

4-1-2006

# Global climate change – a crucial aspect of development planning

Amanda J. Harvey  
*Roger Williams University*

Follow this and additional works at: [http://docs.rwu.edu/cmpd\\_working\\_papers](http://docs.rwu.edu/cmpd_working_papers)

---

## Recommended Citation

Harvey, Amanda J., "Global climate change – a crucial aspect of development planning" (2006). *Macro Center Working Papers*. Paper 24.  
[http://docs.rwu.edu/cmpd\\_working\\_papers/24](http://docs.rwu.edu/cmpd_working_papers/24)

This Article is brought to you for free and open access by the Center For Macro Projects and Diplomacy at DOCS@RWU. It has been accepted for inclusion in Macro Center Working Papers by an authorized administrator of DOCS@RWU. For more information, please contact [mwu@rwu.edu](mailto:mwu@rwu.edu).

## Global Climate Change – A Crucial Aspect of Development Planning

Amanda J. Harvey, Roger Williams University

The phenomenon of global warming, or the increase in the average temperature of the Earth's atmosphere and oceans<sup>1</sup>, has the power to devastate the current efforts towards sustainable development. The climate changes produced by global warming can be partially attributed to natural processes, but these changes are increased and accelerated by greenhouse gases that are the result of human progress<sup>2</sup>. Although it is difficult to predict with certainty the future of the environment, the predictions that have been made with respect to global warming, are based on reliable scientific evidence. Global warming is a genuine threat<sup>3</sup>. The planet is warming at an unprecedented rate, changing climates around the globe and increasing average temperatures and sea levels<sup>4</sup>. Several development plans, including the Millennium Development Goals established by the United Nations, fail to mention the phenomenon of global warming in their rhetoric<sup>5</sup>. This is a mistake, global warming is not a myth, and the development process will suffer immensely if recognition of global warming and its affects on the environment are not factored into development planning<sup>6</sup>.

Indeed, current efforts to promote sustainable development will be negatively affected by global warming, even if the world were to halt the emission of greenhouse gases - which is very unlikely. Due to a delay between the time of emission release, and the way in which emissions harm the atmosphere, if the world were to halt emission production today, the affects would not be seen until about 2050<sup>7</sup>. This, plus the unlikelihood of halting greenhouse emissions in the near future, means the world's attention needs to shift to the much more immediate concern of

---

<sup>1</sup> "Global Warming – Climate" United States Environmental Protection Agency. January 2000. <http://yosemite.epa.gov/oar/globalwarming.nsf/content/climate.html>; Internet.

<sup>2</sup> "Global Warming – Climate" EPA 2000.

<sup>3</sup> Walter, Jonathon; Simms, Andrew. "The End of Development? Global Warming, Disasters and the Great Reversal of Human Progress." New Economics Foundation. 1. [www.neweconomics.org/gen/uploads/e\\_o\\_d.pdf](http://www.neweconomics.org/gen/uploads/e_o_d.pdf). p1; Internet.

<sup>4</sup> "Global Warming – Climate" EPA 2000.

<sup>5</sup> Walter, Simms, "The End of Development? Global Warming, Disasters and the Great Reversal of Human Progress." 1.

<sup>6</sup> Ibid.

<sup>7</sup> Smith, Doug. "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" Environmental Resources Management: Department for International Development. London: October 2002. Annex B, p7. [http://www.erm.com/ERM/Website.nsf/GFN/Volume%20II%20\(Annexes\).pdf/\\$file/Volume%20II%20\(Annexes\).pdf](http://www.erm.com/ERM/Website.nsf/GFN/Volume%20II%20(Annexes).pdf/$file/Volume%20II%20(Annexes).pdf); Internet.

preparing for the environmental effects of global warming. This applies especially to development projects related to water. Put simply, without factoring global warming into the development equation, plans and development projects are not addressing the real needs of the future.

Global warming will have dramatic affects on water resources and water management. A change in level of precipitation will prove to be a large problem in many areas. Precipitation is expected to increase around the world, and by the end of the 21<sup>st</sup> century precipitation levels will have a mean increase of 3.9% globally<sup>8</sup>. A warming of the Earth will bring with it rain storms that have a much higher degree of force, as well as an increase in the frequency and intensity of El Nino-like conditions and tropical storms<sup>9</sup>. Overall, global warming will lead to conditions very similar to El Nino, causing extreme dryness and drought in many areas, as well as extreme rainfall and floods in other areas<sup>10</sup>. Monsoons are expected to become less predictable with changes in severity of the storms and the extent to which they sustain themselves<sup>11</sup>.

