

The difficulty with placing a timeframe on types of environmental degradation is that environmental change is not linear. The environment does not change at some constant incremental rate. Nor does the scientific community have the knowledge to predict accurately how the environment will change. Perhaps ozone depletion can continue for a considerable time before any serious effects occur; conversely, depletion levels may reach some critical threshold in the near future and result in radical environmental change. The nonlinear nature of environmental stress means that caution is required in assessing what types of environmental deficiencies are most likely to contribute to national security concerns, and require policy responses, over a given period.

4. A Conceptual Framework

The following paragraphs will set out a conceptual framework for facilitating and simplifying the understanding of the nature of environmental stress-national security linkages.¹³ Understanding how environmental stress, the measurement of which is difficult in itself, may produce violence is not a simple undertaking. Figure 1 is a diagrammatic presentation of the transformation.

The diagram has three sequential components, and two causal and far from completely deterministic links. The two causal links connecting the components are between: (1) environmental effects and social effects; and (2) the social effects and violent conflict. Moreover, there are many feedback loops that are not shown. For example, the link between military conflict and environmental destruction, such as Iraq's destruction of oilwells in Kuwait and its pumping of oil into the Persian Gulf during the Gulf Conflict,¹⁴ would be represented by a line from violent conflict to environmental effects. Most important is the manner in which social institutions and technology influence the components. Changes in technology will alter relationships in the framework; for example, new technology will influence the degree of environmental stress resulting from population or economic growth. Similarly, formal and informal institutions, such as the cohesion of families or the strength of local

¹³The conceptual framework draws upon analytical work by Thomas F. Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict", International Security, Fall 1991, Vol. 16, No.2., pp. 76-116.

¹⁴See Adam Roberts, "The Laws of War in the 1990-1991 Gulf Conflict," International Security, Winter 1993/94, Vol. 18, No. 3, pp.164-8; James S. Robbins, "War Crimes: The Case of Iraq," The Fletcher Forum of World Affairs, Summer/Fall 1994, Vol. 18, No. 2, pp. 53-4. In addition to pumping more than 100 million barrels of oil into the Persian Gulf, Iraq also intentionally ignited oil fires.