

Chapter 6

The ecological dimension of globalization

Although we have examined the economic, political, and cultural aspects of globalization separately, it is important to remember that each of these dimensions impacts on and has consequences for the other domains. Nowhere is this more clearly demonstrated than in the ecological dimensions of globalization. In recent years, global environmental issues such as global climate change and transboundary pollution have received enormous attention from research institutes, the media, politicians, economists, and the public in general. The ecological effects of globalization are now recognized as potentially life threatening for life on our planet. The worldwide impact of natural and man-made disasters such as the horrifying nuclear plant accidents at Chernobyl, Ukraine (1986) and Fukushima, Japan (2011) clearly shows that the formidable ecological problems of our time can only be tackled by a global alliance of states and civil society actors.

In the 21st century, it has become virtually impossible to ignore the fact that people everywhere on our planet are inextricably linked to each other through the air they breathe, the climate they depend upon, the food they eat, and the water they drink. In spite of this obvious lesson of interdependence, our planet's ecosystems are subjected to continuous human assault in order to maintain wasteful lifestyles. Indeed, cultural values greatly influence how

people view their natural environment. For example, cultures steeped in Taoist, Buddhist, and various animist religions tend to emphasize the interdependence of all living beings—a perspective that calls for a delicate balance between human wants and ecological needs. Judeo-Christian humanism, on the other hand, contains deeply dualistic values that put humans in control of nature. In Western modernity, the environment has thus come to be considered as a 'resource' to be used instrumentally to fulfil human needs and wants. The most extreme manifestation of this 'anthropocentric' paradigm is reflected in the dominant values and beliefs of consumerism. The capitalist culture industry seeks to convince its global audience that the meaning and chief value of life can be found in the limitless accumulation of material goods. Granted, some of the major ecological challenges the world faces today are problems that afflicted civilizations even in ancient times. But until the coming of the Industrial Revolution, environmental degradation was relatively localized and occurred slowly over many centuries.

In the last few decades, however, the scale, speed, and depth of Earth's environmental decline have been unprecedented. Let us briefly consider some of the most dangerous manifestations of the globalization of environmental degradation.

Two major concerns relate to uncontrolled population growth and lavish consumption patterns in the global North. Since farming economies first came into existence about 480 generations ago, the global population has exploded a thousand-fold to reach nearly 7.5 billion in 2017. Half of this increase has occurred in the last thirty years. With the possible exception of some rodent species, humans are now the most numerous mammals on earth. Vastly increased demands for food, timber, and fibre have put severe pressure on the planet's ecosystems.

Large areas of the Earth's surface, especially in arid and semi-arid regions, have been used for agricultural production for millennia,

yielding crops for ever-increasing numbers of people. Concerns about the relationship between population growth and environmental degradation are frequently focused rather narrowly on aggregate population levels. Yet, the global impact of humans on the environment is as much a function of per capita consumption as it is of overall population size (see Figure K). For example, the United States comprises only 6 per cent of the world's population, yet it consumes 30–40 per cent of our planet's natural resources. Together, regional overconsumption and uncontrolled population growth present a serious problem to the health of our planet. Unless we are willing to change the underlying cultural and religious value structure that sustains these ominous dynamics, the health of Mother Earth is likely to deteriorate further.

Some of the effects of overconsumption and population growth are painfully obvious in the current food crisis plaguing vast regions of our planet. Large-scale food riots in Haiti, Indonesia, the Philippines, China, and Cameroon in the last few years highlight increasing limitations on access to food in part as a result of environmental problems such as drought. Other factors include rising oil prices (which affect the cost of transportation of food), diversion of food staples such as corn into production of biofuels in efforts to reduce reliance on petroleum, and unequal access to resources across developed and developing countries. The current food crisis highlights the interconnections between political, economic, and ecological problems that are accentuated by the process of globalization.

