CHAPTER I

INTRODUCTION

1.1 Background

Land degradation is a serious problem in most of the upland agricultural areas of Southeast Asia including Myanmar (Burma). Soil erosion is the most widely recognized and most common form of land degradation and, therefore, a major cause of falling productivity (Stocking and Murnaghan, 2001). It is a natural process and generally aggravated by human intervention, and exceeds the rate of soil regeneration.

In Dry Zone Area of Central Region of Myanmar, soil erosion is high, particularly in the form of water erosion during the rainy season. Rills, gullies and rivers full of sediments show that a considerable amount of soil is carried away, mainly during the destructive intense storms which characterize Myanmar Dry Zone rainfall patterns. In the Myanmar Dry Zone, although annual rainfall ranges between 20 inches (500 mm) and 40 inches (1,000 mm), heavy individual storms and destructive showers occurring within a very short period causing flood and severe erosion. In addition, due to deforestation, soil degradation is now taking place particularly in the central dry zone of the country (NCEA, 1997).

Soil erosion is a physical process, but its underlying causes are firmly rooted in the socio-economic, political and cultural environment in which land users operate (Stocking and Murnaghan, 2001). Therefore, the degree of soil erosion in a particular

climatic zone with particular soils, land-use and socio-economic conditions, will always results from a combination of the above factors (De Graff, 1993).

Pallaris (2000) stated that despite the knowledge acquired and the many technological advances, the threat of land degradation remains as pertinent as ever and one of the main reasons for this is that high risk areas are not being effectively and efficiently identified by the existing erosion risk models. Existing secondary data related to the environmental, socio-economic and land use conditions of an area can be used reliably to identify relative soil erosion risks of a particular area and their spatial distribution.

The overall objective of this study is to explore the influence of major socio-economic factors on erosion processes and conservation measures in a Dry Zone farming context for producing Erosion Risk Map of the study area.

1.2 Rationale of the Study

Land degradation in the Myanmar Dry Zone is becoming a matter of serious concern for its negative implications on the livelihood of the rural population and the environment from which they largely depend. An ever increasing population in combination with unfriendly climatic conditions triggers the rapid misuse of land and over-exploitation of natural resources. As a consequence, soil erosion by water and wind and progressive removal of the vegetative cover are becoming common features observable in most parts of the Dry Zone (Carucci, 2001). Such conditions, together with occasional outbreaks of wild fire also enhance the desertification process of the central dry zone and now becoming a state of seriousness (Carucci, 2001). In

connection with these, soil erosion and land degradation in dry zone area are noted as one of the soil problems in Myanmar.

There is no research on soil losses and erosion in the whole Dry Zone of Myanmar. Agriculture research stations do not include runoff and soil erosion measurement plots. No erosion and land classification studies and maps defining the capability of the land in terms of sustained production of major kinds of land uses are available. It is then almost impossible to estimate with accuracy peak runoff discharges, data on soil losses and erosion trends if not by using empirical models and approximate estimations (Carucci, 2001). And therefore, assessing soil erosion risk is necessary for the proper conservation and improvement of these problem soils as an immediate action (NCEA, 1997).

1.3 Objectives

1. To identify major socio-economic and physical drivers that influence on soil erosion risk from farmer's perception.

2. To estimate a spatially-explicit of soil erosion risk in the study area.

3. To compare the farmers' perception on soil erosion risk with the estimated soil erosion.

1.4 Scope and limitations of the study

Mapping the erosion risk allows for quick localization of the major erosion-prone areas (hot spots). This can be used to help set priorities according to erosion risk, and design measures for erosion control and conservation-management practices. Conventional models of soil-erosion risk assessment require a large amount of

detailed data, which most developing countries do not have. In this study, a technique has been developed to map potential erosion-prone areas of Magway district in the Dry Zone Area of Central Region of Myanmar for the purpose of prioritizing areas for soil conservation and management projects. The method has been developed for the use of existing data of the country. It integrates existing socio-economic and land use data as indicators of soil erosion risk.

The ICONA erosion risk model is useful for forming erosion risk assessment framework of large areas. However, the model does not consider climatic data. Integrating climatic data such as rainfall intensity and distribution parameters and farmers' perception may improve estimations and accuracy of the model for the study area.