IS GLOBAL WARMING THE NUMBER ONE THREAT TO HUMANITY?

Indur Goklany

The Global Warming Policy Foundation
Briefing Paper No 7

GWPF REPORTS

Views expressed in the publications of the *Global Warming Policy Foundation* are those of the authors, not those of the GWPF, its Trustees, its Academic Advisory Council members or its Directors.

Is Global Warming The Number One Threat To Humanity?

Dr Indur Goklany
Indur Goklany, an independent scholar and author, is co-editor of the Electronic Journal of Sustainable Development. He was a member of the U.S. delegation that established the IPCC and helped develop its First Assessment Report. He subsequently served as an IPCC reviewer. He is a member of the GWPF's Academic Advisory Council.

Acknowledgement

The briefing paper first appeared in the climate change and science blog *Watts Up With That*. It is derived from the following paper: Indur M. Goklany, "Is climate change the number one threat to humanity?" *Wiley Interdisciplinary Reviews: Climate Change*, Volume 3, Issue 6, pages 489–508, November/December 2012. The paper is here republished with the permission of the author. Some minor changes have been made.

Is Global Warming The Number One Threat To Humanity?

Summary

This paper challenges claims that global warming outranks other threats facing humanity through the foreseeable future (assumed to be 2085–2100). World Health Organization and British government-sponsored global impact studies indicate that, relative to other factors, global warming's impact on key determinants of human and environmental well-being should be small through 2085, even under the warmest Intergovernmental Panel on Climate Change (IPCC) scenario. Specifically, over 20 other health risks currently contribute more to death and disease worldwide than global warming. Through 2085, only 13% of mortality from hunger, malaria and extreme weather events (including coastal flooding from sea level rise) should be from warming. Moreover, warming should reduce future global population at risk of water stress, and pressures on ecosystems and biodiversity (by increasing net biome productivity and decreasing habitat conversion). That warming is not fundamental to human well-being is reinforced by lower-bound estimates of net GDP per capita. This measure adjusts GDP downward to account for damages from warming due to market, health and environmental impacts, and risk of catastrophe. For both developing and industrialized countries, net GDP per capita—albeit an imperfect surrogate for human well-being—should be (a) double the current U.S. level by 2100 under the warmest scenario, and (b) lowest under the poorest IPCC scenario but highest under the warmest scenario through 2200. The warmest world, being wealthier, should also have greater capacity to address any problem, including warming. Therefore, other problems and, specifically, lowered economic development, are greater threats to humanity than global warming.

Approach Used

The paper:

(a) Compares the global impacts of global warming through the foreseeable future against the impacts of other factors on key determinants of human and environmental well-being in order to gauge whether the negative impact of warming on these determinants exceeds that due to the other factors.

(b) Checks whether human well-being, as measured by net GDP per capita for developing and developed countries through the foreseeable future (and beyond) is projected to be lower under the warmest scenario (per the IPCC's Special Report on Emission Scenarios, SRES) than under the cooler scenarios.

Foreseeable future is optimistically considered to be 2085-2100 — "optimistic" because future impacts depend upon emission scenarios which are driven by socioeconomic assumptions and projections which arguably "cannot be projected semi-realistically for more than 5–10 years at a time."[1]

The following key determinants of human and environmental well-being are examined:

(a) Human health, based on impacts on mortality via hunger, malaria (a proxy for tropical vector-borne diseases), and extreme weather events,

(b) The global population at risk of water stress, and

(c) Ecological impacts, based on net biome productivity (a measure of carbon sink capacity), habitat lost to cropland (a measure of pressure on ecosystems and biodiversity), and loss of coastal wetland.

The future global impacts of global warming on key determinants are derived from the Fast Track Assessments (FTAs) sponsored by the British

1 Lorenzoni I, and Adger WN. Critique of Treatments of Adaptation Costs in PAGE and FUND Models. In: Warren, R. et al. eds. Spotlighting Impacts Functions in Integrated Assessment Models, Tyndall Centre for Climate Change Research Working Paper 91, Norwich, 2006, 72–79. See p.74.