Another significant ecological problem associated with population increases and the globalization of environmental degradation is the worldwide reduction of biodiversity. Seven out of ten biologists today believe that the world is now in the midst of the fastest mass extinction of living species in the 4.5-billion-year history of the planet. According to recent Organization for Economic Cooperation and Development (OECD) reports, two-thirds of the world's farmlands have been rated as 'somewhat degraded' and one-third have been marked as 'strongly degraded'. Half the world's wetlands have already been destroyed, and the biodiversity of freshwater ecosystems is under serious threat. Three-quarters of worldwide genetic diversity in agricultural crop and animal breeds has been lost since 1900. Some experts fear that up to 50 per cent of all plant and animal species—most of them in the global South—will disappear by the end of this century. Hence, many environmentalists have argued that biodiversity should be treated as a planetary asset and held in trust for the benefit of future generations.

Some of the measures currently undertaken to safeguard biodiversity include the creation of hundreds of 'gene banks' located in over a hundred countries around the world. One of

K. Annual consumption patterns (per capita) in selected countries (2012).

Sources: Oil: *CIA World Factbook*, 2012: <<https://www.cia.gov/library/publications/the-world-factbook/index.html>>; Cars: World Bank, 2012: <<http://data.worldbank.org/indicator/ISVEH.NVEH.P3>>; Meat: UN Food and Agriculture Organization, 2010. *Livestock and Fish Primary Equivalent*: <<http://faostat.fao.org/site/291/default.aspx>>; Water: Pacific Institute, *Worldwater.org*: <<http://www.worldwater.org/images/pdf.gif>>

	Annual oil consumption per capita (in litres)	Automobiles per 1,000 people	Annual meat consumption per capita (in kg)	Annual fresh water per capita (in cubic metres)
USA	3,504	808	123	1,518
South Korea	2,606	379	54	525
Finland	2,397	591	73	436
Brazil	572	259	80	297
Egypt	513	43	22	809
Indonesia	302	79	11	356
DR Congo	10	5	5	5

the most spectacular of these banks is the Svalbard Global Seed Vault buried in permafrost in a mountain on the Arctic island of Spitzbergen. Officially opened in 2008, this 'Doomsday Vault' was funded by The Global Crop Diversity Trust (financed by international donors like the Gates and Rockefeller Foundations) and specially designed to store back-up copies of the seeds of the world's major food crops at minus 18 degrees Celsius. Operating like a safety deposit box in a bank, the Global Seed Vault is free of charge to public and private depositors and kept safe by the Norwegian government. But it is doubtful that such laudable 'back-up' measures are sufficient to reverse the escalating loss of biodiversity brought about by humanity's ecological footprint.

Transboundary pollution represents another grave danger to our collective survival. The release of vast amounts of synthetic chemicals into the air and water has created conditions for human and animal life that are outside previous limits of biological experience. For example, chlorofluorocarbons were used in the second half of the 20th century as non-flammable refrigerants, industrial solvents, foaming agents, and aerosol propellants. In the mid-1970s, researchers noted that the unregulated release of CFCs into the air seemed to be depleting Earth's protective ozone layer. A decade later, the discovery of large 'ozone holes' over Tasmania, New Zealand, and large parts of the Antarctic finally resulted in a coordinated international effort to phase out production of CFCs and other ozone-depleting substances. Scientists have warned that the risk of damage to the world's ozone layer has increased as a result of more frequent and severe storms and other 'extreme weather events' associated with global climate change. Other forms of transboundary pollution include industrial emissions of sulphur and nitrogen oxides. Returning to the ground in the form of acid rain, these chemicals damage forests, soils, and freshwater ecosystems. Current acid deposits in Northern Europe and parts of North America are at least twice as high as the critical level suggested by environmental agencies.

Finally, the issue of human-induced climate change has emerged as *the* major focus of domestic and intergovernmental policy as well as grass roots activism. Brought to public attention by former US Vice President Al Gore in the 2000s through his award-winning documentary *An Inconvenient Truth*—as well as the production of numerous scientific reports outlining the dire consequences of unchecked global warming—climate change is clearly one of the top global problems facing humanity today.

