

Environmental Security; India the Lynchpin of South Asia

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Introduction: Environmental issues are now a major factor in regional stability and state security. One of the most important and consequential issues on the emergent national security landscape is conflict triggered by the effects of environmental change (DoD, 2014). The objective of this study is to identify places at risk to violent conflict or acute political instability triggered by the adverse effects of environmental change at a global, regional, and sub-state scale. Environmental security is a process that can be modeled and quantitatively indexed by carefully selecting a critical set of environmental, demographic, economic, and political variables; and the resultant index will identify places at risk to political instability and violent conflict by rank-ordering them from most to least vulnerable. A shift has taken place: during the Cold War, conflict and alliances formed almost exclusively along political lines; but now we have begun to pay greater attention to problems evolving from intensified competition over essential resources and environmental degradation (Floyd, 2014). It appears that environmental change and resource scarcity is already contributing to instability and violence, but especially in the developing world because the environment-conflict nexus is a phenomenon that is correlated to low levels of economic development and high levels of agricultural dependence (Hendrix and Salehyan, 2012; Solow, 2011). Environmental security is now one of several paradigms affecting U.S. foreign policy and national security policy and planning. Although environmental security represents a significant departure from traditional approaches to national security, it does address two fundamental and distinctly important issues: first, the adverse effects of the environment has and is enabling violent conflict, and second, the effects of global environmental degradation are inexorably degrading the well-being of economies (Porter, 1995).

Methodology: The Environment Security Index (ESI) is a composite indicator derived from the geometric mean of salient variables that are organized in a theoretical framework provided by the Environmental Causality Model (Figure 2). The variables, or indicators, characterize salient components of exposure, vulnerability, and adaption. Variables were selected because they relate to the six broad areas of the environment-conflict nexus and are applicable to the scale of the study (i.e., global, regional, and state-level). Moreover, they are well defined, intuitive, and the data are sufficiently robust. They enable a multi-scale comparison because the resultant indices can sufficiently differentiate among states and demonstrate regional disparities (Figure 1).

$$[\text{Equation 1 } z_i = (x_i - \min(x)) \cdot (b - a) / (\max(x) - \min(x))]$$

