LABOUR USE EFFICIENCY OF RICE FARMING IN THAILAND WITH EMPHASIS ON THE CENTRAL PLAIN

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Agriculture was once the leading sector in the Thai economy. The crop production sub-sector was and remains the core of Thai agriculture. An important crop production is rice. In the 1850's the country was rapidly increasing specialization in rice production for exports. The major buyers of Thai rice at that time were the European countries. Before 1855, the Western countries including the United States of America and Britain, tried to conclude the treaty of friendship and commerce with Thailand in order to guarantee their increasing trade interests. In 1821, the East India Company appointed John Crawford as an envoy to the court of Thailand, hoping that he would be able to sign a treaty with Thailand. The mission, however, was unsuccessful. In 1850, the British Plenipotentiary, Sir James Brooke of Sarawak, went to Thailand with the purpose of negotiating a treaty, but he failed. Brooke was followed by the American Ballestier who also failed. In 1855, the British Plenipotentiary had advised its government that only gunboat diplomacy would bring the Thais to accept a Treaty between Britain and Thailand. King Mongkut (Rama IV) of Thailand realized that the age of isolation for Thailand was over. Thailand received the British mission led by Sir John Bowring who negotiated a Treaty between the two countries. After the signing of the Bowring Treaty in 1855, Thailand's international trade expanded and it began to employ both land and labour more intensively. Foreign trade became the engine of growth and the Thai economy became more dependent on rice crop. After 1880, the development of modern transportation and telecommunication networks, especially the connection of telecommunication of Bangkok with the world, played an important role in the growth of rice exports.

The increase in foreign demand for rice which led to rising prices, stimulated the rapid expansion of rice farming. The economic expansion in the late Nineteenth Century can largely be attributed to the production of rice, which accounted for two-thirds of the total exports. During the second half of the Nineteenth Century and the early Twentieth Century, Thai farmers produced an increasing amount of marketable rice, in spite of low innovations in rice production. Facilitated by the availability of land and with simple traditional farming tools, Thai farmers could produce more rice for sale by working harder and extending the area of cultivation. Although there was no significant change in rice farming technology, farmers made adjustments according to available resources to increase their efficiency. Manarungran (1989:19) stated that although there was no technological innovation among Thai farmers, their labour productivity before 1950 was higher than that of their counterparts from other countries. During 1920-1950 labour productivity of Thai rice farming was 3.44 kilograms per man-hour. In contrast, labour productivity of Japanese rice farmers was 2.35 kilograms per man-hour. Japan was land-scarce and labour-abundant country, which was much more advanced than Thailand in terms of their rice-farming technology but had lower labour productivity. Unfortunately, Thailand's advantage over other countries had declined considerably since then because of decreasing labour productivity in rice farming. Rice output during crop years 1996/1997-2003/2004 had averaged 402 kilograms per rai while the average output in other rice producing countries was higher, Vietnam, for example the average rice output was 582 kilograms per rai. This is because the quality of Thai rice is of a higher quality resulting in a lower yield. However, rice has been Thailand's important cash crop, earning as much as 70 billion baht each year in the nineties. Thailand produced 6 million metric tons of rice per year, Thailand is also currently the world's biggest rice exporter. The important markets for Thai rice are Asian countries, especially those in the Asia-Pacific region, such as China and Hong Kong. Other important markets are the Middle East, the United States of America and Africa. In terms of quality, more than 60 percent of the rice exports are high quality rice while the remaining are of medium and low quality. The quality of the rice exported is classified according to the following:

1) The good or high quality rice is 100 percent white rice and it refers to rice with no broken grains. Sixty percent of Thai exports are from high quality rice. The rice that Thailand is most famous for is *hom mali* rice. This variety comprises more than 80 percent of all high quality rice exported. This type of rice is exported to China, Hong Kong, Iran, the United States of America and Singapore.

