

Climate change
versus development:
trade-offs and
synergies

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Introduction

The paper addresses the question of whether it is possible to develop a global strategy for controlling climate change that would simultaneously help to alleviate world poverty and get us back on track to achieve the Millennium Development Goals, or if there is a necessary trade-off between these goals. The answer is twofold. It is argued that there is no a priori conflict between controlling climate change and alleviating world poverty. But it should also be recognised that controlling climate change has very little influence on the achievement of the MDGs by 2015. The actual design of climate change mitigating and adaptation policies will determine if there will be synergies or trade-offs between the dual goals of avoiding climate change impacts and meeting the MDGs beyond 2015.

The dual goals of combating climate change and alleviating poverty

Is it possible to develop a global strategy for controlling climate change that would simultaneously help to alleviate world poverty and get us back on track to achieve the MDGs, or is there a necessary trade-off between these goals? The positive answer to the first part of the question is yes: there is no a priori conflict between controlling climate change and alleviating poverty. The negative answer to the second part of the question is no: a global strategy for controlling climate change will make hardly any difference to achieving the MDGs by 2015. The last part of the question is the most difficult to answer; whether there are synergies or trade-offs between reaching the dual goals will depend on how and

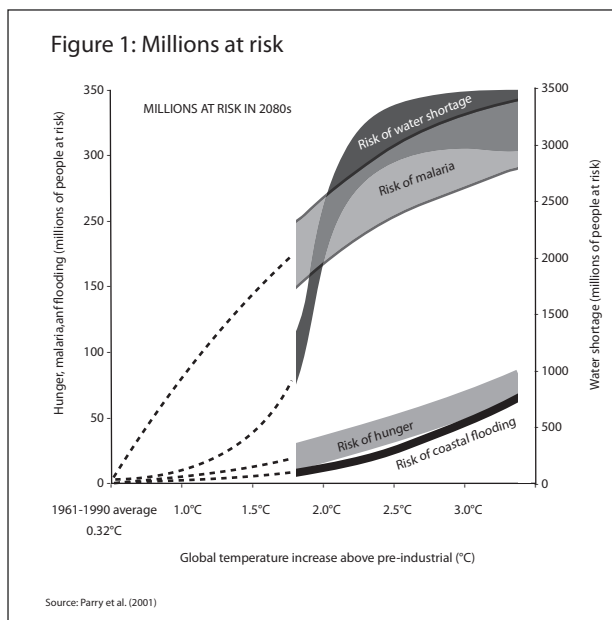
when climate change adaptation and mitigation policies are designed and implemented, and in what ways the living standards of the poor are improved. In the rest of this paper these answers will be elaborated.

Whether there are synergies or trade-offs will depend on how and when climate change adaptation and mitigation policies are designed and implemented

Further climate change is inevitable and the poor are most vulnerable

In 2007, the international debate about climate change made marked progress. The publication of the 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007a, b, c, d), and the awarding of the Nobel Peace Prize to the IPCC and Al Gore catalysed the recognition of climate change as a serious threat by practically all countries, including the United States, China and Australia, through an agreement on joint international action in the Bali Action Plan (UNFCCC 2007). At the same time, the mere posing of the questions in this paper shows that the linkages between the dual goal of alleviating poverty and controlling climate change are increasingly taken seriously (eg UNDP 2003, 2007a). Economic and social development and poverty eradication are mentioned in the first lines of the Bali Action Plan. But is it useful to combine these two important goals, and if so, how? In what ways do they interact? What time scales are we talking about?

Factors that accelerated the political recognition of climate change as an urgent problem were not only the IPCC findings that “warming of the climate system is unequivocal” and that “the global average net effect of human activities since 1750 has been one of warming” (IPCC 2007b), but also that an increasing amount of impacts on physical and biological systems have now been observed (IPCC 2007c). Because of the warming commitment caused by past, present and unavoidable future human activities, further climate changes are inevitable. The poor, and particularly the poor in developing regions, are the most vulnerable to their effects. Regions with the smallest greenhouse gas emissions will be the hardest hit by the effects of climate change and therefore action to limit the risks is imperative. Future climate change impacts will be a function of the level and rate of climate change, but for most realistic future scenarios, they are expected to affect tens to hundreds of millions of people, particularly the poor in the developing world. Impacts include water scarcity, flooding, risks for food security and public health (Figure 1). The EU has adopted a long-term goal of 2°C average global temperature increase to guide climate change control efforts. Beyond that threshold, impacts are projected to increase rapidly, but even below it, significant risks for people and ecosystems exist. How can those risks be reduced?