Government.[2 3 4] Most of the FTA authors also co-authored various chapters of IPCC's Second, Third and Fourth Assessment Reports (AR4). They include, for example, Martin Parry (Chairman, IPCC Working Group II during the preparation of AR4), Nigel Arnell (lead author, LA, water resources chapter, AR4), Robert Nicholls (coordinating LA, coastal systems, AR4), and Sari Kovats (LA, human health, AR4). Not surprisingly, the FTA reports get substantial play in the IPCC reports. I note all this only to emphasize that, from the perspective of those enamored with the "consensus", the provenance of my estimates ought to be impeccable.

Net GDP per capita for each IPCC SRES scenario is estimated by subtracting from the GDP per capita in the absence of any global warming the equivalent losses in GDP per capita from warming due to market, health and environmental impacts, and risk of catastrophe. The specifics of these calculations are detailed in Reference 5.[5] I have attempted to be conservative at each step:

(a) Through 2100, the GDP per capita in the absence of warming is taken directly from the assumptions used to construct each IPCC scenario. Undaunted by the fact that the IPCC scenarios only extended to 2100, the Stern Review provided estimates through 2200.[6] [An obvious example of economists treading where even fools would not dare.] My estimates for the unadjusted GDP per capita, however, assume lower economic growth than does the Stern Review.

(b) Damages from warming are based on the Stern Review's 95th percentile (upper bound) estimate. But the Stern Review's central estimate "lies beyond the 95th percentile—that is, it is an outlier."[7] That is, the damages of warming that I have used are based on an upper bound estimate from a study whose central estimate is itself an outlier. Moreover, the Stern Review's central estimate, like other

2 Parry ML, Livermore M., eds. A new assessment of the global effects of climate change. Global Environmental Change 1999, 9:S1–S107.

3 Arnell NW, Cannell MGR, Hulme M, Kovats RS, Mitchell JFB, Nicholls RJ, Parry ML, Livermore MTJ, White A. The consequences of CO2 stabilization for the impacts of climate change. Climatic Change 2002, 53:413–46.

4 Parry ML, ed. Special issue: an assessment of the global effects of climate change under SRES emissions and socio-economic scenarios. Global Environmental Change 2004, 14:1–99.

5 http://goklany.org/library/Goklany%20Discounting%20the%20future%20Regulation%202009%20v32n1-5.pdf

6 Stern N. The Economics of Climate Change. Her Majesty's Treasury, London, 2006.

7 Tol RSJ. The Social Cost of Carbon: Trends, Outliers and Catastrophes. Economics—the Open-Access, Open-Assessment E-Journal 2008, 2(25):1–24.

studies, overestimates the costs/damages from global warming partly because it does not fully account for increases in future adaptive capacity (see below).

Thus, the net GDP per capita estimates used in the paper should be lower bound estimates.

This paper does not address hypothesized low-probability but potentially high consequence outcomes such as a shutdown of the thermohaline circulation or the melting of the Greenland and Antarctica Ice Sheets, which have been deemed unlikely to occur in the foreseeable future by both the IPCC and the US Global Change Research Program, among others.[8 9 10]

Systematic Biases In Global Warming Impact Studies

The paper notes that global warming impact studies systematically overestimate negative impacts and simultaneously underestimate positive consequences. The net negative impacts, therefore, are likely to be substantially overestimated because these studies fail to consider adequately society's capacity to adapt autonomously to either mitigate or take advantage of climate change impacts.[11 12]

This violates the IPCC's methodological guidelines for impact assessments, which require consideration of autonomous or automatic adaptations. These adaptations depend on, among other things, adaptive capacity, which should advance with time due to the assumption of economic

8 US Global Change Research Program. 2009. Global Climate Change Impacts in the United States, Cambridge University Press, 2009. Cambridge University Press, Cambridge, page 18.

9 Goklany IM. 2009. Trapped Between the Falling Sky and the Rising Seas: The Imagined Terrors of the Impacts of Climate Change. University of Pennsylvania Workshop on Markets & the Environment, December 13 2009.

10 IPCC. Climate Change 2007: The Physical Science Basis. Cambridge University Press, Cambridge, 2007, page 17.

11 Goklany IM. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? Energy & Environment 2007, 18 (7 and 8):1023–1048.

12 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

growth embedded in each IPCC emission scenario (see Figure 1).[13 14 15 16] However, these advances are rarely accounted for fully in impacts assessments. For example, the FTA's water resource study totally ignores adaptive capacity while its malaria study assumes no change in adaptive capacity between the baseline year (1990) and projection year (2085) (see here[17]). Consequently, the assessments are internally inconsistent because future adaptive capacity does not reflect the future economic development used to derive the emission scenarios that underpin global warming estimates.