But perhaps the most influential recent attempt to raise people's consciousness about the dangers of climate change came from an unexpected quarter: the Vatican in Rome. In September 2015, Pope Francis I stood before the UN General Assembly and issued a radical call for the world to address global warming (see Illustration 13). Connecting the issue of climate change to the wider pursuit of equality, security, and social justice, the pontiff went so far as to send his shoes to the 2015 UNIPCC Climate Summit in Paris, to be displayed at the city's Place de la République together with thousands of shoes of other climate-change protesters as a public symbol to curb carbon emissions (see Box 7).



13. Pope Francis I addresses the UN General Assembly on climate change, 25 September 2015.

Box 7 Pope Francis' s Climate Appeal

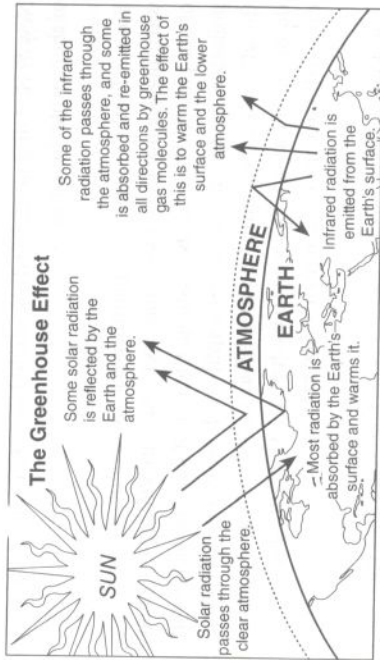
'I urgently appeal, then, for a new dialogue about how we are shaping the future of our planet. We need a conversation which includes everyone, since the environmental challenge we are undergoing, and its human roots, concern and affect us all. The worldwide ecological movement has already made considerable progress and led to the establishment of numerous organizations committed to raising awareness of these challenges. Regrettably, many efforts to seek concrete solutions to the environmental crisis have proved ineffective, not only because of powerful opposition but also because of a more general lack of interest. Obstructionist attitudes, even on the part of believers, can range from denial of the problem to indifference, nonchalant resignation or blind confidence in technical solutions. We require a new and universal solidarity.'

Excerpt from *Laudato Si* ('Praise Be to You'), Encyclical Letter issued by Pope Francis I on 24 May 2015.

Globalization

The consequences of worldwide climate change, especially global warming, could be catastrophic. A large number of scientists worldwide are calling for concerted action by governments to curb greenhouse gas emissions. Indeed, global warming represents a grim example of the decisive shift in both the intensity and extent of contemporary environmental problems. The rapid build-up of gas emissions, including carbon dioxide, methane, nitrous and sulphur oxides, and chlorofluorocarbons, in our planet's atmosphere has greatly enhanced Earth's capacity to trap heat. The resulting 'greenhouse effect' is responsible for raising average temperatures worldwide (see Illustration 14).

The precise effects of global warming are difficult to calculate. Drawing on data collected by NOAA and the UNIPCC, a 2016 National Defense Council report predicts that global average



14. The greenhouse effect.

temperatures in 2100 will be up to 8 degrees Fahrenheit warmer than today—should global emissions continue on their current path. Evidence shows that the decade from 2000 to 2010 was hotter than any other decade in the last 1,300 years. The 'Stern Report', commissioned by the UK government, asserted already in 2007 that average global temperatures had risen by at least 0.5 degrees Celsius based on pre-industrialization temperatures. Higher temperatures are worsening many kinds of extreme weather events, including storms, wild fires, floods, and droughts. And such disasters caused by global climate change not only endanger human lives but cause trillions of dollars of damage.

These significant increases in global temperatures have also led to meltdowns of large chunks of the world's major ice reserves. The polar ice caps have melted faster in the last twenty years than in the last 10,000. The large Greenland ice sheet is shrinking the fastest, and its complete melting would result in a global rise of sea levels of up to 22 feet. However, even a much smaller sea level rise would spell doom for many coastal regions around the world. The small Pacific island nations of Tuvalu and Kiribati, for example, would disappear. Large coastal cities such as Tokyo,

Ocean. Or, perhaps even more horrifying, take the huge floating debris field generated by the devastating Japanese earthquake and tsunami of March 2011 that killed more than 15,000 people across Japan. The disaster caused the partial destruction of the Fukushima Daiichi nuclear plant, in the process allowing the escape of harmful radioactive particles into air and water. Stretching for nearly 2,000 miles and still containing 1.5 million tons of detritus (3.5 million tons have already sunk), this debris field crossed the Pacific in only fifteen months.

