CHAPTER I
INTRODUCTION

1.1 Background Justification

In the age when the petroleum prices have been higher while the production volume has been dropping. Petrol is an exhaustible energy. One many countries have valued and developed seriously is to utilize some crops as raw materials for the production of alternative energy, especially ethanol and bio-diesel as a way of reducing the consumption of petroleum. Such alternative energy requires the low production cost, can be produced easily, and does not pollute the environment. At present, not so much ethanol has been consumed in Thailand because the ethanol production is not modern and efficient. For example, the areas for planting crops for the ethanol production, plantation system, planting season, crop harvesting as well as crop transformed process are improper. These processes greatly take effect to the amount of ethanol output. Therefore, the Ministry of Agriculture and Agricultural Cooperatives places a policy of increasing the ethanol production volume and use, that is, the production of raw materials for ethanol must come from the increase of the amount of crops per each area, not from the expansion of plantation areas in order to prevent the farmers to intrude the reserved forests while such farmers are technically educated about how to grow crops. In addition, the Ministry of Energy has promoted the community-based production of bio-diesel by determining that the production target and distribution must be increasing.

Raw materials used for the production of ethanol come from crops in groups of flour and sugar, e.g. sugarcanes, cassavas, corn, rice, sweet sorghums and other plants. The items keeping the flour or sugar of those plants are transformed by several processes to get 6 some 95% pure ethanol. Such pure ethanol will be blended with other kinds of oil as it deems appropriate so that it is suitable for general engines. This helps reduce the consumption of imported fuel, and reduce the pollution caused by some fuel additives such as MTBE. Thus, the ethanol made from plants provides

the farmers more alternatives in producing agricultural products; they can adjust the prices and meet the break-even point in their production.

At Kanchanaburi Province, some alternative energy plants such as in-season and off-season rice, pineapple, cassava, rubber, and corn have been grown. In this research, it covered only the sugarcane as a huge amount of sugarcane has been grown there; several hundred thousand sugarcanes have been invested. Meanwhile, the farmers intrude some forests and other areas for their farming activities; as a result, such plots of land are utilized inappropriately. The Researcher considers that Kanchanaburi Province is appropriate for this research in order to examine all related factors and elements affecting the sugarcane production. In this research, the Remote Sensing Techniques and Potential Surfacel Analysis would be applied to find out the areas appropriate for planting and increasing the amount of sugarcane output, which would lead to fewer overall production cost of ethanol. The research results would give a guideline of proper land exploitation at Kanchanaburi Province for further promoting the planting of alternative energy plants.

1.2 Objectives

1. To classify reflectance value of various age class of sugarcane.
2. To classify sugarcane cultivation area in Kanchanaburi province using satellite imageries.
3. To identify potential area and misutilization for sugarcane cultivation based upon it’s capabilities.
4. To evaluate the suitability of sugarcane cultivation for food and energy.

1.3 Scope of study

The Geographic Information Systems (GIS) research conducted to discriminate the areas appropriate for plantation of plants for alternative energy at Kanchanaburi Province would include the sugarcane. The scope of research would be divided into 2 parts:

1.3.1 Scope of study area

Kanchanaburi Province consists of 19,483.148 square meters in total, which includes 13 districts: Muang Kanchanaburi, Sai Yok, Bo Phloi, Si Sawat, Tha Maka, Tha Muang, Thong Pha Phum, Sangkhla Buri, Phanom Thuan, Lao Khwan, Dan Makham Tia, Nong Prue, and Huai Krachao as shown in Figure 1.1.

1.3.2 Scope of methodology

1. The several of spectral reflectance at each age of sugarcane were classified by measuring the in-field spectral reflectance value from the spectroradiometer.

2. Sugarcane cultivation areas at Kanchanaburi Province were classified using the satellite images.

2.1 Sugarcane cultivation areas at Kanchanaburi Province were classified using the satellite data analysis by means of hybrid interpretation.

2.2 Sugarcane cultivation areas at Kanchanaburi Province were classified using the vegetation index and physical indices.

3. The potential of areas and land misutilization for sugarcane cultivation at Kanchanaburi Province were assessed.

3.1 The potential of sugarcane cultivation at Kanchanaburi Province in term of area was assessed by Potential Surface Analysis (PSA).

3.2 The suitability of sugarcane cultivation at Kanchanaburi Province in term of economic was assessed by Sugarcane Output Analysis.