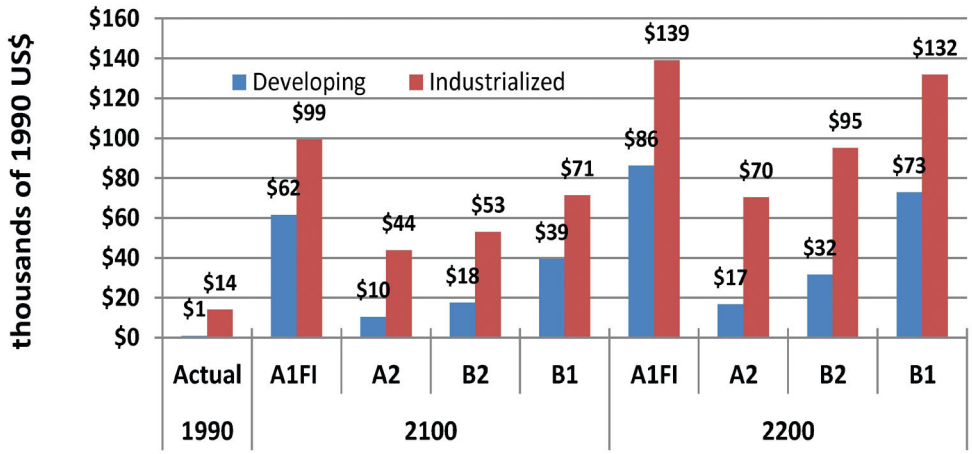

Figure 1: : Net GDP per capita, 1990-2200, after accounting for the upper bound estimates of losses due to global warming for four major IPCC emission and climate scenarios. For 2100 and 2200, the scenarios are arranged from the warmest (A1FI) on the left to the coolest (B1) on the right. The average global temperature increase from 1990 to 2085 for the scenarios are as follows: 4°C for AIFI, 3.3°C for A2, 2.4°C for B2, and 2.1°C for B1. For context, in 2006, GDP per capita for industrialized countries was $19,300; the United States, $30,100; and developing countries, $1,500.[18]

13 Goklany IM. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? Energy & Environment 2007, 18 (7 and 8):1023–1048.

14 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

15 Goklany IM. Discounting the Future. Regulation 2009 (Spring) 32:36-40.

16 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

17 http://goklany.org/library/Richer-but-warmer%20RV.pdf

18 Goklany IM. Discounting the Future. Regulation 2009 (Spring) 32:36-40.

Another source of systematic overestimation of net negative impacts is introduced because impact assessments generally ignore increases in adaptive capacity due to secular technological change. Secular technological change results from the fact that over time:

(a) Existing technologies becomes cheaper (or more cost-effective),

and

(b) New technologies, that are even more cost-effective, become available.[19] [20] [21]

Long-term projections that neglect economic development and secular technological change often overstate impacts by an order of magnitude or more.[22] [23] For example, the FTA's malaria study assumed static adaptive capacity between baseline and projection years (1990–2085).[24] Applying the same assumption to project U.S. deaths in 1970 from various water-related diseases—dysentery, typhoid, paratyphoid, other gastrointestinal disease, malaria—using data from 1900 implies freezing death rates at 1900 levels. But, in fact, from 1900–1970 they declined by 99.6%–100.0%.[25] Similarly, because of the increase in adaptive capacity globally, global death rates from extreme weather events have declined by 98% since the 1920s.[26]

Despite the systematic overestimation of net negative impacts, my paper uses the FTA results without adjusting them downward.

19 Goklany IM. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? Energy & Environment 2007, 18 (7 and 8):1023–1048.

20 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

21 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

22 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

23 Goklany IM. The Improving State of the World. Cato Institute, Washington, DC, 2007.

24 van Lieshout M, Kovats RS, Livermore MTJ, Marten P. Climate change and malaria: analysis of the SRES climate and socio-economic scenarios. Global Environmental Change 2004, 14(1):87–99.

25 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

26 Goklany IM. Deaths and Death Rates from Extreme Weather Events: 1900-2008. Journal of American Physicians and Surgeons 2009, 14 (4):102–09.

Results

Following are the results of the analyses taken from the last two subsections of the WIRE's paper.

