Climate Change Cause Area Report

Authors

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Climate Change Cause-Level Investigation

Cause area	Scope / Impact	Neglectedness	Tractability
Climate Change	●●●●●	●	●●

Analysis of Climate Change

Impact (5/5)

Anthropogenic climate change poses a significant threat to human wellbeing on a global scale. It has even been claimed by leading health journals that dealing with expected warming "...could be the greatest global health opportunity of the 21st century...".[1] The Earth's mean surface temperature has already increased by 0.8°C since the beginning of the 20th century,[2] and 0.6°C since only 1980.[3]

This increase in temperature has been attributed primarily to increased concentrations of greenhouse gases in the Earth's atmosphere, which is itself attributed to the release of such gases through human activities such as energy production, agriculture, transport and land clearing.[4] That human activities are the primary driver of this temperature increase has been confirmed by the International Panel on Climate Change with 95% certainty.[5] Based on projected 'business-as-usual' (BAU) emissions scenarios, if emissions from human activities are not significantly reduced, mean surface temperature is expected to increase by 3.6°C by 2100 (with a 90% confidence interval of 2.3-5°C).[6,7]

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[1] Watts, Nick et al. "Health and climate change: policy responses to protect public health." *The Lancet* 386.10006 (2015): 1861-1914.

[2] "Chapter Climate Change 2014 Synthesis Report ... - IPCC." 2015. 12 Jan. 2016 <https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf>

[3] Carlowicz, M. "Global Temperatures - NASA Earth Observatory." 2010. <http://earthobservatory.nasa.gov/Features/WorldOfChange/decadaltemp.php>

[4] "Chapter Climate Change 2014 Synthesis Report ... - IPCC." 2015. 12 Jan. 2016 <https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf>

[5] "Fifth Assessment Report - Climate Change 2013 - IPCC." 2013. 12 Jan. 2016 <http://www.ipcc.ch/report/ar5/wg1/> p5.

[6] "AR5 Synthesis Report - Climate Change 2014 - IPCC." 2015. 12 Jan. 2016 <https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf>

[7] Nielsen-Gammon, J. "What Is Business As Usual? - Climate Change National Forum." 2014. <http://climatechangenationalforum.org/what-is-business-as-usual/>

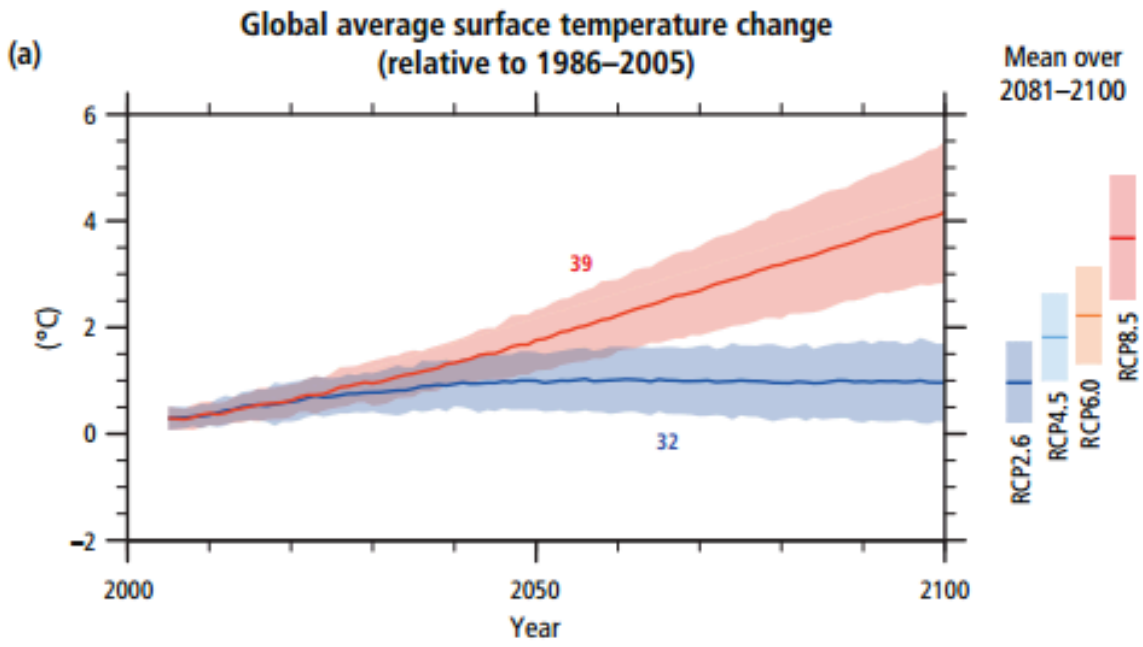


Figure 5

(from IPCC AR5 Synthesis Report): Global average surface temperature change for scenarios RCP2.6 (low emissions) and RCP8.5 (high emissions, high growth)[8]

