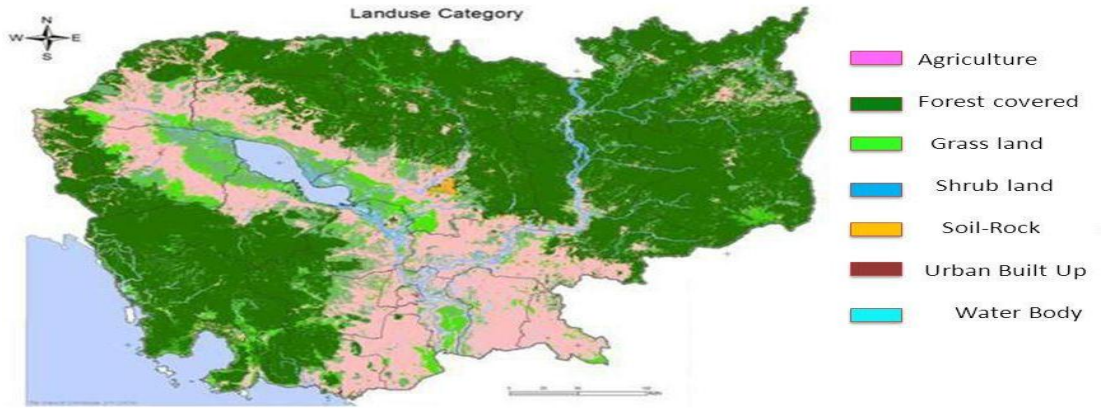


Figure 1.2: Land map of agricultural area in Cambodia
Source: MAFF (2013).

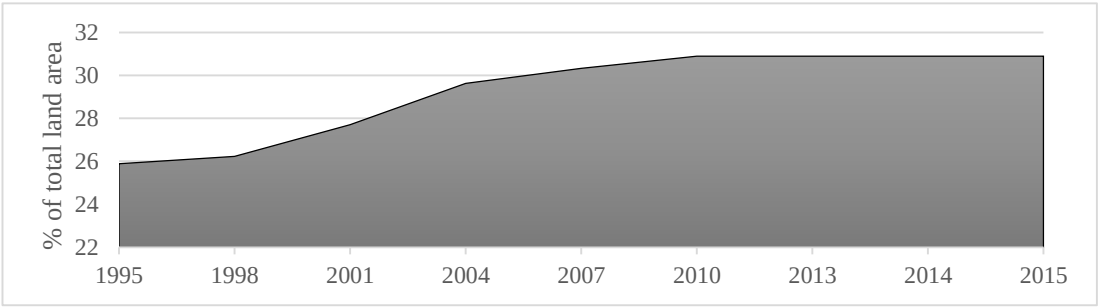


Figure 1.3: Agricultural land in Cambodia (% of land area)
Source: World Bank (2018)

Statistically, Cambodia covers a surface area of 18.1 million hectares, of which 2.7 million hectares are cultivated land and 1 million are taken up by urban areas, towns, infrastructure and waterways. While, agricultural concessions cover 800 000 hectares, landmine-contaminated areas cover 100 000 hectares and protected forest land covers 1.5 million (OECD Development Center, 2014).

According to the National Strategic Development Master Plan 2009-13, in the agricultural sector, the main thrust was to ensure access to land resources, ownership and security for poor rural farmers and the effective socio-economic development of land markets. Reform also sought to promote agricultural industrialization by freeing up land and making it available for commercial purposes by clearing it of mines. The Economic Land Concession (ELC) scheme is an important land reform measure that has been designed to develop intensive agricultural and industrial-agricultural activities (OECD Development Center, 2014).

The Agriculture Sector Strategic Development Plan: 2014-2018 (ASDP) and the Rectangular Strategy Phase-III was prepared by the Ministry of Agriculture, Fisheries and Forestry (MAFF) in May 2015 with the aim to reach the RGC's strategic objectives as well as National Strategic Development Plan update 2014-2018. The overall objective has been to raise agricultural growth to around 5% annually through enhancement of the agricultural productivity, diversification and commercialization, and through livestock and aquaculture by considering sustainable forestry and fisheries resource management (MAFF, 2015).