Synthesis of impacts on key determinants of human and environmental well-being

Regarding human health, the World Health Organization's latest (2009) study on Global Health Risks provides estimates that indicate that global warming is presently outranked by at least 22 other health risk factors (Figure 2).[27] By 2085, despite using impacts estimates that tend to overestimate net negative impacts, warming is projected to contribute less than one-seventh of the total mortality from hunger, malaria and extreme weather events, even under the warmest IPCC scenario (Figure 3). Thus, global warming is unlikely to be the most important health risk facing mankind in the foreseeable future, notwithstanding claims to the contrary.[28] [29]

With respect to water stress, despite massive population growth, the share of global population with access to safe water and improved sanitation currently continues to increase, and deaths from drought have declined by 99.9% since the 1920s. In the future, water-stressed populations may increase, but largely due to non-climate change factors. However, warming, by itself, may reduce net water-stressed population (Figure 4). Aggressive mitigation to limit the global temperature increase to 2 °C, may, moreover, increase net water-stressed population, relative to the "unmitigated climate change" case.[30]

27 World Health Organization (WHO). Global Health Risks. Geneva: WHO; 2009. http://www.who.int/healthinfo/global_burden_disease/global_health_risks/en/index.html (accessed May 8 2011)

28 Costello A, and University College London-Institute for Global Health and Lancet Commission. Managing the health effects of climate change. Lancet 2009, 373:1693–1733.

29 McMichael AJ, Woodruff RF, Hales S. Climate change and human health: present and future risks. Lancet 2006, 367:859–869.

30 Arnell NW, van Vuuren DP, Isaac M. The implications of climate policy for the impacts of climate change on global water resources. Global Environmental Change 2011, 21:592–603.