It deposited on North America's Pacific coast massive amounts of partially toxic materials such as wall insulation, oil and gas canisters, car tyres, fishing nets, and Styrofoam buoys. Heavier items are drifting underwater and might wash up in years to come. Experts fear that some of these materials might exceed safe levels of radioactivity. The debris field circled back to Hawai'i and Japan, between 2013 and 2016, only to start anew its ominous journey toward the Pacific shores of North America in 2017.

The central feature of all these potentially disastrous environmental problems is that they are 'global', thus making them serious problems for all sentient beings inhabiting our magnificent blue planet. Indeed, transboundary pollution, global warming, climate change, and species extinction are challenges that cannot be contained within national or even regional borders. They do not have isolated causes and effects, for they are caused by aggregate collective human actions and thus require a coordinated global response.

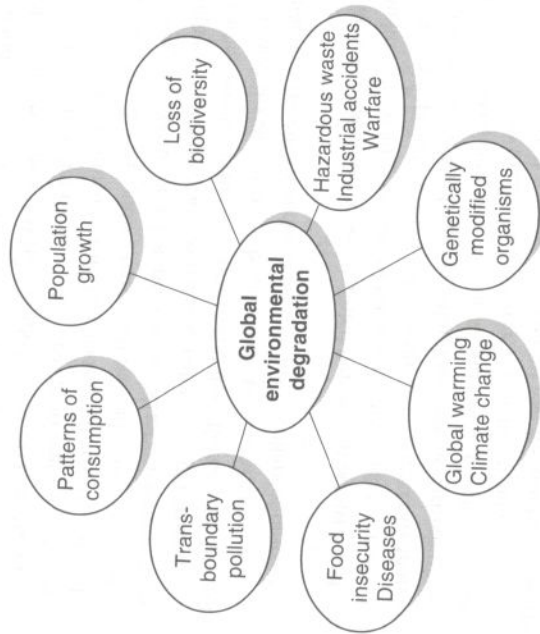
To be sure, ecological problems aggravated by globalization also have significant economic ramifications. Although these effects will be more significant for less developed countries than for rich countries, they will nonetheless affect all people and all nations. Poor countries do not have the necessary infrastructure or income to adapt to the unavoidable climate changes that will occur because of carbon emissions already in the earth's

New York, London, and Sydney would lose significant chunks of their urban landscapes.

But sea level and water temperature rise as a result of global warming are not the only serious problems threatening the health of our planet's oceans. Overfishing, the loss of coral reefs, coastal pollution, acidification, mega-oil spills such as the one following the 2010 BP oil rig explosion in the Gulf of Mexico, and illegal dumping of hazardous wastes have had a devastating impact on Earth's marine environments (see Figure L).

Consider, for example, the 'Great Pacific Garbage Patch'—a gigantic floating mass of often toxic, non-biodegradable plastics and chemical sludge twice the size of Texas that circulates permanently in the powerful currents of the Northern Pacific

Globalization



L. Major manifestations and consequences of global environmental degradation.

atmosphere. As we noted, developing regions are already warmer on average than most developed countries and consequently suffer from a high degree of variability in rainfall. To make matters worse, less developed countries are also heavily dependent on agriculture for the majority of their income. Since agriculture is the most climate sensitive of all economic sectors, developing nations will be more adversely affected by climate change than developed countries.

Further consequences of this vicious circle include increased illnesses, escalating death rates, and crumbling infrastructure. The cost of living will continue to rise, leaving poor households and communities unable to save for future emergencies. Recent scientific reviews like the Stern Report explicitly link the problem of climate change to development and aid provision in poor countries. They will require assistance from the developed world if they are to adapt and survive climate change. Thus, climate change and global warming are not merely environmental or scientific issues. They are economic, political, cultural, but, above all, ethical issues that have been expanded and intensified by the process of globalization.

