

The Middle Path to a Greener Future

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The environmental crisis

This short paper discusses Buddhism and the global environmental crisis, including ecological damage.² Should Buddhists care about these issues? Few readers of this essay live on the front line of the environmental crisis, confronting the stark and immense problems it causes. It might be tempting never to think of affected people (and animals), but then might we not create the cause for others one day to be indifferent to us? Similarly, if we start to imagine the life of a slum dweller in a low-lying, flood-prone area or the insecurity of a debt-burdened farmer hoping for rain, then this issue becomes more real, and more pressing.

Many interlinked forms of evidence tell us about the environmental crisis. Here I focus on climate change and the loss of ecosystem integrity. Not discussed are air pollution, the rising price of oil³ and the likelihood that shortage of phosphate fertilizer will continue to drive up global food prices. Some of these issues are recently discussed elsewhere by the writer.⁴

Climate change

Climate change is principally caused by the burning of fossil fuel (oil, coal and gas) and deforestation. It has many manifestations, and this can make the issue seem very confusing to non-specialists. Evidence of climate change includes melting of the polar ice caps, including by increasingly sophisticated and precise satellite measures.⁵ This decline in ice cover is consistent with the basic science and predictions of climate change science, which dates from the nineteenth century when it was first realized that certain trace gases in the atmosphere, such as water vapor,

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² Butler CD. The Global Environmental Crisis and Sustainability of Civilization: Time for the Buddhist World to Awaken. In: Peoples, Dion (editor). *Buddhist Approach to Environmental Crisis*. Bangkok, Thailand: Mahachulalongkornrajavidyalaya University; 2009. p. 216-25. & Akuppa. *Touching the Earth*. Birmingham: Windhorse Publications; 2002.

³ Hall CAS, John W. Day J. Revisiting the limits to growth after peak oil. *American Scientist*. 2009; 97: 230-7.

⁴ Butler CD. Food security in the Asia-Pacific: climate change, phosphorus, ozone and other environmental challenges. *Asia Pacific Journal of Clinical Nutrition*. 2009; 18(4): 590-7

⁵ Allison I, Bindoff NL, Bindshadler RA, Cox PM, Noblet Nd, England MH, et al. *The Copenhagen Diagnosis. Updating the World on the Latest Climate Science*. Sydney, Australia.: The University of New South Wales Climate Change Research Centre (CCRC); 2009

carbon dioxide and methane, acted like a blanket to trap some of the sun's heat in the atmosphere.

Without this "greenhouse" effect, the average global temperature would be about 30 degrees C lower, or a very uncomfortable minus 15 degrees C.⁶ Another convincing form of scientific evidence is the extensively documented changes in the timing of spring and the behavior of birds, insects and the budding of plants.⁷

Why does climate change matter? The average global temperature is predicted to rise by at least 2-4 degrees C by 2100. It could rise by as much as 7 degrees C.⁸ You might think even this rise would be trivial, because the temperature difference between day and night or a cold and warm season is usually more than 7 degrees C. But climate change science predicts this change to occur in the *average* temperature. For one thing, this makes the chance of longer and hotter heat waves far more likely. Heat waves not only reduce economic productivity but also can be harmful - even lethal - to health, especially for people with chronic illnesses and for the poor, who cannot afford air conditioning. In some cases, the poor do not even have an effective right to access adequate water when working in very hot conditions.⁹

Climate change is already changing the distribution of rainfall, with emerging evidence that heavier rainfall events are increasing.¹⁰ Recent examples include the deluge brought by the slow moving typhoon Morakot in August 2009 that struck southern Taiwan, killing people, destroying bridges and flattening crops.¹¹ About 2.5 meters of rain fell in just two days, the highest rainfall in at least five decades. Less than two months later two severe typhoons, Ketsarna and Parma, struck within eight days of each other, flooding a large part of the northern Philippines and displacing over 400,000 people.¹² In a few short weeks, a severe drought in the south-central Indian states of Karnataka and Andhra Pradesh was broken by extremely heavy rains, judged as the greatest in a century. At least one

⁶ Weart SR. The Discovery of Global Warming. Cambridge, MA: Harvard University Press; 2003

⁷ Körner C, Basler D. Phenology Under Global Warming. *Science*. 2010; 327: 1461-2

