

## **Global environmental change and human health: biodiversity, climate and desertification**

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Historically, environmental health concerns have focused on toxicological and microbiological risks to health from local exposures, such as air pollution or contaminated waters. The scale of environmental health problems has expanded from household (e.g. indoor air pollution), to neighbourhood (e.g., domestic wastes) to city (e.g. urban air pollution) to region (e.g. transboundary contamination), and now to global level (e.g. climate change). Large-scale environmental hazards to human health include global climate change, the health risks posed by stratospheric ozone depletion, loss of biodiversity, changes in hydrological systems and the supplies of freshwater, land degradation and stresses on food-producing systems (see figure). Appreciation of this scale and type of influence on human health requires a new perspective which focuses on ecosystems and on the recognition that the foundations of long-term good health in populations relies in great part on the continued stability and functioning of the biosphere's life-supporting systems. It also brings an appreciation of the complexity of the systems upon which we depend.

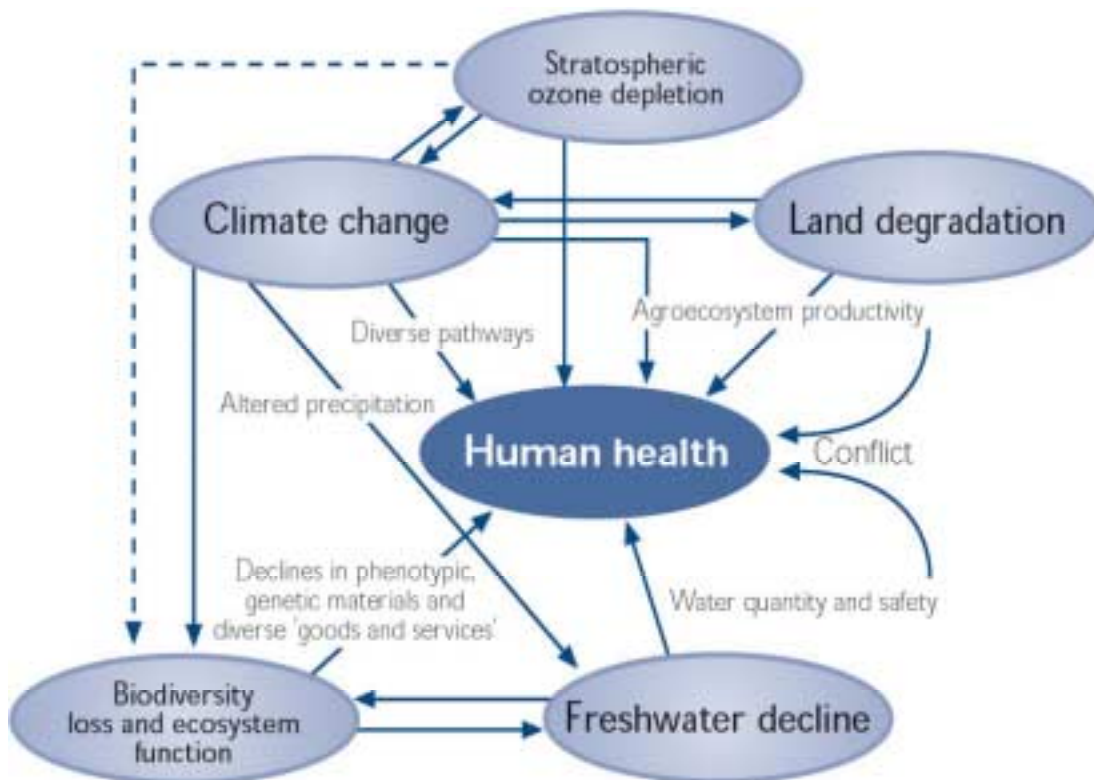
We are aware of the many possible paths by which climate change can impact on health. These include direct impacts, such as temperature related illness and death; the health impacts of extreme weather events; the effect of air pollution in the form of spores and moulds. Other impacts follow more complex pathways such as those that give rise to water and food borne diseases; vector borne and rodent borne diseases; or food and water shortages. Examples of WHO work in this area include workshops addressing needs of Small Island States, and work in Europe to assess early impacts of climate change on health. WHO and partners are publishing this year a book on Climate Change and Human Health specifically addressing risks and responses; and a set of methods to assess vulnerability and adaptation options.

We are becoming increasingly concerned about the health consequences of biodiversity loss and change. An important consequence for humans is the disruption of ecosystems that provide "nature's goods and services". Biodiversity loss also means that we are losing, before discovery, many of nature's chemicals and genes, of the kind that have already provided humankind with enormous health benefits. There are also well founded concerns about the need to understand and assess the impacts of modern food biotechnology on human health, and WHO has contributed to this field. In addition, WHO, UNEP and Harvard University are collaborating in a forthcoming publication addressing Biodiversity and Health.

Increasing pressures of agricultural and livestock production are stressing the world's arable lands and pastures. Land change - damaged by erosion, compaction, salination or chemicals - has impacts on health. From a health standpoint we are concerned about desertification. Again in this case through complex pathways, which include increased poverty, we observe impacts related to nutrition, population displacement, water- food- and vector borne diseases, and air pollution. WHO addresses all the above in its

contribution to the health components of the Millennium Ecosystem Assessment, which is an extensive study of the linkages between the world's ecosystems and human well-being

In most developing countries, the health sector has a major task in combating specific diseases which carry a very large burden, such as HIV/AIDS, TB and malaria among others. Our challenge is to also keep the health sector well informed on environmental risk factors. These include traditional hazards (such as indoor air pollution from the use of biomass fuel, or lack of safe drinking water), modern hazards (such as urban air pollution or chemical and radiation hazards), and emerging hazards such as global environmental change, including potential health risks from climate change, biodiversity loss and desertification. The latter is best achieved in the context of a framework which relates all these global changes, and their combined impacts on health.



For further information please refer to *Climate Change and Human Health: Risks and Responses*. McMichael et al (eds), WHO, WMO, UNEP, 2003, in press. Available from [publications@who.int](mailto:publications@who.int) .

Internet: WHO Geneva, <http://www.who.int/phe>  
WHO Regional Office for Europe, <http://www.who.dk/globalchange>