The Agriculture Sector Strategic Development Plan 2014-2018 well-defined MAFF's core strategy goals into four basic pillars as the following:

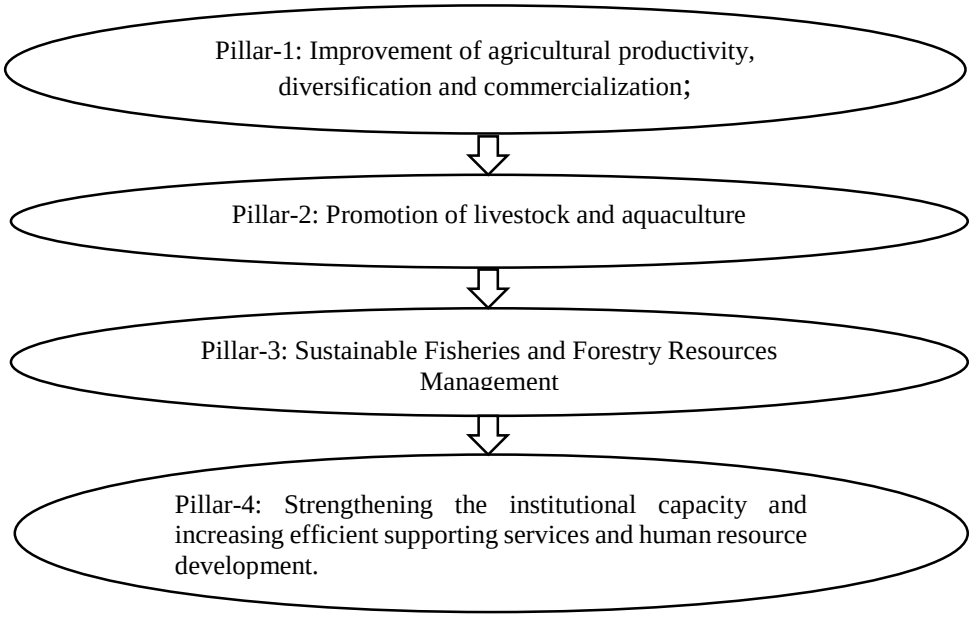


Figure 1.4: MAFF's core strategy goals into four basic pillars in 2014-2018
Source: MAFF (2015)

The long-term Vision 2030 in Cambodia and the **Rectangular Strategy, Phase III** have designed the structural transformation of the Cambodian economy to establish a middle income country status, and have reflected the industrial sector as a key driver of its economic development. The industrial sector will be subsidize by the engagement of the addition of the labor surplus in the agriculture sector and move them to higher production and income sectors. Income earned from industry will be consumed for food and other consumptions in order to develop the industry sector (RGC, 2015).

The recognition of this vision will contribute generally to the domestic economic growth throughout the sustenance and upgrade of sustainable and high economic growth, job creation for Cambodian laborers and growth in value-added areas for the economy, and increase of profits for the Cambodian populace (RGC, 2015.)

