CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

This research was to apply Geographic Information Systems (GIS) to classify suitable sugarcane cultivation areas in Kanchanaburi Province using the analysis of satellite imageries, hybrid interpretation, classification of various indices, spatial potential evaluation. The research results were concluded below.

5.1 Conclusion

Spectral reflectance values of sugarcane cultivation areas for sugarcane at different ages (1-8 months) were 0.1920, 0.2055, 0.2121, 0.2258, 0.2103, 0.2321, 0.2241 and 0.2363 respectively.

From classifying the sugarcane cultivation areas in Kanchanaburi Province, it was found that the correlation index model was more accurate than the hybrid interpretation method; overall accuracy equaled to 82.71 % (Kappa index = 0.67).

High suitability for sugarcane cultivation areas at Kanchanaburi Province was found at Sai Yok District, Thong Phaphum District and Si Sawat District respectively because of suitable factors, including annual rainfall, soil drainage, soil depth, soil texture, temperature, slope, pH, distance from irrigation, distance from water sources, and land utilization. (See detailed factors in Appendix)

In areas suitable for sugarcane cultivation, they were utilized as sugarcane cultivation areas, agricultural areas and other areas. This showed that the land was misused because the sugarcane cultivation areas were used for growing other plants or other activities.

From sugarcane cultivation areas, they could produce 500,209.28 tons of sugar and 341,606,343.4 liters of ethanol.

The consumption of sugar in Kanchanaburi Province amounted to 32,577.01 tons by comparing the average sugar consumption at 39 kilograms per

person per year (Sugar consumption surveyed by the Deparment of Heath, 2011). From the analysis of satellite imageries, Kanchanaburi could produce 500,209.28 tons of sugar; so the excessive amount after consumption there was 481,007.34 tons. This excess was sold outside the province or utilized in the production of 319,358,623.415 liters of ethanol, which was consistent to the strategy of energy plants, especially sugarcane and cassava (Ministry of Agriculture and Agricultural Cooperatives), that is, the sugar production would be served for the consumption first, and the excess would be used to produce ethanol.

Sugarcane productivity from sugarcane cultivation areas according to the potential area was higher than the productivity from the actual sugarcane plantation areas in Kanchanaburi Province, either sugar or ethanol.

5.2 Recommendation

1) The sugarcane cultivation areas in Kanchanaburi Province by applying the remote sensing technique, hybrid interpretation, indices could be classified more clearly and accurately because those sugarcane cultivation areas could be classified by the spectral reflectance from field data, by a mathematic method by mean of Accuracy Assessment. The field data collection should carefully be planned. The data collection should be done in the clear weather; it is sunny and no cloud for the consistency of the spectral reflectance data according to satellite imageries, and for the completeness of data analysis results.

2) The classification of sugarcane cultivation areas by way of spectral reflectance can be applied to classify the sugarcane cultivation in other areas for the sugarcane cultivation planning.

3) In this research, only 3 indices were selected; namely, Normalized Difference Vegetation Index (NDVI), Bare Soil Index, and Water Index. So, the analysis of indices to classify the sugarcane plantation areas may include other indices in order to classify the sugarcane plantation areas appropriately such as Transformed Normalize Difference Vegetation Index (TNDVI), which is an index for the classification of green biomass and chlorophyll in plants especially grass.

4) This research applied the evaluation of suitable areas using Geo-Informatics System and Potential Surface Analysis. The factors in this study are a part of all factors influencing the suitability of sugarcane cultivation areas for this research only. There may be other environmental factors, e.g. soil fertility, etc. Therefore, the assessment of suitable sugarcane cultivation areas should include some important factors, which will be integrated and applied in others area.

5) This study can be the guidance of setting up some measures for the management and planning of suitable sugarcane plantation areas to further promote the sugarcane cultivation, and to solve the land utilization problems.