⁸ Allison I, Bindoff NL, Bindschadler RA, Cox PM, Noblet Nd, England MH, et al. The Copenhagen Diagnosis. Updating the World on the Latest Climate Science. Sydney, Australia.; The University of New South Wales Climate Change Research Centre (CCRC); 2009

⁹ Hajat S, O'Connor M, Kosatsky T. Health effects of hot weather: from awareness of risk factors to effective health protection. *The Lancet*. 2010. & Kjellstrom T. Climate change, direct heat exposure, health and well-being in low and middle-income countries. *Global Health Action*. 2009; 2: <http://www.globalhealthaction.net/index.php/gha/article/viewArticle/1958/2183>

¹⁰ Allison I, Bindoff NL, Bindschadler RA, Cox PM, Noblet Nd, England MH, et al. The Copenhagen Diagnosis. Updating the World on the Latest Climate Science. Sydney, Australia.; The University of New South Wales Climate Change Research Centre (CCRC); 2009

¹¹ Pan CJ, Reddy KK, Lai HC, Yang SS. Role of mixed precipitating cloud systems on the typhoon rainfall. *Annals of Geophysics*. 2010; 28: 11-6

¹² Parry J. Typhoon hits the Philippines, killing more than 280 people. *BMJ*. 2009; 339: b4105

million people became temporarily homeless.¹³ While none of these events can definitely be attributed to climate change, they are consistent with predictions made about climate change. This overall pattern is highly unlikely to be random.

Climate change is also likely to harm food security in a world in which hunger and other forms of malnutrition are already increasing.¹⁴ Finally, climate change is predicted to substantially increase sea level, by at least one meter by 2100.¹⁵ The mechanism for rising sea level is twofold: as the oceans war they expand; secondly the melting ice from Greenland and Antarctica, will releasing large quantities of water into the seas. This water will be fresh, and in the Northern hemisphere this may impair the flow of the Gulf stream, which warms northern Europe.

Sea level rise will be especially problematic for large coastal cities including Bangkok, Ho Chi Minh City and Cairo where, in some cases, sea level rise is already worsened by subsidence, including due to reduce silt deposition due to dams.¹⁶ Sea level rise also threatens to reduce coastal soil fertility (including by salinization and flooding) and thus harm crop yields and livelihoods.¹⁷ It will likely drive large scale migration, causing displaced people to experience unpleasant and extremely limited lives, confined within refugee camps that are little better than prisons.¹⁸

In summary, climate change is a very serious global issue requiring immediate and concerted global action. Even though most Buddhists live in comparatively poor countries whose contribution to climate change is comparatively modest, Buddhists can make many important contributions to slowing the pace of climate change.

Such actions include to reduce the waste of energy use, and to invest in renewable power. Where available, public transport is almost always less harmful to the environment than are private cars. Bicycles are good for fitness, air quality and the environment. However they can be dangerous and unpleasant to use in cities that are crowded with cars. Policy makers however, can slowly over time change the nature of cities to make them more attractive for bicycles and public transport. Enormous energy is also used in the construction of infrastructure, especially if

¹³ Anonymous. No respite from Andhra floods, Karnataka seeks rehab help. 2009 [cited; Available from: http://www.thaindian.com/newsportal/enviornment/no-respite-from-andhra-floods-karnataka-seeks-rehab-help-roundup_100256953.html

¹⁴ Butler CD. Food security in the Asia-Pacific: climate change, phosphorus, ozone and other environmental challenges. *Asia Pacific Journal of Clinical Nutrition*. 2009;18(4): 590-7 & Butler CD. Food security in the Asia-Pacific: Malthus, limits and environmental challenges *Asia Pacific Journal of Clinical Nutrition*. 2009; 18(4): 577-84

¹⁵ Allison I, Bindoff NL, Bindschadler RA, Cox PM, Noblet Nd, England MH, et al. The Copenhagen Diagnosis. Updating the World on the Latest Climate Science. Sydney, Australia.; The University of New South Wales Climate Change Research Centre (CCRC); 2009

¹⁶ Bohannon J. The Nile Delta's Sinking Future. *Science*. 2010; 327: 1444-7

¹⁷ Inman M. Hot, flat, crowded—and preparing for the worst. *Science*. 2009;326: 662-3

¹⁸ Butler CD, Harley DO. Primary, secondary and tertiary effects of the eco-climate crisis: the medical response. *Postgraduate Medical Journal*. (in press)

involving concrete. It is therefore important that such infrastructure is genuinely useful and is also constructed without cheating, so that it remains durable for many years, and can withstand all but the most severe earthquake (if in an earthquake prone area). Of course, maintaining building standards is another form of honesty, a virtue praised by Buddhists and other people of faith. Yet, around the world, there are numerous cases of infrastructure where people have cheated. This waste has an environmental cost as well as being a direct threat to safety.

