

EFFECTS OF GLOBAL WARMING ON HUMAN CULTURAL DIVERSITY

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Summary

Global climate warming poses risks and challenges to the continuity of the many varied human cultures that exist in relationship to particular, diverse environmental contexts and natural resources. Cultural groups that are already economically and politically disadvantaged may face the greatest dangers and losses. These include indigenous and island populations, ethnic and cultural minorities, and economically impoverished groups. Cultural effects of global warming flow from: agricultural decline and the generation of environmental refugees; disruption of cultural continuity due to increased mortality from infectious diseases, mental dysfunction, stunted child development from malnutrition, and the disruption of family life. Complex interactions exist between military activity and its contribution to environmental pollution, its use of world resources that could be devoted to human social development, and the spiraling cycle of social violence which gravely threatens cultural stability and continuity. All humanity is impoverished when cultural diversity is diminished. To address the cultural effects of global warming, policy and research priorities include alternative energy and transportation, population control and women's social development, and expanded support for organic agriculture not dependent on fossil fuels. Policy-making processes at all levels must be democratized to include all cultural groups in global political and economic decision-making. Principles of social justice require redistribution of wealth so that social resources are directed to poverty alleviation and social development as a key component in worldwide efforts to mitigate and reverse the current climate warming trend.

1. Introduction

Culture includes all physical artifacts, social structures and functions, belief and value orientations exhibited and utilized by identifiable groups of people in specific geographic locations around the world. The diversity of cultures is based on variations in the patterns by which peoples assemble a living society from the elements above. The author's assumptions are that cultural diversity is a positive social good for humanity and that it is an aspect of human values that cannot be reduced to an economic measure. Additionally, just as ecological science proposes that ecosystems with rich varieties of species are stronger (more resistant to destabilization and collapse), this article assumes that varied human societies enrich and strengthen the whole human species. In contemporary studies of the interactions between ecological and human systems many scholars suggest that diverse human societies (especially those indigenous to a region) support and protect ecological diversity. For example, traditional forest and mountain dwellers in various countries have fought intensely to save their forest environments from destruction by external economic interests.

The changes in the global ecosystem caused by climate warming will have profound effects upon the varied human cultures embedded in natural environments. The technologically advanced modern societies have developed in such a way that many people can easily ignore their ultimate dependence on the resources and normal functioning of the natural environment. Societies and cultures that are poorer, by economic measures, are often more directly aware of their dependence on predictable, traditional climate patterns. This article discusses the many cultural impacts of climate change, arguing that economically disadvantaged and vulnerable populations will bear the greatest burden. However, because both ecological and human cultural systems are

inherently linked and interactive, the significant changes occurring in the global climate will eventually have similar significant effects on all classes and cultures across the globe. The impact of climate change may well exceed even the most serious social consequences of past changes in climate or other natural events such as floods or drought.

The social sciences, such as history, sociology, and anthropology, have demonstrated the interactive effects between nature, climate and culture over the centuries of development of human civilizations (see *Climate Changes and their Influence on the Course of Human History*). One need only reflect briefly on the wide differences between, say, Arctic and tropical cultures, to appreciate the depth of these interactions. Contemporary ecological science and the growing sense of “crisis” in the functioning of the global ecosystem have heightened people’s awareness of these relationships. Global warming will alter the climate, seasons, water supplies, and soil quality, in turn affecting both the supply and species of plants and animals in localities and regions. Agriculture, the foundation of civilization, will be the human activity most profoundly affected. The availability of food, and the continuing ability to produce it locally, is the primary challenge to the maintenance of cultural groups around the world. Shifting climate and seasonal patterns threaten food production by contributing to depletion of water and soil supplies and by supporting the mutation and florescence of insects and plant diseases. In turn, famine and food shortages create environmental refugee movements and cause severe retardation of children’s physical and mental development. Dislocated adults, with depleted energy and health status, cannot maintain and pass on cultural practices when they have lost their environmental niche. Relocation in other societies is increasingly difficult, politically. For example, there is resistance to the entry of North Africans in Europe and to Haitians and Mexicans in the United States. Moreover, in a foreign physical and social environment, many elements of cultural diversity, most especially language, are frequently irretrievably modified or lost.

Infectious disease pathogens (such as insects and bacteria) flourish in warmer climates. The cultural diversity of global society is threatened when whole communities are decimated by epidemics of contagious diseases. A sobering picture of what could lie ahead is presented by the current impact of AIDS in several African countries, where as many as 25% of the children in some communities are orphaned. The family is the primary social structure for passing on culture. Entire cultural traditions are destabilized when nuclear and extended families are disrupted or destroyed by massive disease outbreaks.