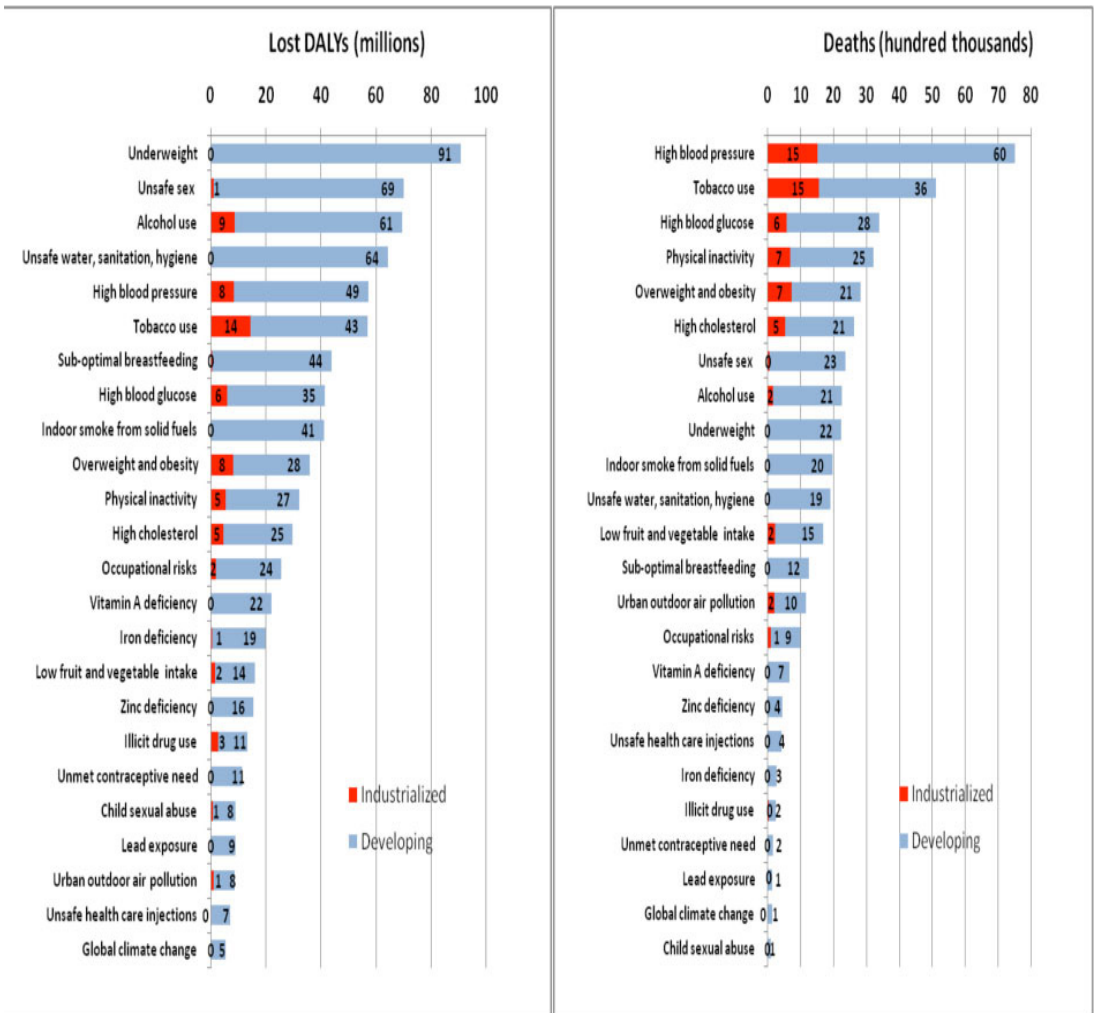

Figure 2: Ranking global public health priorities based on mortality (right hand panel) and disability-adjusted life years (DALYs) lost prematurely (left hand panel) in 2004 for 24 health risk factors. The total length of each bar indicates the magnitude of deaths or lost DALYs globally to the specific health risk factor. For developing countries, the ranking of global warming is unchanged, whereas for industrialized countries it would rank second-last on the basis of deaths, and fourth-last on the basis of lost DALYs.

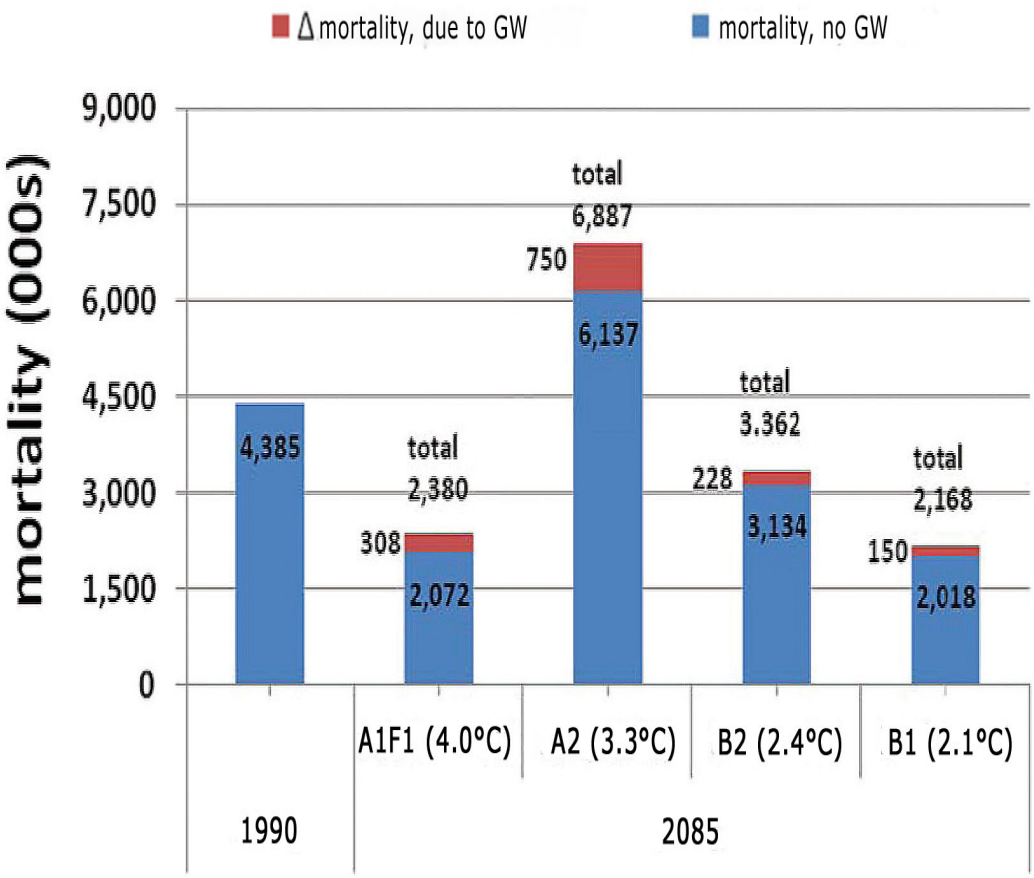

Figure 3. Deaths in 2085 due to Hunger, Malaria and Extreme Events, With and Without Global Warming. Only upper bound estimates are shown for mortality due to global warming. Average global temperature increase from 1990-2085 for each scenario is shown below the relevant bar.