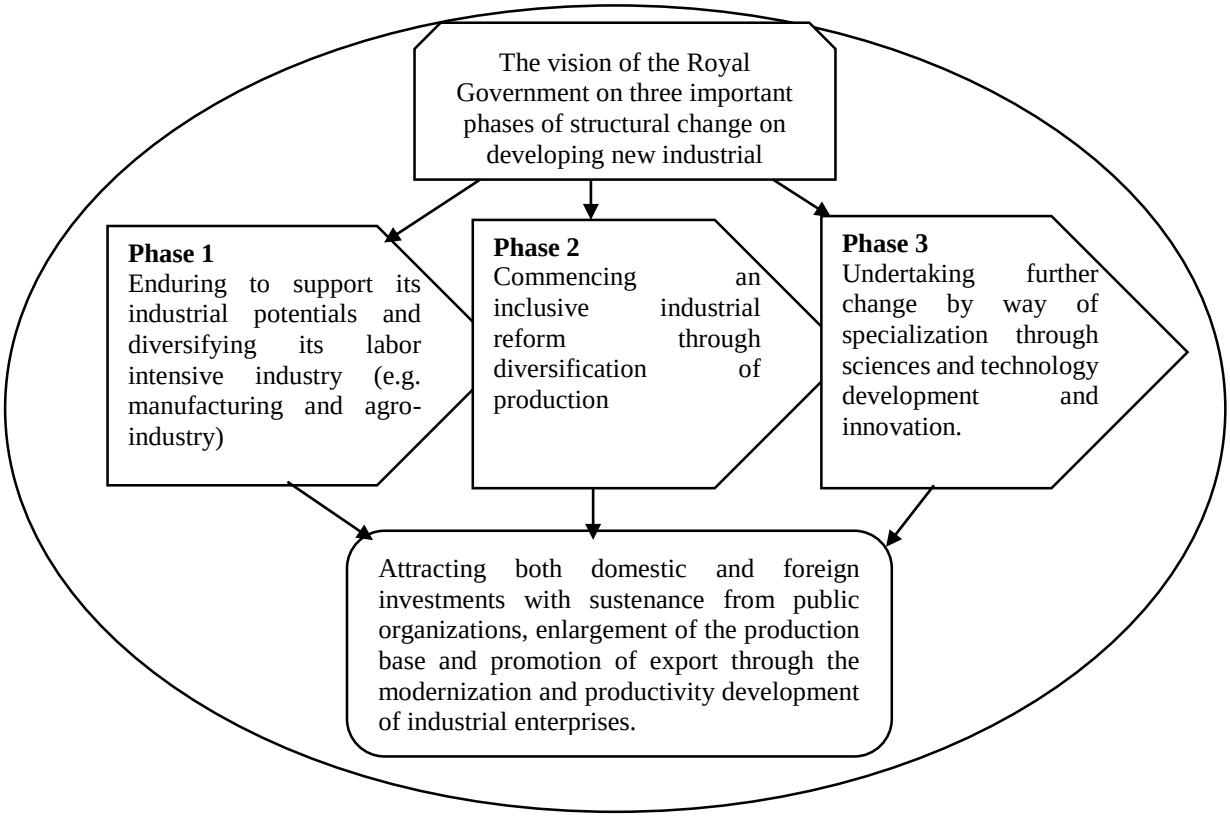
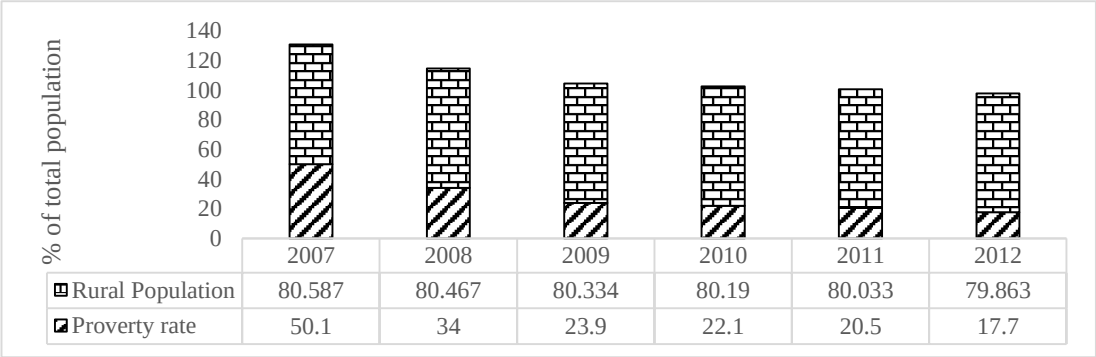


Figure 1.5: The Rectangular Strategy, Phase III of Industrial development Policy
Source: RGC (2015)

The Cambodian government has established comprehensive policies to support investment in agriculture. Being an agricultural country, Cambodia has vast potential in the agriculture sector as there is an abundance of available arable land. Nevertheless, the sector has not been adequately developed, relatively due to limited capital investment in irrigation systems, technology, fertilizers and energy. For the time being, investment is limited because of the global economic crisis in late 2008 which hit Cambodia's major sectors, such as garments, tourism and construction (Saing *et al.*, 2012). Although, the MAFF (2015) showed that investment in the sector declined because of low capital investment and the low appropriability of returns from agricultural investment projects. Since Cambodia's economic growth is narrowly based, promoting agriculture plays a crucial role in strengthening the country's economy. It has, therefore, been prioritized in the government's Rectangular Strategy

as a key pillar in achieving growth, employment, equity and efficiency (Saing *et al.*, 2012)



	2007	2008	2009	2010	2011	2012
Rural Population	80.587	80.467	80.334	80.19	80.033	79.863
Proverty rate	50.1	34	23.9	22.1	20.5	17.7

Figure 1.6: Poverty Rate and Rural Population (in % of total population).
Source: World Bank (2018).

