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The Use GIS and Remote Sensing in the Assessment of Magat Watershed in the Philippines

A thesis presented in partial fulfilment of the requirements for the degree of Master of Environmental Management

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Abstract

The Philippine watersheds are continually being degraded— thus threatening the supply of water in the country. The government has recognised the need for effective monitoring and management to avert the declining condition of these watersheds. This study explores the applications of remote sensing and Geographical Information Systems (GIS), in the collection of information and analysis of data, in order to support the development of effective critical watershed management strategies.

Remote sensing was used to identify and classify the land cover in the study area. Both supervised and unsupervised methods were employed to establish the most appropriate technique in watershed land cover classification. GIS technology was utilised for the analysis of the land cover data and soil erosion modelling. The watershed boundary was delineated from a digital elevation model, using the hydrological tools in GIS.

The watershed classification revealed a high percentage of grassland and increasing agricultural land use, in the study area. The soil erosion modelling showed an extremely high erosion risk in the bare lands and a high erosion risk in the agriculture areas. This supports the need for effective conservation strategies and a land use plan in the study area. The use of remote sensing and GIS could assist watershed environmental planners and managers to achieve this objective.

Dedication

I dedicate this thesis to my mother Nanang Luring

My wife Jennifer

And my two daughters

Katreena and Karla

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Above all I give thanks, glory and honour to the Divine Providence, for all the blessings we have received, especially during the course of my study.

List of Abbreviations

Abbreviations

asl	above sea level
BAR	Bureau of Agricultural Statistics
DEM	Digital Elevation Model
DENR	Department of Environment and Natural Resources
ETM	Enhance Thematic Mapper
GCS	Geographical Reference System
GIS	Geographical Information Systems
IWMP	Integrated Watershed Management Plans
LGUs	Local Government Units
MLC	Maximum Likelihood Classification
RUSLE	Revised Universal Soil Loss Equation
RS	Remote Sensing
STRM	Shuttle Radar Topography Mission
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
UTM	Universal Transverse Mercator
WEPP	Watershed Erosion Predication Project
WGS	World Geographical System

Table of Contents

Figures

Tables