

## CHAPTER I

### INTRODUCTION

#### History and Background of the Research

Throughout the last two decades, large amounts of Thai Government funds have been invested in highway construction and improvement, mainly to provide benefits to the society. Besides the general concept of the economic benefit of a development highway, there is an increase in the efficiency of transport and a reduction in transportation cost. The so-called direct benefits take the form of reduced cost of vehicle operation, saving in time, reduction of accidents, and an increase in the comfort and convenience in driving. A number of investigators have addressed themselves to the matter of indirect benefits, which are concerned with the benefits accruing to industry, commerce, residents, and landowners. Most of those studies have shown that an improved highway results in benefits to the public at large, and that an investment of funds for an improvement would be economically justified. However, few such general studies have been conducted in developing countries.

In Thailand, a number of studies have been undertaken of the indirect benefits of particular highways. These studies were initially aimed at the changes in the pattern of agriculture that had occurred, or could be expected to occur, as a result of the

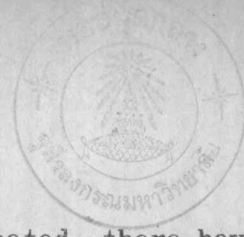
improvement or construction of a new highway. As experience was gained, investigators broadened their horizons and dealt with factors other than benefits to agriculture. Forest and mineral production, business and commercial activity, health and educational facilities (which may also be called social development) have come to be included as additional parameters of the indirect benefits accruing from the improvement or construction of highways. Most of these research projects (KASIRAKSA, 1963; PATANAPANICH, 1964; VIRUJHAKUL, 1970) appeared to be sensitive evaluations of the indirect benefits, which were analysed by a combination of cross-sectional and time-series analyses to detect the effects of change on an existing situation. Recently, two studies (AGATVIPAT, 1973; LERTPANYAVIT, 1973) found that sudden changes in the pattern of agricultural production and social development had not occurred following the construction of two major highways in Thailand. This led to the question of whether the earlier analyses were based upon an insensitive methodology, or whether there was an absence of the effect of the two highways on the economic development of the study areas. In one case, in the area of Lampang-Lampoon-Chiang Mai, a strong pattern of economic growth had been established well prior to the construction of the highway; this seemed not to have been altered substantially by the new construction. In the other case, the Pattani-Narathiwat Highway, an established pattern of receding economic change in the study area was not overcome by the construction of the greatly improved highway.

The present research is an attempt to answer the above questions, or at least to contribute a better understanding of the achievement of the agricultural output of remote areas tapped by new or significantly improved feeder roads. The research also aims to relate transportation factors to agricultural input, output, and farmers' mobility. The relative significance of the role the feeder road plays in the pattern of development was also investigated.

### Literature Review

Transportation is a broad subject which is difficult to cover comprehensively. Assessment of the benefits from feeder-road investment has been dealt with by many different methodologies: (1) minimum cost of construction (or construction and maintenance); (2) direct user benefits (with or without generated traffic, induced agricultural output, or a combination of traffic and production factors); (3) land-rent approach; (4) national income approach; and (5) increased agricultural output. Several of these approaches employ appropriate mathematical models. Each method has its own strengths and weaknesses in measuring the economic benefits which are contributed by a road, as BOVILL and HINE (1973) have pointed out. They also mentioned the disadvantages of each method, but admitted that each method attempted to measure a different aspect of the economic environment. They concluded that there is no readily available, unambiguous method for evaluating the benefits of feeder roads in developing countries.





In Thailand, as previously indicated, there have been very few studies of the economic benefits of feeder roads.<sup>1</sup> Most studies have been conducted to evaluate the agricultural output and the economic changes imputable to the presence of a new or improved major highway. As yet, these evaluations have not led to a general method that would be suitable for forecasting the economic effects of new highways. Neither would direct-user benefits (considering the low traffic volumes of feeder roads which are subject to large fluctuations) be effective in justifying the cost of construction. In much that has been written, it seems obvious that public projects should be evaluated in terms of a nation's goals. Yet this is not often done, nor would it be easy to do. One reason for the inadequacy of contemporary methods of analysis is perhaps the over-emphasis placed on transportation. Other parameters that might reasonably be investigated as related to augmented agricultural production are irrigation, improved or selected seeds, fertilizers and pesticides, agricultural advice, financial credit, marketing, storage and processing of agricultural products, and commodity prices. The decision maker should evaluate all of the significant factors and combinations of factors which are capable of increasing output.