A mainly vegetarian diet is also less harmful to the climate, especially if meat grown in intensive “landless” farms is avoided. Food from such farms is also generally grown in ways that are very cruel to species, such as chickens, pigs and cattle.

Ecosystem Integrity

There is also a slowly growing understanding of the immense scale of human domination of formerly wild landscapes.¹⁹ All over the world, forests are being replaced by cropland and plantations, such as palm oil, including in large parts of Southeast Asia.²⁰ The resultant tragic loss of species includes some that are highly intelligent and sensitive, like orangutans and other primates.²¹ Other exotic species are harmed and threatened by widespread beliefs in the value of traditional medicines. The number of charismatic large wild animals, such as tigers, snow leopards and pandas is now so low that they can be counted in thousands, or even hundreds.

The Convention on International Trade in Endangered (CITES) has partially restricted trade in some endangered species, but was never designed to protect against such other threats as the inexorable loss of habitat underway, especially in Africa and part of Asia. The recently concluded meeting of CITES (March, 2010) has failed to restrict trade in the bluefin tuna, a seriously endangered marine species.²² This is largely because of the financial and political power of Japan, a country with a substantially Buddhist population. Japanese citizens consume four-fifths of the world’s bluefin tuna and provide a steady market for poorer countries with big fishing industries like Tunisia. Due to the lobbying of Japan and its financially dependent allies, a blocking vote of one third of the 175 members of CITES agreed, effectively, to place trade before conservation, thus corrupting the intent of this convention.

¹⁹ Millennium Ecosystem Assessment. *Living Beyond Our Means. Natural Assets and Human Well-being.* Washington: Island Press; 2005

²⁰ Danielsen F, Beukema H, Burgess ND, Parish F, Brühl CA, Donald PF, et al. *Biofuel Plantations on Forested Lands: Double Jeopardy for Biodiversity and Climate.* Conservation Biology. 2008

²¹ Ceballos G, García A, Ehrlich PR. The Sixth Extinction Crisis. Loss of Animal Populations and Species. *Journal of Cosmology.* 2010;7 & International Union for Conservation of Nature. *Primates in Peril: The World’s 25 Most Endangered Primates, 2008–2010* 2010

²² Editorial. *The Fishing Lobby Wins Again* New York Times. 2010 March 20; Sect. A16

The global population is increasingly over-fishing its oceans, while simultaneously climate change is making those oceans more acidic, thereby reducing the resilience of future fish stocks.²³ Coral reefs are declining globally, a process predicted to quicken because of warmer temperatures and increased ocean acidification.²⁴

These losses of fellow species signify more than the expansion of the human “footprint”. What will it be like for our descendants to inhabit a world in which there are almost no wild natural spaces? No doubt humans can adapt, but it seems likely to impose a heavy spiritual and psychological cost.²⁵

In addition, the loss of “keystone” species will alter the productivity of some systems, such as coral reefs, harming the livelihoods of people dependent on them, like tourist workers and fisherfolk. The widespread conversion of mangroves, often to grow prawns, may also affect humans adversely, since the mangroves act as a buffer against tsunamis, storm surges and cyclones.²⁶ Widespread mixing of species around the world is occurring, including of pathogens (disease-causing agents).²⁷ While much of this traffic and trade in species is beneficial, for example by allowing potatoes from South America to be grown in Africa, some is harmful, such as the spread of Chikungunya and other viruses across an increasing area of the Indian Ocean and parts of Asia.²⁸

Population

Climate change and ecological disruption are primarily driven by human need, greed and selfishness. If the world had limitless resources, our collective avarice and destruction would be harmful but less important than our current situation suggests. In fact, many of the world’s resources will be seriously depleted if current trends of consumption continue.²⁹ Some of these resources are already growing scarce, such as mature forests in Thailand and oil from the North Sea off the

²³ Smith MD, Roheim CA, Crowder LB, Halpern BS, Turnipseed M, Anderson JL, et al. Sustainability and global seafood. *Science*. 2010; 327: 784-6

