

Vulnerability & Adaptation: Concepts

Vulnerability is defined as the susceptibility to stresses or hazards, and the capacity (or lack, thereof) to prepare, cope and recover from such hazards.

Human vulnerability, in particular, is a condition resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard. Human vulnerability includes the vulnerability of social and economic systems, health status, physical infrastructure and environmental assets. It is the concept that explains why a community is more or less at risk to a given hazard.

However, neither vulnerability alone nor hazard alone determines the occurrence of a disaster. A hazard, by itself, is simply a potentially damaging event or physical disturbance and it is the combination of hazard and vulnerability that disaster occurs. (Mitchell, J. K. (eds.) (1999). *Crucibles of Hazard: Megacities and Disasters in Transition*. Tokyo: UN University Press. As quoted in *Mumbai after 26/7 Deluge: Some Issues and Concerns in Regional Planning*. R. B. Bhagat, Mohua Guha and Aparajita Chattopadhyay, www.cicred.org)

What is Vulnerability to Climate Change?

The IPCC definition: "The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity. The term 'vulnerability' may therefore refer to the vulnerable system itself, e.g., low-lying islands or coastal cities; the impact to this system, e.g., flooding of coastal cities and agricultural lands or forced migration; or the mechanism causing these impacts, e.g., disintegration of the West Antarctic ice sheet. (IPCC – http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch19s19-1-2.html)

Vulnerability & Adaptation – Some Issues

There is a difference between Climate Risk and Climate Vulnerability. The entire human population is at risk. However vulnerability is the inability to withstand shock without suffering long-term or irreversible loss of well-being. It must be kept in mind that "Ability to withstand" is not equivalent to "Coping". "Coping" is an insufficient concept. It does not probe the long-term or irreversible loss of well-being.

The entire (global) population will suffer various negative effects due to climate change. Some more. Some less. But who suffers, how and to what extent is determined by global, national and regional/local level inequalities - not by some individual inadequacies! In this sense it is the poor who are vulnerable. Social processes deeply condition the ability to withstand shock. The shock may result from macroeconomic factors. It may leave the vulnerable worse off. The failure to provide basic entitlements and compensatory services may push the vulnerable into a poverty trap or a debt crisis. Typically this involves sale of physical assets (including land, livestock for rural poor), loss of human opportunities (post-shock loss of educational opportunities, nutritional deprivation) etc.

Thus the pre-shock conditions of vulnerability are connected to higher-risk-higher-income generating activity rather than lower-risk-lower (but steadier) - income generating activity.

Thus reducing vulnerability: means building the "Real" Adaptive Capacity which entails: 1) Human Development, 2) Active Role of the State in building infrastructure, 3) Social Insurance mechanisms against risks, 4) Favorable Macroeconomic Conditions including economic growth and 5) Political Empowerment for Socially Transformative Action. (T. Jayaraman, from a lecture at the TISS-DSF-AIPSN Workshop, Mumbai, 3rd March, 2011.)

Adaptive capacity: Focus on perturbations alone (environmental, socioeconomic, technological) is insufficient for understanding the responses of, and impacts on, systems (social groups, ecosystems, places) exposed to such perturbations. The ability of the system to attenuate stresses or cope with the consequences is critical. We need a clearer understanding of coping strategies or mechanisms, of who and what are at risk, from what. Which are the specific stresses and perturbations which have higher risk and major impacts? This includes the consequences and attendant risks of slow (or poor) system recovery.

This perspective suggests that the most vulnerable individuals, groups, classes and regions or places are those that: experience the most exposure to perturbations or stresses; are the most sensitive to perturbations or stresses (i.e. most likely to suffer from exposure); and have the weakest capacity to respond and ability to recover.

Within this extended vulnerability framework, there is formal recognition that macro-forces - broad-scale environmental and human systems within which the local system resides - come together to affect the local system and, simultaneously, influence the pressures that act upon it. Different pressures across scales come together in various sequences to create unique "bundles" of stress that affect local systems. A major hypothesis holds that when stresses or perturbations emanating from the environment coalesce with those arising from society, significant consequences can result. For example, economic depression reduces society's capability to develop or maintain pre-emptive coping measures to reduce the impacts of drought, such that the co-occurrence of drought and economic depression synergistically enlarges the vulnerability of the system. (The vulnerability of global cities to climate hazards, Alex De Sherbinin, Andrew Schiller and Alex Pulsipher, Environment and Urbanization, Vol 21, Number I, April 2009-Sage, New Delhi)

Further reading:

Vulnerability and Adaptation to Climate Change: Concepts, Issues, Assessment Methods.
http://www.iisd.org/cckn/pdf/va_foundation_final.pdf

Climate change and India: a 4x4 assessment: A Sectoral and Regional Analysis for 2030s, November 2010. <http://moef.nic.in/downloads/public-information/fin-rpt-incca.pdf>