$$[\text{Equation 2: } z_i = (n_i \cdot (-1)) + 4]$$

$$[\text{Equation 3: } VRI = (A \cdot B \cdot C)^{1/3}]$$

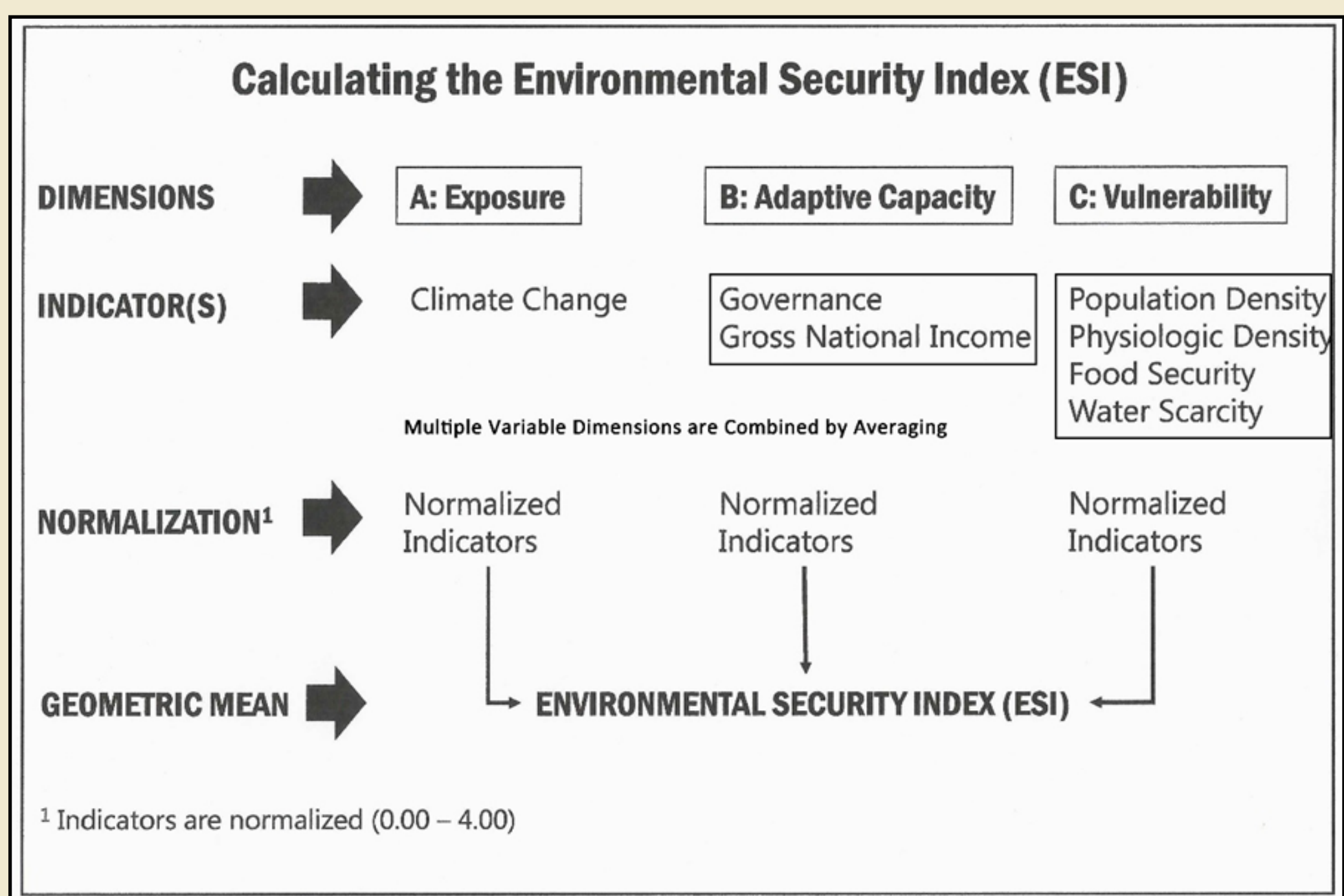


Figure 1: The ESI model

Discussion: The results indicate that vulnerable states can be identified on a local level using a framework of climate change, adaptive capacity and vulnerability just as on a global level. India is identified as an at risk state on the global scale (Figure 4). Looking at a regional scale, India is less vulnerable compared to neighboring states, excluding China. If India were to destabilize, much of South Asia would be at a greater risk for destabilization (Figure 3). Adaptive capacity is a better indicator of potential conflict in the face of climate change (Figure 6). A majority of India's states have the capacity to be in the 1.0 – 3.0 vulnerability range that can flip from one level of instability to the other (Figure 7). These vulnerabilities are based on land use decisions that can be effected by climate change (Figure 5). Resource access and governance will determine the future of these states, and South Asia.

