CHAPTER 1

INTRODUCTION

Nowadays, constructions of water resources are a problem in many countries in the world. Especially in developing countries, developed of economic system and growing of industrial released a lot of pollutants to their environments. In the past, there were less of people in the country and rich of natural resources so the environment problems are not serious, but now rapidly increasing of human population cause to demand of consumable with natural resources are not balanced. The increasing of water demand for human activities cause effected to water health especially freshwater. Freshwater are important to basic human subsist and their activity. Lake, pond, river and stream can supplement human activity for example in agricultural and used in their city.

In Southeast Asia, Mekong River is important resources in this region. Its has been divided into two subbasins (Upper Mekong Basin and Lower Mekong Basin). The Lower Mekong Basin was defined by Economic Commission for Asia and the Far East (ECAFE) as part of the Mekong River basin downstream of Chiang Saen, Thailand. Its basin covers a catchment area of approximately 606,000 km^2 or 76% of Mekong River Basin (Quang and Nguyen, 2003). Approximately 5% of the annual

flow of the Mekong is regulated by dams. China has two existing mains dams and intends to complete six more and Lao PDR has started construction on several of 23 projects planned for completion before 2010 (Kite, 2001). The construction of dams and the human activities in the Mekong River Basin might be affected to water quality. The decreased of water quality would be effected to the organism which live in the river and its can feedback the impact to human livelihood nearly this river. The use of biological indices to assess water quality base on macroinvertebrates began in Germany in early part of the 20th century (Merrtitt *et al*., 2008). Today, the use of the benthic macroinvertebrates fauna as an indicator for a qualitative classification of freshwater systems has increased in many regions of the world. One of the major advantages of biomonitoring with benthic macroinvertebrates is the possibility to detect changes in water quality that occur at the time of sampling as well as changes that have occurred within a longer period before sampling. In comparison, chemical and physical analysis might be more accurate, but these only reflect the actual conditions in the water body at the time of sampling. Furthermore, macroinvertebrates show sensitivity towards various factors that are responsible for changing in water quality, and they are less expensive to work with than chemical and physical analysis (Pontasch and Cairns, 1991; Stein *et al*., 2008). Aquatic macroinvertebrates can be used for the evaluation of water quality in two ways. First, the taxonomic diversity of a benthic invertebrate community reflects the water quality conditions, since generally a high diversity indicates a high water quality. Second, specific taxonomic groups can be used as bioindicators, which are characteristic for certain habitat and water quality conditions (Hynes, 1984). However, the use of biological monitoring in developing countries has been limited to date and lack of information (Mustow, 2002). So the

used of macroinvertebrates for monitoring water quality of Mekong River was important and might be continued in the future for save this river health and quality life of the local people.

Objectives:

1. To study the relationship between water quality and diversity of macroinvertebrates in the Mekong River and its tributaries in part of pass through Thailand and Lao PDR.
2. To assess water quality of Mekong River and its tributaries in part of pass through Thailand and Lao PDR by using biological indices.