UNDERSTANDING EMERGENT ENVIRONMENTAL PROBLEMS

A Coevolutionary Approach to Change in Biophysical and Human Systems

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Abstract

Environmental problems are rooted in changes to biophysical systems. However, their causes, effects and impacts are located in the social, political and economic systems in which they are embedded. The understanding and management of environmental problems can never be confined solely to their physical manifestations, but must take into account this wider context if they are not to be doomed to failure.

This paper describes a conceptual framework for understanding the ways in which environmental changes are linked to changes in human systems. The emphasis is on recognising environmental issues as emergent systems, embedded in overlapping hierarchies of systems, with causes and effects which vary over space and through time, and impacts which are mediated through complex processes of knowledge and perception, to which often fragmented management systems must struggle to find solutions. The framework is illustrated using examples from a number of case studies, on air quality, bovine spongiform encephalopathy (BSE, or 'mad cow disease') and water degradation.

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