Chapter 10

Sustainable Land Use and Watershed Management in Response to Climate Change Impacts: Case Study in Srepok Watershed, Central Highland of Vietnam

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ABSTRACT

The Srepok river basin (28,600 km²) is located in the Central Highlands of Vietnam. There are many critical issues for soil and water resource management in the basin. Therefore, to make suitable adaptation plans, decision makers need to understand the extent of the potential impact of both climate change and human activity on local soil and water resources. The objective of this chapter was to investigate changes

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in stream flow, sediment load, and hydrological processes resulting from land use change and climatic variation. Plausible scenarios of land use change developed in a GIS environment based on current conditions, information from the area, and climate change scenarios were built on outputs of GCMs from the SEA-START. These changes were then inputted into SWAT model to project future hydrological variables. Results demonstrated that stream flow was predominant, followed by evapotranspiration. Groundwater was more predominant than surface water. This has been one of the best outstanding advantages in the Srepok watershed.

**INTRODUCTION**

Soil and water resources in many countries are currently under severe pressure due to human intervention and changing runoff patterns caused by climate and land use changes. Population growth and human-induced development have accelerated the speed of land use/cover changes that in turn affect hydrological processes. In addition, climate change may affect many aspects of the natural ecosystems. Hence, understanding climate change impacts on hydrological conditions is essential to enable more efficient soil and water resource development.

The Srepok river basin, a sub-basin in the Lower Mekong river basin was selected as the study area (Figure 1). At present, there are many critical issues for soil and water resource management in this basin (The Government of Vietnam, 2006). These problems range from:

*Figure 1. Srepok watershed in Central Highland of Vietnam*