# CHAPTER 1

## INTRODUCTION

Nowadays, the environmental problems such as water pollution, air pollution, noise pollution and soil pollution should be considered in Thailand. Another concern is the decline of natural resources such as petroleum, ore, forests, flora and fauna cause by population growth. The increase in population must use much more natural resources. At the present, the economic growth and technological progress are making the cultivation of resources easier than in the past. But this results in over consumption and a lavishness which are characteristics of our present society (Ruangpanit, 2003).

Water is the most important and essential element of all organism life and is the origin of many flora and fauna. Human uses of water for life maintenance include: consumption, agriculture, industry, transportation, a source of energy and recreation. Water is an inexhaustible natural resource. Wastewater does vanish but can be recovered for use by the natural water cycle. Water covers 71 percent of the surface of the earth. Most of the water volume is found in the ocean. Whereas, only 3 percent of all water on earth is freshwater (Wetzel, 1975). Seventy-eight percent of freshwater are icebergs at the North Pole and South Pole that can not be used. Thus, usable water is volume and wastewater must be included. The conservation of our water is important and needs to be a concern.

Urbanization and agricultural development have been processing on highlands in the north of Thailand for decades. This impacts the forests and the sources of the streams and causes a lack of fresh water for consumption throughout the year. Moreover, a high volume of wastewater is produced from communities, agriculture and livestock. Chiang Rai Province is located the mountains and is near the origin of many rivers such as Kok, Ing, Mae Lao, Mae Sai, Mae Chan and Mae Kham. Thus, it is a suitable place for plantations such as rice, corn, tobacco, tea, coffee, and vegetable growing and recently orange plantations have been initiated in large

numbers. This research studied the Mae Kham Watershed in Mae Chan and Mae Fah Laung Districts, Chiang Rai Province. Wastewater was discharged to the streams of this area from the many plantations. The concern about water pollution of the local people in Mae Kham Watershed is brought up in cooperation with water conservation in order to take care of the water resources of their villages. Conservation is started by studying the characteristics and water quality to help in planning and the organization water use and conservation for the future.

The study was to assess and compare water quality in each study site where different water was used. In this research aquatic insects were used as bioindicators and this method was compared to some physico-chemical properties. A diversity of aquatic insects in the watershed was also studied. The results were used for water the resource management of the local people.

**Objectives:**

1. To assess water quality of Mae Kham River by using aquatic insects as the bioindicator.
2. To monitor water quality of Mae Kham River and its tributaries, in Chiang Rai Province by using physical, chemical and biological parameters compared with the surface water quality standard of Thailand.