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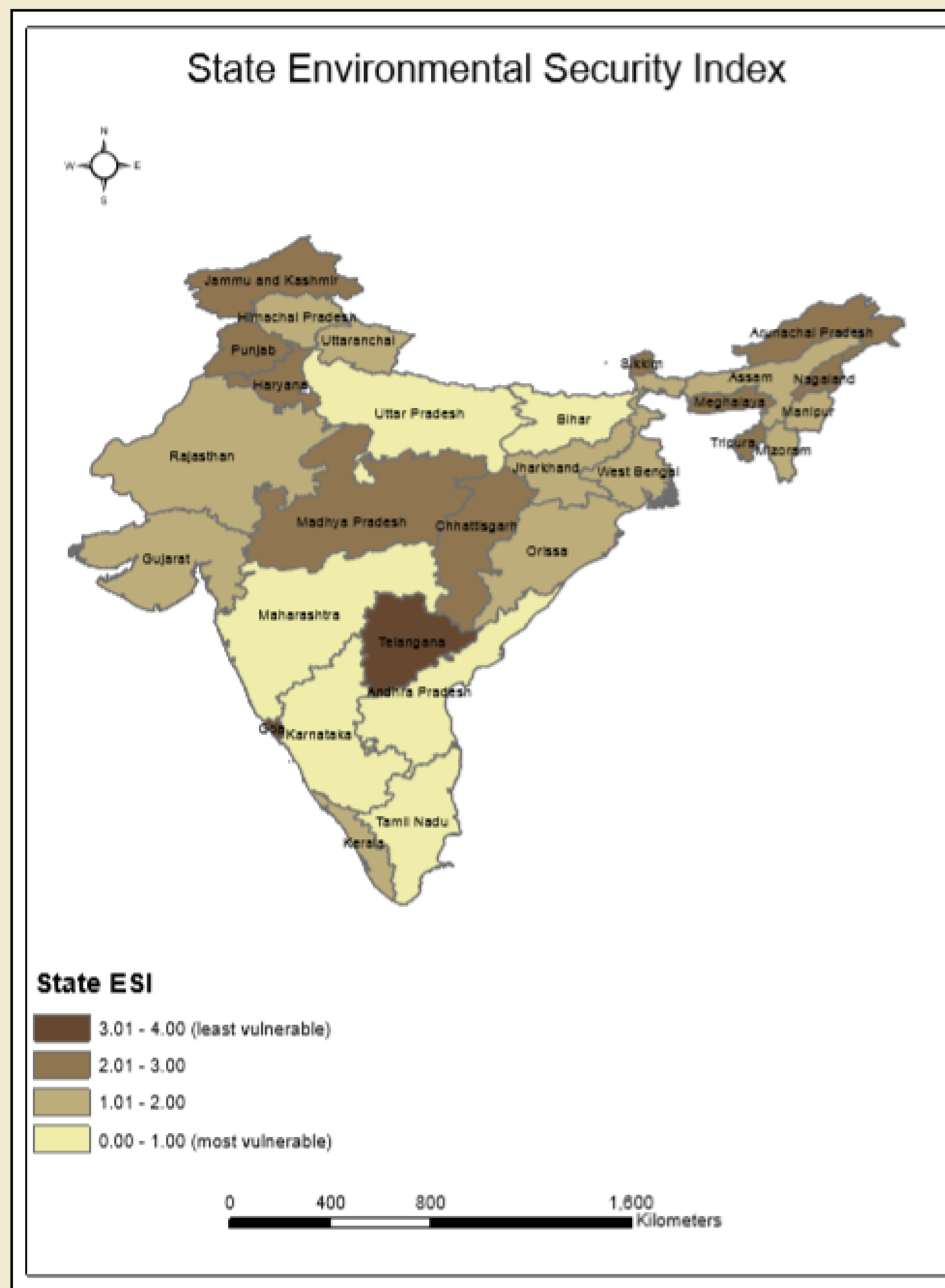