2) The medium quality rice which has 10-15 percent of broken grains, contributes to only 5 percent of Thai rice exports. The major countries importing this variety are Indonesia, Malaysia and some African countries.

3) The low quality rice includes the type with more than 20 percent broken grains and parboiled rice. Currently this variety of rice comprises 35 percent of Thai rice exports and it is exported to Africa and the Middle East.

Although Thailand is still the current leading rice exporter in the world, its share in the world rice market has been declining. There is increased competition from other exporting countries for all varieties of rice. Vietnam and China are two important competitors producing low quality rice. The labour costs in these two countries are comparatively lower. Other problems faced by Thai farmers are the low level of technology in rice production and producing rice of uneven quality.

To alleviate these problems, Thailand needs to re-double its efforts to develop high quality rice to export to those countries with higher purchasing power. The market for this type of rice is more stable than those for rice of medium and low qualities. Thailand should also start improving its medium and low quality rice, so that their export values can increase. The government has since carried out several schemes to improve the quality of rice production. Some of the programs or policies which were implemented to help increase Thai rice exports include the following.

1) Implement “Good Agricultural Practices” (GAP) in order to produce high quality, chemical-free rice. This is already practised in many developed countries in Europe.

2) Develop rice packages in forms and sizes which suit the tastes of consumers in importing countries.
3) Affix labels on packages providing details such as nutrient values and the proper or recommended way to cook the rice for those who are not familiar with cooking rice.
4) Promote and facilitate the production of rice variety with potential growth in sales such as steamed rice. This variety is in fact the low quality rice. This rice variety still has the potential for export earnings especially from markets in developing countries.

One of the advantages that Thailand has in the production of rice is the high work rate of the Thai farmers. These farmers have been growing rice for a long time. In the Thai rice sector, there are still a significant number of farmers. During crop years 1982/1993-1995/1996 for example, an average of 75 percent of farmers in agriculture were engaged in rice farming. Unfortunately, Thai farmers suffer from low productivity even though they are hard working. If these farmers are efficiently utilized there will be increased potential for growth in rice farming.

As labour utilization is crucial in Thai rice farming, research and empirical studies on this issue are necessary. There should be studies to see if the workforce is efficiently utilized. The findings of such studies will have important implications especially for planners who design and implement policies to improve the competitiveness of Thai rice.

This study is primarily on the efficiency of the use of labour force in rice farming in Thailand. This is an important issue since Thailand is still considered an agricultural country. The sector is the most important sector for creating employment for the growing labour force. On average, 49.38 percent of employment in Thailand were in the agricultural sector during the period 1990-2000. However, as stated earlier, research and empirical studies on labour productivity in rice farming are lacking. It is imperative to examine the efficiency of labour usage in order to provide useful information for stakeholders. With this knowledge on labour productivity, they will make better decisions to allocate resource use in rice farming including labour input.

Aside from studying on labour productivity of farmers, this study hopes to analyze the contribution of input growth and Total Factor Productivity in rice farming. It will provide an understanding about the main sources of rice output growth, including the role of technological progress. The contribution of each input growth in the growth of rice output and the substitution possibilities between labour and land use in rice farming will help towards planning for optimizing the combination of capital and labour utilization.

The following section gives an overview of the Thai economy. The structural changes of the Thai economy, including a detailed analysis of the development of the agricultural sector are then presented. This is followed by a discussion of the productivity of workers in rice farming. The Chapter concludes by setting out the research problem, the objectives of the study and the tentative chapter scheme.

1.2 The Thai Economy

During the period 1961-2004, the GDP of Thailand grew at an impressive average rate of was 6.8 percent (see Table 1.1). Nevertheless, Thailand is still considered a developing agricultural country. To trace the country's economic development, the important macro economic indicators are presented in this section. They include population, GDP, per capita income, non-agricultural income, trade balance, exports and imports, balance of payments and currency exchange rates. Additionally, interest rate, inflation rate and rate of unemployment are also discussed.

