



Multi-criteria Assessment of Landscape Vulnerability and Land Use Potentials in Central Vietnam

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INTRODUCTION

Quang Nam province (Fig.1) is a poor region in central Vietnam which is highly impacted by ongoing land conversion, population growth, migration, hydropower plant construction, gold mining and other activities leading to the province's economical growth. These activities then affect the environment by increasing soil erosion, causing contamination of rivers/soils and leading to fragmentation of the landscape. In order to improve the situation and in order to apply appropriate measures it is necessary to know the vulnerability of the landscape and the land use potentials.

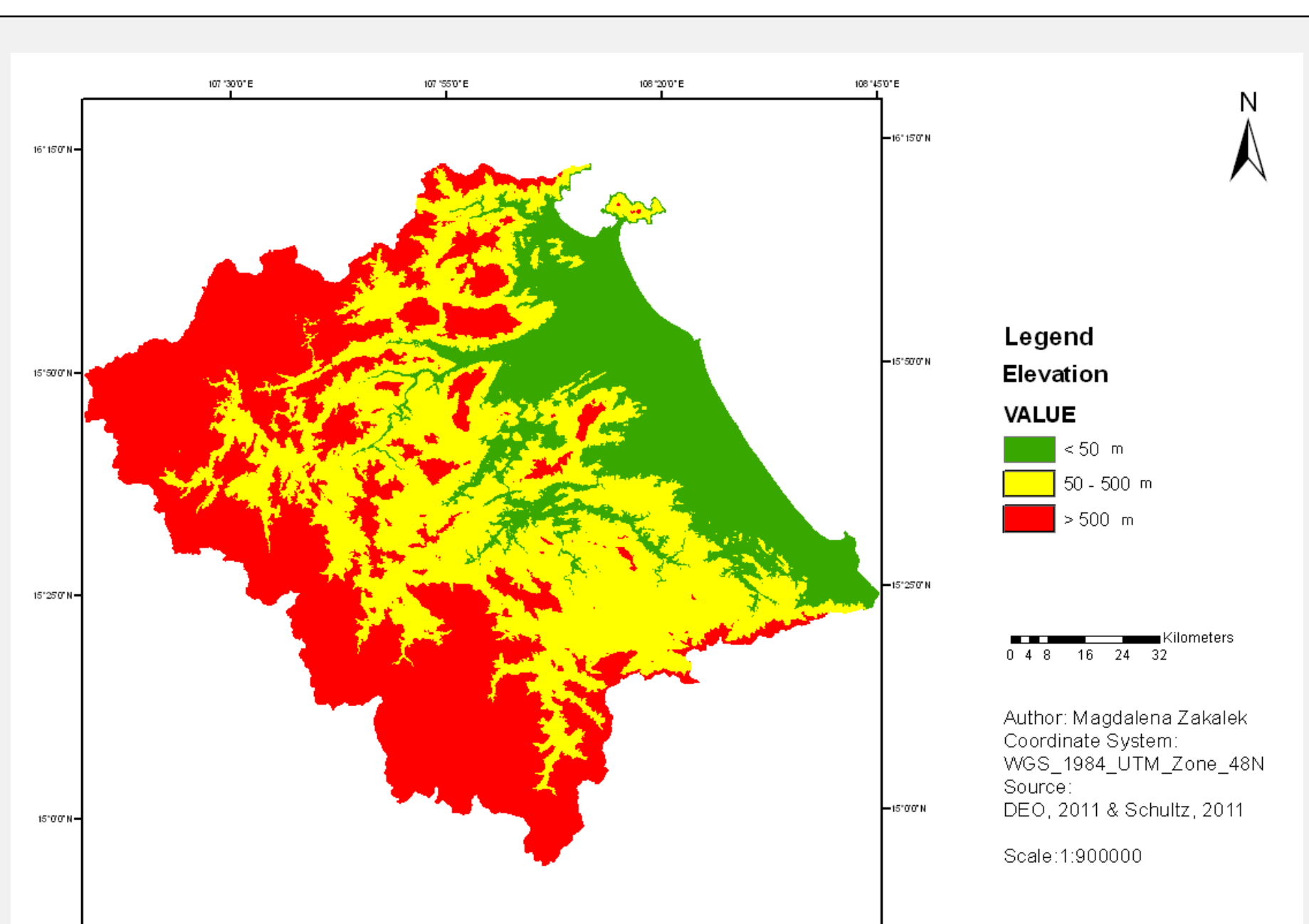


Figure 1: Elevation Map of the Quang Nam Province (Zakalek, 2011)

AIM

Determining the landscape's vulnerability and assess the potential of the study area. The assessment of the vulnerability will be based on the forest, road, river and soil erosion status in the study area.