According to Figure 1.6, showing the poverty reduction from 2007 to 2012, Cambodia's poverty reduction has mostly happened in rural regions and was rapid from 2007 to 2009, at the height of the food and financial crises. The poverty reduction was clarified by some factors, including an increase in the price of rice, growth in rice production and growth in agricultural wages. Also, it can be contributed to the robust growth all over the economy and, in particular, in the agricultural sector, which has increased the rural household incomes (ADB, 2014). Agriculture raised a lot of rural families out of extreme income poverty from the period of 2007 to 2010, and agriculture can further contribute to the reduction of poverty, such as with increased production, increased rice prices and higher wages. Nevertheless, the pattern shows that the rate of poverty reduction has dropped since 2012. Especially since, most of the Cambodians live in rural areas, approximately 80% in 2012, and around 60% of the population depends on income generated from agriculture (World Bank, 2018). Agriculture is the key to address poverty reduction and influence future directions of economic development (World Bank, 2017b).

Table 1.1 Employment and Unemployment in Cambodia *(%)*

	2007	2009	2010	2011	2012	2013
Employed-to-population ratio	80.3	81.5	84.1	84.9	81.3	79.9
Urban	69.4	70.4	73.1	73.5	75.3	72.9
Rural	83.1	84.5	87	88	83.1	81.9
Women	73.9	76.9	80.6	81.3	76	74.1
Men	87.5	86.6	87.9	88.7	87.1	86.3
Unemployment rate-to-population ratio	0.7	0.1	0.3	0.2	0.2	0.3
Urban	2.2	0.3	0.6	0.4	0.4	0.3
Rural	0.4	0.1	0.3	0.2	0.1	0.3
Women	0.8	0.1	0.3	0.1	0.2	0.3
Men	0.7	0.2	0.4	0.3	0.1	0.3

Source: ADB (2015).

Table 1.1 showed the employed and the unemployed populations. According to ADB (2015), the employment-to-population ratio was 81.9% in rural areas, against 72.9% in urban areas in 2013. Due to the lower participation rate and slightly higher unemployment rate among women, women worked slightly less than men throughout the period examined. Moreover, the unemployment rate was 0.7% in 2007. The data of the unemployment rate showed 2.2% in the urban area, compared to the rural area which was 0.4 % in 2007. Unemployment was also more likely to have happened in urban areas than in rural areas, although the differences remained small.

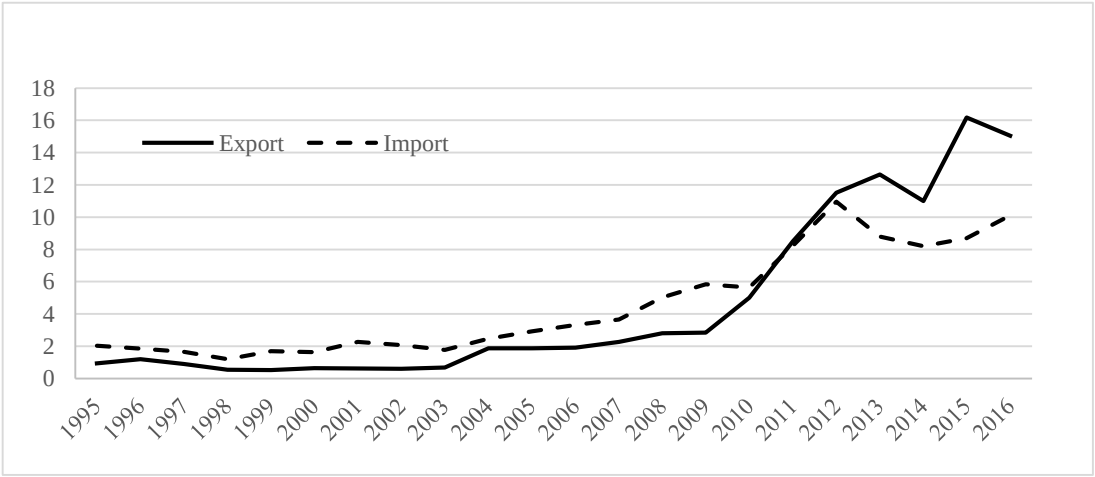


Figure 1.7: Import and Export of Agriculture (% of total product).
Source: UNCTAD (2018).

Figure 1.7 showed that the exports of agricultural output strongly increased to a 16% growth in 2015, and decreased a bit to 15% in 2016, with slower growth in garment exports. Meanwhile, there was an import growth from 2% to 10% in 2016. Cambodia's export forecasts are robust. Agriculture is seen to be continuing a similar trend of growth as with last year, and government spending will prospectively increase. The dropping trend of exports and imports, however, persisted during most of 2015, except in the last quarter when it finally revealed signs of turning around.