Planning for economic development became a formal process of the Thai government in 1961 when the National Economic Development Board (NESDB) was established. The Thai Economic Plan achieved an impressive growth rate of 8.1 percent during the First Development Plan (1961-1966). However, the Second Development Plan (1967-1971) witnessed a decline in growth rate. The average GDP growth rate was 7.8 percent although it was projected to reach more than 8 percent. The slowdown in overall growth reflected a decline in foreign investments, reduced US military spending, and the disappointing performance in agriculture, which grew at only 4.5 percent during the period. The decline in the growth of agriculture was due partly to the droughts of 1967 and 1968, and partly to the fluctuation in world prices of major export commodities.

Table 1.1: GDP Growth Rates of Thailand, 1961-2004

Year	GDP Growth rate (%)
1961	7.2
1971	8.6
1981	5.6
1991	8.6
1992	8.1
1993	8.3
1994	9.0
1995	9.2
1996	5.9
1997	-1.4
1998	-10.5
1999	4.4
2000	4.8
2001	2.2
2002	5.3
2003	7.0
2004	6.2
2005	4.5
Period	**Average**
1961-1966	8.1
1967-1971	7.8
1972-1976	6.5
1977-1981	7.4
1982-1986	5.4
1987-1991	10.9
1992-1996	10.0
1997-2001	-0.2
2002-2005	5.7

Source: Bank of Thailand. *Thailand's Key Economic Indicators, various years.*

Between 1972 and 1986, the government promoted the manufacturing sector by implementing an industrial-oriented policy. The Third Plan (1972-1976) saw a disappointing GDP average growth rate of only 6.5 percent. The main causes of this less than expected growth rate during this period were the 1973-74 oil crisis, the resultant world economic slump and the continued decline in US military spending. The slowdown was also partly attributable to the poor performance in agriculture, which grew at only 3.9 percent. In spite of the expansion in the manufacturing sector, it was evident that it was still not creating enough jobs. Between 1972 and 1982, for example, the rate of investment was as high as 20 percent while the rate of employment was only 12 percent. Further, in 2003 the manufacturing sector contributed 36 percent in GDP, but it contributed only 15 percent to employment. Even though migration from rural to urban areas was rapid and clearly visible, it was widely thought that the benefits such as employment and higher income of manufacturing were not reaching the majority of the population.

The performance of the economy during the Fourth Development Plan (1977-1981) was affected by the rapidly changing world economic conditions, particularly the rising oil prices, high interest rates and declining demand and prices of commodity exports. In spite of the unfavorable external conditions, the economy expanded satisfactorily, enjoying an average growth rate of 7.4 percent.

The Fifth Development Plan (1982-1986) continued to give high priority to economic restructuring, the maintenance of financial stability and the welfare of the rural poor. This period coincided with slower growth as a result of the world recession of the early 1980s. Largely as a result of the international oil price increases of the 1970s and early 1980s, Thailand suffered a severe deterioration in its terms of trade. The overall growth rate of 5.4 percent was the lowest compared to all the earlier plans. The Thai macroeconomic policy was adjusted sharply to counter the imbalances described above. The adjustments included a significant fiscal contraction. The fiscal deficit was transformed into a surplus, equivalent to 1.3 percent of the GDP in fiscal year 1988 and 4.9 percent in 1990. At the same time, Thailand was experiencing an export boom in manufactured products.

The Thai economy soared in the next two Development Plans and enjoyed high annual growth rates of 10.9 percent and 10 percent in the Sixth and Seventh Development Plans respectively. However, the economic growth rate fell drastically to -0.2 percent during the Eighth Development Plan due to the financial crisis in 1997-1998. Nevertheless, Thailand survived the economic crisis by earning foreign income through exports and tourism. Thailand experienced an annual growth rate of 5.9 percent in 2002-2005. However, the tourism industry was adversely affected in 2004 due to the Tsunami. Thailand is expected to reach 4.5-5 percentage of growth in 2006.