Extreme Events

The impacts of such a temperature increase would be extensive. For instance, a variety of extreme weather events would increase significantly in both severity and frequency,[9] as has already been observed for periods of extreme heat, heavy precipitation events, fluvial floods, and tropical cyclones.[10] Increased climate variability, also attributed to temperature increases, has already contributed to increased human mortality and greater disruptions both to ecosystems and to human wellbeing through an increased incidence of heat waves, droughts, floods, cyclones and wildfires.[11] From the 0.8°C warming thus far, the increased likelihood of droughts and other such events has had already been felt – the current drought in Ethiopia has already left approximately 425,000 children in need of treatment for severe malnourishment[12] and is expected to leave 15 million in need of food aid.[13] The 2003 European heat wave resulted in

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[8] "Chapter Climate Change 2014 Synthesis Report ... - IPCC." 2015. 12 Jan. 2016 <https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf>

[9] "AR5 Synthesis Report - Climate Change 2014 - IPCC." 2015. 12 Jan. 2016 <https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf>

[10] ibid. p53

[11] ibid. p53

[12] "Ethiopia 2016 Humanitarian Requirements Document - Unicef." 2015. 13 Jan. 2016 <http://reliefweb.int/sites/reliefweb.int/files/resources/ethiopia_hrd_2016.pdf>

[13] "7.5 million going hungry as Ethiopia crisis worsens ..." 2015. 12 Jan. 2016 <http://reliefweb.int/report/ethiopia/75-million-going-hungry-ethiopia-crisis-worsens>

70,000 excess deaths.[14] The 2007-2010 drought in Syria, made 3 times as likely by climate change, led to the migration of up to 1.5 million people from rural to urban areas, and has since contributed significantly to the loss of life in the country's recent civil war.[15]

Apart from exacerbating armed conflicts, such droughts and other extreme events also impact heavily on the poor, with weather events cited as a leading cause of sliding back into poverty in India.[16] The World Bank estimates that by 2030 climate change will have pushed 100 million people back into poverty.[17] It is estimated that, under a BAU scenario, an additional 720 million people will be put at risk of extreme poverty between 2030 and 2050,[18] which is as many as have exited extreme poverty in the past two decades.[19] These effects are expected only to increase further with additional temperature increases.[20]

Food Supply

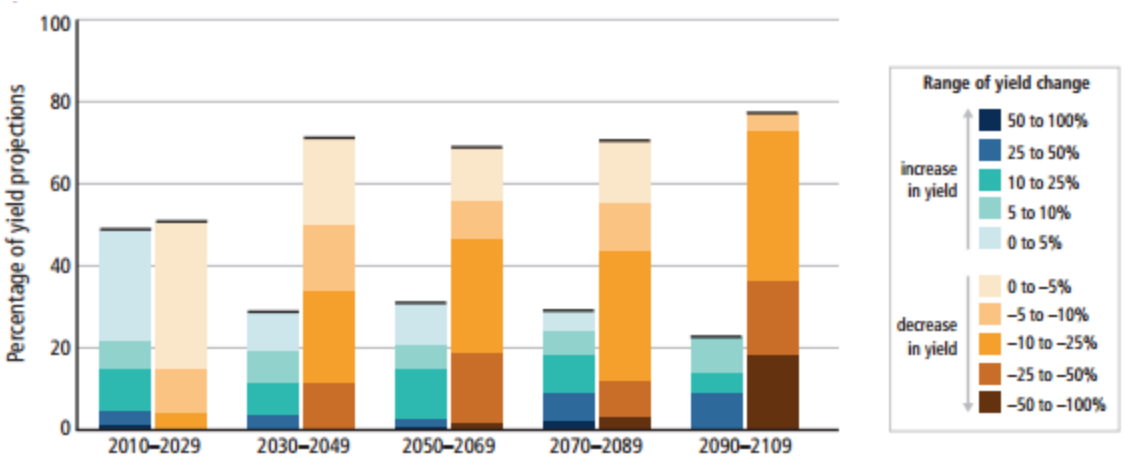


Figure 6 (from IPCC AR5 Synthesis Report): Summary of projected changes in crop yields (mainly wheat, maize, rice and soy), due to climate change over the 21st century.[21]

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[14] Robine, Jean-Marie et al. "Death toll exceeded 70,000 in Europe during the summer of 2003." *Comptes rendus biologies* 331.2 (2008): 171-178.