Table 1.2 Agricultural production in thousands of tons, 1998-2016

	1998	2003	2008	2012	2014	2015	2016
Cassava	66.534	330.649	3,676.232	7,613.697	8584.605	9,410.691	10,206.51
Maize	48.51	314.591	611.865	950.909	550	400	351.361
Rice, paddy	3,509.871	4,710.957	7,175.473	9,290.94	9324	9335	9,827.001
Rubber	40.82	32.489	31.676	22.169	18.433	17.141	16.112
Sugar cane	133.053	173.105	385.238	573.771	531.127	578.706	610.878
Vegetables	465	482.962	504.086	628	536.43	539.242	541.928

Source: FAOSTAT (2018).

Table 1.2 indicated the agricultural production trend of the other main crops consisting of cassava, maize, rice, rubber, sugar cane and vegetables from 1998 to 20016. As shown in Table 1.2, among all the crops, the cassava had the highest output of more than 10,206.51 thousand tons of production in 2016. Whereas, rubber had dropped to 16.82 thousand tons of production, as compared to around 40 thousand tons of production in 1998. The production of each crop had been increasing for this period, but it indicated a strong fluctuation every year.

Table 1.3. Share of manufactured products in Cambodia

Industrial Classification	2012	2017
	Share (%)	
Food, Beverages & Tobacco	8.2	8.3
Textile, Wearing Apparel & Footwear	74.2	65.5
Paper & Paper Products	1.9	2.7
Rubber	6.6	7.3

Source: World Bank (2017b).

According to Table 1.3, recently, the presence of manufacturing products was rising. The highest share was textile, wearing apparel and footwear at 65.5%, among others. Paper and paper products had increased to 2.7% in 2017 as compared in 2012 with a 1.9% product share. Moreover, rubber had grown in 2017 to 7.3%. Whereas, food, beverages and tobacco had increased a bit by 0.1% from 2012 to 2017.

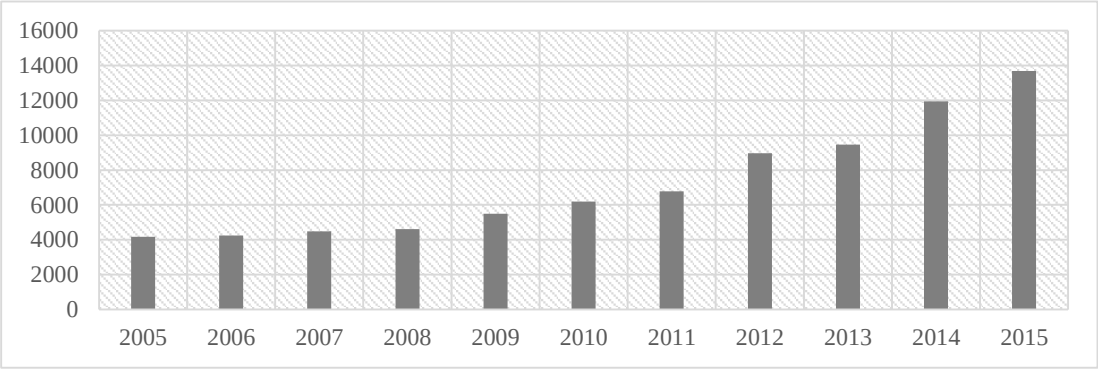


Figure 1.8: Usage of agricultural machinery (Thousand Units)
Source: FAOSTAT (2018) and cite from BDLINK (CAMBODIA) CO., LTD report (2018).

Regarding Figure 1.8, it provided a trend of the agricultural machinery in Cambodia. Simple machines dominated the agricultural mechanization, although the use of machinery has dramatically increased over the past ten years. Mechanizing the

Cambodian agriculture sector will help to develop productivity and decrease challenges from a dropping labor force in the rural area. It will also make new business opportunities to import machinery, along with new job opportunities to operate and repair machines. Off-farm employment has considerably raised farmers' investment in agricultural machinery (Chhun *et al.*, 2015).