Global warming will eventually affect all cultural and class groups in every society. However, currently and in the near future, the most serious effects are suffered by the most vulnerable populations: indigenous cultures, economically impoverished groups and societies, and island nations. The latter are of special significance for a consideration of cultural diversity because their long geographic isolation encouraged the development of extraordinarily varied languages and cultures. The predicted rise in ocean level renders them at primary risk of displacement or cultural extinction under the conditions of extreme global warming.

As global warming indirectly contributes to the depletion of natural resources,

especially water and land, local and regional conflicts and violence may escalate. The interactive relationships among environmental depletion, poverty, violence and war around the globe are complex and many-faceted. However, it is quite likely that global warming will exacerbate social unrest and instability through its effects on reduction in resource availability. In turn, war and violence destroy cultural traditions by weakening individual psychosocial capacities and disrupting the family support system and the local community's way of life.

Two key ethical implications of global warming incorporate concerns for maintenance of cultural diversity throughout the world community. First, the wide range of threats to cultural diversity is borne first and most heavily by poor and vulnerable populations, both within and between existing nation-states. The second key ethical concern is that future generations will be deprived of access to their environmental and cultural heritage, which violates intergenerational justice. In both of these results, the social injustice includes the fact that social and economic costs of global warming accrue first and most heavily toward those who benefit the least from industrialized society based on fossil fuels (the primary source of greenhouse gases). The capacity to sustain and pass on diverse human cultures is thus construed as a social justice challenge related to global warming.

Policy responses and research inquiries to mitigate and curb the negative effects of global warming on cultural diversity and continuity must be guided by awareness of the complex interactions between environmental and social problems. Priority areas for research and policy development include: nonpolluting, affordable energy and public transportation development; intensified, culturally appropriate population control initiatives and investment in the social and economic development of women; significantly expanded international aid to reduce poverty and to improve health conditions among the world's most vulnerable populations and cultural groups; and agricultural reform to restore ownership to communal or small family farmers and to promote organic production methods.

2. Global Warming, Agriculture, and Cultural Diversity

The dawn of civilization is associated with the rise of agriculture. The ability to raise surplus food supported the development of cities and the opportunity for larger numbers of people to devote their time and energy to other pursuits associated with the development of civilization, such as religion, art, and commerce. But the diversity of societies and civilizations that have developed over centuries cannot be explained without considering the influence of local ecological resources and overall local environment. The climate and soil, the type of water supplies (fresh or marine), the biotic residents of a local area, and other natural features comprehensively shaped the habits, technology, work, recreation, travel, food, and other cultural adaptations in uniquely different ways around the globe. For example, Asian civilizations were traditionally based on rice; Meso-American on maize; the Inca (Peru) on potatoes, and European on wheat and other cereals. The diffusion of non-native species around the world and the forces of modernity have certainly modified but not completely erased the linkages between varying local and regional ecosystems and the many diverse human societies and cultural groups around the world. One of the primary effects of global

warming on human culture will occur through the modification of agricultural practices.

Throughout most of history the majority of people in every society remained in agriculture as a way of life. Only since the Second World War has the majority of population moved away from agricultural occupation in industrialized societies. In economically poorer, less industrialized societies, the majority continues to be engaged in agriculture. However, this balance is also altering: wars, the industrialization of agriculture (with loss of employment), and depletion of soil and water resources are contributing to the vast movement of rural populations to mega-cities in many poor nations in Africa, Asia, and Latin America. Mexico City, now considered the second largest city in the world, with over 18 million inhabitants, is the leading example of this trend. China has been losing valuable agricultural land to industry and roads, and over 100 million peasants have migrated to cities in the past decade. Other rapidly growing cities include Lagos (Nigeria), Bombay (India), and Sao Paulo (Brazil).

2.1 Threats to Agriculture

Urban culture retains its ultimate dependence on agriculture. But global warming first and most deeply threatens rural populations that remain engaged in various forms of agriculture. Global warming (exacerbated by other factors, such as agricultural technology) poses various threats to agricultural viability. These results could include: soil degradation and erosion, reduction in water supplies, changes in the supply and patterns of occurrence of rainfall, frequency and intensity of storms and other weather events, along with increases in the total numbers and varieties of insect pests and other plant diseases. If these threats materialize, hunger and geographic displacement of human populations and other species may increase significantly (see *Climate Change and Agriculture*).

