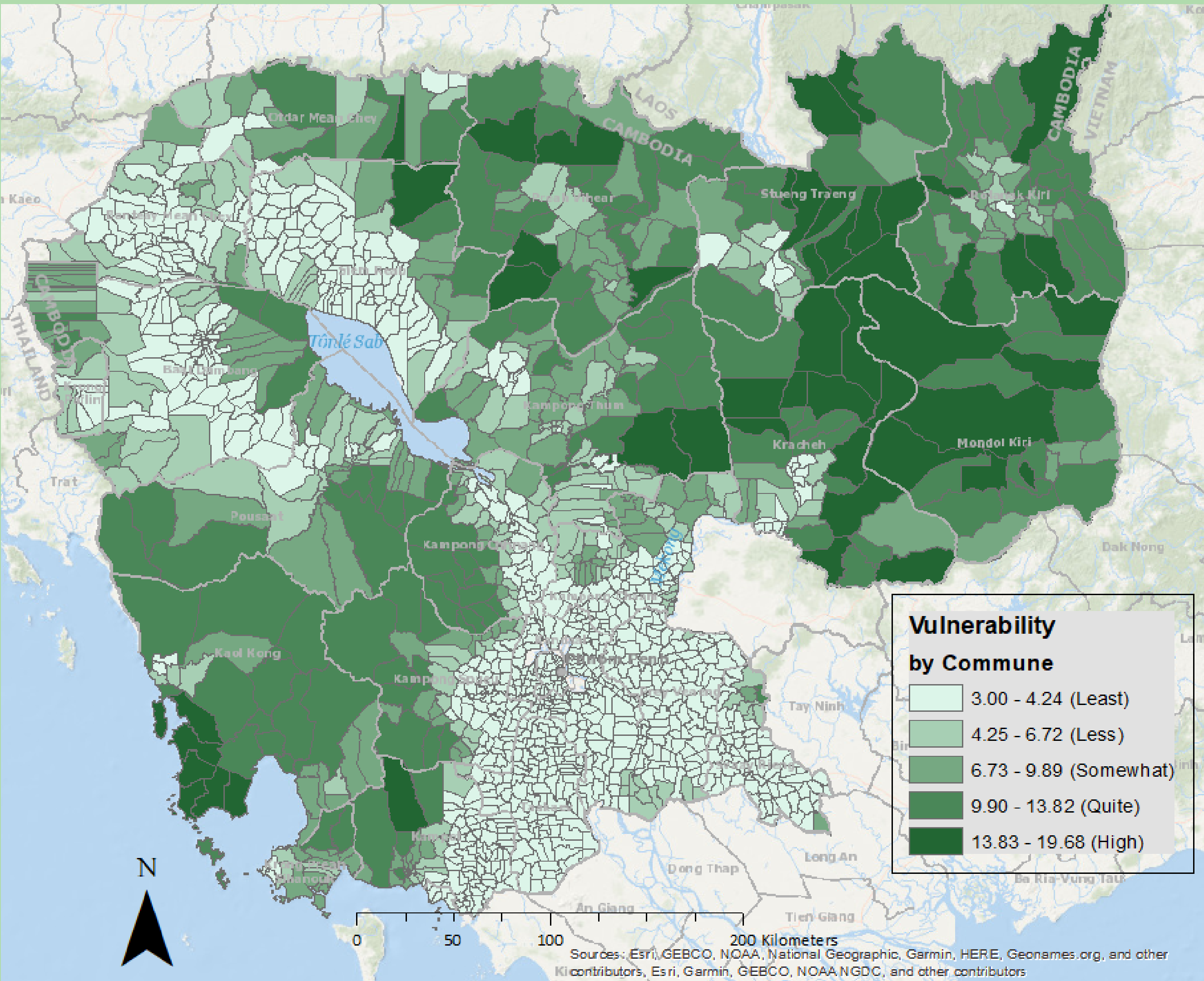


White Gold: The Vulnerability of Smallholder Rice Farmers in Cambodia

Introduction

Since 2010, rice has been more than a staple crop for domestic consumption but has recently been dubbed “white gold” for its use as a major commercial good with extensive export potential. Most Cambodian farmers are smallholders with less than two hectares per household. Adaptability is one of the key determinants that indicate resilience against the difficulties that climate change and policy present to farmers. Thus, assessing farmer’s ability to adjust to climate change, fight land battles, or protest bad policy decisions are each crucial indicators of whether a farmer is able to continue productivity. This project analyses the vulnerability that smallholder farmers in Cambodia have to being displaced or evicted. Ultimately, the factors that were chosen indicate the risk of farmers being forced to leave their land or find a new profession. The factors that are used to indicate vulnerability of displacement for this project are: proximity to markets and roads, distance from Economic Land Concessions (ELCs), and the threat of climate hazards (drought, flood, and storms).

