



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Global Warming and Sustainable Development

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The term "development" implies in a change of direction that represents an improvement of the human condition, "sustainable" implies that this will continue indefinitely or at least for a very long time. One of the main impediments to the continued improvement is global warming, and Amazon is an area that is expected to suffer the worst consequences of climate change, if this change is allowed without making dramatic reductions in greenhouse gas emissions. Global warming affects both the temperature and precipitation, but the changes are very uneven throughout the world. For most of the world, the increased temperatures will bring more rainfall because, in warm oceans, more water evaporates and has to fall somewhere as precipitation. However, in the Amazon this is not expected. Instead, two different phenomena are expected, both exacerbated by global warming, intensifying droughts in the region. One is El Niño, which causes droughts and forest fires in the northern part of the Amazon, such as the Great Fire of Roraima 1997-1998. El Niño is activated by hot water in the Pacific Ocean. A second form of Amazonian drought is activated by hot water in the Atlantic. This causes drought in parts of southern and western Amazonia, as the disastrous drought of 2005. A recent modeling study indicates that the frequency of this type of drought would increase dramatically in the next few years if it is allowed that the atmospheric concentrations of greenhouse gases increase following the pattern of "business-as-always." The annual probability of a drought of the magnitude of the event in 2005 was 5% in 2005 but increases to 50% in 2025 and 90% in 2060. These changes threaten the survival of the Amazon forest and with it the prospects for sustainable development in the region, including the proposal of this author to sustain the rural population of the region based on the environmental services of the forest. Future climate changes in the Amazon depend on decisions on emissions. As one of the countries most threatened by global warming, Brazil should be taking the lead in reducing emissions, with commitments to reduce Amazon deforestation which is the main source of significant emissions of Brazilian greenhouse gases.