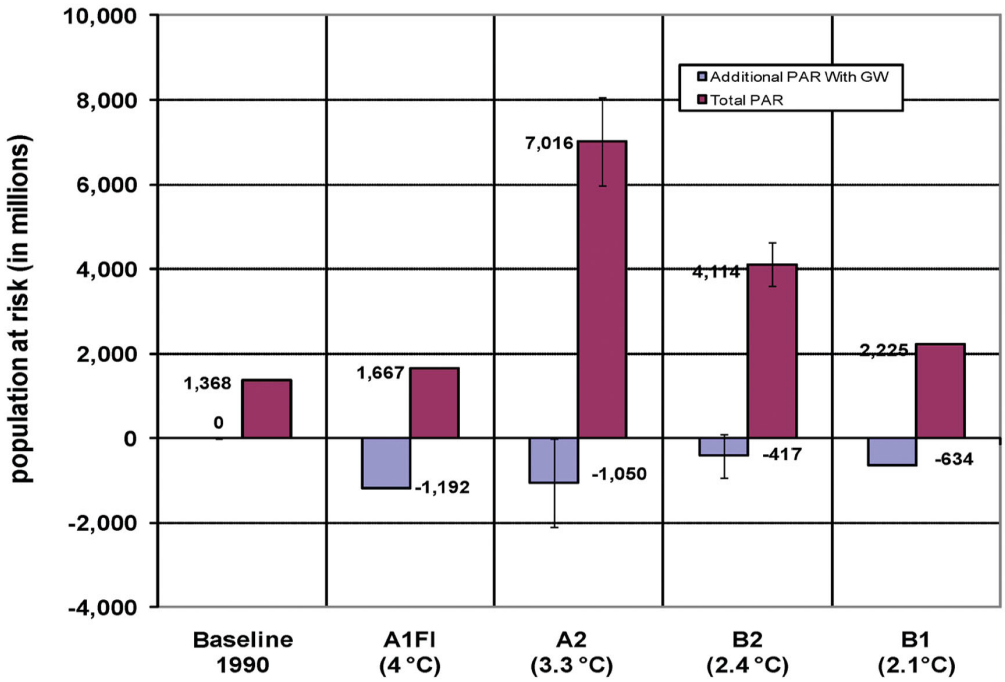

Figure 4. Population at Risk (PAR) from Water Stress in 2085, With and Without Global Warming. The vertical bars indicate the PARs based on the mid-point estimates of several model runs, while the vertical lines indicate the range of estimates.

With respect to ecological impacts through 2100, global warming might (a) increase net biome productivity, which translates into greater vegetation and net carbon sink capacity; and (b) decrease the amount of habitat converted to human use, which would reduce pressures on biodiversity and ecosystems (Table 1). However, coastal wetlands are projected to be further reduced, but more because of non-climate change factors than climate change (Table 1).

		Base-line 1990	A1F1 (warm-est)	A2	B2	B1 (cool-est)
Global temera-ture increase (ΔT) in 2085	de-gree Celsius	0	4.0	3.3	2.4	2.1
Global popula-tion in 2085	billions	5.3	7.9	14.2	10.2	7.9
GDP/capita, global average in 2085	$/cap-ita	3.8	52.6	13.0	20.0	36.6
CO2 concentra-tion in 2100	ppm	353	970	856	621	549
Net Biome Pro-ductivity with cliamte change in 2100	Pg C/ yr	0.7	5.8	5.9	3.1	2.4
Loss of habitat to cropland with climate change in 2100	% of global land area	11.6	5.0	n/a	13.7	7.8
Global losses of coastal wetlands in 2085						
Losses due only to sea level rise	% of cur-rent area	n/a	5-20	3-14	3-15	4-16
Losses due to other causes	% of cur-rent area	n/a	32-62	32-62	11-32	11-32
Combined losses	% of cur-rent area	n/a	35-70	35-68	14-42	14-42

Table 1: Ecological indicators under different scenarios, 2085-2100

These results also indicate that if climate were to be rolled back and frozen at its 1990 level—something that is not feasible with current technology without also risking rolling back economic development

and increasing poverty to levels corresponding to pre-World War II levels—then in 2085, mortality from malaria, hunger and extreme weather events would be reduced by no more than 13%, the net water-stressed population might increase globally, and threats to biodiversity and ecosystems might, likewise, increase.