Table 1.2: Key Economic Indicators of Thailand, 1991-2004

Year	Population (million)	GNP (billion Baht)			GNP Per Capita (Baht)
		Agriculture	Non-Agriculture	Total	
1990	54.55	363.6	1,681.8	1,945.4	38,613
1991	57.37	282.7	1,829.1	2,111.9	43,655
1992	58.03	296.3	1,986.3	2,285.6	48,311
1993	58.34	289.1	2,181.8	2,470.9	53,772
1994	59.10	303.4	2,389.6	2,693.0	60,865
1995	59.46	276.6	2,665.1	2,941.7	69,326
1996	60.63	288.8	2,826.5	3,115.3	75,146
1997	60.81	286.8	2,785.8	3,072.6	76,057
1998	61.45	282.6	2,467.1	2,749.7	72,979
1999	61.66	289.2	2,582.8	2,872.0	72,981
2000	61.88	309.9	2,698.5	3,008.4	77,863
2001	62.31	320.0	2,753.6	3,073.6	80,558
2002	63.46	322.2	2,914.2	3,237.0	84,919
2003	64.00	359.0	3,108.5	3,464.7	91,398
2004	65.08	341.8	3,336.7	3,678.5	99,339

Source: Bank of Thailand (2005). *Thailand's Key Economic Indicators*.

The Thai economy during 1990-1996 grew at an average of 8 percent per year. It was driven mainly by the non-agricultural sectors. From Table 1.1, it can be seen that the Thai economy had fallen into a period of depression after the financial crisis of 1997. In 1997 and 1998, the country's economic growth rates were -1.4 percent and -10.5 percent respectively. As a direct consequence of the economic difficulties, the country's average economic growth rate during the Eighth Development Plan (1997-2001) was -0.2 percent. Since then, however, the Thai economy had recovered. In 2002, the growth rate improved to 5.3 percent and by 2003, it further increased to 7.0 percent. However the Thai economy slowed down again in the beginning of 2004 to 2005. It decreased from 6.2 to 4.5 percent, respectively. This is mainly due to the adverse impact of the global economic slump on the external sector. Further, cost of production increased because of the higher petroleum price. Income earned from tourism also declined since the Tsunami disaster in December of 2004.

The most serious negative impact of the 1997 financial crisis on the country's economy was the closure of as many as 58 investment and trust companies as well as 1 commercial bank. Because of the adverse liquidity situation, investment in the agricultural sector became stagnant. Private businesses faced so much financial difficulties that they had to reduce production, resulting in the retrenchment of thousands of workers. Many workers who shifted from the agricultural sector to the urban areas during the pre-crisis period had to move back to farming and other agricultural activities. (This will be discussed in greater detail in Section 1.3.)

The actual population growth rate during the 5 years of the Eighth Development Plan averaged 0.6 percent a year. The low growth rate was about the same as forecasted in the Plan. However, despite the crisis, GNP per capita grew at a satisfactory rate of 0.2 percent per year for 2000-2001. It increased from 76,057 baht in 1997 to 80,558 baht in 2001 (see Table 1.2). Also, growth of the agricultural sector income exceeded that of the non-agricultural sector income after 1997. For instance, in 2000, income growth rate of the agricultural sector increased to 7.2 percent from 2.3 percent in 1999. In contrast, the income growth rate of the non-agricultural sectors in 2000 decreased to 4.5 percent from 4.7 percent in 1999 (see Table 1.3).

