D09

Large Scale Quantitative Vulnerability Analysis for Regional Flood Hazard

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1 Introduction

Floods are known as frequent and most devastating events worldwide. In Asia continent, some countries are much affected by flood disasters, which are extremely vulnerable. The important reason is that the impacts of hazardous flood events are often exacerbated due to vulnerability in the affected context. The identification of regional vulnerability to flood hazard and the components contributing to vulnerability is crucial for emergency preparedness, immediate response, mitigation planning, and recovery from flood disasters. Thus the need for a spatially oriented vulnerability analysis is highlighted, such as the identification, assessment and ranking of vulnerability. Large scale flooding due to heavy rainfall and drainage congestion has been regularly experienced in the Huaihe River basin, China. The summer dominant rainfall, special topographic and socio-economic conditions make the region highly vulnerable to flooding. Taking the Huaihe River basin as case study, this research intends to develop a quantitative methodology for analyzing large scale vulnerability to regional flood hazard.

Firstly the theoretical perspective of vulnerability to regional flood hazard is reviewed according to previous literature. In terms of conceptual framework of flood hazard vulnerability analysis, this research develops a methodology to characterize the vulnerability of regional flood hazards from biophysical and social aspects, which adopts scenario analysis of typical flood event and spatial multi-criteria analysis approach respectively. Finally the integration of biophysical and social vulnerability is discussed.

2 Methodology

To identify spatial distribution and relative heterogeneity of vulnerability, to improve understanding of the underlying processes, and to prioritize strategies to reduce vulnerability, this study takes scenario analysis of typical flood event of the year 2003 occurred in the Huaihe River basin with the application of MODIS composite satellite data to characterize the biophysical vulnerability, and develops spatial multi-criteria analysis approach to quantitatively measure social vulnerability (**Fig. 1**). Finally, taken the county as assessment unit, the integration of biophysical and social vulnerability to regional flood hazard is discussed.

In conclusion, the geographic variability in biophysical, social, and integrated vulnerabilities at the county level across the Huaihe River basin suggests a variation in the capacities of different county or city to cope with flood disasters. This study helps illustrate the zones necessary to decrease the vulnerability and strengthen its resilience while living with increasing floods.

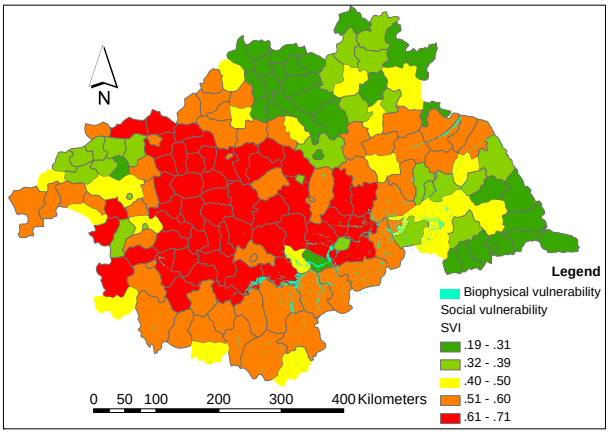

Fig. 1 The biophysical and social vulnerability to flood hazard in the Huaihe River basin, China, 2003.