Figure 2: The environmental security index for India

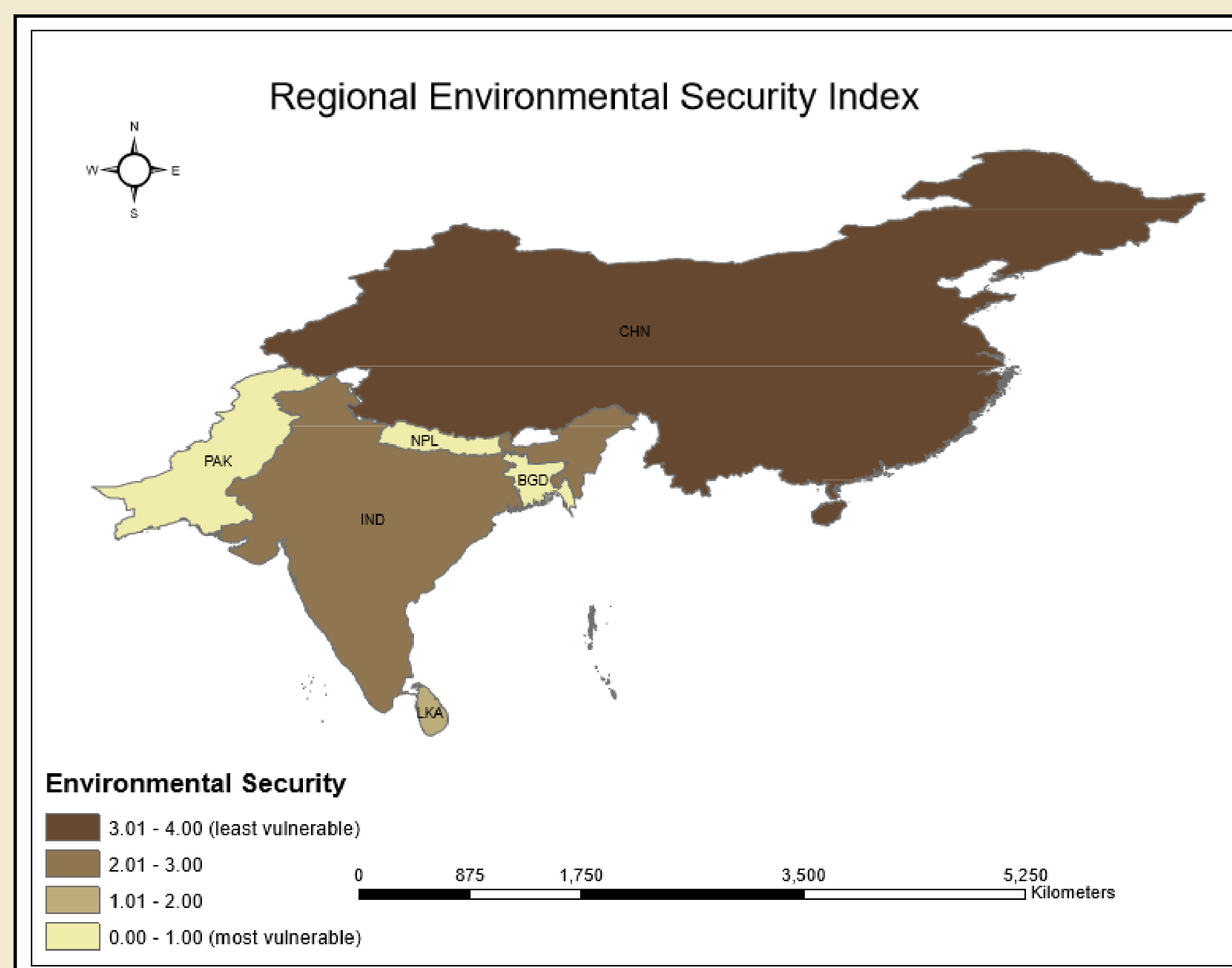


Figure 3: The environmental security index for South Asia

