

# CHAPTER I

## INTRODUCTION

### 1.1 Background and Justification

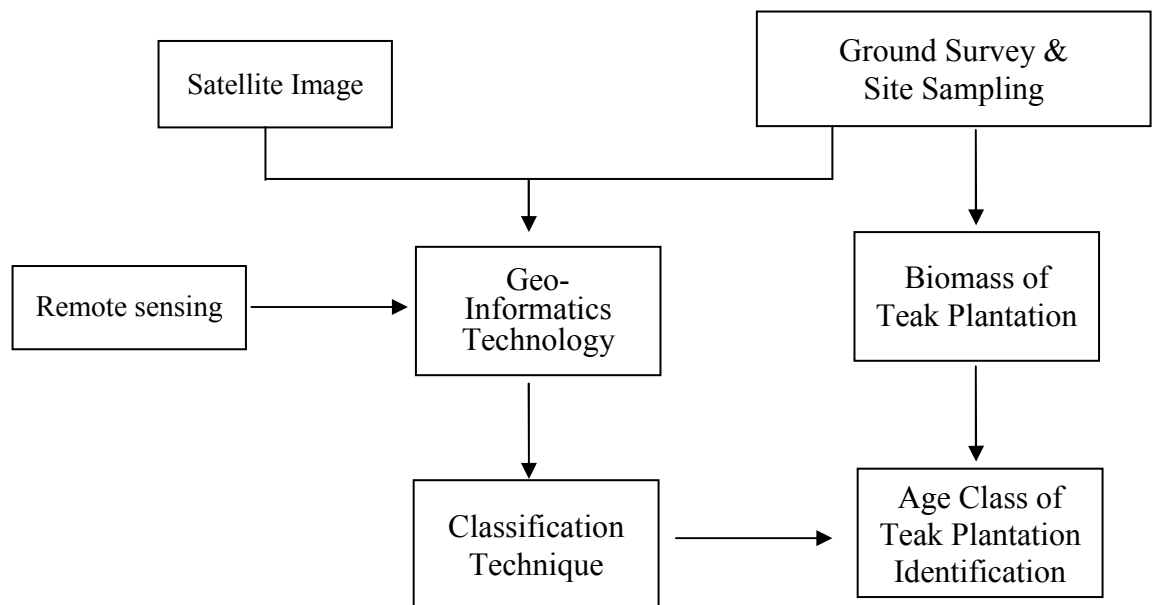
The major causes of climate change are greenhouse gases (GHGs) which make the serious environment problem for ecosystems, natural resources, economics, society and politics at both national and international level. The GHGs in the atmosphere will be trap energy from the sun then enhance the global temperature. There are many numbers of GHGs such as Water vapor (H<sub>2</sub>O), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), but carbon dioxide (CO<sub>2</sub>) is clearly the majority because the concentration of it rises continuously. The earth's atmosphere contains 280 ppm in 1765, 354 ppm in 1990 and become 380 ppm in 2005 and was still climbing. In addition, Carbon dioxide has an atmospheric lifetime of between 50 - 200 years [1].

Carbon sequestration is a good alternative for tackling global warming. Huge amounts of carbon are stored in natural forests, but as they grow at a slower rate than plantations, they do not actively sequester as much carbon per unit area. The idea is mainly to use plantation to lock up carbon in living trees and then after timber is harvested, the carbon will be transferred into durable constructions and furniture [2]. Plantation in Thailand has many species planted such as *Eucalyptus spp.*, *Acacia spp.*, but Teak is the most area. There are 836,000 hectares in 2000 [3].

Measuring amount of carbon found in forest is so intensive labour. The alternative approaches have been used to estimate the carbon within individual trees and then transfer to a stand of trees. And new techniques are evolving using remote sensing and satellite imagery to determination. The technique can be applied in landscape scale with less cost and time than another approach [4]. Therefore, still many opportunities for plantations are used as part of the multifunctional landscapes such as changing in environmental agreements (e.g. The Kyoto Protocol) [2]. This study is determination of aboveground carbon storage of Teak by using remote sensing

technology aims to establish appropriate procedure for Teak plantation area identification.

## 1.2 Conceptual Framework



**Figure 1-1 Conceptual Framework Diagram**

## 1.3 Objectives of the Study

1) To establish appropriate procedure for Teak plantation area identification in Khun Mae Kham Mee Plantation, Prae Province.

2) To estimate aboveground carbon storage capacity in 2 age stages (Primary stage: 3-7 years old and Rotation stage: 25-38 years old) of Teak plantation.

## **1.4 Scope of study**

### **1.4.1 Study Area**

The study site was located in Khun Mae Kham Mee Plantation, Rong Kwang District, Prae Province.

### **1.4.2 Methodology**

Identify 2 age stages of Teak plantation by using two methods consist of logical operation and regression model. And, age stage model according to plantation management characteristics is also generated. The digital LANDSAT imageries were employed to become a baseline data for operation model establishment. Then, estimate aboveground carbon storage with allometric equation.

## **1.5 Expected Result**

- 1) Age classes area of Teak plantation in Khun Mae Kham Mee Plantation.
- 2) Biomass and carbon storage of Teak plantation.
- 3) Age class model which adapt in similar condition areas.