

Case Study III: Environmental Stress

Background

The last area where one might envisage extending the application of the Open Skies regime has to do with *environmental stress*, or the depletion and/or degradation of the natural resources of the land. The depletion and degradation of and the subsequent competition over renewable resources is the result of contamination, mismanagement and over-utilization. Environmental change impact on four basic media of the environment: air, water, soils and various components of biological diversity. These range from ecosystems and habitats to species and genetic resources. Many species and resources are found in more than one country (i.e., trans-boundary river basins and/or boundary watercourses) and require international cooperation for their conservation. This reality highlights the critical importance of developing productive links between and among countries.

Presented below are some natural and man-made pressures behind environmental stress.

Climate Change

Climate change is expected to have a range of consequences, notably effects on agriculture and water resources. There is also growing scientific evidence that natural ecosystems are among most sensitive to global warming. Changes in the volume and distribution of precipitation as well as changes in the incidence of climatic extremes, especially high temperature extremes, put crops at risk from late frost, summer drought and emergent plant diseases. More frequent and intense heatwaves and/or drought will stress water resources, increasing the risk of fires. Shifts in climate zones will move faster than the ability of many plant species to migrate – a way of escape which in any event may already be foreclosed because of the intensity of land-use by man. Recently it has been reported that “habitat loss to climate change in the next 50 years will be greater than all the land lost to agricultural clearing to date.”³³

Disasters due to Natural Hazards

Much attention traditionally has been focused on the threat that natural hazards pose to people and structures. The threat of natural hazards to habitat and various ecosystems demands a similar priority, especially when ecosystems are the basis for economic livelihood. The maintenance of productive fishing, agriculture together with livestock raising and forest product utilization depends on minimizing all forms of ecosystem degradation.³⁴ Damage from floods and drought, landslides, wildfires (with associated smoke and haze) and other disasters with climatological background (i.e., severe and adverse temperature variation) is increasing as a result of changes in the landscape as well as from more frequent appearance of extreme weather events attributable to climate change.

Chemical Pollution and Contamination

The enormous increase in waste and the widespread use of chemicals during the past 40 years have resulted in large swathes of potentially productive land being lost due to soil and groundwater contamination. Major sources of chemical contamination include inappropriate and unauthorized waste dumpings, improper handling of hazardous and toxic substances, abandoned industrial/mining sites and military installations, and agricultural intensification. At present time, soil (and groundwater) contamination with heavy metals, oil products and PCBs around abandoned military bases in Eastern Europe and on the territory of the FSU poses the most serious ecological risk. Chemical pollution is also caused by ozone concentrations in the troposphere and by emissions of ozone-depleting substances into the stratosphere. Decreased ozone in the stratosphere is unwanted because a thinner ozone layer results in more ultraviolet-B (UV-B) entering the lower atmosphere and reaching the Earth's surface. UV-B radiation can initiate a number of chemical and biological processes that are harmful to the humans and, especially, aquatic ecosystems. UV-B radiation can also adversely affect the growth of terrestrial plants.

³³ Reported at the annual meeting of the American Association for the Advancement of Science by Thomas Lovejoy, president of the H. John Heinz III Center for Science, Economics and the Environment in Washington. See Dan Whipple, “Climate Change Threatens Biodiversity,” A UPI News Service Story (February 18, 2003), p. 1.

³⁴ See Hamilton, “Science and Technology,” p. 59.