CHAPTER I. INTRODUCTION

Cultivation in the highland of Northern Thailand at an elevation of 1000 m or higher has been extensively practiced in recent years by Hmong hilltribe. This is the result of both Thai government and international organizations' drive to curb down the illegal cultivation of opium poppy, the source of heroin drug by the Hmong hilltribe, through the introduction of substitute crops.

According to HCRDC 1992 report, the establishment of highland development projects in northern Thailand was a culmination of the pilot projects implemented by the United Nation Crop Replacement and Community Development Project to explore the viability of replacing opium poppy cultivation by a variety of substitute crops and other alternative sources of income. These pilot projects were run from 1972 until 1979 introducing vegetables such as cabbage, carrots and garlic and other perennial crops like coffee and longan as substitute crops. These projects are aimed only at curbing down if not totally eliminate the opium cultivation without considering the negative impacts that may be effected into the neighboring watersheds and waterbodies. With the introduction of substitute crops which require high inputs of fertilizers and pesticides, coupled with the intensive and improper cultivation and further expansion of agricultural areas in the highland, problems arise in the neighboring waterbodies ranging from sedimentation , organic pollution to the contamination of rivers and streams by agricultural pesticides. In many circumstances, these agricultural activities have been proven to be affecting and altering the animal communities in waterbodies of the world (Hynes, 1960). This is further made complicated by the fact that these projects are situated at elevation above 1000 m and in steep slopes which are rather vulnerable to soil erosion resulting to the siltation of rivers

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and streams. So far, there has been no study conducted to evaluate the impact of these agricultural activities in the highland to stream fauna.

The use of aquatic macroinvertebrate communities in assessing water quality has been proven to be successful and is infact the most common and popular particularly in temperate industrially developed countries. These animals effectively integrate short and long-term changes in the habitat and water quality and react to critical factors of short duration which would be undetected by a regularly timed sampling program. This is because of their long life, constant presence, sedentary habit, comparatively larger size and their endurance to external stress, they can integrate changes which reflect the characteristics of both the sediment and the water column (Reddy and Rao, 1991). They can also be used to complement the physico-chemical monitoring of water quality (Olive et al., 1988). They have been recognized as good indicators of aquatic pollution, particularly organic pollution and eutrophication of waterbodies, as by their continuous presence, they reflect the long-term water quality (Reddy and Rao, 1991). Clesceri et al. (1989) noted that severe organic pollution usually results in a restriction in the variety of macroinvertebrates to only the most tolerant ones and a corresponding increase in density of those tolerating the polluted conditions, usually low dissolved oxygen concentration. On one hand, siltation and toxic chemical pollution may not only reduce but eliminate the entire macroinvertebrate community from an affected area.

This study was conducted mainly to evaluate the effects of highland cultivation on stream macroinvertebrate communities. And to provide baseline data of these streams which may change totally in the future due to further expansion and development and to which any further studies may refer.

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