[15] Kelley, Colin P et al. "Climate change in the Fertile Crescent and implications of the recent Syrian drought." *Proceedings of the National Academy of Sciences* 112.11 (2015): 3241-3246.

[16] Moser, Caroline ON. *Reducing global poverty: The case for asset accumulation*. Caroline ON Moser. Brookings Institution Press, 2008.

[17] Hallegatte, Stephane et al. *Shock Waves: Managing the impacts of climate change on Poverty*. World Bank Publications, 2015.

[18] McFarland, Will, and Chris Hoy. "Zero poverty, zero emissions." (2015).

[19] "PovcalNet - The World Bank Group." 2010. 13 Jan. 2016 <http://iresearch.worldbank.org/PovcalNet/>

[20] McFarland, Will, and Chris Hoy. "Zero poverty, zero emissions." (2015).

[21]

In addition to extreme weather events, climate change is also expected to adversely affect the food supplies of many of the world's poor. Crop yields in Africa are expected to be lowered by 5% with 2°C of warming and 15% if warming increases to 2.5°C.[22] In Sub-Saharan Africa in particular, where up to 60% of household income is spent on food, average food prices are expected to rise 12% by as early as 2030.[23] Worldwide, a meta-analysis of 1,700 different crop yield simulations has shown that there is majority consensus that crop yields will be negatively affected from 2030 onwards and also that a majority of projected decreases will exceed 10% in the latter half of the century.[24] This is made somewhat worse by the result that all of the positive yield changes will occur in temperate regions, so the impact on the vast majority of the world's poor located in equatorial regions will be even greater.[25] These decreases in crop yields and the resultant food shortages are expected to increase undernutrition, micronutrient deficiencies, and stunting in the developing world.[26,27] In particular, by 2050 there will be an additional 25 million children who are undernourished and, by 2030, incidence of severe stunting in Sub-Saharan Africa and south Asia and might increase by 23-62%.[28]

Water Supply

Water shortages are yet another adverse impact of climate change. With the continued reduction of snowpacks due to warming, a large portion of the 2 billion people who currently rely on melting snow for their water supply will be affected.[29] With 2°C of warming, 400 million of these people will be put at risk of water scarcity.[30] Flooding and drought will also affect the availability of safe drinking water in many areas. One effect, which has already been observed in Bangladesh, is the increase in maternal and pre-natal deaths due to (pre)eclampsia and

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[22] "Turn Down The Heat - Documents & Reports - World Bank." 2015. 13 Jan. 2016 <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/07/17/090224b0828c0f20/1_0/Rendered/PDF/Turn0down0the00lience000full0report.pdf>

[23] Hallegatte, Stephane et al. *Shock Waves: Managing the impacts of climate change on Poverty*. World Bank Publications, 2015.

[24] Challinor, AJ et al. "A meta-analysis of crop yield under climate change and adaptation." *Nature Climate Change* 4.4 (2014): 287-291.

[25] ibid.

[26] Hagos, Seifu et al. "Climate change, crop production and child under nutrition in Ethiopia; a longitudinal panel study." *BMC public health* 14.1 (2014): 884.

[27] Hallegatte, Stephane et al. *Shock Waves: Managing the impacts of climate change on Poverty*. World Bank Publications, 2015.

[28] ibid.

[29] Mankin, Justin S et al. "The potential for snow to supply human water demand in the present and future." *Environmental Research Letters* 10.11 (2015): 114016.

[30] "Fifth Assessment Report - Climate Change 2013 - IPCC." 2013. 12 Jan. 2016 <http://www.ipcc.ch/report/ar5/wg1/>

gestational hypertension.[31] Another effect will be an increase in diarrheal illness, with 48,000 additional children expected to die of such illnesses each year by 2030.[32] An increase in temperature will even prevent highly effective low-cost methods of water disinfection from being utilised in many areas where daytime temperatures exceed 45°C.[33]

Disease

Of particular concern, temperature increases are expected to greatly increase the number of deaths due to disease.[34] It has already led to malaria incidence in Nepal increasing by more than 25%[35] and, worldwide, 2-3°C of warming is expected to put 150 million more people at risk for malaria.[36] Cases of Dengue fever are also set to increase enormously (with the potential for epidemics increasing by 31-47% in areas studied),[37] with cases in Sri Lanka already increasing by 600% between 2008 and 2014.[38]