The use of machinery is dependent on farm size, the variety of crop being farmed and the geographical area of the farm. For instance, farmers who run huge farms will be likely to use more agricultural machinery, such as tractors and harvesters, while farmers who have small plots of farm land do not use such heavy machinery. The use of machinery has gradually improved areas of planting, irrigation and, more lately, harvesting since the 1990s (BDLINK (CAMBODIA) CO., LTD report, 2018). The rice industry is beginning to implement mechanization, though some phases like shifting rice crops and fertilizing fields are still performed by hand. Other crops, such as corn, cassava, bean, rubber, sugar cane and fruit, also need machinery for land preparation, harvesting, scattering and weeding, most specifically for huge commercialized farms, are also investment opportunities (BDLINK (CAMBODIA) CO., LTD report, 2018).

With continued growth in the agriculture sector and government policies to improve agricultural productivity, it is clear that the market for agricultural machinery will become progressively essential in Cambodia (MAFF, 2015).

1.2 Problem Statement

Figure 1.9 shows the contribution of the agriculture, manufacturing and services from 1993 to 2015. The service sector was the highest contributor to the GDP, accounting for 41% of the total GDP, followed by agriculture with 28% and manufacturing at 17% in 2015. Nevertheless, agriculture continues to make an increasing contribution to the growth of the Cambodian economy. The sector grew 4.3% in 2012 and accounted for 4.75 million workers out of a labor force of 8 million in 2011. Moreover, agriculture and manufacturing are likely to have a complementary relationship. Starting from 1995, the percentage of the agriculture sector (contributed almost 50 percent) was higher than the manufacturing sector (10 percent). However, the pattern went on a downward trend and agriculture output declined for 6 consecutive years from 2001 to 2007. Agricultural output dropped from about 40 percent of the GDP in 2001 to 30 percent in 2007. Also, the agricultural output had decreased much more in 2015 to less than 30 percent of the GDP as compared to the manufacturing output which had increased to almost 20 percent of the GDP (World Bank, 2018). This leads to a question of "What factors have contributed to the drop of the agriculture sector in Cambodia?" In summary, there has been no empirical study on this topic found so far in the Cambodian context. Hence, the first objective of this study has aim to investigate the factors influencing the agricultural output in Cambodia.

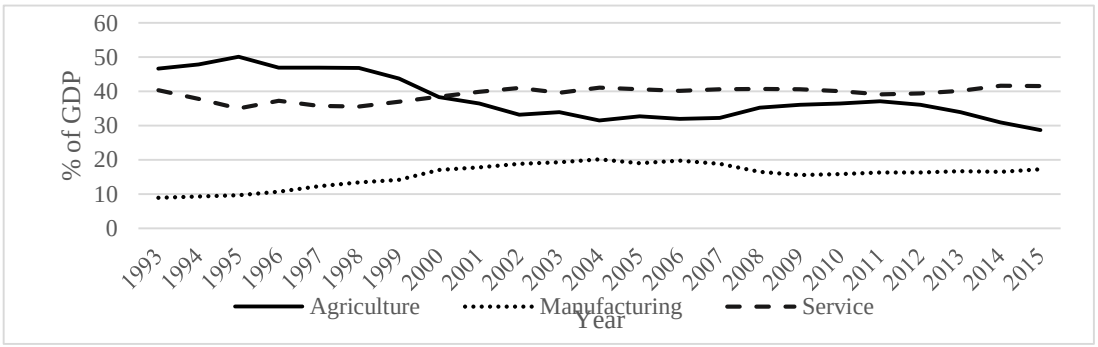


Figure 1.9: Agriculture, Manufacturing and Service in Cambodia (in % of GDP)
Source: World Bank (2018).

The manufacturing sector is considered the next logical step to progress from the agriculture-based economy (Henneberry *et al.*, 2000). Under the stages of the growth model of development (Rostow, 1960) any country will have to rely on their employment of agriculture to give way to manufacturing in order to achieve high economic development. Nevertheless, Cambodia has just recently joined the low-middle income group and, therefore, we believe that there is still room for a win-win situation between agriculture and manufacturing. In order words, both can be developed further without leaving any sector behind. Generally, manufacturing can also be further supported by use of a more-up to-date technology.

Unfortunately, bringing about a win-win situation is not easy as both are competing for the same resources, especially labor, land and capital. Agriculture provides food and raw materials for industry; in turn, industry supports the modernization of traditionally equal systems by providing new inputs and improved technical skills. Faruquee (1995) pointed out that, if the investments are not contributing to the agriculture sector, a non-significant effect of the adjustment in the capital formation will be observed for the agricultural output. In the case in Pakistan, the policy has encouraged industrial growth by diverting resources to the industrial sector and leaving the agricultural sector (Faruqee, 1995).