2.1.1 Changes in Weather and Water Supplies

Scientific estimates are that up to one-quarter of the global cropland may already be severely to moderately degraded. The Intergovernmental Panel on Climate Change (IPCC) in 1996 estimated that nearly all the earth's arid and semiarid lands will become desertified over the next century, if present patterns of expansion continue. Climate change and human and livestock population increases could hasten this trend (see *The Intergovernmental Panel of Climate Change*). The United Nations reports that since 1970, per capita water supplies have decreased by two-thirds. Depleted water supplies affect urban and industrial use, in addition to the impacts on agricultural capacity (see *Effects of Global Warming on Water Resources and Supplies*). Overall, climate experts believe that global warming may contribute to various climate extremes—more frequent and severe droughts or, conversely, excessively heavy and rapid rainfalls, and, an increase in the frequency and intensity of storms of all types. Tens of thousands of people have already died in extreme weather events since the early 1990s. The death of 140 000 from a cyclone in Bangladesh in 1991 may be the worst single disaster (see *Cost Implications of Storms, Floods and Droughts*). Money and time devoted to disaster prevention and response represent resources lost for social and economic development to maintain and enhance dynamic cultures within societies and nations.

2.1.2 Direct Effects of Climate and Weather on Crops and Animals

The alterations in climate patterns and increases in overall temperatures affect crop development in various ways, as different plant species are adapted to bud, pollinate, and grow under certain temperature conditions. Moreover, weeds, insect pests, and plant diseases (fungal and bacterial agents) thrive under warmer conditions and can be expected to become even greater threats, over wider geographic areas if warming patterns, combined with other environmental changes (such as declining water supplies), continue. Animal husbandry is also affected by climate change through impacts on livestock feed, direct effects of weather on animal health and reproduction, a period. Worldwide studies on the effects of climate change on agricultural crop yields, compiled by the IPCC, suggested there will be wide variations by continent and region. In some situations, for example in northern Europe, warmer temperatures may benefit crop yields, but the major worldwide effects are likely to be negative. Losses or changes in the species of plants or animals available to rural economies can significantly weaken cultural patterns imbedded in use of specific varieties for food or ceremonial events. For example, native peoples of the Pacific northwest region of North America may find their cultures considerably threatened by extinction of Pacific salmon, if global warming raises water temperature beyond levels the salmon can tolerate. Plants and animals are more than sources of food; they are central to the composite of distinctive social practices which we label the diversity of cultures.

2.1.3 Effects of Agricultural Change on Vulnerable Human Populations

Given the wide variability of effects, the IPCC concluded that the best way to conceptualize the effects of global warming on agriculture is the notion of “vulnerability.” From this perspective, the populations of sub-Saharan Africa are deemed the most vulnerable, followed by South Asia and East Asia, especially China. Thus, the many diverse rural cultures engaged in agriculture may bear the greatest and earliest burden of a warming world. A growing body of research by scholars and rural activists in many countries reveals the many negative environmental and social consequences of the Green Revolution, which increased agricultural dependence on irrigation and heavy infusions of fertilizers and pesticides derived from fossil fuels. Transfer of land-use practice and types of ownership to the capitalist model, which encourages primary production for export, has impoverished and socially unraveled many rural communities that previously were able to subsist on crops adapted to local soil and climate, for example maize and beans in Mexico and rice and wheat in India. In her 1991 study of the effects of the Green Revolution on agriculture in India, Vandana Shiva traced the roots of social violence in the Punjab region to the introduction of hybrid seeds and concentration of land ownership. The 1990s uprising of the rural peoples of Chiapas, Mexico is centered on agrarian issues, especially the demand for breakup and restoration of large land holdings to peasant ownership and use. The precarious state of agriculture, worldwide, and the impoverishment experienced by rural populations in many countries demonstrate the multifaceted, interactive effects among natural events, anthropogenic environmental change and threats to the viability of the most vulnerable cultural groups.

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Biographical Sketch

Dr. Marie D. Hoff is executive director of Catholic Charities of Idaho, USA. While developing the research for this article, she was professor of social policy and social change methods at Boise State University, Boise, Idaho, USA. She also has served on the faculty of Saint Louis University, St. Louis, Missouri. Dr. Hoff has published books and scholarly articles and has lectured in a wide variety of professional and community settings on the many effects of environmental decline on society and individuals. Her research focus is sustainable community development methods.

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