CHAPTER 1

INTRODUCTION

1.1 Statement of Problem

The Northern region of Thailand covers one-third of the total area of the whole Kingdom, the agricultural land accounts for about 20% and the gross agricultural product (GAP) at constant 1988 prices owned 19.5%, but the employed agricultural labor accounted for 23.6% of that in Thailand in 1991. The main occupation in northern region of Thailand is agriculture. In 1991, about 70.4% employed labor work in agriculture. The gross regional product (GRP) of northern region is 257,763 million Baht at current price. Among this, GRP in agriculture is 65,999 million Baht, accounting for 25.9% (national level is 12.8%). However, the per capita income is 23,328 Baht that is far below the national average level 44,085 Baht (see Table 2.1 and Figure 1.1). Obviously, in this region, large labor force produce less output and in turn obtain low income, and consequently it causes certain people's emigration and other social problem due to poverty suffering. Therefore, the main problems concerning northern Thailand agricultural sector are: (1) how can agricultural production be further increased; and (2) how can farmers' income be raised through raising productivity?

Since the income gap between the people in various regions has increased through the second plan period (see Table 1.1), Thailand government has make efforts to accelerate rural development in various regions and try to narrow the gap of income discrepancy. Thus far, the gap is still exist and even larger with the pressure of rapid economic growth. Subsequently, the government has mentioned the rural poverty problem in every following five-year plan agenda. In deed, the problems mentioned in the above paragraph have become cliché-ridden issues. In order to solve the problems,

a full understanding of the agricultural production process need to be clear and essential points should be cached as the basis to draw government policies.
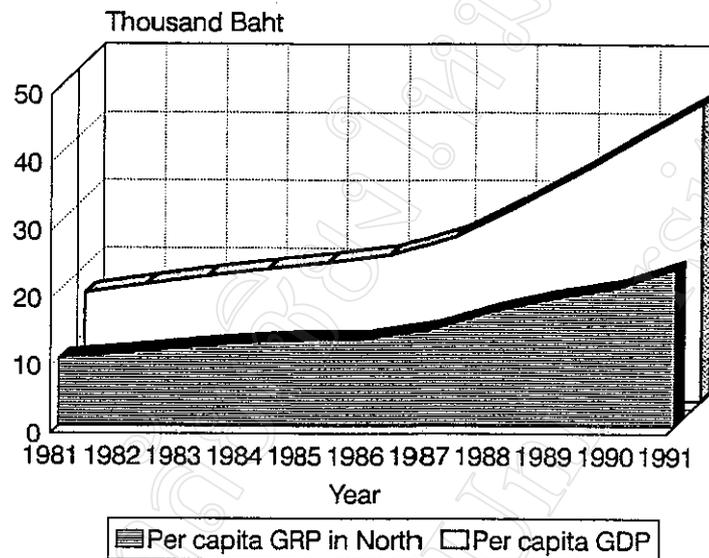

Figure 1.1 Comparison of per capita GRP in northern region with per capita GDP at national level, 1981-1991

Source: Drawn from NESDB data, 1995.

Table 1.1 Per Capita Income by Region at Current Price (Baht), 1960 - 1979

Year	North	Northeast	South	Central	Bangkok Metropoli- tan area	Country
1960	1,496	1,082	2,700	2,565	5,630	2,106
1970	2,699	1,822	3,858	4,622	10,234	3,849
1979	8,781	4,911	12,683	17,655	30,161	12,067

Source: Adapted from NESDB.

1.2 Rationale

Further increase in agricultural production can be achieved through raising productivity and further modification of existing economic and social conditions, as well as more input use in production processes. More material input use will certainly

increase total production cost and perhaps result in soil erosion. The better way is to improve the production efficiency to increase output without increase input use by adjusting the unsuitable institutional factors, and to increase agricultural productivity through improving existing or adopting new technology. However, among institution, input, and technology, which source has the largest potential, what are the feasible solutions to increase agricultural production? What kinds of measures should be taken? This study will make an attempt to address these issues and analyze the effects of input use and technological change on northern Thailand agricultural production growth through a time-series review.