By encouraging manufacturing growth through the development of the agricultural sector, the position of the rural poor can be improved while simultaneously providing a compact framework for the country's manufacturing development. Although, instead

of doing this, the developing countries' governments attempt to industrialize the economies at such a high speed that the agricultural development declines, resulting in poor agricultural performance and low manufacturing productivity (Yao, 1996).

Turning to the case in Cambodia, agricultural development is a main component of the Cambodia Industrial Development Policy 2015–2025. It helps to enhance the development of the industry, small and medium enterprises and skills training, and improves worker development. Over the longer term, developing a domestic agro-processing industry would give a boost to agricultural development by producing demand for high-quality raw materials from agriculture. For the time being, however, the Industrial Development Policy, 2015–2025 has not been implemented at the pace projected in the innovative strategies. A faster implementation would support an energetic agro-processing industry emerging in Cambodia (ADB, 2017b).

Manufacturing in Cambodia has yet to be well established since the country needs a few more decades to become an industrial country. Therefore, manufacturing is in the process of development in order to create a good pattern based on agriculture. In the Cambodian context, we need to promote this sector since manufacturing is uncertain for now. It can be clearly seen that the issue within the pattern of the agriculture sector is that it is declining as compared to manufacturing, which is increasing (World Bank, 2018). To confirm the potential, the second objective of this study has been to examine the impact of the manufacturing sector on agricultural output.

1.3 Research objectives

Generally, the objective of this study is to examining the determinants of agriculture output in Cambodia. Specifically, this study will be the following sub-objectives:

1. To investigate factors influencing agricultural output in Cambodia.

2. To examine the impact of manufacturing sector on agriculture output.

1.3 Research questions

The general research question of this study is "What factors promote agriculture sector in Cambodia". Specifically, this study will have the following sub-questions:

- What are the determinants of agricultural output in Cambodia?

- Is manufacturing in Cambodia agriculture-led?

1.5 Scope of the Study

This study focuses on Cambodia's experience in developing its agriculture sector for the period between 1993 and 2015.

1.6 Significance of the Study

This research is of significance to students, lecturers, stakeholders and department/institution directors in the field of Finance and Economics in general, and

in cognition of agriculture development, specifically:

1. The significance is of knowing determinants of agricultural output in Cambodia. The agricultural outputs are significant components of the economies in Cambodia. Agriculture also contributes to the maintenance of cultural heritage and the economic viability of rural communities. Agriculture has developed a significant implement for country strategies in economic growth

2. The manufacturing in Cambodia agriculture-led is to show the benefits of manufacturing system and production. Industrial development is observed as the most significant for economic evolution. Transformation from agriculture to manufacturing is the procedure in economic development. Anyway, the effect of agricultural growth is of agriculture's lead role.

1.7 Key Definitions

1. **Agriculture** is denoted the numerous products that have domestic products for people and endure the worldwide populace (Harris and Fuller, 2014).

2. **Manufacturing** is quality is viewed as conformance to requirements and specification. (Lagrosen *et al*., 2004)

3. **Gross Domestic Product (GDP)** aggregates on value added by capital and labor of the process of production (Daly, 2006).

4. **Demand- Led Industrialization:** The results of Social Accounting matrix (SAM) examined basically robust macro-relationships from agricultural demand-led (ADL) industrial development, increment in GDP is a significantly contrasted to developing from manufacturing growth situated to any nourishment production (Bautista *et al.,* 1999).

1.8 Organization of chapters

This thesis is structured into five chapters. Frist chapter is the introduction that contains of the overview of study, the statement of problem, the research objectives, research questions, the scope of the study, significant of the study, key definitions and organizations of chapters. The next chapter reviews the determinants of agriculture development and the agriculture-led industrialization in Cambodia. The third chapter identifies the methodology of this study. The fourth chapter discusses the result and discussion. The last chapter presents the conclusion of the study.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Cambodia is located in South-East Asia and borders with Thailand, Vietnam and Laos. Cambodia has a tropical monsoon climate, which has wet and dry seasons. The land is flat for the most part in the central part of the country, and has mountainous and upland areas in the southwest, north and northeast. The total land area of Cambodia is 181 035 square kilometers (Keskinen, 2003). Cambodia moved to middle-income status in 2015, with the gross national income (GNI) at 1,070 US dollars (World Bank, 2017a).