These changes across the globe should be cause for immediate concern about drought and flood control issues. Areas that experience flooding will see an increase in the frequency and strength of those floods<sup>12</sup>. Dry regions that become drier as a result of global warming will experience a decrease in soil fertility that will be detrimental in agriculturally sustained areas which, among other things, will increase the demand for irrigation<sup>13</sup>. People in these areas will also face problems obtaining the water necessary for human survival. In areas that experience a moderate or wet climate, and are expected to get wetter, there will be increased flooding in coastal and floodplain areas<sup>14</sup>. Also a risk is the threat of flooding in urban areas. Significant rainfall would be a cause of many serious problems in urban areas where storm drains and water management systems are not up to par<sup>15</sup>. These may be places where heavy rainfall was never before a significant threat, but global warming may serve to change this. In hill covered land, increased

---

<sup>8</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex B, p7.

<sup>9</sup> Ibid., Annex B, p8. – A relatively small increase in the frequency of *actual* El Nino conditions is the prediction.

<sup>10</sup> Ibid., Annex B, p11.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid., Annex E, p5.

<sup>13</sup> Ibid., Annex E, p11.

<sup>14</sup> Ibid., Annex F, p4.

<sup>15</sup> Ibid.

rainfall can be expected to cause an increase in land and mudslides. Heavy rainfall will increase the intensity of these natural disasters where they occur, and may become a new threat to a hill laden area that has never before experienced heavy enough rainfall to be affected<sup>16</sup>. This serves as evidence that there will be an increased need for water management in places that have not viewed it as critical in the past. It also means that there will be a need for greater flood protection and more efficient delivery of water resources in many areas<sup>17</sup>.

Those areas that have development plans in place, or have ongoing projects, may need to reassess their strategies to account for the climate changes that result from global warming. Should they choose to overlook the global warming threat, their efforts may solve the current problem, but the fact that conditions are expected to worsen in many areas may mean that the new project that is expected to provide a permanent solution may only be a veritable band-aid.

Global warming will also affect sea levels. From 3,000 years ago until the start of the 20<sup>th</sup> century, the global sea level remained fairly constant, rising at 0.1-0.2mm per year<sup>18</sup>. Since 1900, the sea level has risen 1-2mm per year, and more surprisingly, since just 1992, the sea level has risen 3mm per year<sup>19</sup>. Rapid increase in sea level, such as that which has been recorded recently, is a serious threat to low lying coastal areas. By 2050, it is predicted that over 25 million people living in these areas will be at high risk<sup>20</sup>. India is ranked as one of the countries that is the most vulnerable to a rise in sea level. The population has settled densely in coastal areas and near river deltas. A rise of just one more meter will displace 7 million people in India and destroy 5,700km<sup>2</sup> of land<sup>21</sup>.

Another problem caused by rising sea levels in many areas, including India, is the encroachment of salt water on coastal land, thus contaminating fresh groundwater that is used for drinking<sup>22</sup>. Salination of this water will render it useless or require the process of desalinization. Countries along the coastlines that depend on coastal agriculture and whose citizens are living within one

---

<sup>16</sup> Ibid.

<sup>17</sup> "Effects of Global Warming" *Science Daily Online*. 2006.

[www.sciencedaily.com/encyclopedia/Effects\\_of\\_Global\\_Warming#Development](http://www.sciencedaily.com/encyclopedia/Effects_of_Global_Warming#Development); Internet.

<sup>18</sup> "Effects of Global Warming" 2006.

<sup>19</sup> Ibid.

<sup>20</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex F, p6.

<sup>21</sup> Ibid., Annex F, p7.

<sup>22</sup> "Effects of Global Warming" 2006.

meter of the sea, such as India, Bangladesh, and several countries in Africa, will bear the burden of this rise in sea level<sup>23</sup>. It can be presumed that areas such as these have coastal defenses, but if global warming is not considered and plans are based only on statistics of past sea level rise, then it will not be noted that the sea level is likely to rise at a more rapid rate than ever before.

Global warming in these areas will not only create a sea level rise, but will also be the cause of more frequent and more intense storm activity than has been seen in the past, thus resulting in a more frequent occurrence of devastating floods and strong winds<sup>24</sup>. Emergency response systems in these areas should also be re-evaluated on the basis of global warming predictions because without the global warming factor, emergency response systems may appear effective due to past successes<sup>25</sup>. And, without considering global warming, the fact that the danger in these areas is going to be much greater in coming years will likely be overlooked, thus leaving emergency response teams unprepared. Insurance options would also be helpful in areas like India and Bangladesh to help offset the cost of governments having to rebuild after storms and flooding<sup>26</sup>. However, although it is a daunting task, relocation of these coastal dwellers to higher, safer land, would be the most productive, and safest option<sup>27</sup>.

