Human ecology, human resilience, human security

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ABSTRACT: The stability of a country is directly linked to its resilience, with resilience defined as the quality that allows a system to absorb shocks without breaking or collapsing. Shocks can be delivered by nature (e.g., hurricanes or earthquakes), society (e.g., economic failures), humanity (e.g., ethnic clashes), or any combination of these (e.g., climatic drought leading to water scarcity leading to conflict). Shocks may come in close succession, placing mounting pressure on human systems. Collapsing human systems give way to more shocks, and all can spiral downward into widespread violence, suffering, and war. Conventional wisdom suggests that the capacity of a country to absorb such shocks will be determined by good governance, wealth, ethnic harmony, and other related qualities. We pursue the theory that human resilience also derives from the condition of the human ecology, which includes all the characteristics of the ecology of other living systems: population, population growth rates and density, age distributions, disease, abundance or scarcity of resources including water, energy, and food, resource consumption rates, pollution, and other impacts on the broader ecological environment. This research asks what policies or actions might strengthen human ecological conditions and human resilience, how successive shocks, collapses and conflict can be avoided. We are developing the Human Resilience Index and Model (HRIM) to help measure and simulate these effects. The index shows the rank of countries relative to the risk they face from their declining human ecological condition. The model allows users to experiment with different sets of dynamics to learn how different treatments might affect a country's position in the index, and how they might affect overall stability and the risk of conflict. Early work shows a preponderance of African nations with a high risk of instability on account of declining human ecological conditions, with high population growth rates and low caloric intakes playing potentially important roles.

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Howard Passell works in the Earth Systems Analysis Department at Sandia National Laboratories, in Albuquerque, New Mexico. His work focuses on sustainability and resource management projects associated with water, energy, and food resources, with an emphasis on the links between those and other systems, including ecosystems, demographics, economics, public health, governance, and security. His work has involved resource monitoring, modeling, management, capacity-building, and policy-related projects at various scales in the U.S., Central Asia, the Middle East, and North Africa. Of special interest is the relationship between resources, population, ecosystems, and human security. His undergraduate studies were in classical literature and the liberal arts. He earned master's and doctorate degrees in conservation biology and hydrogeoecology at the University of New Mexico.