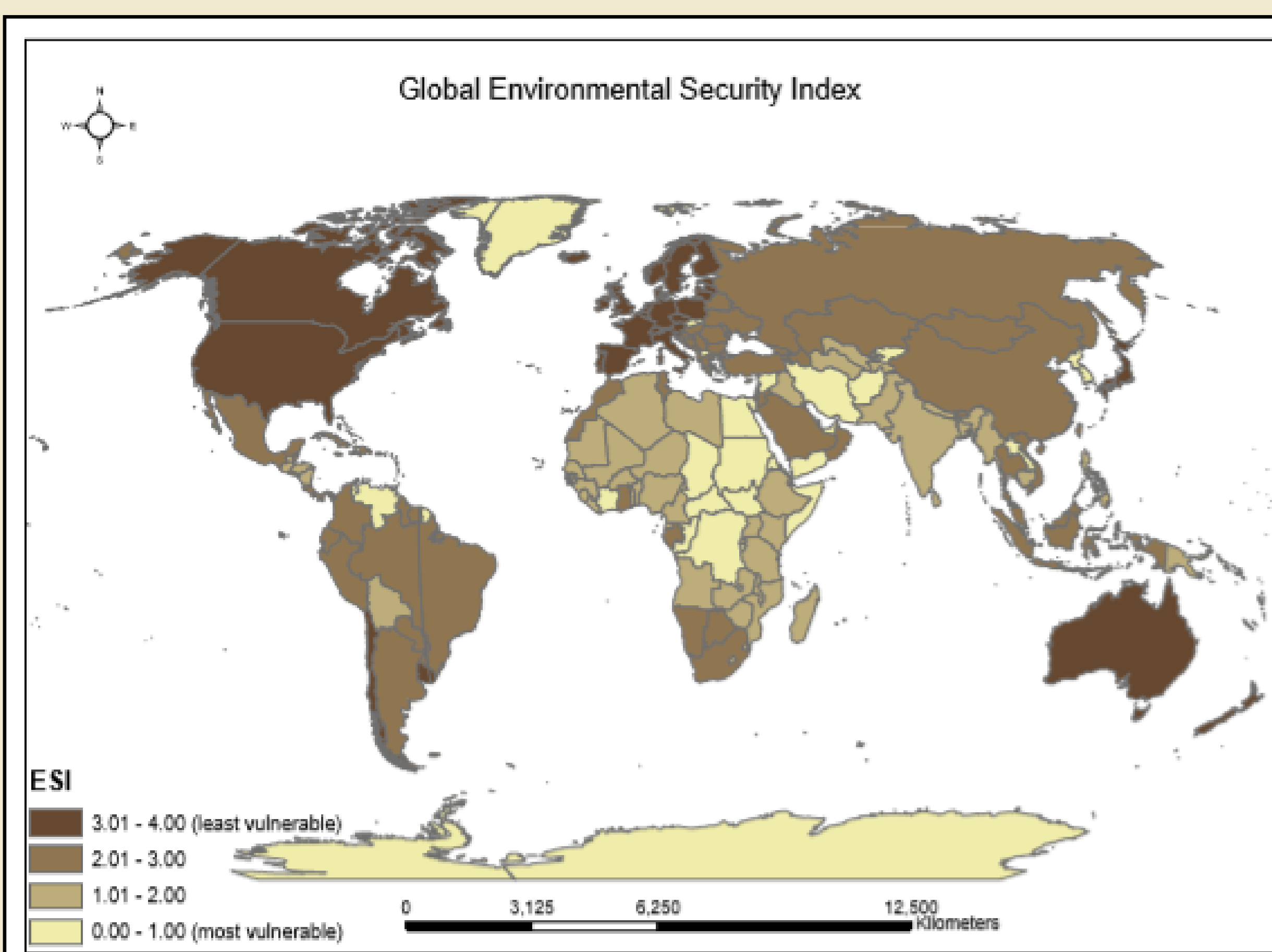


Figure 4: The global environmental security index

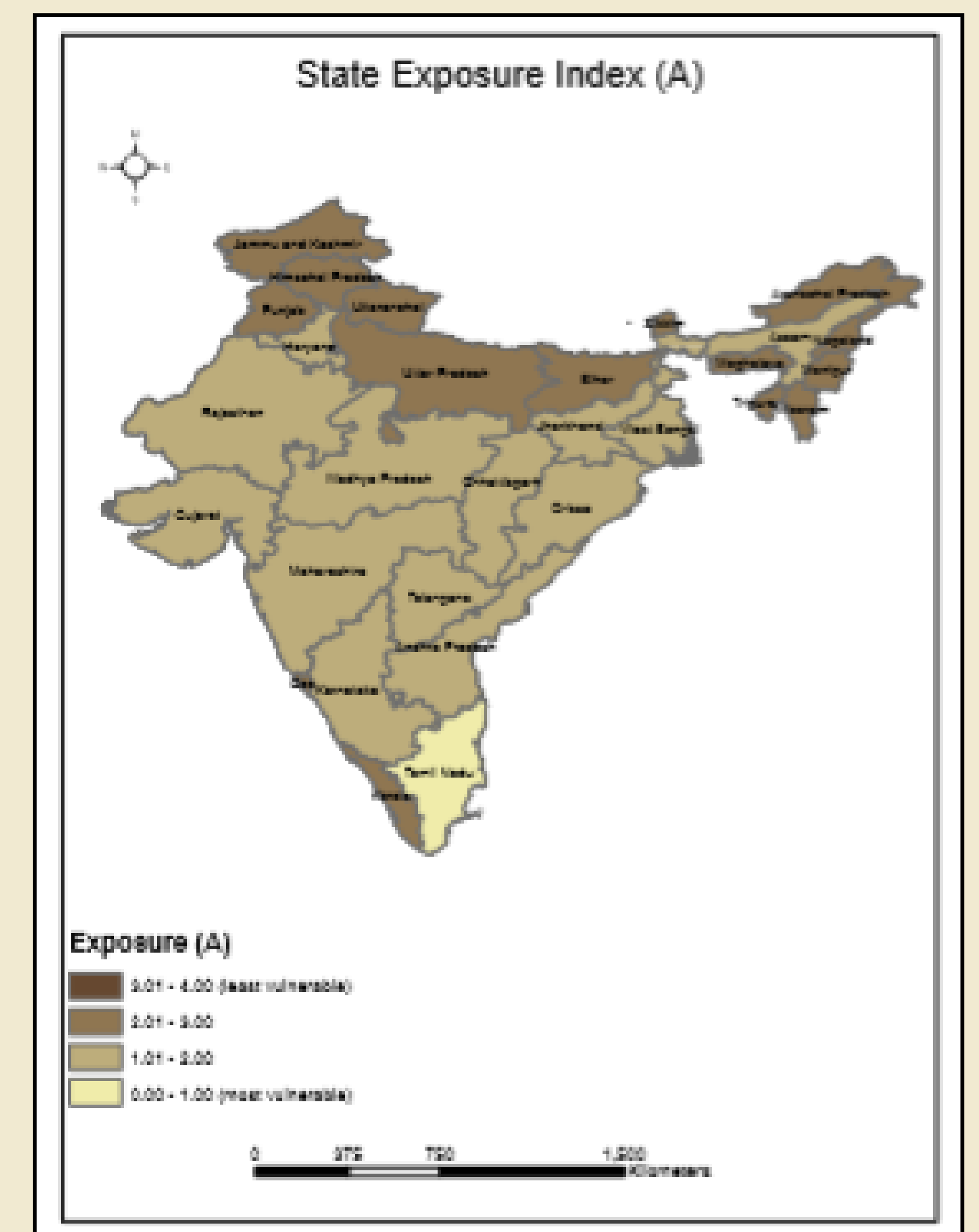