Table 1.3: Income Growth Rates by Sector, 1990-2004 (percent)

Year	GDP Growth Rate	Agricultural Sector	Non-Agricultural Sectors
1990	11.2	-4.7	14.1
1991	8.6	7.3	8.8
1992	8.1	4.8	8.6
1993	8.3	-2.4	9.8
1994	9.0	5.0	9.5
1995	9.2	4.0	9.8
1996	5.9	4.4	6.1
1997	-1.4	-0.7	-1.4
1998	-10.5	-1.5	-11.4
1999	4.4	2.3	4.7
2000	4.8	7.2	4.5
2001	2.2	3.2	2.0
2002	5.3	0.7	5.9
2003	7.0	11.4	6.5
2004	6.2	-4.8	7.4

Source: Bank of Thailand (2005). *Thailand's Key Economic Indicators*.

The inflation rate during 1991-1996 averaged 5 percent. It was well below the economic growth rate. It can be seen from Table 1.4 that the country's inflation rate was extremely high after the financial crisis of 1997. In 1998, the inflation rate soared to 8.1 percent. The crisis caused a decline in investment in the non-agricultural sectors. This decline led to a supply shortage. Price of goods and services as well as the cost of imported capital or intermediate goods rose significantly. This led to a contraction in aggregate demand for all goods and services. However, since 1999, the inflation rate has fallen steadily (see Table 1.4). The combination of lower oil prices and domestic economic slowdown caused inflation to decline steadily.

Table 1.4: Inflation Rate of the Thai Economy, 1991-2003

Year	Inflation Rate (%)
1991	5.7
1992	4.1
1993	3.4
1994	5.0
1995	5.8
1996	5.9
1997	5.6
1998	8.1
1999	0.3
2000	1.6
2001	1.6
2002	0.7
2003	1.8
2004	2.7

Source: Bank of Thailand (2005). *Thailand's Key Economic Indicators.*

As regards to international trade after the financial crisis in 1997, the country enjoyed surplus earnings in both the trade balance and balance of payments. The devaluation of the Thai baht was a major factor contributing to the surplus. As exports became relatively cheaper, imports became more expensive. The lower investments since the crisis also resulted in lower imports of intermediate and capital goods.

Table 1.5: External Account and Exchange Rate of Thailand, 1991-2004 (billions US$)

Year	Export	Import	Trade Balance	Balance of Payments	Exchange Rate (Baht/US$)
1991	28.3	37.8	-9.5	4.2	25.5
1992	32.2	40.1	-7.9	3.0	25.4
1993	36.6	45.1	-8.5	3.9	25.3
1994	44.7	53.4	-8.7	4.2	25.2
1995	55.7	70.4	-14.7	7.2	24.9
1996	54.7	70.8	-16.1	2.2	25.3
1997	56.7	61.3	-4.6	-10.6	31.4
1998	52.9	40.7	12.2	1.7	41.4
1999	56.8	47.5	9.3	4.6	37.8
2000	67.9	62.4	5.5	-1.6	40.2
2001	63.1	60.6	2.5	1.3	44.5
2002	66.1	63.4	2.7	4.2	43.0
2003	78.1	74.3	3.8	0.1	41.5
2004	95.0	93.5	1.5	5.7	40.3

Source: Bank of Thailand (2005). *Thailand's Key Economic Indicators.*

It is evident from Table 1.5 that the Thai economy suffered a trade deficit between 1991 and 1997. Since 1998, Thailand experienced a trade surplus due to the devaluation of baht. However, in the year 2000, the country again suffered a balance of payments deficit due to the need to service public debt from IMF.

It is obvious that the 1997 economic crisis had adversedly affected the rate of unemployment in Thailand. In 1998, it shot up to 4.4 percent compared to a mere 1.5 percent in 1997. However, with the expansion in non agricultural sectors such as the hotel and the construction industries, the employment rate declined to 3.1 percent during 1999-2003.

Table 1.6: Unemployment Rate in Thailand, 1990-2003

Year	Rate of Unemployment (%)
1990-1996	2.4
1997	1.5
1998	4.4
1999-2003	3.1

Source: National Statistical Office, Thailand (2004). *Report of the Labour Force Survey.*

In response to labour union demand, the Thai government began setting a minimum wage in 1973. Table 1.7 shows the minimum wage rate in the Thai economy from 1994 to 2005. In 1994, the minimum wage set by the government was 135 baht per day. The minimum wage remained stagnant between the periods 1996-1997, 1998-2000, 2001-2002 and 2003-2004. By the year 2005, it had only increased by 40 baht compared to that of 1994.