Total Impact

Aggregating only a few of the many adverse effects of climate change, the World Health Organisation estimates that deaths due to increased temperatures reached 150,000 per year in 2000.[39] Even assuming continued progress on health, each year from 2030 to 2050 it is estimated that 38,000 additional deaths will occur due to heat exposure, 48,000 due to diarrhoea, 60,000 due to malaria, and 95,000 due to childhood undernutrition.[40] Excluding the numerous other diseases, extreme weather events, and unrelated factors which are expected to

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[31] Khan AE, Scheelbeek PF, Shilpi AB, Chan Q, Mojumder SK, Rahman A, Haines A, Vineis P. Salinity in drinking water and the risk of (pre)eclampsia and gestational hypertension in coastal Bangladesh: a case-control study. PLoS One. 2014 Sep 30;9(9):e108715. <http://www.ncbi.nlm.nih.gov/pubmed/25268785>

[32] Hallegatte, Stephane et al. *Shock Waves: Managing the impacts of climate change on Poverty*. World Bank Publications, 2015.

[33] Keogh, MB et al. "Capability of 19-L polycarbonate plastic water cooler containers for efficient solar water disinfection (SODIS): Field case studies in India, Bahrain and Spain." *Solar Energy* 116 (2015): 1-11.

[34] World Health Organization. *Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s*. World Health Organization, 2014.

[35] Dhimal, Meghnath, Bodo Ahrens, and Ulrich Kuch. "Climate Change and Spatiotemporal Distributions of Vector-Borne Diseases in Nepal–A Systematic Synthesis of Literature." *PloS one* 10.6 (2015): e0129869.

[36] Hallegatte, Stephane et al. *Shock Waves: Managing the impacts of climate change on Poverty*. World Bank Publications, 2015.

[37] Patz, Jonathan A et al. "Dengue fever epidemic potential as projected by general circulation models of global climate change." *Environmental Health Perspectives* 106.3 (1998): 147.

[38] "Climate change and dengue in Sri Lanka - SciDev.Net ..." 2015. 13 Jan. 2016 <http://www.scidev.net/south-asia/environment/news/climate-change-and-dengue-in-sri-lanka.html>

[39] ANDRONOVA, N. "Chapter 20 GLOBAL CLiMATE CHANGE - World Health ..." 2005. <http://www.who.int/publications/cra/chapters/volume2/1543-1650.pdf>

[40] World Health Organization. *Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s*. World Health Organization, 2014.

contribute heavily to human mortality and morbidity, these four factors are thus expected to lead to 250,000 deaths per year from 2030 to 2050[41] and, without considerable adaptation and further advances, this can be expected to continue indefinitely beyond 2050. Of course, this is likely a considerable underestimate of the effect of climate change on total mortality, due to the many other factors not considered. However, these causes of death would likely constitute a very large portion of the total death toll and, unfortunately, research into this area has not progressed enough to provide a more accurate figure.

Neglectedness (1/5)

Climate change is an area which seems far from neglected - in 2012, global investment in responding to the threat of climate change reached US$359 billion.[42] This exceeds the combined investment directed towards human trafficking ($124 million by OECD nations)[43] and development assistance for addressing mental health ($164 million/year as of 2014)[44] by approximately 1,250 times and demonstrates that the area is far from neglected. Assuming that a reasonably large proportion of that $359 billion is spent cost-effectively, or that even 0.5% is spent on the most high-impact responses to climate change, this indicates that it is extremely unlikely that additional donations will have a sizeable marginal impact.

However, as a factor affecting the impact of donations, neglectedness may not be a necessary condition for donations to a cause area to have a high impact for a low cost. If current investments are made without regard for effectiveness, or if there is sufficient scale and tractability, there may still be opportunities for cost-effective and high-impact charitable interventions. For instance, globally, $6.5 trillion is spent each year on health,[45] approximately $1 trillion of it in non-OECD countries, and yet there is sufficient inefficiency that interventions remain which are both inexpensive and highly effective – for instance, treatment of schistosomiasis in sub-Saharan Africa can be performed for $1.23 per person per year.[46] It is possible that climate change is similar, if the scale of the problem still exceeds the $359 billion of funding which it receives each year and if the interventions which remain are sufficiently cost-effective.

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[41] ibid.

[42] Initiative, Climate Policy. "The Global Landscape of Climate Finance 2013." *CPI Report. Available from: http://climatepolicyinitiative. org/wpcontent/uploads/2013/10/The-Global-Landscape-of-Climate-Finance-2013. pdf [Accessed 3/9/2013]* (2013).