²⁴ Schuttenberg H, Hoegh-Guldberg O. A World with Corals: What Will It Take? [letter]. *Science*. 2007; 318:* & McNeil BI, Matear RJ. Southern Ocean acidification: A tipping point at 450-ppm atmospheric CO₂. *Proceedings of the National Academy of Science (USA)*. 2008; 105: 18860-4

²⁵ Wilson EO. *The Creation: An Appeal to Save Life on Earth*. New York: W.W. Norton; 2006

²⁶ Primavera JH. Mangroves, fishponds, and the quest for sustainability. *Science*. 2005; 310: 57-9 & Srinivasan UT, Carey SP, Hallstein E, Higgins PAT, Kerr AC, Koteen LE, et al. The debt of nations and the distribution of ecological impacts from human activities. *Proceedings of the National Academy of Sciences*. 2008; 105: 1768-73

²⁷ Anderson PK, Cunningham AA, Patel NG, Morales FJ, Epstein PR, Daszak P. Emerging infectious diseases of plants: pathogen pollution, climate change and agrotechnology drivers. *TRENDS in Ecology and Evolution*. 2004; 19(10): 536-44

²⁸ Charrel RN, Lamballerie Xd, Raoult D. Chikungunya Outbreaks — The Globalization of Vectorborne Diseases. *New England Journal of Medicine*. 2006; 356(8): 769-71

²⁹ Hall CAS, John W. Day J. Revisiting the limits to growth after peak oil. *American Scientist*. 2009; 97:230-7

coast of Britain. Wetlands are limited, as are beautiful beaches, forests and many other species.

Oil is growing more scarce and difficult to recover, as are reserves of natural gas and even coal. The size of the human population, now soaring towards seven billion souls, cannot be ignored as a factor in our evolving crisis.³⁰ Buddhism, unlike Catholicism, has no specific prohibition on contraception. Buddhists can contribute to lifting the taboo on this sensitive topic. A middle way is consistent with small families, especially in today's crowded world. While some countries equate population size with political power, many large countries are desperately poor; high population growth is likely to deepen their poverty and to increase their vulnerability, including to climate change.³¹

Conclusion

We are now in the midst an unfolding eco-social crisis. There is a race between solutions and problems at the global scale.³² Links between scarcity of natural resources and the ancient human responses of resentment, conflict, terrorism and ill-governance threaten the lives of our descendants and perhaps even of ourselves as a species. Yet such human values as co-operation, sharing and peacefulness hint that solutions are still possible.³³

Buddhists have much to contribute, including restrained consumption: a middle path which rejects the waste of resources in displays of wealth designed to gain ephemeral status. Buddhists can instead focus on friendship, good relationships, and meditation. Metta can be extended to the protection of other species, and indeed of whole ecosystems.³⁴ Buddhists can also become more engaged with efforts to slow climate change and improve ecosystem resilience. New electronic forms of communication are slowly allowing a wider dissemination of information and activism.

Buddhists can improve their understanding of science. Science can then be used as a tool for right livelihood, including the benefit other humans, future humans and other species. Science should not be automatically rejected as “anti-religious” or “anti-Buddhist” any more than should a road or a railway. A path has value, so does

³⁰ Butler CD. Human carrying capacity and human health. *Public Library of Science Medicine*. 2004; 1(3): 192-4

³¹ Bryant L, Carver L, Butler CD, Anage A. Climate change and family planning: least developed countries define the agenda. *Bulletin of the World Health Organisation*. 2009; 87:852-7

³² Butler CD. Environmental change, injustice and sustainability. *Journal of Bioethical Inquiry*. 2008; 5(1): 11-9

³³ Walker B, Barrett S, Polasky S, Galaz V, Folke C, Engström G, et al. Looming global-scale failures and missing institutions. *Science*. 2009;325:1345-6

³⁴ Akuppa. *Touching the Earth*. Birmingham: Windhorse Publications; 2002 & Badiner AH, editor. *Dharma Gaia. A Harvest of Essays in Buddhism and Ecology*. Berkeley, CA: Parallax Press; 1990

science. At the same time there is much that science can learn from Buddhism and other faiths. Many scientists still work for the benefit of the military, rather than peace. Many scientists work to destroy rather than conserve. Buddhists who judge scientists by its failing are not being sufficiently critical or discerning. My hope is that, in the world to come, science and religion, including Buddhism, can co-evolve to drive a more humane and sustainable future for us all.