Protecting people from climate or climate from people?

Limiting the effects of climate change can basically follow two roads: adaptation (initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects: protecting people from climate) and mitigation (implementing policies to reduce greenhouse gas emissions and enhance sinks: protecting climate from people). While in the past, adaptation and mitigation were sometimes portrayed as competing strategies, it is now more widely acknowledged that the two are usually complementary (eg Swart & Raes 2007). The complementarity can be illustrated by considering that the two strategies address different objectives over time. Mitigation can be seen as primarily aiming at avoiding serious large-scale and world-wide impacts over

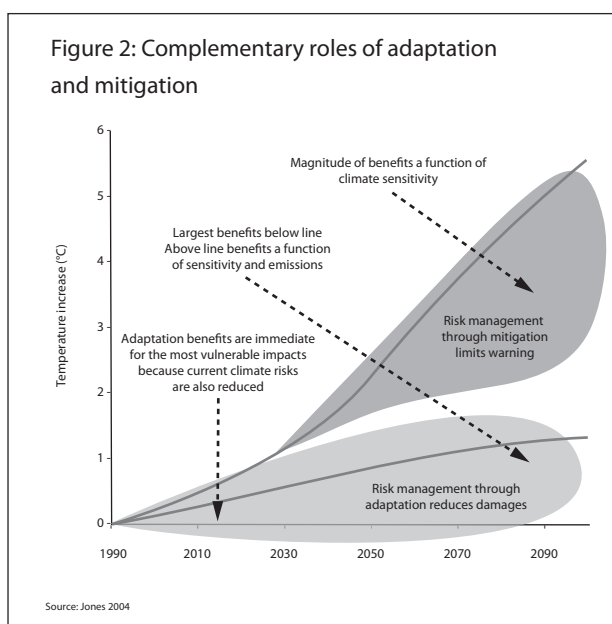
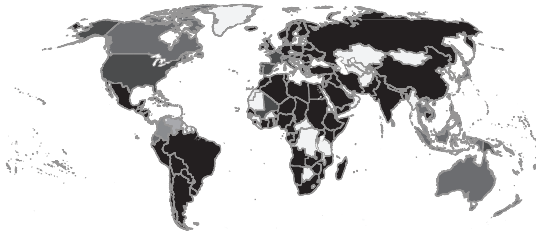
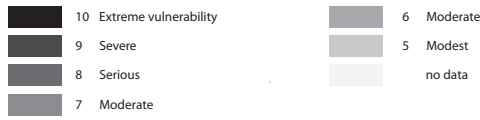
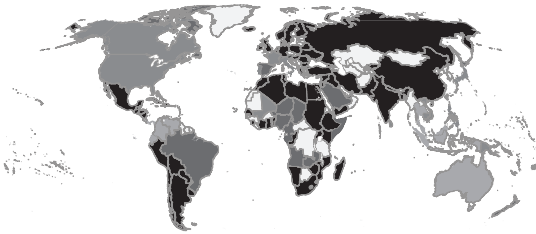


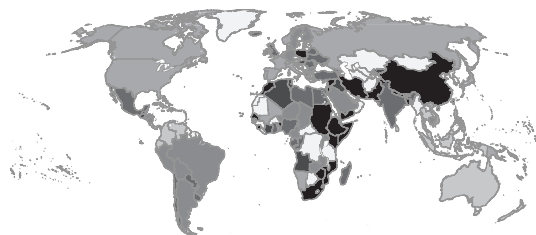
Figure 3: Variability as a function of mitigation and adaptive capacity.