[43] Ucnikova, Martina. "OECD and Modern Slavery: How much aid money is spent to tackle the issue?." *Anti-Trafficking Review* 3 (2014).

[44] "Financing Global Health 2014 - Institute for Health Metrics ..." 2015. 12 Jan. 2016 <http://www.healthdata.org/sites/default/files/files/policy_report/2015/FGH2014/IHME_PolicyReport_FGH_2014_1.pdf>

[45] "WHO | Spending on health: A global overview." 2007. 13 Jan. 2016 <http://www.who.int/mediacentre/factsheets/fs319/en/>

[46] "Schistosomiasis Control Initiative - Giving What We Can." 2015. 13 Jan. 2016 <https://www.givingwhatwecan.org/top-charities/schistosomiasis-control-initiative/>

Tractability (2/5)

The impacts of climate change may be prevented or reduced through philanthropic activities, although the effectiveness of different methods vary greatly. Political advocacy may potentially have the greatest effect, though the probability of success or of having a marginal impact through individual contributions is small and extremely uncertain. Direct actions which reduce emissions have an effect which is a great deal less uncertain but smaller in scale. So too, actions which respond to the impacts of climate change in order to reduce their severity may aim to have smaller impacts but also involve far less uncertainty.

Research into the effectiveness of climate advocacy is extremely sparse, and we have not found any organisations working on climate advocacy which can demonstrate a high probability of success. It is hence impossible to claim any level of tractability through political advocacy.

However, direct action to reduce emissions may be more promising. Studies by the World Health Organisation have indicated that the average cost to human health incurred by greenhouse gas emissions is approximately 1 DALY[47] per 5,000 tonnes of CO_2-equivalent,[48] although this figure is subject to an enormous degree of uncertainty and may be considerably outdated. Nonetheless, based on research to date, it is our current best guess of the health impact per tonne of emissions. If it is accurate, the tractability of climate intervention through such direct action may be quite high. If charitable organisations and carbon offset providers have the capacity to successfully scale up their operations, and provided that the cost of emission reduction is sufficiently low, then reducing emissions through direct action could be extremely tractable. For the organisations which work on this, however, cost-effectiveness is a major problem (see below).

Direct action which responds directly to the adverse impacts of climate change may be a great deal more tractable. Of the 250,000 annual deaths predicted by the WHO to result from climate change, many of these can be prevented more effectively and at much lower cost through proven health interventions rather than advocacy or direct mitigation (see below).

Charities working in this area

Mitigation of climate change through direct action is an area that already receives a great deal of funding in the form of carbon offsets. Such offsets are widely available for approximately US$10.[49,50] Based on the findings of a 2013 investigation by Giving What We Can into 50 different climate change charities, the most cost-effective charity working on mitigation through direct action was Cool Earth[51]. Cool Earth safeguards rainforest by using donated money to help

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[47] This is calculated over the next 200 years and at a discount rate of 3% per year.

[48] Gasper, Des, and S Rocca. "Is an individual's impact on health harm via climate change ethically negligible?." (2014).

[49] "ClimateCare." 2006. 12 Jan. 2016 <http://climatecare.org/>

[50] "Carbon Footprint Ltd - Carbon Management Services ..." 2003. 12 Jan. 2016 <http://www.carbonfootprint.com/>

[51] Mogensen, A. "Cool Earth - Giving What We Can." 12 Jan. 2016 <https://www.givingwhatwecan.org/files/cool%20earth%20report.pdf>

develop rainforest communities economically to a point where they do better by not selling their land to loggers. We estimate that, through these activities, Cool Earth is able to prevent 1t of CO_2 emissions for every $1.34 in donations it receives. This is more than 7 times more cost-effective than the typical carbon offset scheme.

Political advocacy, typically, is an activity which has a comparatively high uncertainty and low chance of success, and for which it is particularly difficult to evaluate the effectiveness.[52] With this in mind, it is nevertheless possible that advocacy initiatives with even a low chance of success may have quite a high value if the scale of the problem they seek to address is sufficiently large. In the case of climate change, given the enormous scale of the problem, it is possible that organisations which work on advocacy might be more effective than those working on direct action. So too, it is entirely possible that they are not, and the extreme level of uncertainty in evaluating this prevents us from firmly recommending any such organisations as more effective than those engaging in direct action.