Table 1.7: Minimum Wage in the Thai Economy, 1994-2005 (Baht per day)

Year	Wage
1994	135
1995	145
1996	157
1997	157
1998	162
1999	162
2000	162
2001	165
2002	165
2003	169
2004	175
2005	175

Source: Office of Wage Committee, Ministry of Labour (2005). *Minimum Wage in the Thai Economy.*

Table 1.8 shows the interest rate in Thailand from 1990-2004. It is obvious that the interest rate between 1990 and 1998 was extremely high (10.5-16.3 percent). The reason may be due to tight monetary policy. The Thai government decided to bring down the interest rate in order to boost economic activities and increase domestic spending. With the Thai fiscal and monetary policies, the government decreased the interest rate on government bonds and the banks make loan easily available. The interest rate declined steadily since 1999. By 2004, the rate had declined to just 5.6 percent.

Table 1.8: Interest Rates in Thailand, 1990-2004

Year	**Interest Rate (%)**
1990	16.3
1991	14.0
1992	11.5
1993	10.5
1994	11.8
1995	13.8
1996	13.1
1997	15.3
1998	11.8
1999	8.4
2000	7.9
2001	7.3
2002	6.8
2003	5.6
2004	5.6

Source: Bank of Thailand (2005). *Thailand's Key Economic Indicators.*

1.3 Structural Changes of the Thai Economy

An understanding of the historical growth of the Thai economy is necessary in order to understand the structural changes of its economy. The Thai economy experienced its first structural change in 1855 when the Bowring Treaty was signed. One of the provisions of the Treaty was that Thailand had to open its economy. Rice became an important crop for export and Thailand became a major rice exporter. However, the open economy policy had adversely affected the domestic investors who found it difficult to compete with their foreign counterparts. Thus, the policy of protection for the domestic industry was adopted. However, the strategy of emphasizing domestic investment did not result in the desired level of industrialization. This is partly because most businesses imported cheap merchandise from other countries rather than to produce them locally a higher cost. Furthermore, during that time, almost all big business firms were state-led, if not owned by the government itself. Moreover, during 1965-1971, the main thrust of government policy was to promote democracy and eliminate communism which had made tremendous in-roads in the Thai rural society. One of the government strategies to eradicate poverty was to re-distribute wealth to the rural areas. The government began a strategy of relocating manufacturing industries to non-metropolitan areas. The Board of Investment (BOI) provided more fiscal incentives to local investors. There were many measures to attract investors including the provision of tax reduction. By 1971, Thailand achieved high investment growth. However, most of the investments were in import-substitution industries.

Between 1965 and 1972, the growth rate of the industrial sector slowed down because of the limited size of the domestic market. There was a shift in government policy from promoting domestic-oriented to export-oriented industries. The government provided more incentives for export-oriented industries. Production for exports was given priority and importance. Furthermore, during the Sixth Development Plan (1987-1991), Thailand's economic goal was to achieve the status of a newly industrialized country (NIC). The three major factors expected to generate economic growth were foreign markets, foreign direct investments and foreign tourists.

