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**A New Challenge in Global Environmental Governance:
Adaptation to the Effects of Climate Change on Health and
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**A NEW CHALLENGE IN GLOBAL ENVIRONMENTAL
GOVERNANCE: ADAPTATION TO THE EFFECTS OF CLIMATE
CHANGE ON HEALTH AND SUSTAINABLE DEVELOPMENT**

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Introduction: Interactions of Climate Change, Health and Human Development

A sizeable proportion of the many severe health problems faced by people living in developing countries can be traced to climate change-induced conditions. There is sufficient evidence of a link between climate change and health through the impacts of droughts, floods, coastal storms, etc. on human well-being and security (WHO, 1997; WHO, 2008; Oxfam, 2008; UNAIDS and UNEP, 2008). Despite strong indications that the adverse effects of climate change can exacerbate present health challenges in developing countries, existing global governance systems have failed to adequately address contemporary global health issues as they interact with changes in climate. Furthermore, though the threats posed to human well-being and sustainable development by climate change and global infectious diseases, such as the HIV/AIDS epidemic, are similar and inter-linked, these similarities and linkages have received hardly any recognition in global health governance innovations.

The problems of the existing systems global governance systems to respond adequately to the health challenge of climate change impacts are exacerbated by state failures to deal with public health issues which have transnational implications such as in responding to the threat of pandemics. States may resent external and local pressures to cooperate with 'outsiders' on national health concerns, which they consider as interference and even perceive as a threat to sovereignty (ICISS, 2001). There are examples of governments unwilling to assume accountability to the international community on 'sensitive' matters relating, for example, to the need to address public health as a human right including providing access for women to sexual and reproductive health services, or to the need to provide information on viruses (Holbrooke and Garrett, 2008). Efforts to integrate health and climate change concerns in a common global governance framework could in effect result in a sort of 'tug-of-war' between sovereign responsibilities entrusted to the state, on the one hand, and the external obligations of the state to the international community, on the other.

Jurisdictional tussle over health sovereignty between national interest and foreign influence underlines the importance of identifying innovations that are most promising as the basis for designing and promoting a global governance framework that establishes a link between climate change concerns and human health. In cognizance of the duty of the state to assume responsibility for health matters in its territorial space, innovations in global health governance for adaptation to the effects of climate change would need to make allowance for the necessity of national health sovereignty as well as the role and governance of dominant international institutions. This is required in order to provide an appropriate and adequate response at both national and global levels to the interlinked challenge of health and climate change in a globalizing and increasingly inter-dependent world. It implies the redesigning of global governance on the basis of an 'innovation agenda' that addresses climate change as an element of health sovereignty and at the same time holds out promise for supporting effective changes in global health governance that reflect both national priorities and global standards. The harmonization of national

interest with international concern in an integrated global governance framework is challenging and could be problematic in some cases.

This paper explores the nature and problematic of the link between health, human development and climate change in developing countries and particularly in sub-Saharan Africa (SSA). It makes the case that the emergence and re-emergence of a number of diseases in recent time can be attributed in varying degrees to climate change-induced environmental and ecological factors derived mainly from human interactions with its eco-systems and consequent changes in bio-diversity and habitat through greenhouse gas emission, deforestation, use of pesticides, over-fishing and over-grazing, etc. The paper highlights the link between poor governance in responding to the impact of climate change on human well-being and security, on the one hand, and the failure of global health governance to address major health conditions which exist predominantly in the developing regions, on the other. This leads to the observation that the combination of the two interlinked problems of poor climate change governance and inappropriate health governance could have a devastating impact on livelihoods and human well-being, particularly in resource-poor countries such as those in SSA. It points out that of all the socio-economic conditions associated with poverty reduction and the achievement of sustainable development, health ranks among the most important.¹ Given that health and climate change share similarities in terms of impacts on human well-being and development, it argues that the inter-linkage of health and climate change provides possibilities for incorporating the two issues in a common global governance framework and in an integrated manner.

The structure of the paper is as follows. It begins with an elaboration of the conceptual framework for understanding and analyzing the interaction between climate change, health and human development. Next, it examines the different 'pathways' through which climate change affects health status and human development, and identifies elements in the adaptation to climate change that could complement and support appropriate innovations in global health governance. This is followed by a review of intergovernmental initiatives at the global level by the World Health Organisation (WHO) and within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) to respond to the 'adaptation needs' of resource-poor developing countries. From the standpoint of the interest of the developing countries, and against the background of the principles of equity, mutual responsibility and social justice, the paper highlights salient points in the negotiations leading to the 15th Conference of the Parties to the UNFCCC in Copenhagen in December 2009, which will seek to come up with a successor to the Kyoto Protocol. In conclusion, the paper assesses how the outcomes of the Copenhagen climate change summit could contribute to innovations and improvement in global health governance required for facilitating adaptation to climate change in developing countries.

¹ Several of the Millennium Development Goals (MDGs) relate to health and environmental factors; see WHO, 2005.

The Link between Climate Change, Health and Human Development: A Conceptual Framework

While there is broad consensus that climate change exacerbates existing health challenges in developing countries, not much attention has so far been paid in the context of the UNFCCC to the direct and immediate impact of climate change on human health and development. Analysis at the international level of the impact of climate change on society has so far been carried out mainly through the lenses of environmental and energy issues, and with the emphasis on medium to long-term effects. Accordingly, much of the focus and effort by the UN and other intergovernmental bodies has been on limiting greenhouse gas emissions associated with human activity, particularly burning of fossil fuels such as coal, oil and gas. This approach reflects an attempt to deal with the *cause* of the problem, and is driven mainly by the ultimate objective of the UNFCCC².