Each factor caused by global warming ultimately results from the fact that the temperature of the Earth is rising, thus causing changes in precipitation patterns, storm intensity, and sea levels. The result of this temperature increase over the coming years will be a much higher maximum temperature resulting in more hot days, and a much higher minimum temperature, resulting in less cold days<sup>28</sup>. This increase in warm days and decrease in cold days will impact several areas, some of which have already been discussed, but also including glaciers. Since approximately the year 1900, there has been a 50% loss of glacial surface area<sup>29</sup>. This melting is the cause of flash floods and the overflow of glacial lakes which then serves to make river water flow much more unpredictable. The receding of glaciers is expected to increase as the severity of the global

---

<sup>23</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex F, p7-12.

<sup>24</sup> Ibid., Annex E, p5.

<sup>25</sup> Ibid., Annex F, p12.

<sup>26</sup> Ibid.

<sup>27</sup> Ibid.

<sup>28</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex B, p8.

<sup>29</sup> "Effects of Global Warming" 2006.

warming problem increases<sup>30</sup>. Glacial melt has a negative impact on river systems, which could pose a serious problem to any development projects planned or in progress. The melting causes shifts in the flow of rivers depending on the season. The rivers are also impacted by changes in flow patterns which could potentially result in high flow periods where there once were low, and low flow periods where there once were high. It could also mean that high flow periods become even higher, presenting a flood risk, and that low flow periods become even lower, thus increasing water scarcity issues. This problem could have serious consequences for current water distribution strategies, or those currently in planning stages for the future<sup>31</sup>. If global warming is not considered, the water allocation may not be sufficient for some areas, and may cause an overabundance of water where it is not a significant need.

If the current global warming trends continue, problems such as the above are predicted in many areas. In Asia, for example, the cooler regions are expected to experience amplification in flooding because the warmer temperatures will result in hastening snowmelt. The floods could cause problems for farming in the areas because excess water will prevent the connection of seed to soil. Seeds will likely be washed away<sup>32</sup>. A predicted problem is a lack of storage capacity for excess water, resulting from snowmelt and runoff, to be used when needed in later seasons<sup>33</sup>. If affected areas in Asia have insufficient storage capacity for this excess water that occurs in one given season, they could experience a water scarcity problem in later seasons where normally, snowmelt would still be occurring and providing these areas with water<sup>34</sup>. If these flood waters are managed better, and stored for later use, they will solve two problems. First, by preventing flooding, and second, by providing water that will otherwise be scarce during later seasons. It will save farms from flooding, and then serve to save them from drying out<sup>35</sup>. Without such a plan in place, global warming could be the cause of severe damage in the agricultural abilities of those in Asia.

Latin America and Africa will also face new problems with the oncoming increase in global temperature. The temperature change in Latin America will likely be the cause of a change in the

---

<sup>30</sup> Ibid.

<sup>31</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex E, p4-5.

<sup>32</sup> Ibid., Annex E, p9.

<sup>33</sup> Ibid.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid.

hydrological cycle that the area now experiences. Changes in runoff caused by snowmelt will affect water availability and the degree to which water can be stored in basins and watersheds<sup>36</sup>. In Africa, temperature changes are likely to increase the amount of space taken up by desert land<sup>37</sup>. This, paired with the prediction of variable rainfall, will certainly be life threatening.

Without factoring climate change into the development equation, the world will suffer from inadequate planning. Plans and projects currently underway need to reconfigure their strategy and account for changes that scientists have predicted. These development plans may fix the current problem, but in thirty or forty years the problems of today will be exacerbated by global warming and the developments made will prove to have been only a temporary solution. The world will then be back at square one – or worse. We will return to the table with the same problems and the same questions about a world that is ever-changing. Without considering global warming, aspirations for development are not being given a fighting chance by policymakers and development planners. The gap between science and policy regarding this issue needs to be bridged in order for success<sup>38</sup>.

Put in terms directly relevant to this conference, macro engineering projects intended to better manage water will come up short unless they factor in the consequences of global warming.

---

<sup>36</sup> Smith, "Final Report: Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Volume II" 2002: Annex E, p10-11.

<sup>37</sup> Ibid.

<sup>38</sup> Walter, Simms, "The End of Development? Global Warming, Disasters and the Great Reversal of Human Progress." 14.