Thailand is a developing country which has enjoyed rapid economic development in the last few decades. In the earlier phases of development, the agricultural sector was the leading sector in the Thai economy. In the 1960s and 1970s, agricultural output accounted for 38.0 percent and 27.0 percent of the Gross Domestic Product (GDP) respectively. In contrast, the manufacturing sector accounted for 12.0 percent and 16.0 percent of the GDP for the corresponding periods. Since 1855, the agricultural development has significantly influenced the level and pace of economic expansion in Thailand. The transformation of the Thai economy began in 1958, when the First Development Plan was initiated. The manufacturing and service sectors became important sectors contributing to economic growth. The rapid expansion in the manufacturing sector since the 1980s brought about by the government's growth-oriented industrialization policy led to the declining importance of the agricultural sector. The agricultural share in GDP decreased from 27 percent in 1970 to 20.6 percent in 1980. In contrast, the manufacturing sector's share in GDP increased from 16 percent in 1970 to 21.7 percent in 1980, thus assuming the leading role in driving economic growth. By 2003, the agricultural sector's share has further declined to 10.2 percent while manufacturing's share has increased to 38.4 percent (see Table 1.9). Despite these structural changes, Thailand is still a predominantly agricultural country. Farmers living in the rural areas still form a significant proportion of the population.

Table 1.9: Share of Gross Domestic Product by Sector, 1960 to 2003 (percent)

Year	Agriculture	Manufacturing	Others
1960	38.0	12.0	50.0
1970	27.0	16.0	57.0
1975	24.8	20.0	55.2
1980	20.6	21.7	20.7
1985	19.9	20.7	59.4
1990	13.5	27.8	58.7
1995	10.7	31.0	58.3
1996	10.6	31.4	58.0
1997	10.5	32.5	57.0
1998	11.5	32.2	56.3
1999	11.3	34.7	54.0
2000	11.3	35.2	53.5
2001	10.4	36.5	53.1
2002	9.9	38.4	51.7
2003	10.2	39.3	50.5

Source: NESDB (2004), *National Income Statistics of Thailand, New Series, 1970-2003.*

The structural change in the economy in terms of output in different sectors, however, did not result in a corresponding change in labour structure. According to Takei (2002), the agricultural sector had the largest share of the labour force and employment in the Thai economy for the period of 1960-2004 (see Table 1.10).

Table 1.10: Population, and Labour Force in Thailand, 1960 to 2004 (million persons)

Year	Population	Total Labour Force	Labour Force in Agriculture	% of Labour Force in Agriculture
1960	26.26	13.50	11.33	82.40
1970	34.40	16.65	13.20	79.30
1980	44.82	22.52	15.94	70.80
1985	51.80	26.13	18.12	69.30
1990	54.55	30.84	19.73	64.00
1991	57.37	32.65	19.49	59.69
1992	58.03	33.01	19.68	59.63
1993	58.34	32.84	18.24	55.55
1994	59.10	32.58	17.96	55.12
1995	59.46	33.00	16.93	51.30
1996	60.63	34.48	19.99	57.97
1997	60.81	34.85	20.02	57.44
1998	61.45	35.22	19.96	56.67
1999	61.66	35.60	19.84	55.73
2000	61.88	35.97	19.32	53.71
2001	62.31	36.34	13.61	37.45
2002	63.46	34.25	14.04	40.99
2003	64.00	34.85	13.88	39.83
2004	65.08	35.82	13.63	38.05

Source: National Statistical Office. *Report of the Labour Force Survey, various issues.*

Note: Before 1988, the labour force was defined as those between 11-60 years old; from 1988-1995, it was defined as those between 13-60 years old; and since 1996, it was redefined as those between 15-60 years old.

The proportion of the total labour force in agriculture sector was 82.4 percent in 1960, 79.3 percent in 1970, 70.8 percent in 1980, 64.0 percent in 1990 and 38.1 percent in 2004. While in most Southeast Asian countries, the labour force had shifted to non-agricultural sectors, in Thailand, more than 60 percent of its labour force were still engaged in the agricultural sector in 1990 (Saker, 1996: 194). Although the proportion has been declining, nevertheless, during 2001-2004 around 39.08 percent of the labour forces still worked in the agricultural sector. A major reason why the proportion of labour force in agriculture has been declining from 2001 and 2003-2004 are due to a drought during this period. During the Eighth Development Plan period (1997-2001), the agricultural sector contributed around 40 percent of the total employment in the country. This is shown in Table 1.11.