There has been much debate in public and academic circles about the severity of climate change and the best ways for the global community to respond to it. As can be gleaned from the list of major global environmental treaties, international discussion on the issue of global warming and environmental degradation has been occurring for over thirty years. Yet, while much has been written and spoken about this issue, few coordinated measures have been implemented. Most international environmental treaties still lack effective enforcement mechanisms.

For the most part, political efforts in favour of immediate change have been limited. However, the most significant obstacles to the creation and implementation of an effective global environmental agreement have come from the unwillingness of China and the

United States—the world's two largest polluters—to ratify key agreements. Both nations see measures to reduce carbon emissions and thereby slow global warming as threats to their economic growth. Yet inaction on climate change today will have more dire consequences for economic growth tomorrow (see Figures M and N).

Still, there are some grounds for guarded optimism. For example, significant agreement exists that certain limitations on carbon emissions must be placed on all nations. Some rich countries in the EU—and Australia—managed to impose a national carbon tax on emitters. But poor countries argue that they should not be bound by the same carbon measures or trading schemes as developed countries. They make this argument for two reasons. First, they need to build up their industries and infrastructures in

Country	Total emissions (kilo tons of CO ₂)	Per capita emissions (tonnes per capita)
China (mainland)	10,540,000	7.6
United States of America	5,334,000	16.5
India	2,341,000	1.8
Russian Federation	1,766,000	12.4
Japan	1,278,000	10.1
Germany	767,000	9.3
Islamic Republic of Iran	618,000	7.9
Republic of Korea	610,000	12.3
Canada	565,000	15.9
Brazil	501,000	2.5
Global total	35,669,000	5.0

M. The top ten carbon dioxide emitters, 2014.

Sources: PBL Netherlands Environmental Assessment Agency (2015); Olivier, J. G. J., Janssens-Maenhout, G., Muntean, M., Peters, J. H. A. W., Trends in global CO₂ emissions – 2015 report, JRC report 98184 / PBL report 1803, November 2015; <http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts_per1990-2014>; and <<http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2014>>

other developed countries in its commitments on capping and reducing carbon emissions.

Unfortunately, the next US government did not fundamentally break with the approach of its predecessor. Although President Barack Obama made stronger rhetorical gestures in favour of environmental protection, his actions did not match his words. For example, at the 2009 Copenhagen Climate Summit, Obama acquiesced to unspecified, non-legally binding agreements that fell far short of the Summit's goal to establish a strong and binding global climate agreement.

In the same vein, the much anticipated 2012 UN conference on Sustainable Development in Brazil—known as Rio + 20 because it was held twenty years after the historic 1992 Rio Summit on Climate Change—merely produced toothless documents that paid lip service to a 'common vision' of environmental sustainability but failed to mandate binding emission reduction targets. National states proved themselves to be unwilling to engage in the sort of environmental multilateralism that would produce measurable results in the worldwide struggle against global warming.

In December 2015, however, the UN Framework Convention on Climate Change summit held in Paris, France, proved to be a turning point for action to limit climate change with an expressed objective to move to a zero carbon world within the foreseeable future. Uniting all of the world's nations in a single agreement on tackling climate change for the first time in history, the Paris 'global climate deal' comprised a number of key elements. First, the parties committed themselves to arresting the rise of global temperatures. Second, they pledged to limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil, and oceans can absorb naturally, beginning at some point between 2050 and 2100. Third, countries agreed to review each other's contribution to cutting emissions every five years so as to scale up the challenge. Finally, rich countries

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Year	Million metric tonnes of carbon
1750	3
1800	8
1850	54
1900	534
1950	1,630
2000	23,650
2014	37,500

N. Long-term global CO₂ emissions.

Source: Olivier J. G. J. et al. (2015). Trends in global CO₂ emissions; 2015 Report, The Hague: PBL Netherlands Environmental Assessment Agency; Ipspra: European Commission, Joint Research Centre

order to pull themselves out of poverty. Placing significant carbon emissions restrictions on their industries would seriously impede their economic development. Secondly, they argue that poor countries have not been responsible for the production of most of the greenhouse gases that have caused the current problem. Identifying developed countries as the primary producers of greenhouse gases, they suggest that the major burden for limiting the production of greenhouse gases should fall on the developed world—at least until developing countries have pulled their populations out of extreme poverty.