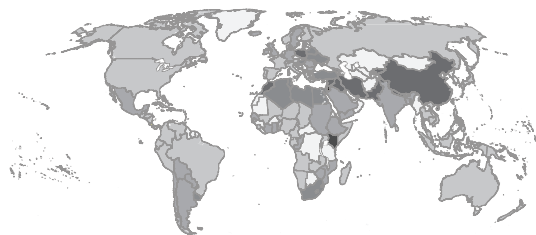
A. Scenario A2 in year 2100 with climate sensitivity equal to 5.5°C
Annual mean temperature with aggregate impacts calibration



B. Scenario A2 in year 2100 with climate sensitivity equal to 5.5°C
Annual mean temperature with aggregate impacts calibration
and enhanced adaptive capacity



C. Scenario A2-550 in year 2100 with climate sensitivity equal to 5.5°C
Annual mean temperature with aggregate impacts calibration



D. Scenario A2-550 in year 2100 with climate sensitivity equal to 5.5°C
Annual mean temperature with aggregate impacts calibration
and enhanced adaptive capacity

Source: Yohe et al. 2007.

the longer term as well as risks of abrupt climate changes (“avoiding the unmanageable”, see also Figure 2). Adaptation can then be seen as addressing the shorter-term remaining impacts caused by climate change and current climate variability (“managing the unavoidable”, wording from the Scientific Expert Group on Climate Change 2007). Thus, reducing vulnerability in the long-term requires both mitigation and adaptation. The latter depends on enhancement of the adaptive capacity of the poor. This is illustrated in Figure 3, in which the level of vulnerability is depicted as a function of the level of adaptive capacity (left panels: low, right panels: high) and level of mitigation (top panels: no mitigation, bottom panels: stabilisation at 550 ppm, Yohe et al 2007).

Another reason that adaptation and mitigation can be considered as complementary response strategies is that the principal sectors involved are often different (energy, industry, building and transport sectors for mitigation; and health, land, water and coastal management for adaptation). In some areas adaptation and mitigation can offer synergies, such as in land and water management (soil protection, forest management, urban design; for a more comprehensive list see Swart & Raes 2007). In other cases there can be trade-offs, often caused by the energy requirements of adaptation options or the potential climate vulnerability of renewable energy options.

Climate change and poverty

Both climate change mitigation and adaptation can be related to poverty and the MDGs. Already at the present time climatic change makes it more difficult to achieve the goals and the associated objectives of poverty eradication and sustainable development. In the longer term, this will be exacerbated. Examples of

Table 1: Climate change will constrain the ability of developing countries to reach their poverty reduction and sustainable development objectives under the UN Millennium Development Goals

MDG	Climate risks
Goal 1: Eradicate extreme hunger and poverty	<p>Changes in natural systems and infrastructure will:</p> <ul style="list-style-type: none"> ● Reduce the livelihood assets of poor people ● Alter the path and rate of national economic growth ● Undermine regional food security
Goal 2: Achieve universal primary education	<p>Climate change could lead to a reduction in the ability of children to participate in full-time education by causing:</p> <ul style="list-style-type: none"> ● Destruction of infrastructure (such as schools) ● Loss of livelihood assets (increasing the need for children to engage in income-earning activities) ● The displacement and migration of families
Goal 3: Promote gender equality	<p>Depletion of natural resources, reduced agricultural productivity and increased climate-related disasters could:</p> <ul style="list-style-type: none"> ● Place additional burdens on women's health ● Limit women's time to participate in decision-making and income-generating activities ● Reduce the livelihood assets of women
Goals 4, 5, and 6: Reduce child mortality, improve maternal health and combat HIV/AIDS, malaria and other diseases	<p>Increased child mortality, reduced maternal health and the undermining of the nutritional health needed by individuals to combat HIV/Aids are expected to occur as a result of climate change-induced:</p> <ul style="list-style-type: none"> ● Extreme weather events ● Increase in prevalence of certain vector-borne and water-borne diseases ● Heat-related mortality ● Declining food security ● Decreased availability of potable water
Goal 7: Ensure environmental sustainability	<p>Climate change will have a direct impact on environmental sustainability because it:</p> <ul style="list-style-type: none"> ● Causes fundamental alterations in ecosystem relationships ● Changes the quality and quantity of natural resources ● Reduces ecosystem productivity
Goal 8: Develop a global partnership for development	<p>Climate change threatens to exacerbate current challenges to the achievement of the MDGs. Funding for development and adaptation must be greatly increased to meet the needs of the poor.</p>

Source: UNDP 2007

factors frustrating the achievement of the MDGs include decreased food security through changing precipitation patterns and associated crop yields, slower economic growth through health impacts and climate-related migration, additional stresses on gender equality, and impacts through decreased access to safe drinking water (see also Table 1, and UNDP 2003, 2007). Especially in sub-Saharan countries, which are already experiencing the most serious problems in meeting the MDGs, climate change stresses will constrain MDGs attainment (Boko

et al 2007). Can adaptation and mitigation help in alleviating poverty, and more specifically, achieving the MDGs?