Figure 5: Climate vulnerability for the states of India

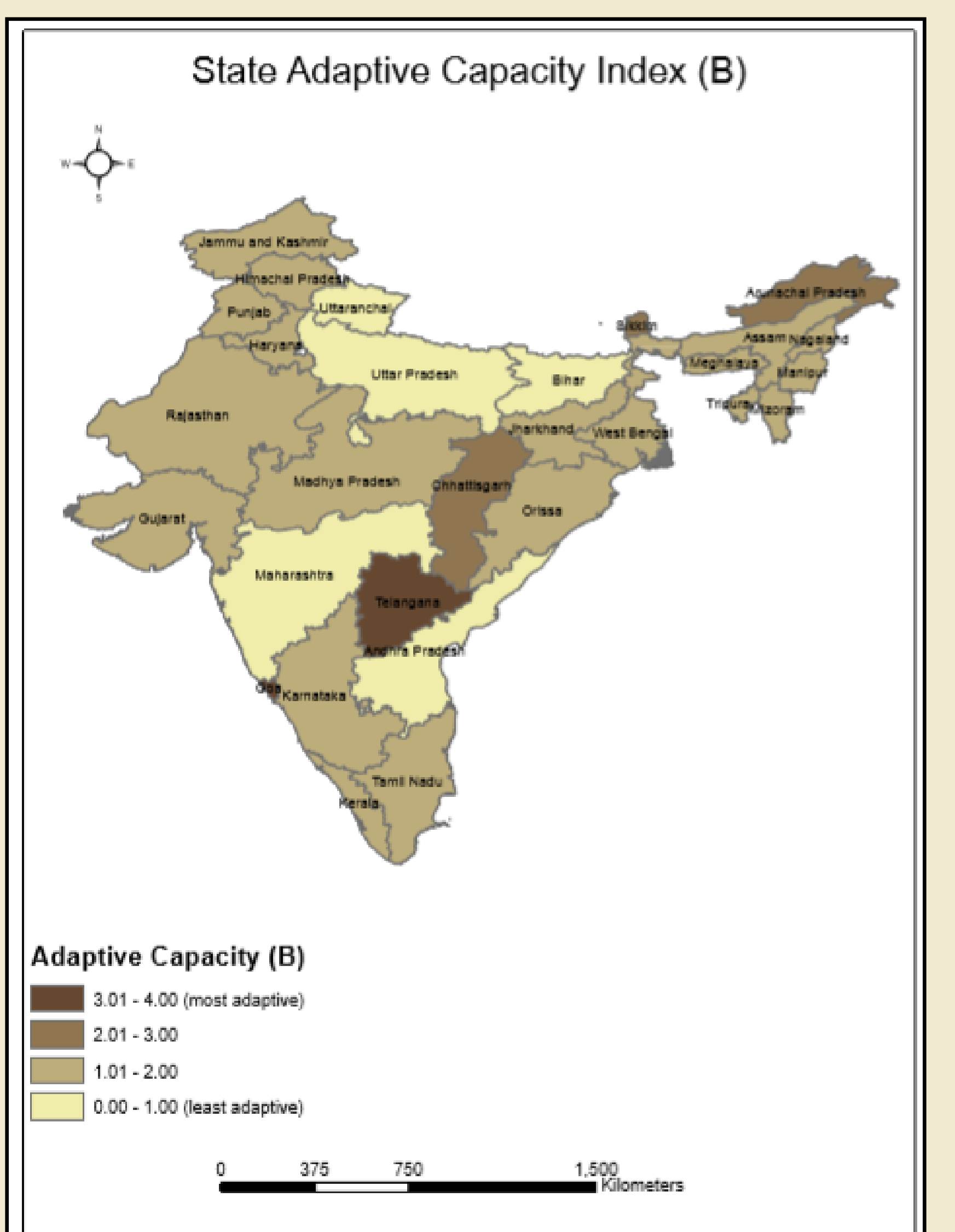


Figure 6: The governance capacity of the states of India