METHODS

An overview on the combination of the methods used is shown in Fig. 2. First, all data concerning soil erosion are overlaid in order to determine the soil erosion amount. Then, the forest status is determined using the distinction between forest dense and forest disturbed. In the next step, the farmers are interviewed in order to get to know about the farmer's perception of the agricultural methods applied and of the associated environmental problems. These land management data are used to assess the vulnerability of landscapes. In the last step, rivers' and roads are incorporated to further consider the anthropogenic impact of landscape vulnerability.

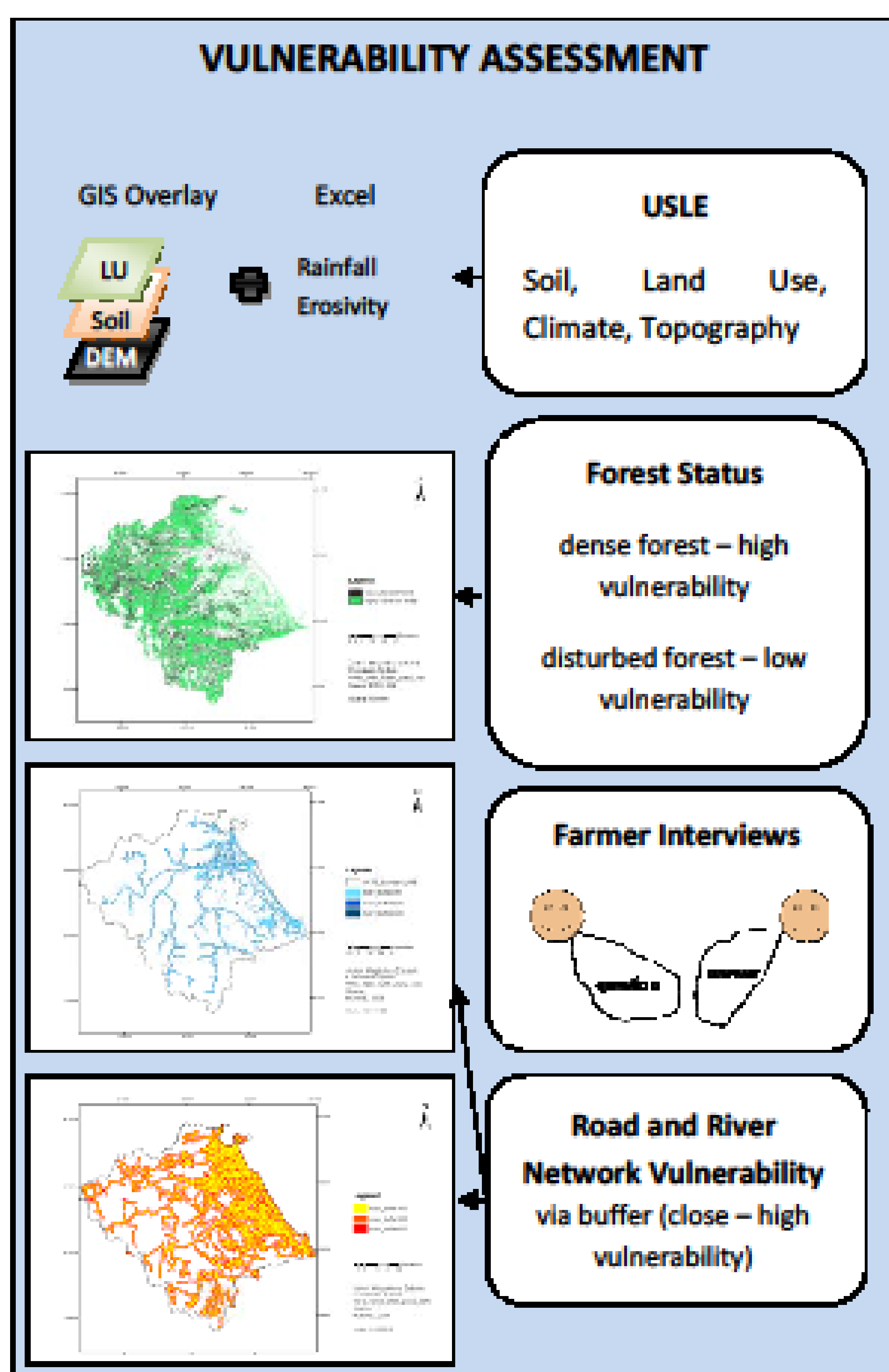


Figure 2: Combination of the Methods Applied in the Research

CONCLUSION

The results showed that the lowlands are highly vulnerable to anthropogenic activities and natural hazards. This means that there is a high need to protect this area by restricting the land use to those areas which are distant from the river network to decrease the amount of pollutants reaching the river water.

In the midlands, agricultural practices should be enhanced but in a sustainable way, as this area is naturally more prone to erosion. To achieve this, the farmers have to be involved in the land management by changing the crop sequence and applying soil erosion reducing measures. The same applies to the highlands which have even steeper slopes and are, thus, even more prone to erosion. Such areas should be land use restricted.