Adaptation and MDGs

Many of the determinants of adaptive capacity and sustainable development, including its economic and social dimensions, are similar. Hence, in general enhancing adaptive capacity and actual adaptation action can be considered to help meet the MDGs in regions that are vulnerable to climate change. Although the UNFCCC defines adaptation in the context of anthropogenic climate change, in practice it is more meaningful to apply a broader definition of adaptation, encompassing climate change in general and even current climate variability. Also in practice, vulnerability to climate change and climate variability is often related to climate extremes such as storms, floods and prolonged droughts, particularly in the developing countries. In this context adaptation is closely tied to disaster preparedness and prevention at the local level (eg IISD et al 2005, Red Cross/Red Crescent 2007). Climate change adaptation should be taken into account in programmes aiming at meeting the MDGs to avoid increased vulnerability (eg taking into account increasingly erratic weather conditions in rural development planning, avoidance of constructing health facilities in vulnerable areas, etc). In some industrialised countries climate change is increasingly seen as an opportunity as well as a threat (eg flood control combined with increased access to fresh water resources, nature protection, and recreation; improvement of health facilities for senior citizens; attractive new urban designs etc). Also, in developing countries adaptation options can possibly be identified that not only reduce risk but also capture opportunities.

Mitigation and MDGs

Adaptation can ameliorate climate change impacts and help meet MDGs in the short term, but mitigation can mainly reduce risks in the longer term. Only mitigation activities that are developed in synergy with adaptation options or enhance adaptive capacity can help achieve the MDGs in the shorter term. Conversely, mitigation activities that would lead to reduced income for vulnerable groups or sectors could reduce adaptive capacity and make it more difficult to achieve the MDGs. This might be the case in regions that are vulnerable to the potential economic effects of mitigation, eg in countries dependent on the production and export of fossil fuels. Also, if the production of biofuels for climate change mitigation purposes developed in an unsustainable fashion and led to conflicts with food production, there may be trade-offs. In general, if the main policy goal is to alleviate poverty, investing in climate change mitigation is not very effective. Resources should rather be spent on public health, education, governance and other aspects of development.

One institutional link between mitigation, adaptation and poverty is through the UNFCCC's arrangements. With mitigation action becoming increasingly stringent, projects in the context of the Clean Development Mechanism (CDM) will become increasingly important, with a positive spin-off for the Adaptation Fund which is filled through a share of the CDM proceeds.¹

1. The Adaptation Fund was established to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol. The Fund is to be financed with a share of proceeds from CDM project activities and receive funds from other sources. The share of proceeds amounts to 2% of certified emission reductions (CERs) issued for a CDM project activity.

In addition, CDM projects aim at sustainable development in the host country, and can include reducing vulnerability to climate change.

MDGs, poverty and climate change

Maybe unfortunately, climate change is not explicitly taken into account in the MDGs. It has been suggested that the MDGs should be expanded to reflect the important role that energy access can play in poverty alleviation (CSD 2005, UNDP 2007c). But, for the time being, we have to work with the MDGs as they are. Above, we have mainly looked at the issue of the nexus between climate change and poverty through a climate change lens, as suggested by the key question to be addressed in the paper. One could also wonder what meeting the MDGs and alleviating poverty implies for the climate change challenge. For most developing countries, alleviating poverty is the main goal, and climate change at most a hindrance to achieve it. Also, this coin has two sides. Meeting the MDGs implies a significant improvement in the standards of living for the poor. On the one hand, this will enhance both adaptive and mitigative capacity, but on the other hand the associated use of natural resources such as fossil fuels may lead to increasing GHG emissions.