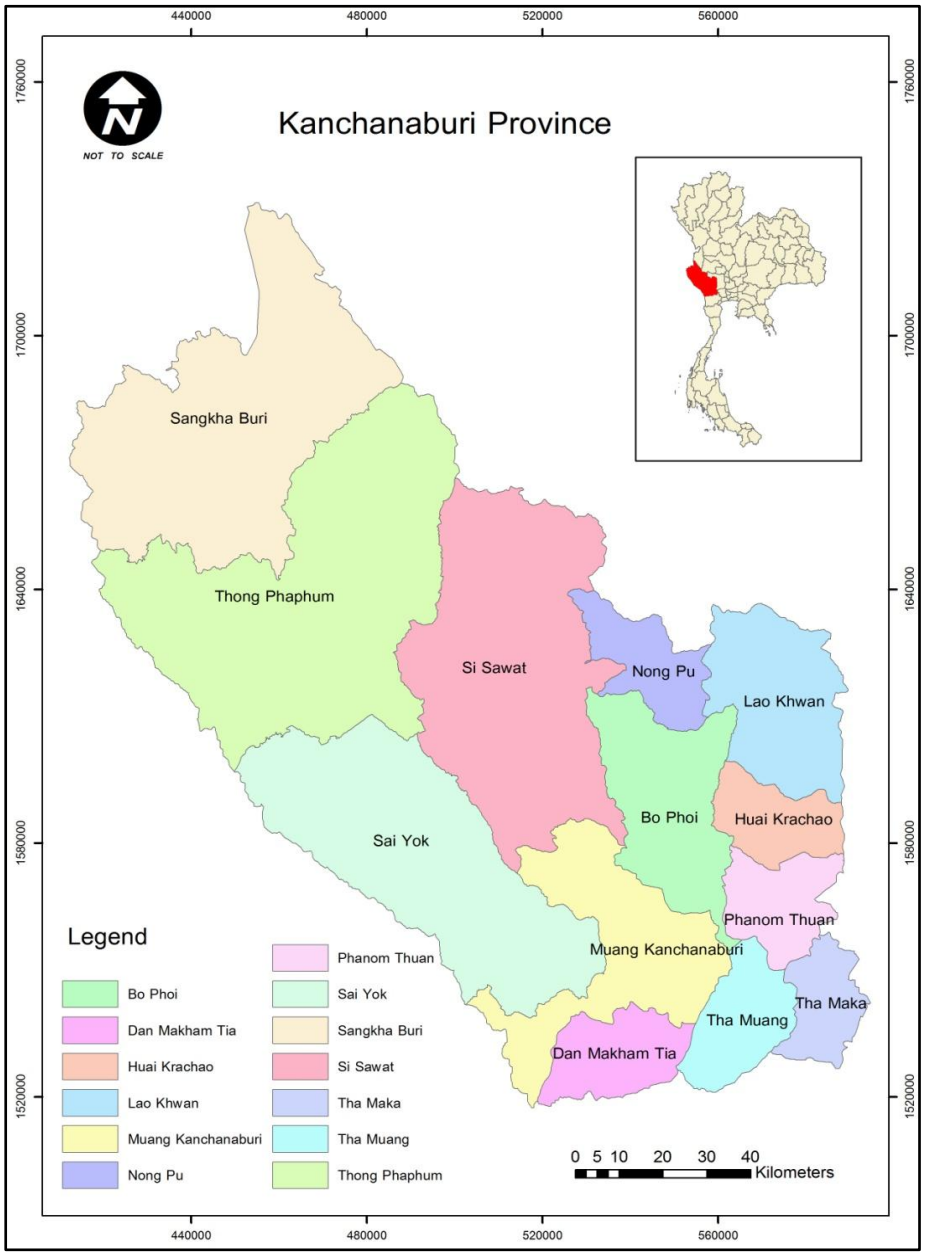

Figure 1.1 Kanchanaburi province

1.4 Conceptual framework

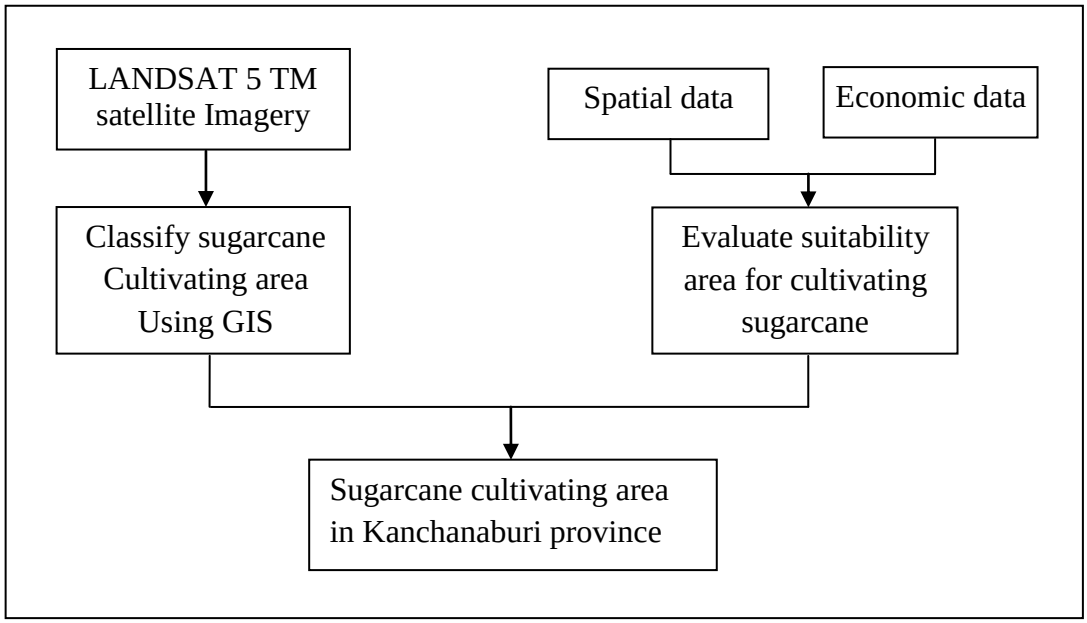

Figure 1.2 Frameworks

1.5 Expected outcomes

1. Types of spectral reflectance of sugarcane in age class.
2. Sugarcane cultivation area in Kanchanaburi province.
3. Potential area in Kanchanaburi province for sugarcane cultivation.
4. The suitability of sugarcane plantation areas at Kanchanaburi Province in term of area potential to be applied in the plan for proper and efficient exploitation of land.
5. Productivity of sugarcane in food and energy.