

EFFECTS OF GLOBAL WARMING ON WETLANDS

J.O. Ayode

Department of Geography, University of Ibadan, Nigeria

Keywords: Greenhouse effect, global warming, climate change, wetlands

Contents

1. Introduction
 2. Global Warming
 3. Wetlands
 4. Effects of Global Warming on Wetlands
- Bibliography

Summary

The possible impacts on wetlands of global warming and the accompanying climate change have been described here in a qualitative manner. From theoretical considerations and the little available evidence, it is reasonable to project that the impacts will in general lead to further loss of wetlands, whether on the land or along the coasts. Given the environmental significance of wetlands, humankind must try to conserve the world's stock of wetlands by initiating actions to reduce the emission of greenhouse gases that are responsible for the phenomenon of global warming. It is gratifying that actions are already being taken at various levels to address the problem of global warming and climate change, although these actions need to be intensified.

1. Introduction

It is estimated that wetlands cover between 4% and 6% of the earth's land surface. Although there are various definitions of wetlands, their common characteristic is that they are areas of land where the water table is at or near the surface permanently or for some defined period of the year. Wetlands are therefore basically waterlogged ecosystems with peculiar physiochemical and biological processes and characteristics.

Wetlands perform important environmental functions and provide people with some socioeconomic benefits. In spite of this, several human activities related to use of land pose a threat to wetlands in many parts of the world, especially in areas that are well populated. It is estimated that more than 50% of the world's wetlands were lost in the twentieth century as a result of human activities including agriculture, mining, urban development, and land drainage for various purposes.

This is not to say that natural factors such as subsidence, sea-level rise, and drought do not play a role in the loss of wetlands. These operate on a longer timescale than human factors. Besides, there is increasing evidence that through various activities humankind is capable of exacerbating or intensifying the effect of natural factors such as sea-level rise and climate change on increasing aridity

This article attempts to examine the ways in which global warming, which is basically human-induced, can affect wetlands, especially their areal extent (i.e. their size) and geographical distribution. First, the issue of global warming is described and explained. This is followed by a discussion of wetlands as ecosystems and their significance for the environment at large and for humankind. The possible ways global warming and related factors can influence wetlands are then described. The implications of these effects are examined and some suggestions offered on what can be done to deal with the problem.

There are few empirical studies that can be consulted on the subject. Besides, there is no complete agreement among scientists regarding the nature of the climatic change that global warming may cause worldwide. However, water is a critical element of wetland ecosystem, whether located inland or in coastal areas. Any factor that plays any role in determining the quantity and availability of this water in existing or prospective ecosystems must therefore be considered.

2. Global Warming

The average temperature of the earth is about 15°C. Without the greenhouse effect of the atmosphere the average temperature of the earth would be about -18°C thus making life on this planet impossible. The greenhouse effect of atmospheric gases such as carbon dioxide (CO₂) and water vapor, is such that these gases absorb terrestrial radiation and prevent them from escaping to space, thus keeping the earth warmer than it would have been. The greenhouse effect is thus a natural process by which the earth's temperature is maintained at a level that makes life on this planet possible.

Since the industrial revolution, the capability of humans to produce a number of greenhouse gases has increased considerably. Such gases include CO₂, nitrous oxides, methane, and chlorofluorocarbons, the last being entirely human made—they do not occur naturally in the atmosphere. The burning of fossil fuels for a variety of purposes now adds five billion tonnes of CO₂ to the atmosphere annually. This amount is increased by another one billion tonnes annually caused by the destruction of natural vegetation, which causes the level of CO₂ in the atmosphere to increase by reducing the amount plants use during photosynthesis.

The use of fossil fuels is also the major cause of increase in the level of nitrous oxides in the atmosphere. Another cause is the denitrification of fertilizers farmers use to improve crop yield. There are two main human-made sources for the increase in the level of methane in the atmosphere. These include the growing population of livestock such as cattle, pigs, and sheep, which release methane through their digestive systems, and the increasing area of land used for rice paddies worldwide.

Chlorofluorocarbons are gases used, for example, as coolants in refrigerators, as insulating foams, and as propellants in aerosol spray cans. It is mainly the above gases that are responsible for the enhanced greenhouse effect that is the cause of the global warming that is currently being experienced.

Available data indicate a near consistent rise in the average temperature of the earth, especially since the mid-nineteenth century following the industrial revolution. The

global mean surface temperature has increased by about 0.7°C since the late nineteenth century. The global temperature rose between 1980 and 2000 faster than in any other 20-year period since the beginning of instrumental records.

-
-
-

TO ACCESS ALL THE 6 PAGES OF THIS CHAPTER,
[Click here](#)

Bibliography

- Allaby M. (1994). *Macmillan Dictionary of the Environment*, 4th ed., 377 pp. London: Macmillan.
- Gilpin A. (1986). *Environmental Planning: A Condensed Encyclopedia*, 348 pp. Oxford: Gothard House Publications.
- Houghton J.T. et al., eds. (1996). *Climate Change 1995: The Science of Climate Change*, 572 pp. Cambridge, U.K.: Cambridge University Press, published for the Intergovernmental Panel on Climate Change.
- Houghton J.T. (1997). *Global Warming: The Complete Briefing*, 2nd ed., 251 pp. Cambridge, U.K.: Cambridge University Press.
- Watkins R.T. et al., eds. (1996). *Climate Change 1995: Impacts, Adaptations, and Mitigation of Climate Change: Scientific-Technical Analyses: Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change*, 878 pp. Cambridge, U.K.: Cambridge University Press.