

For Reference/Citation

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Are We Appropriately Assigning Causes to Global Warming?

by

Lucio Munoz*

*Independent Comparative Researcher/Consultant, Vancouver, BC, Canada Email: munoz@interchange.ubc.ca

Abstract:

Global warming is a systematic issue driven by natural and human-influenced landscape and gas emission changes that can occur at the same time. Yet, these causes are often looked at separately. This presentation has two goals: (1) to present global warming as a systematic issue through qualitative comparative means; and (2) to use this framework to point out that focusing our attention only on gas emission targets may not be the most appropriate global response for addressing this issue.

Introduction

There is agreement today that both landscape changes and increasing gas emissions into the atmosphere, whether by natural and/or human-influenced processes are connected with the current dynamics of global warming. In other words, natural and anthropocentric activities are affecting atmospheric processes (Graves and Reavey 1996; Reid 2000). And currently, efforts are being directed at devising fair development programs with as little landscape and gas emission impacts and/or as much landscape and gas emission mitigation as possible. For example, the fair and efficient distribution of costs associated with gas emission reduction goals is cited as the central goal of so-called joint implementation programs (IEG 1997; Jackson et al 2001).

Methodology

First, I introduce a global warming mathematical framework based on the interaction of natural and human-influenced landscape and gas emission changes. Second, I outline specific implications derived from this mathematical framework that can be used to demonstrate how attempting to address global warming issues by focusing our attention on gas emission targets only is not an appropriate solution.

Terminology used in this presentation:

W = Global warming

N = Natural factors

N1 = Natural landscape changes

N2 = Natural gas emission changes

H = Human factors

H1 = Human-influenced Landscape changes

H2 = Human-influenced gas emission changes

A system based global warming framework (W)

In general terms, global warming issues (W) are driven by natural landscape changes (N1), natural gas emission changes (N2), human-influenced landscape changes (H1) and human-influenced gas emission changes (H2), all at the same time. For example, volcanic eruptions or weather related catastrophes are taking place at the same time as human-influenced deforestation and industrial production patterns, which lead to landscape changes and gas emission changes at simultaneously. This general situation is expressed by the mathematical formula below:

$$\mathbf{W = N1 \times N2 \times H1 \times H2}$$

This expression can be used to extract relevant general and specific implications such as the following: The general implication is that global warming (W) is clearly a complex issue that requires systematic attention as it is simultaneously affected by natural (N) and human (H) factors. This appears to be consistent with the position taken recently by the Delhi Ministerial Declaration on Climate Change (COP 8/Proposal by the President) when linking climate change concerns and sustainable development issues systematically.

The first implication is that the above formula demonstrates what happens when there is a possibility that natural factors are absent partially ($N = 1$ or $N2 = 1$), or totally ($N1 = N2 = 1$). In this case global warming (W) still could take place driven solely from human influenced factors (H). For example, even if we assume that natural contributions to landscape and gas emission changes are minimal, human global warming can still occur.

So addressing human impacts on global warming is a very important task. The second implication from the above formula is the possibility that even when human factors are absent partially ($H = 1$ or $H_2 = 1$), or totally ($H_1 = H_2 = 1$), global warming (W) still can occur, influenced solely by natural factors (N). For example, even if we were successful in properly managing human impacts, natural global warming can still take place from such forces as volcanic eruptions and the flux of gasses from the ocean. So accounting for natural impacts on global warming is also a very important task.

The third implication from the formula above is the possibility that even when natural and human influenced landscape impacts are absent ($N_1 = H_1 = 1$), global warming (W) still could occur, influenced solely by natural and/or human gas emission impacts (N_2, H_2). In other words, in the absence of landscape changes or under a perfect landscape model, gas emissions from automobile combustion and ocean gas fluxes can still occur, increasing global warming processes. This points to the need to account for and to address all sources of gas emissions. And the fourth implication of the above mathematical relationship is the possibility that even when natural and human gas emission impacts are absent ($N_2 = H_2 = 1$), global warming (W) still can take place, influenced solely by natural and/or human caused landscape changes (N_1, H_1). Thus, in the absence of gas emission impacts or under a minimal natural and human influenced emission development model, landscape change driven global warming can take place. This reveals the situation that focusing global warming efforts only on a set of gas emission targets is not a systematic solution to a systematic problem, as attention should be placed at the same time on landscape impacts; and therefore, it should not be expected to be an appropriate solution.

Conclusion

Addressing global warming issues (W) by focusing our attention only on gas emission targets is not the most appropriate solution, as demonstrated by the mathematical formula above. Landscape changes and their impact on global warming (natural and human influenced) should also be considered. The necessary and sufficient condition to address global warming issues appropriately is the implementation of development programs dealing with natural and human-influenced landscape and gas emission issues at the same time, world-wide. The facts above should be reflected directly in international efforts to link global warming issues and sustainable development; not indirectly as declarations such as the recent Delhi Ministerial Declaration on Climate Change-COP 8/Proposal by the President appears to suggest.

References

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