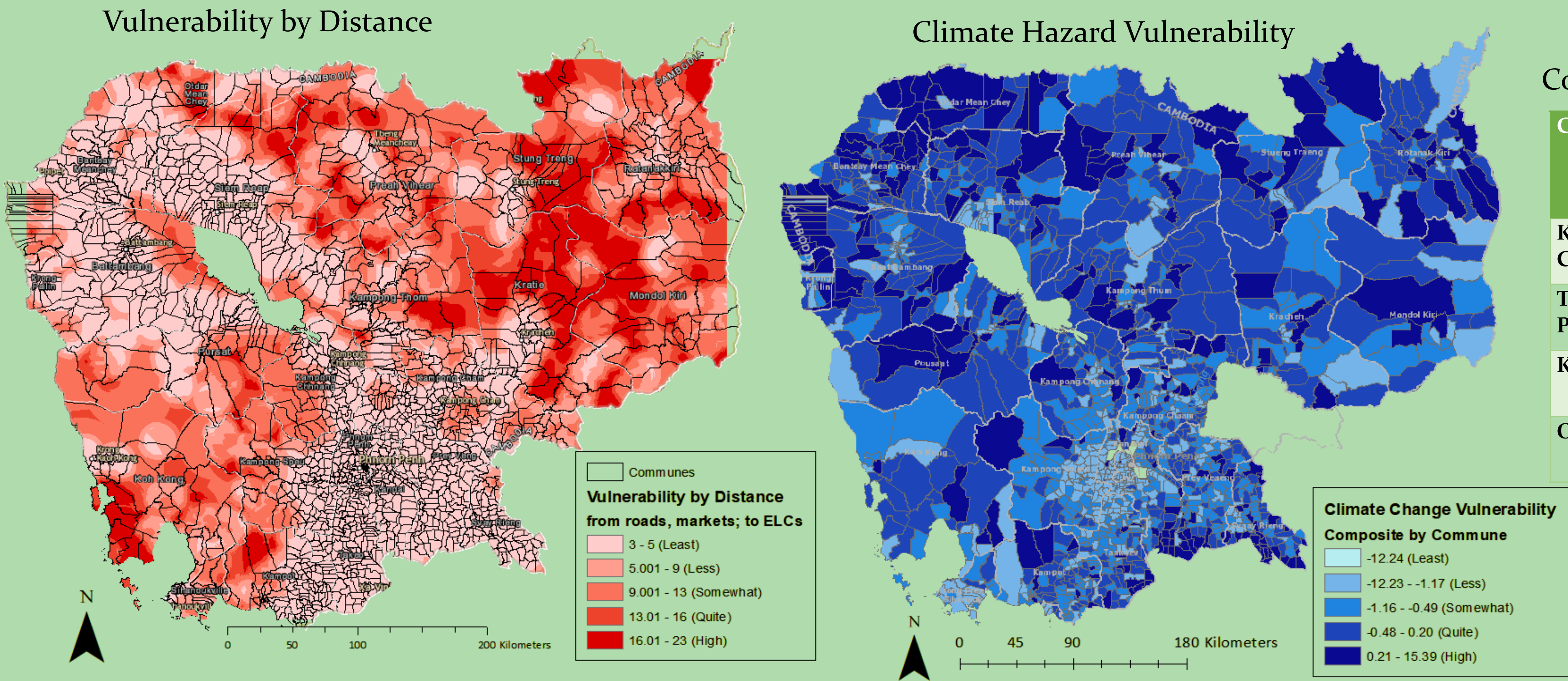


Methods

Roads, markets, and ELCs are vector line, density raster, and vector polygon layers respectively. Euclidean distance measurements were performed on each layer to determine vulnerability. For both roads and markets, the farther communes are located, the higher vulnerability score they received. The opposite was true of distance from ELCs. These three Euclidean distance rasters were combined using the raster calculator which is depicted in the Vulnerability by Distance map below. Climate hazard vulnerability and the Commune Database are vector polygon layers. The communes with the highest combined vulnerability for drought, flood, and storm threats are depicted in the Climate Hazard Vulnerability map below. In order to find the communes most vulnerable, zonal statistics were performed resulting in the final map above.

Conclusions

Strikingly, this project has shown that about 7.8% of smallholder farmers in Cambodia are vulnerable to displacement. Considering the importance of rice production to the economy of Cambodia, losing smallholder farmers would be detrimental. Empirical evidence from other developing countries suggests that there is an inverse relationship between land size and productivity, indicating that in developing countries with abundant labor, small farms produce more per hectare and per year than large ones. Not only that but evidence shows that small production has valuable social benefits and can actually contribute to the country’s competitiveness. This study could provide organizations or governments with valuable information about potential subjects for projects or assistance programs directed to the unique vulnerabilities of smallholder rice farmers in Cambodia.



Communes with Most Vulnerable Smallholder Farmers

Commune	Province	Number of Smallholder Farmers	Mean Distance Vulnerability Score	Climate hazard vulnerability composite rank
Kampong Cham	Kratie	658	17.74	139
Trapeang Phleang	Kampot	622	15.61	14
Kraya	Kampong Thom	621	15.87	484
Ou Krieng	Kratie	541	17.34	864

All maps displayed on 1:2,700,000 scale
Coordinate System: WGS 1984 UTM Zone 48N
Projection: Transverse Mercator
Data Sources: OpenDevelopmentCambodia, ESRI
Online Sources: Robert Cramb: https://doi.org/10.1007/978-981-15-0998-8_11; images from Paul Pichugin and Dean Wickham

Cartographer: Nicole Atallah
Course: UEP 232 Intro to GIS
Date: May 8, 2020