Table 1.11: Employment by Sector in Thailand, 1960-2003 (percent)

Year	Agriculture	Manufacturing	Others
1960	82.3	3.4	14.3
1970	79.3	4.1	16.6
1971	77.8	5.6	16.6
1975	73.0	7.5	19.5
1980	70.7	7.9	21.4
1985	68.9	7.9	23.2
1986	64.0	9.1	26.9
1987	60.0	11.0	29.0
1989	60.65	11.06	28.29
1990	63.95	10.16	25.89
1991	54.00	13.18	32.82
1992	53.34	13.57	33.09
1993	53.03	13.62	33.35
1994	48.06	14.61	37.33
1995	46.70	14.95	38.35
1996	44.27	15.15	40.58
1997	45.12	14.63	40.25
1998	44.83	15.12	40.05
1999	45.39	14.96	39.65
2000	44.52	15.92	39.56
2001	42.20	15.90	41.90
2002	43.20	14.70	42.10
2003	41.20	15.20	43.60

Source: National Statistical Office, Thailand *Labour Force Survey, various years.*

It is evident from Table 1.11 that in 2003, around 41.20 percent of total employment were in the agricultural sector compared with 15.20 percent in the manufacturing sector. Further, the Bank of Thailand (2003) reported that the growth rate of employment was 1 percent while output grew at 2 percent in the industrial sector in 2002-2003. It can be noted that the growth of the industrial sector did not lead to a growth in employment. There are many reasons for this. Firstly, the government implemented a number of tax incentives, which were biased towards the use of capital. Industrial investors were exempted from paying taxes for three years and the tax for goods and machines imported was reduced. With these incentives, the investors preferred the use of machines rather than employing labour. Secondly, most products which were meant for export must meet minimum standards of quality. Machines and capital intensive production could help meet these standards. Finally, most of the workers who moved from the rural areas to the industrial sector were unskilled labour. They had low levels of education, little experience with factory jobs and thus had limited abilities to contribute to the industrial sector. Thailand Development and Research Institution (TDRI, 1998) reported that 60 percent of the labour force had only primary school education. Those who completed secondary and tertiary education constituted 16 and 12 percent respectively. It can be seen that an increase in investment may not necessarily bring about a proportionate increase in employment. Between 2000 and 2004, the rate of investment increased at an average 7.90 percent while the growth rate of employment in non-agricultural sectors was only at 4 percent.

The population growth during 1990-2001 averaged 1.22 percent per year and has declined to 0.04 percent per year during 2001-2004. The labour force in Thailand experienced an average growth of 1.92 percent per year during 1990-2001 and also has declined by 3.75 percent per year during 2001-2003. It may be due to the successful implementation of family planning policy which discouraged large families. As a result, the population between 15-60 years old has declined. Between 1990-1996, an average 57.43 percent of the labour force were in the agricultural sector. In 1997, of the total labour force of 34.85 million, 57.43 percent were in the agricultural sector. This is due to the impact of the financial crisis, which caused workers to move back to the agricultural sector. Since 1998, the proportion of the labour force in agriculture had started to decline. This was partly attributed to the government's policies which provided more incentives for investment and employment in the non-agricultural sectors. It is clear that the financial crisis resulted in a decline in employment in the manufacturing and non agricultural sectors.

During the harvesting seasons between 1991/92 and 1995/96, the number of families in the agricultural sector increased by 0.58 percent per year (Office of Agriculture Economics, Thailand, 2000). In 1995/1996, there were as many as 5.25 million agricultural families (see Table 1.12). By the year 1998/1999, the number of farming families had gone up to 6.61 million families, an increase of 26 percent. The increase in the number of agricultural families during this period may be due to the financial crisis of 1997. This crisis resulted in the high rate of unemployment in non-agricultural sectors and a large number of them moved back to the agricultural sector. However, the number of agricultural