One charity which has had success through advocacy is Sandbag, which campaigns to improve the EU Emissions Trading Scheme and facilitates the purchase and destruction of permits in this scheme. Prior to 2013, Sandbag had lobbied to have 900 million permits removed from the scheme - the equivalent of 225 million tonnes of CO_2 emissions removed from the permit system.[53] During the time this lobbying took place, Sandbag's budget was $315,000.[54] This suggests that, on average, Sandbag may be able to avert a tonne of CO_2 for $0.0014 through advocacy. However, it is unclear how much Sandbag's lobbying efforts contributed to the removal of those credits. It is also unclear how many more credits Sandbag might be able to remove from the scheme and whether additional donations will improve its ability to achieve this.

Another charity which may appear promising is the Citizens' Climate Lobby, which campaigns to have carbon pricing legislation introduced and enacted in the United States by organising volunteers to approach their congressional representatives.[55] Like Sandbag, it is unclear how effective their lobbying efforts are and whether additional donations will increase their chances of success. Despite extreme uncertainty, however, it does seem plausible that the Citizens' Climate Lobby may be able to achieve significant change at a low cost, as the United States is currently the 2nd highest emitter of greenhouse gases,[56] carbon pricing is considered an

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[52] "Political change | Giving What We Can." 2014. 13 Jan. 2016 <https://www.givingwhatwecan.org/research/charities-area/political-change>

[53] "Sandbag Report - Giving What We Can." 13 Jan. 2016 <https://www.givingwhatwecan.org/sites/givingwhatwecan.org/files/reports/Sandbag%20Report.pdf>

[54] ibid.

[55] "About CCL - Citizens' Climate Lobby." 2014. 13 Jan. 2016 <http://citizensclimatelobby.org/about-ccl/>

[56] Olivier, Jos GJ, Greet Janssens-Maenhout, and Jeroen AHW Peters. *Trends in global CO2 emissions: 2012 Report*. Hague: PBL Netherlands Environmental Assessment Agency, 2012.

effective method of mitigating emissions,[57,58] and it seems quite probable that only political action in the United States could provoke large-scale action from other nations.[59]

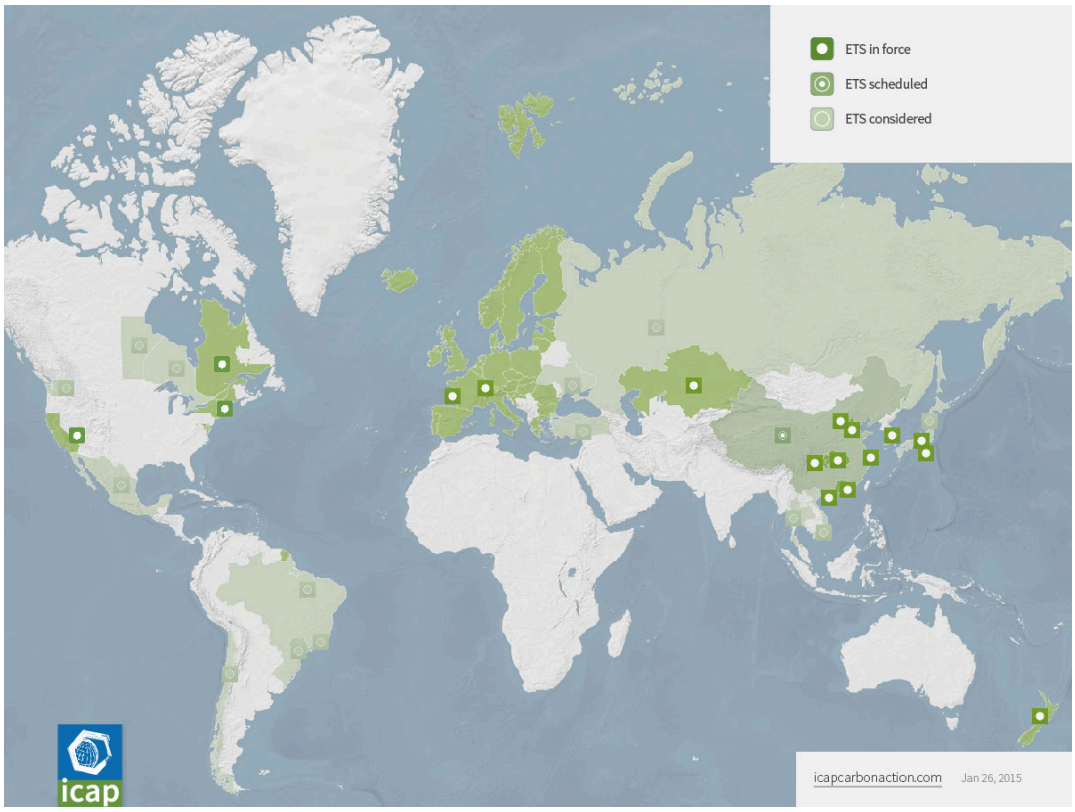


Figure 7 (from International Carbon Action Partnership: Only a few states in the US currently have emissions trading schemes in place