The United States has expressed strong opposition to these arguments by insisting that all countries should be subjected to the same limitations on carbon emissions. At the Thirteenth Conference of the Parties (COP 13) to the United Nations Framework Convention on Climate Change (UNFCCC) in Bali 2007, the US delegation repeatedly blocked negotiations by demanding that developing countries take more responsibility for their contribution to global warming. At the same time, however, America has been reluctant to enter into any agreement that might slow its own economic growth. Throughout the 2000s, the Bush administration walked away from key international treaties such as the Kyoto Protocol while remaining significantly behind

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promised to help poorer nations by providing 'climate finance' to adapt to climate change and switch to renewable energy. While the final signing of the Paris Agreement in 2016 constitutes an important milestone in the global struggle for environmental sustainability, it nonetheless represents only the first step on the long road to a zero carbon world powered by non-fossil energy sources such as solar, wind, and wave. In 2018, the parties will meet again to assess their progress, with further review meetings scheduled every five years.

In their comprehensive study *Globalization and the Environment* (2013), the Australian political scientists Peter Christoff and Robyn Eckersley have identified five deep-seated and interlocking problems that stand in the way of an effective global environmental treaty system:

1. States have failed to integrate environmental and economic governance at the national level.
2. States have failed to integrate environmental and economic governance at the international level.
3. Powerful social forces continue to resist or co-opt efforts to transform economies and societies in a more ecologically sustainable direction.
4. The neoliberal economic discourse remains globally dominant, undermining sustainable development and ecological modernization discourses and practices.
5. All of the above persists because national and international accountability mechanisms remain weak and inadequate in a globalizing world.

The 2015 Paris agreement only addresses some of these points. Moreover, not all of the provisions of the treaty are legally binding, which means that international peer pressure constitutes the most effective form of enforcement available for addressing domestic

Name of Treaty/Conference	Coverage/protection	Date
UNESCO-World Heritage, Paris	Cultural and natural heritage	1972
UNEP Conference, Stockholm	General environment	1972
CITES, Washington, D.C.	Endangered species	1973
Marine pollution treaty, London	Marine pollution from ships	1978
UN Convention on Law of the Sea	Marine species, pollution	1982
Vienna Protocol	Ozone layer	1985
Montreal Protocol	Ozone layer	1987
Basel Convention	Hazardous wastes	1989
UN 'Rio Summit' on Environmental Climate Change	Biodiversity	1992
Jakarta Mandate	Marine and coastal diversity	1995
Kyoto Protocol	Global warming	1997
Rotterdam Convention	Industrial pollution	1998
Johannesburg World Summit	Ecological sustainability, pollution	2002
Bali Action Plan	Global warming	2007
UN Copenhagen Climate Summit	Global warming	2009
UN Cancun Climate Summit	Global warming	2010
UN Durban Climate Summit	Global warming	2011
UN Rio + 20	Sustainable development	2012
UN Paris Climate Summit	Climate change	2015

O. Major global environmental treaties/conferences, 1972-2015.

activities that are protected by national sovereignty. Thus, the negotiations over climate change serve as an instructive example for how the various dimensions of globalization intersect. In this case political globalization simply has not kept up with the demands of ecological globalization.

But time is of the essence. Some leading scientists believe that a further decade or two of slow, gradual action would make it impossible to avoid the disastrous impacts of climate change and ecological degradation (see Figure O). Confronted with the ill health of our Mother Earth in the second decade of the 21st century, it has become abundantly clear to many people that the contemporary phase of globalization has been the most environmentally destructive period in human history. It remains to be seen, however, whether the growing recognition of the ecological limits of our planet will translate swiftly into profound new forms of political cooperation across borders. As we will discuss in Chapter 7, much depends on challenging a powerful global ideology that is rooted in the utopia of unfettered markets and the desire for the unlimited accumulation and consumption of material things.

Globalization