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LAND USE POTENTIAL ASSESSMENT

RESULTS

The results obtained in the research (Fig. 3) can be summarized as follows: The erosion potential increases in the direction of the Lao border and also in the rainy season. Settlements, roads and rivers tend to concentrate in the lowlands making this area particularly vulnerable to anthropogenic activities.

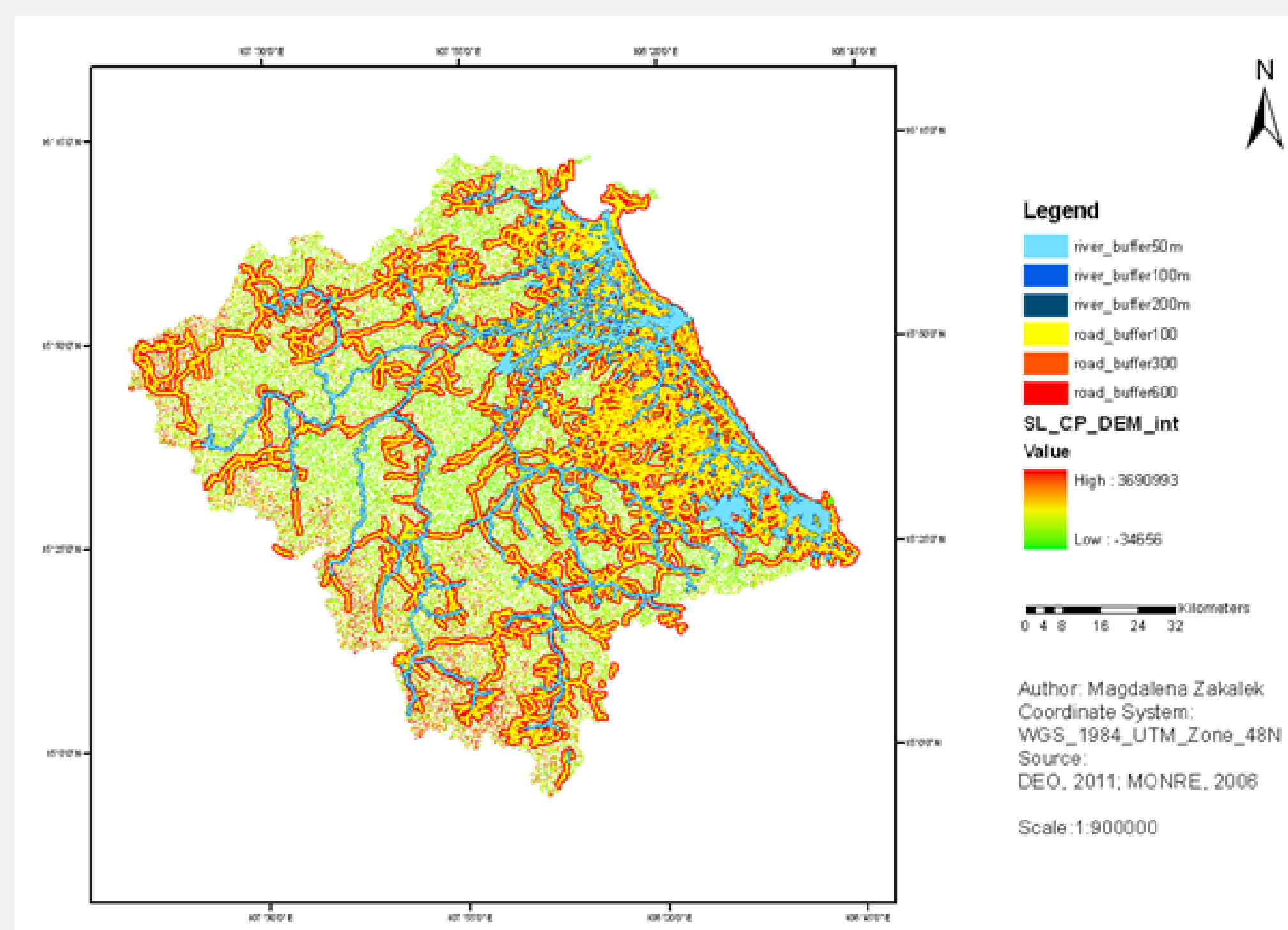


Figure 3: Overview of the Vulnerability Results Obtained in the Research

Additionally, in the western direction the forests tend to be more vulnerable than those closer to the coast. The farmer interviews have shown that the farmers tend to plant crops which either bring more profit or which they have traditionally planted. The land is thus often not used in the best/sustainable way in order to not degrade the resource soil and to maintain the land productivity for future generations. This can also be seen in the lack of soil erosion reducing measures.