Most Cambodian farmers are smallholders with less than two hectares per household. Cambodia's country populace faces new difficulties in high populace development, including market economy and universal private venture, sustenance security and diminishing rural farming conditions because of the quickly evolving financial conditions since 1990 (Shatkin,1998). In addition, Mund (2011) illustrated that agriculture's role in Cambodia is ensuring food security in society and the domestic level, and also in the procedure of occupation and profit for a developing populace.

Sustained economic development is one of the principals for financial development. As a result, it is significant to recognize the source of development that will make higher wages and more employment opportunities. In this view, the agriculture sector

is still the backbone of the economy while the manufacturing segment will logically contribute towards economic development.

2.1 Theoretical Review

In this section, we briefly review some theories underpinned our study. Firstly we discuss the theories of agriculture' role just to give an overall overview of the importance of agriculture on economic development, though this is not the central area of our study. The second theory we discussed is how human capital helps to improve agriculture; basically, the human capital theory was used to support the hypothesis that education may help to influence agriculture sector development. In our study, we used the Cobb-Douglas production to summarize the relationship between agricultural output and its determinants and some of the other models that were important to relate any two of the explanatory variables, for instance, the conservation model, the location model, the diffusion model and high-payoff model. There are detailed discussion in the next sub-section of the theoretical review.

2.1.1 Theories of agriculture's role

The role of agriculture in development is regularly dismissed in the face of the element of structural transformation. Dual economy models (Lewis, 1954) suggested capital accumulation through the development of the manufacturing sector, further strengthening the notion of the backwardness and inadequate potential of agriculture. Rosenstein-Rodan, (1943), in the balanced growth theory, indicated that agriculture and industry are inter-twined, where agriculture supplies goods and raw materials to

the industry and the industry provides a market for agriculture. Hirschman (1958), in the unbalanced growth theory, described the inter-relationship between agriculture and industry through 'forward-linkage' and 'backward-linkage'. The two-sector structural transformation models (Lewis, 1954; Ranis and Fei, 1961) of economic development show that the transformation of the surplus labor in agriculture with zero or negative marginal products to industry promotes economic development due to the commercial reinvestment of earnings in the industrial sector. Growth rates in agriculture and industry are commonly inter-dependent. If the output in agriculture drops over time due to diminishing returns, industrial growth also begins to slacken (Thirlwall, and Keynes, 1999).

In contrast, in most of the developed Asian countries, apart from the countries of Singapore and Hong Kong, China, agriculture played a vital role in launching the period of high growth. In these countries' economics, the relation between agricultural growth and poverty reduction has shown a positive connection between the rapidness of growth in the political economy and a development policy that stressed the role of the rural economy. For instance, Indonesia and Vietnam, has tilted the investment significance towards rural development, while the transformation of agriculture in other Asian nations, such as India, Pakistan and Cambodia has been sluggish (Briones and Felipe, 2013).

The common theory by Johnston and Mellor (1961) discusses the role of agricultural growth. Agriculture is a source of: (i) food, (ii) foreign exchange earnings, (iii) labor,

(iv) savings for capital formation and (v) purchasing power to produce demand for manufactures. The development in agriculture supports the growth of industry. The contributions of agriculture to output and employment might drop in developed economies. Therefore, this path remains to be explained further as agricultural development-led industrialization (Adelman, 1984).

2.1.2 Models of Agricultural Development

Throughout the 20th century, the major evolution in agricultural history has been taken from the resource-based system to a science-based system of agricultural production in most of the countries, with a few exceptions: a few areas of East Asia, Western Europe and the Middle East. This, according to many authors; see for example, Ruttan and Hayami (1972), Ruttan (1977), Ruttan (1980), Janssen (1986), Ruttan (1987), Ruttan (1988), and Jones (2010), explained the agricultural growth literature have classified several models as follows:

(i) The conservation model is strengthened by the theory in the English classical school of economics of diminishing returns to labor and capital applied to land and labor. This model highlighted the evolution of a structure of progressively complex land- and labor-intensive cropping systems, the production and labor-intensive capital formation in the form of physical facilities to more efficiently develop land and water resources (Ruttan, and Hayami, 1972; Ruttan (1977); Ruttan, 1980).

(ii) *The diffusion model* of agricultural growth has provided the main foundation for the research and extension efforts in farm management and production economics since the last half of the 19th century. The diffusion of better agricultural practices is