CHAPTER 1

INTRODUCTION

Soil degradation and water pollution are serious environmental concerns due to intensified land use and unsustainable agricultural land management practices in South Africa. Over the world, millions of hectares of arable land are already lost due to soil erosion and it poses a great threat to sustainable agricultural production (ICRISAT, 1986; FAO, 1992). Severe conditions of soil erosion are often found in the semi-arid and arid climates, and large areas of South Africa can be classified as semi-arid and arid. It is estimated that soil erosion by water in South Africa has already affected about 6.1 million hectares of cultivatable and 10.9 million hectares of the grazing land. Of the 6.1 million cultivatable land 15% is severely, 37% is moderately and the rest is slightly affected (Barnard *et al.,* 2000; LandCare and Desertification, 1998). All over the world resource-poor farmers are frequently faced with severe erosion problems and the need exist to be able to predict and evaluate the susceptibility of these areas to erosion (El-Swaify *et al.,* 1982).

To address this soil degradation, a national LandCare program was launched and implemented in South Africa. LandCare is aimed at improving sustainable utilisation and management of the natural resource base, particularly the agricultural resources. LandCare in South Africa focuses on capacitating communities involved in farming through a series of partnerships to implement sustainable land management practices (Nduli, 2000). The success of implementing sustainable land management practices by farming communities requires that they participate in LandCare projects. Furthermore, they should be able to identify the causes of soil erosion in both regional and local biophysical systems in their socio-economic perspective. Monitoring and evaluation are processes used to evaluate the success of the LandCare project and referred to as participatory monitoring and evaluation. Participatory Monitoring and Evaluation (P&ME) simply means having the communities involved by the LandCare project by participating in its monitoring and evaluation.

Participatory monitoring and evaluation process requires tools that can be used as evaluation tools in the monitoring and evaluation process. Erosion models are examples of

evaluation tools that can be used in P&ME to make comparative measures (impact assessment) of physical characteristics. For example, they can be used to monitor and evaluate changes in soil loss under various land uses and management systems (Woodhill and Robins, 1998). The models should be able to simulate management practices in LandCare to evaluate and monitor their impacts on land degradation by erosion through changing conditions of land use and management practices. However, not all erosion models and field assessment methods can be used for this purpose due to their availability, limitations and principles. In the literature several soil erosion models and field assessment method are described to study soil erosion. It is believed that methods that can be used to prevent soil erosion are more appropriate than to reclaim the land, particularly in developing countries (Norman and Douglas, 1994).

The aim of the study was to identify and select suitable erosion models and field assessment methods that can be applied as erosion evaluation tools in the monitoring and evaluation of erosion in a particular area and to evaluate the management practices of the selected erosion tools.

Specific objectives are:

1. To theoretically evaluate the suitability of erosion prediction models and field assessment methods as soil erosion tools for use in Participatory Monitoring and Evaluation;
2. To select suitable prediction model(s) and field assessment method(s) for evaluating and monitoring erosion under communal land management practices;
3. To apply the selected prediction model(s) and field assessment method(s) in a prediction scenario using data emanating from LandCare project to test their suitability as erosion tools in participatory monitoring and evaluation.