1.3 Literature Review

The literature relative to the development and production efficiency measurement are voluminous. The relevant literature mainly on Thailand agricultural development are as follows:

Chotigeat (1978) stated that over the period of 20 years (1953-1972), the structural changes of the agricultural sector were apparently occurring around the early 1960s: the sector transformed from a mono-rice-culture to diversified-crop-culture. During the former period, Thai farmers employed basically the two major inputs of capital (land, livestock, and simple tools) and labor in the production process; whereas, later, during the latter period, the three major farm inputs of capital (land, livestock, small and heavy machinery), fertilizer, and labor were basically used for production (especially the modern-farm inputs were very vital). Finally, the author drew the conclusion that the traditional, the transformation, and the modernization period of Thai agriculture were in the 1950s, the early 1960s and from 1967 onward, respectively.

Nitsmer (1992) examined the impacts of agriculture-led development on economic growth and income distribution in Thailand by using computable general

equilibrium analysis. Agriculture-led development is defined in model specification as simultaneous increases in agricultural productivity and government investment in agriculture, and a reduction in export taxes. Using base period (1980) data in simulations, agriculture-led development stimulates agricultural growth and overall economic growth. The results of the simulation shows that an agriculture-led development strategy was plausible for Thailand under the conditions prevailing in the early 1980s.

Mittelhammer *et al.* (1980) stated that the contribution of increased input use and technological progress to agricultural output growth in Thailand (1950-1976) are about 62.4% and 37.6%, respectively. Output growth due to neutral technological progress was estimated to be about 1.1% per year. However, the study based on the assumption that the production performance are perfect efficient, and the authors contributed the agricultural potential only to neutral technological progress. Therefore, without efficiency accounting, the contribution of technological progress might be over estimated.

Scandizzo (1984) analyzed the agricultural growth and factor productivity in developing countries using cross-country data during three time periods of 1966-68, 1972-74, 1978-80 and all data used are three-year average. The study showed that during 1966-80 period, Thailand total agriculture growth was 57.38%, in which differential factor effect accounted for 67.15%; technological progress accounted for 42% (including biased and unbiased technological progress effect -160.54% and 118.53%).

Patamasiriwat and Suewattana (1990)[1] studied the sources of growth of agricultural production 1961-1985, based on TDRI model. The study found that agricultural production had expanded extremely rapidly from 1961 to 1977, but had slowed from 1978 to 1985. This slowdown resulted from the inability to bring new

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[1] This reference was quoted from Dr. Vichya Nakarugsa.

land under cultivation and from low output prices. Education, and important factor in increasing production efficiency and greatly productivity, can account for about 33 percent in the growth rate of agricultural production. However, soaring input prices (such as fertilizer) became a burdensome farm cost, contributing to the decline in farm investment capacities. This study commented that the effects of technology contribute to production growth. The study ignored the impact of efficiency improvement.

Fan (1991) analyzed the effects of technological change and institutional reform on production growth in Chinese agriculture. An econometric method was developed to separate the contribution share of technological change, institutional reform and input use to total agricultural production growth. Pooled data were used in that study. The results showed that during 1965-1986 period, the factor contribution shares to the Chinese agricultural growth were as follows: total input use, 57.5%; Institutional change, 26.6%; and technological change, 15.7%.

Yuan (1993) studied the impacts of institutional reform, technological change and input use on agricultural production of Guizhou province in China. Methodologically, he followed Fan's study but time-series data from 1951 to 1989 were used, and examined the fluctuation of production growth in the "Cultural Revolution" period.

Nakarugsa (1995) examined the sources of growth in Thai agriculture covering the period 1961-1991. Methodologically, following Fan's study to analyze the contribution of input uses, technological change and efficiency improvement to agricultural production (actually is crop production including 22 crops). However, the model he simulated is a restricted Cobb-Douglas form, and divided the three decades into three time period, i.e., 1961-70, 1971-80, and 1981-91. Because this is the first one to simulate the model of Thailand crop production with large sample and long time period, whether the function form fits the Thailand crop production reality is still a moot point and it needs further investigation.

Due to the lack of systematically report of the provincial and regional statistical data, except the cross-sectional survey data, rare time-series analysis has been done quantitatively on the Thailand regional level about the input and technological impacts on agricultural production.

1.4 Objectives

The specific objectives of this study are to analyze the relative contributions of input growth, technological change and agricultural production efficiency improvement to the growth of agricultural production in northern Thailand.

1.5 Usefulness of the Study

Through this study, a picture of different input contribution share to production can be obtained. Based on this finding, recommendation on reasonable input uses can be suggested. By investigation on technological impacts, and the change of technical efficiency, the potential of agricultural production can be observed, and corresponding measures can be taken to promote agricultural production further.