Overall cause assessment

Climate change poses a sizeable threat to human health and wellbeing and is directly attributable to human activities. The scope of the problem is potentially greater than many individual diseases and risk factors which currently influence morbidity and mortality, and warrants a timely and substantial response on the part of governments and institutions which may be able to enact mitigation policies. However, the problem of climate change is far from neglected in terms of investment and, due to a lack of cost-effective interventions which prevent or mitigate climatic change, it is not an area in which there is a great deal of tractability. For individual donors, it appears that the only positive impacts that can be made with any degree of certainty are through direct action into either emission reduction or responding to the adverse effects of climate

[57] "Effective Carbon Prices - Books - OECD iLibrary." 2013. 13 Jan. 2016 <http://www.oecd-ilibrary.org/environment/effective-carbon-prices_9789264196964-en>

[58] Calderón, Silvia et al. "Achieving CO 2 reductions in Colombia: Effects of carbon taxes and abatement targets." *Energy economics* (2015).

[59] Meinshausen, Malte et al. "National post-2020 greenhouse gas targets and diversity-aware leadership." *Nature Climate Change* (2015).

change. There is, however, a large discrepancy in cost-effectiveness between the two methods, with emission reduction providing far less value for money. Responding to the worst effects of climate change, meanwhile, can be done through existing interventions into global health and it is here, due to the cost-effectiveness of existing interventions, that we expect private donations to have the most positive impact.

Charity Recommendations

Cool Earth

Donor fit: Climate change mitigation through direct action

What is the problem?

Emissions of CO_2 contribute to anthropogenic climate change which, in turn, have extensive negative impacts on human health and wellbeing. The World Health Organisation estimates that, by 2030, 250,000 people will die each year due to the effects of climate change.[60] It has also indicated that approximately 1 DALY is incurred for every 5,000t of CO_2-equivalent emitted.[61]

How does this charity address it?

Cool Earth aims to fight global warming through fighting deforestation in the rainforest. They use donated money to help develop rainforest communities economically to a point where they do better by not selling their land to loggers. Cool Earth does not buy rainforest directly, but rather provides economic incentives to make sure the local communities opt not to sell their rainforest to loggers, such as support for sustainable local industries. In addition, the areas of forest selected for protection are selected strategically such that they might block off a much larger area from illegal logging. For instance, the 250,000 acres of rainforest in Ecuador's Awacachi Corridor in Ecuador allow for the protection of an additional 350,000 hectares of forest.

High level evaluation

Cost-effectiveness (2/5) and robustness of evidence (2/5)

As of 2013, Cool Earth had successfully protected 352,091 acres of rainforest at an average cost of $154/acre.[62] At that time, it was estimated that future projects would continue to protect rainforest at a rate of $109-126/acre.[63] Periodic transect sampling performed by Cool Earth and

[60] World Health Organization. *Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s*. World Health Organization, 2014.
[61] Gasper, Des, and S Rocca. "Is an individual's impact on health harm via climate change ethically negligible?." (2014).
[62] "Cool Earth - Giving What We Can." 13 Jan. 2016 <https://www.givingwhatwecan.org/files/cool%20earth%20report.pdf>
[63] ibid.

other research indicates that each acre protected will hold 260 tonnes of CO_2.[64] In addition, due to the price elasticity of wood, protecting forests leads to an increase in demand of less than half.[65] There is also a degree of uncertainty in each of these measurements and, given this, we estimate that Cool Earth reduces CO_2 emissions by 1 tonne for every $1.34 spent. Using the estimate of 5000t of CO_2-equivalent per DALY, it is estimated that Cool Earth is able to avert a DALY for $6700. However, this figure is subject to enormous uncertainty and, due to this, we cannot claim with high degree of confidence that Cool Earth can indeed avert an average of 1 DALY for every $6700 donated.

Cool Earth also estimates that, as of 2016, 5,000,000 additional acres have been shielded for 640,000 acres directly protected.[66] If this is also included in the calculation, the approximate cost per tonne of CO_2 averted is approximately $0.15 and the cost per DALY is $760. Again, however, this is highly uncertain.