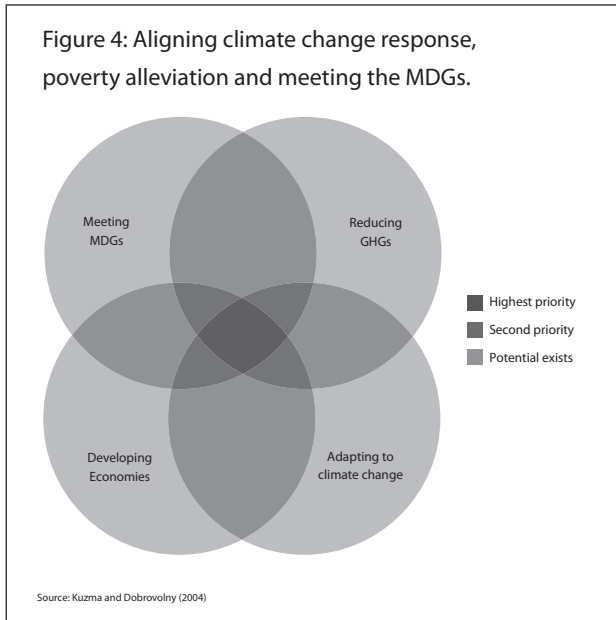
The balance in the long term is not a priori evident, since theoretically energy can be provided in a sustainable fashion with low emissions. But past experiences have suggested that economic growth in developing countries is usually accompanied by increasing emissions and other environmental stresses (eg UNEP 2007). Because the per capita emissions of the poor in developing regions are still very low, from the perspective of global greenhouse gas emissions the increases of emissions resulting from the increased energy access of the rural poor are very modest, especially in the early stages of development.

But also in the longer term emissions do not need to soar to the levels of today's industrialised countries. Various long-term scenario analyses suggest that there are ways to stabilise greenhouse gas concentrations,

The development of bio-fuels may reduce greenhouse gases and stimulate local development, but if not produced sustainably it can have trade-offs

limit dangerous interference with the climate system, increase per capita incomes in developing regions and narrow the income gap, all at the same time. There may be different ways to achieve this, eg mainly through internationally coordinated policy initiatives or through more bottom-up sustainable development initiatives, or a combination of both (UNEP 2007). The macro-economic costs do not need to be very high (IPCC 2007d). But how can this be achieved at the local or project level? Actions to achieve one of the goals do not necessarily contribute to meeting another. There may be trade-offs that have to be identified and avoided.

A subset of possible actions can contribute to more than one goal, and some actions can contribute to all, if properly designed. Such actions should get priority. In Figure 4, the darker the area, the more synergy between the goals. For example, the development of bio-fuels may reduce greenhouse gases and stimulate local development, but if not produced sustainably it



can have trade-offs such as competition with food production or making energy production vulnerable to climate change. Increased irrigation or cooling may be effective adaptation options, but generates more greenhouse gas emissions if fueled by fossil energy. Erosion control, increased water use efficiency, climate-proof urban design and rural development initiatives, afforestation and the promotion of public transport are examples of potentially synergetic options.

Already for some time, at various levels, programmes have started to encourage such

synergies. At the global level, the Poverty and Environment Initiative coordinated by UNEP and UNDP works to meet the multiple goals of stimulating economic development and protecting the environment mainly through mainstreaming poverty-environment linkages into national development planning processes (UNDP/UNEP 2007). PEI is supported by a partnership of governmental and non-governmental development agencies. As yet, Clean Development Mechanism (CDM) projects have still a low volume and are not very well distributed over countries, with the largest share in just a few large countries (UNDP 2006). To address this problem, UNDP has initiated an MDG carbon facility to facilitate access to carbon finance for a wider range of developing countries than those involved in current CDM activities, and to promote emission reduction projects which contribute to the MDGs simultaneously (UNDP 2007b).

How CDM projects can best contribute to broader sustainable development objectives such as alleviating poverty will have to be learned as the programme expands (eg see Troni et al 2003). The Climate, Community and Biodiversity Alliance, a partnership between firms, NGOs and research institutes is also promoting the simultaneous pursuance of economic and environmental goals, and has developed voluntary standards to help design and identify land management projects that simultaneously minimise climate change, support sustainable development and conserve biodiversity (CCBA 2005).

Many more initiatives at various levels increasingly try to address the issues jointly, recognising that development programmes and policies are likely to be most successful if climate change is taken into account. Conversely, climate change response strategies are most likely to be successful if they are embedded in the pursuance of broader sustainable development initiatives. This is increasingly recognised. While this is an encouraging development, there will be no easy solutions. Overcoming pertinent barriers, such as inadequate governance and insufficient access to environmentally sound technologies will remain a tough challenge for decades to come.

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