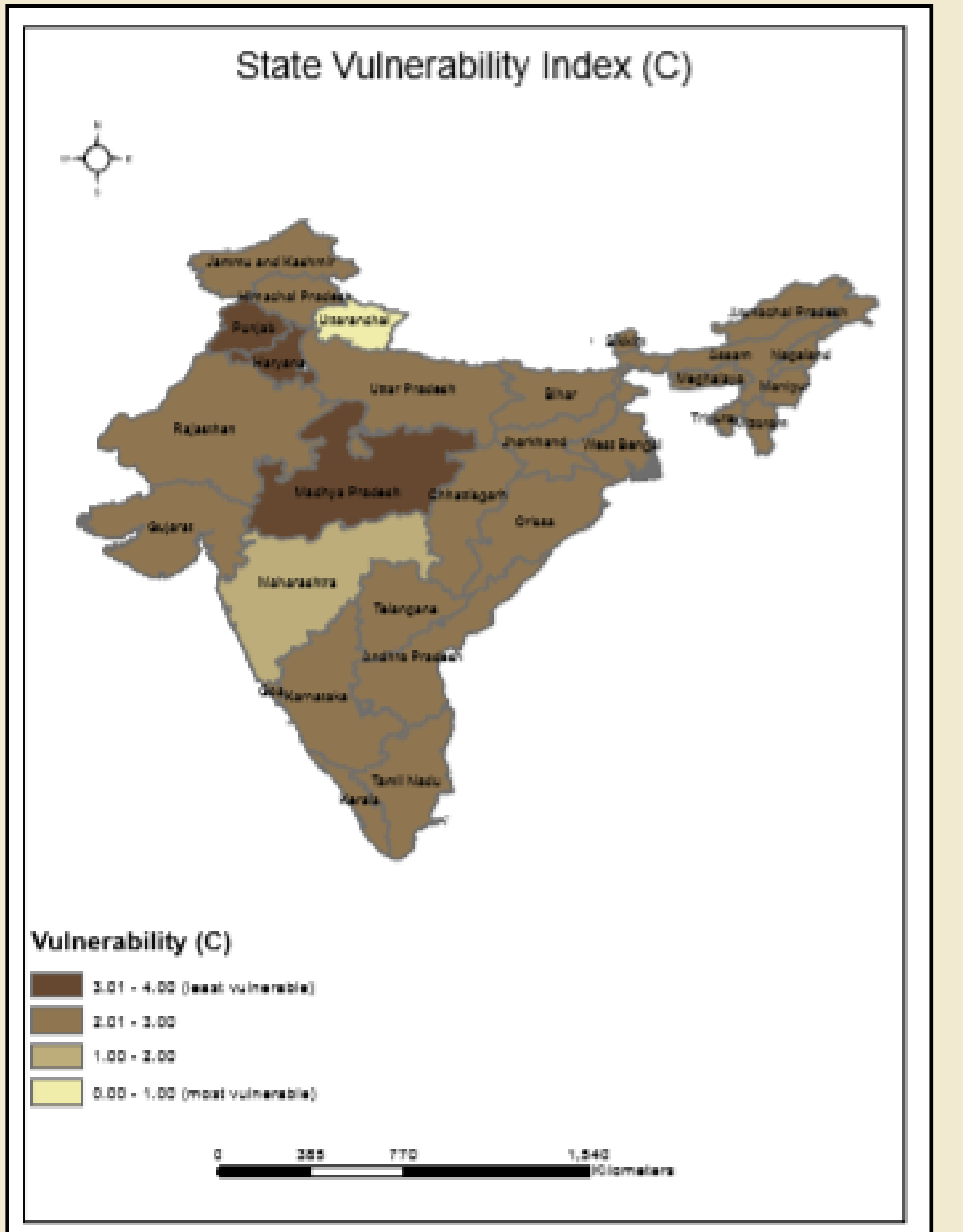


Figure 7: Vulnerability of the states of India

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