Thus, in aggregate, while global warming may be important, other factors would have a much greater net adverse impact on human and environmental well-being in the foreseeable future.

Future net GDP per capita and human well-being in a warming world

The above conclusion is reinforced by estimates of future net GDP per capita. Figure 1 [derived using the results of the Stern Review] indicates that net GDP per capita in both developing and industrialized countries should be highest under the richest-but-warmest (A1FI) scenario and lowest under the poorest-but-most-populous (A2) scenario, at least through 2200.

It has been shown elsewhere that improvements in a variety of direct or indirect indicators of human well-being are correlated with GDP per capita.[31] [32] [33] These indicators include life expectancy, infant mortality, food supplies per capita, absence of malnutrition, educational attainment, access to safe water and sanitation, health expenditures, and research and development expenditures. For most of these indicators, the relationship is logarithmic in GDP per capita. Notably, the UN Development Program's (UNDP's) most commonly used Human Development Index (HDI)[34] — which was developed as an indicator of human well-being that would supplement, if not supplant, GDP per capita[35] —is also correlated with (a) GDP per capita with a correlation

31 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

32 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development2009, 1(3).

33 Goklany IM. The Improving State of the World. Cato Institute, Washington, DC, 2007.

34 UN Development Program. 2011. Frequently Asked Questions (FAQs) about the Human Development Index (HDI). http://hdr.undp.org/en/media/FAQs_2011_HDI.pdf (accessed December 23 2011).

35 Sen A. Assessing Human Development: Special Contribution In: United Nations Development Programme (1999). Hu-

coefficient of 0.74, and (b) logarithm of GDP per capita with a coefficient of 0.94 (based on cross country data for 2009).[36] This is to be expected because the logarithm of per capita GDP (or income) is a component of HDI and the other two components are life expectancy and an educational factor, both of which are themselves correlated with the logarithm of GDP per capita.[37] [38]

Accordingly, GDP per capita should itself serve as an approximate indicator for human well-being. And since the Stern Review estimates include losses from market effects, non-market effects from environmental and public health impacts, and the risk of catastrophe, the net GDP per capita shown in Figure 1 should also serve as a useful but imperfect indicator of human well-being that fully considers the effects of unmitigated warming.

In any case, because climate change impacts assessments as a rule do not provide projections of life expectancy and educational factors that could be employed to estimate HDI, future net GDP per capita, despite its imperfections, is perhaps the best one can do for an indicator of future human well-being that also accounts for the impacts of warming.

Figure 1, therefore, indicates that if humanity has a choice, it ought to strive for the developmental path corresponding to the richest scenario notwithstanding any associated global warming.

This should, moreover, have additional knock-on benefits. First, adaptive capacity should be highest under the wealthiest scenario, ceteris paribus.[39] Thus, society's ability to cope with (or take advantage of) any global warming ought to be highest under this scenario. [Note that the upper bound estimates of damages from unmitigated climate change are already factored into the derivation of net GDP per capita.] Second, the health impact of global warming should be least under the richest scenario because this impact is related to poverty, and poverty is most

man Development Report 1999. New York: Oxford University Press, 23.

36 UN Development Program. International Human Development Indicators, 2011. http://hdr.undp.org/en/statistics/hdi/ (accessed November 26 2011).