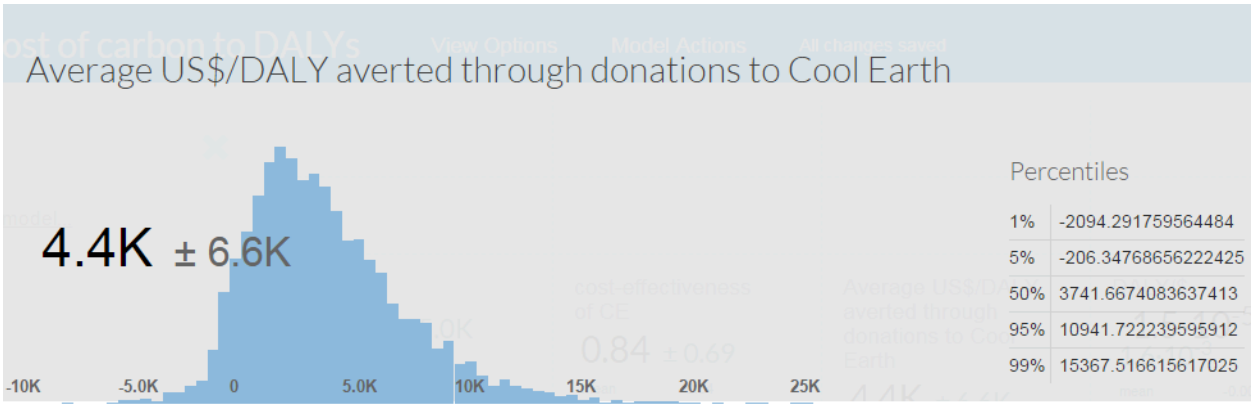


Figure 4: Estimating the average cost per disability adjusted life year averted through donations to Cool Earth, considering uncertainty in both the impacts per tonne of CO_2-equivalent emitted and the cost-effectiveness of Cool Earth's activities. This is based on extremely rough estimates and illustrates the extreme degree of uncertainty in claims about the cost-effectiveness of climate change mitigation.

The interventions of Cool Earth also provide sizeable co-benefits to local communities. They claim to have supported 174 cacao growers and 64 coffee producers to improve their income, allowed 55 lives to be saved through emergency evacuations, reduced incidences of malaria by 60% in some regions, and equipped 14 rainforest schools.[67] Unfortunately, however, Cool Earth could not be contacted to verify these figures, provide independent sources, or give us the total costs for their work up to the present. Likewise, the above estimate of 5,000,000 additional acres of rainforest shielded could not be independently verified.

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[64] ibid.
[65] FAO. "Adjustments to the scenario." 2006. 13 Jan. 2016 <http://www.fao.org/docrep/w4388e/w4388e0y.htm>
[66] "Our Impact - Cool Earth." 2015. 13 Jan. 2016 <https://www.coolearth.org/our-impact/>
[67] ibid.

Quality of implementation (4/5)

Cool Earth monitors protected areas through community rangers and satellite imagery and no deforestation has been detected in Cool Earth's protected areas. This has also been verified by the International Arm of the French Forestry Commission. Nearby forests that were not protected are relevantly similar and have been 30-40% cleared.[68] This indicates that Cool Earth's work has been highly successful in achieving its aims. In addition, no other organisation is doing comparable preservation work which would have spared those same forests if Cool Earth had not been involved and which could not easily move to other forests given Cool Earth's involvement.

Room for more funding (unknown)

As of 2013, Cool Earth required $1.9 million in additional funding to pursue the Ashaninka project, only one of the numerous prospective projects.[69] Since then, Cool Earth has scaled their operations significantly and expanded to the forests of the Democratic Republic of Congo and Papua New Guinea.[70] Cool Earth could not be contacted for the exact funding gap.

Overall evaluation

Of the organisations working on mitigating climate change through direct action (the only means of which evidence suggests is reliable and effective), Cool Earth is one of the most cost-effective. Independent evidence supports their claims of the size of their impact and it can be expected that 1 tonne of CO_2 emissions will be averted for every $0.15-$1.34 donated, although these amounts are subject to a large degree of uncertainty.

[68] from ONF International (International Arm of the French Forestry Commission), 2013.
[69] "Cool Earth - Giving What We Can." 13 Jan. 2016 <https://www.givingwhatwecan.org/files/cool%20earth%20report.pdf>
[70] "Our Projects - Cool Earth." 2015. 13 Jan. 2016 <https://www.coolearth.org/projects/>