CHAPTER I.   INTRODUCTION

The assessment of water quality is necessary for the study of problems related to artificial and natural changes in the quality of inland water bodies. With the advent of industrialisation and   increased populations, the range of purposes for which water is required have increased, together with greater demands for higher quality water. Over time, water requirements have emerged for drinking and personal hygine, fisheries, agriculture, industrial production, etc. Each water use, including abstracttion of water and discharge of wastes, leads to specific, and generally rather predictable, impacts on the quality of the aquatic environment. In addition to these intentional water uses, there are several human activities which have indirect and undesirable, if not devastating, effects on the aquatic environment.

Examples are uncontrolled land use for urbanisation or deforestation, accidental (or

unauthorised) release of chemical substances, discharge of untreated waste or

leaching of noxious liquids from solid waste desposits. Similarly, the uncontrolled

and excessive use of fertilizers and pesticide has long-term effects on ground and

surface water resources.

The concept of biological indicators for environmental condition originated

from the now-famous work of Kolkwitz and Marsson (1908,1909). They developed

the idea of saprobity (the degree of pollution) in rivers as a measurement of the

degree of contamination by organic matter and the decreasing of dissolve oxygen by

this contamination.

Monitoring of benthic macroinvertebrates is an important biological method

for organic water pollution measurement especially in inland water bodies (e.g.

Chessman 1995, Wright 1995). It has been used as routine method in National

Biomonitoring Programmes of many countries such as Germany, Denmark and

Britain.(Chapman,1992)

Macroinvertebrates are attractive targets for biological monitoring efforts because they are a diverse group of long-lived, sedentary species which react strongly and often, predictably to human influences on the aquatic ecosystem (Resh,1993).Similar approaches using plants(Reid et al. 1995; Whitton & Kelly 1995) and fish (Bishop & Podgeon 1995; Harris 1995) have been used successfully and should not be dismissed.

Habitats of the macroinvertebrates are the principle determinant of biological potential, set the context for interpreting biosurvey results and can be used as a general predictor of biological condition. Macroinvertebrates are affected by the habitat in which they grow, and their communities can be classified by characteristics of the habitats(Haslam,1990)

Chiang Mai which is the biggest city in Northern Thailand was selected as the study area. The running waters in the study area comprise the Ping river, streams, and canals running into it. The running waters often have relatively

unstable bottoms , and sides, and have close nutrient relationships with contiguous

terrestrial environments. Land use patterns and human activities in the watershed

area affect the water quality. This is reflected in the sorts of animals and plants

which inhabit the running waters. Our knowledge of the ecology of running waters

in terms of habitat characteristics and macroinvertebrate communities is very limited.

Therefore, quantitative surveys of macroinvertebrates and habitat characters were

done to investigate the present status of water quality in different types of water

bodies in or near Chiang Mai City. This habitat evaluation will provide useful

baseline information for the evaluation of water quality in terms of the presence of

macroinvertebrate communities in different habitats as related to the physical and

chemical conditions of different running waters.