37 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

38 Goklany IM. The Improving State of the World. Cato Institute, Washington, DC, 2007.

39 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

likely to be eliminated—and eliminated sooner—under this scenario. Third, many health risks that currently rank higher than global warming are also poverty-related (Figure 2). More importantly, the cumulative contribution of various poverty-related diseases to global death and disease is 70–80 times greater than warming. But these diseases are also most likely to be eradicated under the wealthiest-but-warmest scenario. Fourth, mitigative capacity should also be highest under the wealthiest scenario.[40]

Finally, the wealthiest scenario should also have the highest adaptive and mitigative capacities to address not just climate change but any other problem. As shown elsewhere[41] [42] [43], the determinants of human well-being improve with economic and technological development. The relationship is somewhat more complex for environmental determinants: initially these determinants deteriorate, but then go through an environmental transition[44], after which they begin to improve with development.[45] [46] This is why the wealthiest countries generally have a cleaner environment, greater reversion of agricultural lands to nature and, de facto, more stringent environmental protections than developing countries. Given the projections of net GDP per capita (Figure 1), all countries are more likely to be on the right side of the environmental transition by 2100, particularly under the warmest scenario.

A corollary to this is that if greenhouse gas (GHG) policies effectively increase poverty, e.g., by slowing economic growth or increasing the prices of basic needs (such as food to adequately fulfill the body's energy requirements or fuel to maintain safe ambient conditions) then the resulting mortality increases might, given the climate system's inertia, exceed any reductions in these health effects due to GHG reductions for decades.

A case in point is biofuels. Much of the increase in biofuel production

40 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

41 Goklany IM. Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change 2007;doi:10.1007/s11027-007-9098-1.

42 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

43 Goklany IM. The Improving State of the World. Cato Institute, Washington, DC, 2007.

44 http://goklany.org/library/EJSD%202009.pdf

45 Goklany IM. Have increases in population, affluence and technology worsened human and environmental well-being? Electronic Journal of Sustainable Development 2009, 1(3).

46 Goklany IM. The Improving State of the World. Cato Institute, Washington, DC, 2007.

is the result of policies designed to displace fossil fuel consumption, partly due to the perceived need to limit GHG emissions. This has had the unintended consequence of increasing food prices and, indirectly, hunger and poverty in developing countries. The increase in poverty due to increased biofuel production since 2004 in response to such policies is estimated to have increased deaths in 2010 by 192,000 and disease by 6.7 million lost DALYs[47], which exceeds the 141,000 deaths and 5.4 million lost DALYs attributed to warming.[48]

To summarize, climate change is not the world's most important problem. Other problems have a larger negative impact on human and environmental well-being. Reduced economic development, in particular, would be a bigger problem, especially for developing countries. And if climate change policies compromise such development, they too can become problems despite the best intentions. Alternatively, greater economic and technological development would help society deal not only with climate change, but other, higher priority problems simultaneously.

Corollary

Although the paper does not explicitly address the issue of whether the global temperature increase (ΔT) ought to be limited to 2 °C above pre-industrial levels, the analyses presented in the paper indicates that human well-being under the warmest scenario (which is projected to increase temperatures by 4 °C above 1990 by 2085) is higher than under the cooler scenarios, despite substantially overestimating its net negative impacts (at least through 2200). Note that the net GDP per capita analysis on which this is based does consider environmental impacts and the risk of catastrophe, courtesy of the Stern Review.

47 Goklany IM. Could Biofuel Policies Increase Death and Disease in Developing Countries? Journal of American Physicians and Surgeons 16 (1):9–13.

48 World Health Organization (WHO). Global Health Risks. Geneva: WHO; 2009. http://www.who.int/healthinfo/global_burden_disease/global_health_risks/en/index.html (accessed May 8 2011)

The Global Warming Policy Foundation is an all-party and non-party think tank and a registered educational charity which, while open-minded on the contested science of global warming, is deeply concerned about the costs and other implications of many of the policies currently being advocated.

Our main focus is to analyse global warming policies and their economic and other implications. Our aim is to provide the most robust and reliable economic analysis and advice.

Above all we seek to inform the media, politicians and the public, in a newsworthy way, on the subject in general and on the misinformation to which they are all too frequently being subjected at the present time.

The key to the success of the GWPF is the trust and credibility that we have earned in the eyes of a growing number of policy makers, journalists and the interested public.

The GWPF is funded overwhelmingly by voluntary donations from a number of private individuals and charitable trusts. In order to make clear its complete independence, it does not accept gifts from either energy companies or anyone with a significant interest in an energy company.

Published by the Global Warming Policy Foundation

For further information about the GWPF or a print copy of this report contact:

The Global Warming Policy Foundation
1 Carlton House Terrace, London SW1Y 5DB
T 020 7930 6856
M 07553 361717
www.thegwpf.org

Registered in England, no 6962749
Registered with the Charity Commission, no 1131448