In 1962, a significant step towards an awareness of the need for changing the traditional methods of transportation planning was

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<sup>1</sup> Two notable exceptions are JITTASATRA, Nit (1967) and KLANGBOONKONG, Viroj (1971).

taken by the BROOKINGS INSTITUTION (1967) in a five-year transport research program. However, most of the Brookings research effort was directed toward finding appropriate techniques for planning and conducting economic evaluations of primary roads. Research on the planning and evaluation of agricultural roads in rural areas of developing countries did not receive much attention. One of the principal conclusions that appeared in a brief summary of the principal findings of the Brookings five-year study is that "transport is an essential ingredient of almost every aspect of development, and should be an integral part of investment programs in agriculture, industry, and other sectors. Viewing transport as a separate problem has resulted in costly mistakes in the choice, timing, location, and design of projects. This has often reduced the potential contribution of transport to economic and social progress."

Little progress took place until 1974; perhaps the latest idea concerned with transportation planning, especially in analyzing development roads, was written by WOLFF (1974): "A multi-disciplined group must be employed. For a typical rural road, it may include land-use specialists, agro-industrial planners, development, agricultural and transport economists, highway engineers, and rural sociologists. A comprehensive development plan is prepared in which improved highway access is one of the factors under review. The analyst must carefully identify the factor costs for each input." He also suggested that: "If a program includes supervised rural credit, application of fertilizers, expanded agricultural extension (advice) and improved crop

selection, the analyst must establish the economic costs of each of these factors. These factor costs must be added to the overall project costs before the benefit/cost analysis of the proposed rural feeder road program can be undertaken." As the preceding pertains to development roads, the combination of economic and social goals is considered to be a major indicator of development. Besides these, some roads are built in response to political objectives.

Meanwhile, the Thai Government agency for ACCELERATED RURAL DEVELOPMENT (ARD) (1973) carried out impact studies for five projects in Prachub Khirikhan Province. Each project included feeder road construction, housing, and water resource development. The study contributed a long list of possible impacts on the people, comparing these conditions before and after the projects were implemented. Impact on time saving, allocation of activities during leisure time, planted area, amount of agricultural production, price, income, extension of new agricultural technology, job distribution, and other factors were studied.

In 1974, ARD and the World Bank developed a technique for ranking feeder road projects based on estimated impacts or benefits from a proposed feeder road. This analysis identified six easily-measured variables as the most significant. These variables are: (1) construction cost; (2) population that would be directly affected; (3) agricultural production quantity; (4) expected increase in planted area; (5) present passengers on mini-buses;



and (6) population within the influenced area. The method of making the estimates is explained in the ARD Manual on Construction of Feeder Roads, (ACCELERATED RURAL DEVELOPMENT, 1974).

More recently, LANSDELL (1975) studied the impact of one case-study feeder road on the area it serves. Using anthropological methods of data collection in Northern Thai villages; he compared the impacts of the road as seen by the villagers and the Government.

#### Purpose and Scope of Study

Prachuab Khirikhan and Petchaburi Provinces, situated in the southwestern part of Central Thailand were chosen as the areas of interest, partly because there are not too far from Bangkok for the convenience of gathering information. In particular, the study is concerned with two feeder roads which were constructed in the past few years, and which penetrate into developing agricultural areas. These two areas were selected as being in areas having similar geographic, climatic, and socio-ethnic patterns to ensure a sound understanding of farming practice in this region. An important factor which led to their selection is that each road has a land development project established along it. The later probably adds a greater usefulness to the present research.

The objectives of this study were as follows.

1. To study the actual output achieved in the study areas and the degree to which the maximum practical potential was **achieved** by the farmers of the area served by the feeder road.

Potential development in this context is taken to mean the near-maximum net farm income or agricultural output of commodities typical of the geographic region.

2. A concept of "achievement of potential" was used to evaluate the potential development of samples of those areas. Inherent in the study was the need to obtain an understanding of the sensitivity of the final "achievement quotient" to the degree of uncertainty of each of the principal variables.

3. To study the relative significance of the role the feeder roads played in the pattern of development. In other words, with respect to other inputs, what was the relative importance of transportation in affecting agricultural production as compared to good soil, adequate water, fertilizer, farm labour, agricultural extension advice, financial credit, markets, prices, etc.

4. To compare the potential development achieved in the project areas, to which much assistance has been contributed by the Government, with the non-project areas which have not benefited from such inputs.

5. To study the problems of transporting agricultural input and output, and the mobility of farmers in the study areas. The actual transport activities in the areas were studied to become aware of the existing transport facilities.

6. An origin-destination survey was used to investigate the existing transport activities of the people and vehicles in the study areas.



### Expected Value of the Research

This research will deal with the achievement of agricultural development in the two case-study areas, the role the feeder roads and the other sectors played in the pattern of development, and the effects of transportation on agricultural activities and people in those areas. The final result should provide guide lines which consulting engineers could apply in Thailand to appraise the probable respond of a given area to the introduction of a feeder road, consideration being given to the degree of presence of other input factors. Also, the research should enable the engineers' assessment to reflect the reliability of the end result with regard for the uncertainty of the data, or of assumptions made in the absence of data.