

1. INTRODUCTION

Rice has an important role in the diet, culture, and economies of Thailand and the Southeast Asian countries. The Agricultural Business Section (1995) reported that Thailand rice production was about 18 million-ton and 72 percent of this quantity was used for local consumption, the rest was exported to the world market. The report also estimated the average rice consumption of Thai people per person per year to be 149 kilograms in 1982. The decrease of rice consumption to 128.8 kilograms per person was reported in a conference proceeding entitled 'Overview of the Rice Market Demand' in 1996 (Department of Agriculture, 1996).

Paddy rice has to be transported for processing in the milling companies. Consequently, the millers take the important roles in rice market. Fifty six percent of the total number of paddy rice production is sold to the local trader while the rest are shared among the millers and the government agencies. Price is the major incentive for farmers to decide on to increase or decrease their cultivated land. Pinthong (1977) reported the close relationship between the price of paddy rice at farm gate and the one of the processor at the rice wholesale market in Bangkok.

It is sensible that the market information in only one location cannot be the representative of the whole marketing system. The process of collecting data at a large scale such as provincial scale and the analysis of these data can produce more useful information on the interactions between rice production and marketing.

The road network, its density and surface quality, can change the pattern of rice transportation and marketing, i.e., some existing mills may become more or less competitive with respect to their distribution of rice or rice trading between

production areas and mills. Due to the numerous amounts of rice transportation needed, the large-scale mills, all locate close to the main street or the highway. The medium-scale mills locate their plants close to the crop area and they are also concerned about being the shortest distance to the main street. As a matter of fact, their locations and the incurred transportation cost effects the price offered to the farmers, some existing large-scale mills could enjoy an economic disadvantage over the smaller ones.

Trade zones or market area of individual rice mills can be determined by the equality of the net price to the farmers. However, the net price is affected by the price offered by rice mills, transportation, and other handling costs. The accuracy of cost estimation depends greatly on the precision location of rice mills, road conditions or any impedance.

Spatial information system through its network analysis capability can be implemented to reassess the cost involved in marketing of rice based on transportation network, market accessibility and spatial interactions between rice production areas and rice processing centers. The purpose of this study is to (1) develop a spatial database for rice mill and rice production area in Chiang Mai, (2) construct a transportation network for determining the cost of rice transportation to existing rice mills, and (3) determine accessibility and spatial interactions among the rice mills and rice production areas to assess the potential trade zone and the level of competitiveness among the rice mills.