

Case Study I: Natural Disasters

Background

Natural and man-made crises are taking place today at an ever-increasing rate. Recently completed statistics indicate that the number of reported crises have increased exponentially from just a dozen in the first decade of the 20th century to almost 500 in the 1990-96 timeframe alone. Most crises occur in smaller, developing countries where there is insufficient means to act effectively either before, during or after a crisis. In the main, we are witnessing the persistence of protracted man-made crises, emerging crises in areas considered to be stable in the past and, increasingly, adverse effects resulting from natural disasters.

From 1975 to 1994, for example, natural disasters have killed over 24,000 people and injured some 100,000 in the U.S. and its territories alone.¹⁰ This U.S. experience reflects similar trends worldwide, except for the fact that the human toll elsewhere is in relative terms greater. Similarly, the dollar losses associated with most types of natural hazards are huge and rising. Munich Reinsurance estimates the total direct costs to the global economy due to natural disasters now to exceed some \$ 400 billion each year.¹¹ While these sums may seem high, it is important to realize that when the numbers are disaggregated they represent only a small fraction of the Gross Domestic Product (GDP) for industrialized societies. By contrast, relative losses for smaller and developing nations represent a significantly greater fraction of their national economic output and can, as a result, set back their economic progress by years. Natural disasters are recognized today to be one of major impediments to sustainable development. In addition, what should be noted is the role that natural disasters play in displacing people. There are currently some 20-25 million of Internally Displaced People (IDPs) and around 12 million refugees worldwide.¹²

The Root of the Problem

The rising human toll and growing economic losses due to natural disasters is not an altogether unexpected occurrence but rather a consequence of complex interaction among three known variables.

A wide variation in the number and intensity of natural hazards is normal and to be expected. However, there were as many as three times great natural disasters in the 1990s as there were in the 1960s, which led many scientists to suspect that the recent upsurge was a product of something new. Today it is of course recognized that the Earth's physical system itself has been changed, which has led to the current increased warming of the global climate. A warmer climate, in particular higher levels of precipitation and diurnal temperatures, is expected to produce more severe and more frequent weather-related extremes, such as storms, floods, droughts and large-scale forest fires.¹³

Changes in the demographic composition and distribution of population globally increase the direct exposure of greater numbers of people to many natural hazards. Growing population pressure results in increasing residential occupation of hazardous lands, such as coastal zones that are subject to hurricanes, earthquake-prone fault zones, flood plains, unstable slopes of volcanoes and fire-prone areas. The settlement of hazard-prone areas usually also results in the destruction of local ecosystems that otherwise provide protection from natural perils, thus contributing to the next disaster and magnifying its effects.

The built-in urban environment, with its public utilities, vast transportation networks, its plants, homes and office buildings, is growing in density, making the potential losses from natural disasters larger with each passing year. Urban risks are particularly acute in case of the world's megacities, where rapid

¹⁰ D. Mileti, "Synopsis," in: *Disaster by Design: A Reassessment of the Natural Hazards in the United States*. Washington, D.C.: Joseph Henry Press, 1999, p. 18.

¹¹ Richard Holdaway, "Is Space Global Disaster warning and Monitoring Now Nearing Reality?" *Space Policy* 17 (2001), p. 127. See also, Ray A. Williamson, *et al.*, "The Socioeconomic Benefits of Earth Science and Applications Research: Reducing the Risks and Costs of Natural Disasters in the USA." *Space Policy* 18 (2002), pp. 57-65.

¹² Citing the 1999 UNHRC data. See Einar Bjorgo, "Supporting Humanitarian Relief Operations," ch. 19 in: John C. Baker, *et al.* (eds.), *Commercial Observation Satellites: At the Leading Edge of Global Transparency*. New York: McMillan for RAND and ASPRS, 2001, esp. pp. 403-404. See also: European Space Agency, *Crisis Preparedness and Humanitarian Aid*. GMES Working Groups, *Draft Requirements Briefing* (April 22, 2001), 9 pp.

¹³ See, for example, "Climate Change Boosting Flood, Disaster Peril for Billions: Report." *An AFP News Service Story* (February 27, 2003), pp. 1-3.