Based on the link between climate change and health, there is a need to focus on the *vulnerability* of humans to both current and future impacts of climate change. The concept of vulnerability represents a combination of two key concerns: (1) exposure to the impacts of climate change, and (2) ability to cope with the consequences of climate change which depends on a variety of economic, social and institutional factors. Given the different pathways which connect climate change and health, and the range of socio-economic factors which determine the nature of the interactions of the two issues, there is an urgent need to put climate change on the international agenda as a *development* issue - as distinct from its environmental impacts and energy implications. It is also important to highlight the impacts of *contemporary* changes in climate on human development, rather than focusing only on medium and long-term projections of the damage that climate change will cause over time.

Another conceptual issue that has to be clarified upfront in any analysis of the impact of climate change on developing and resource-poor countries is that of *adaptation*, which refers to the response by individuals, communities and institutions (governmental, intergovernmental or multilateral) to changes in climate and the impacts of those changes. Adaptation to climate change is crucial for reducing vulnerability. Effective adaptation will manage and reduce the risk associated with changes in climate (similar to disaster risk reduction measures), and successful adaptation will reduce vulnerability by building on and strengthening existing coping mechanisms. It follows then that vulnerability reduction should be integrated into wider policies and programmes for effective adaptation.

Conceptually, the two issues of health and climate change should be viewed as ‘long-wave’ events of global importance and which have wider inter-generational socio-economic consequences and humanitarian implications. While the interactions between these two long-wave global concerns are through identifiable pathways, as discussed

² The stated objective of the UNFCCC is to achieve “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”, on the basis of an international agreement among the parties concerned on climate change, Article 2, United Nations, 1992. The most high profile agreement reached within the framework of the UNFCCC is the Kyoto Protocol, which entered into force in 1995 and introduced targets for reduction in greenhouse gas emissions.

later, they are nevertheless characterized by regional variations in climate change impact and differences in health status of the population. In resource-poor settings like sub-Saharan Africa, long-term changes in temperature and rainfall will affect health through pathways such as infectious diseases, food insecurity, population displacement and forced migration. The combined impact of the adverse effects of climate change, on the one hand, and the relatively poor health status of the majority of the population, on the other, would increase vulnerability to conditions of poverty and undermine gains in well-being, with potentially dangerous consequences for governance and stability. Past, present and future impacts of the interactions of health and climate change will vary with physical conditions and socio-economic factors, and such a complex and interlinked situation would no doubt require a comprehensive and integrated system of global health governance for dealing with the challenges of adaptation to climate change.

The need for a system of global health governance that does not conflict with the precept of health sovereignty but also meets the global governance challenge of climate change adaptation could be approached from two perspectives. The first is the institutional system of international organizations, multilateral institutions and the state, in terms of their governance structures and mechanisms and the impact of these structures on power relationship and decision-making authority. The second is the nature of policy at both the international and domestic levels, as required for the transformation or expansion of the system of global health governance to accommodate linkages between climate change and health issues. In both systems, the state is the dominant actor, although there might be other important non-state actors involved. The primacy of state authority is reflected in the reality of long-standing governance arrangements: within intergovernmental entities in the multilateral system, it is the member states or their representatives that offer direction and guidelines for the decisions taken by global institutions; similarly, it is member states that negotiate and ratify treaties on global health and climate change issues as well as take action to implement them at national and regional levels. Therefore, the state has a major role in global governance innovations for addressing the challenges of adaptation to climate change.

The Pathways through which Climate Change, Health and Human Development Interact
The majority of the humanitarian disasters globally between 1900 and 2000 were climate-related, and virtually all of these in the context of the developing world entailed health risks and emergencies. (Mitchell and Tanner, 2006; Jarman, 2007; Stern, 2007). New patterns of disease have been driven by temperature and rainfall variation over time (WHO, 2008). The effects of climate change on health are generally manifested in medium to long-term risks stemming from drought and sea-level rise which could affect livelihoods and human well-being through worsening poverty and inequality; the spread of infectious diseases; food insecurity; displacement of populations and humanitarian needs; and increased competition for natural resources. These are the main pathways through which climate change and health interact.

Various reports by the Intergovernmental Panel on Climate Change (IPCC) and WHO have predicted that unchecked global warming will have an enormous impact on human well-being and sustainable development in developing countries. These reports include

projections which indicate, for example, that hundreds of millions of Africans will face water insecurity by the middle of this century; that malaria and other infectious diseases will threaten many more millions of Africans as temperatures rise; that wild animal species on which some African countries for revenue from tourism will be endangered; and that increased incidence of flooding which will destroy coastal areas as sea levels rise. The fact is that global warming is well under way and its consequences are already visible in many African and other developing countries. According to the World Meteorological Organization (WMO), global warming is linked to unprecedented rainfall and flooding in many parts of Africa in recent time, resulting in losses in human well-being of unprecedented magnitude (WMO, 2007). Since the start of this millennium, severe droughts have already hit several countries in the region and even been linked to the Darfur conflict (Faris, 2007). Rising sea level could inundate low-level coastal zones and islands: a recent report prepared by the Gambian government noted that in the event of a one metre rise in sea level almost 100 km. of coastal area including the whole the capital city of Banjul will be lost (Government of the Gambia, 2008).

Poverty and inequality

Climate change is already affecting the lives of people worldwide, but the impact is likely to be most severe and felt soonest by the world's poorest people. They may be more vulnerable to climate change simply because of where they actually live – in exposed areas such as flood plains and slums on unstable hill slopes that are at most risk to natural disasters such as floods and coastal hurricanes. The poor have less access to resources to withstand the damage to property, infrastructure and livelihoods that climate change brings. Humanitarian disasters linked to climate change have wreaked havoc on the livelihoods of some of the poorest people in the developing world where over 90 per cent of climate change disaster-related mortality and morbidity have occurred. Climate change threatens to derail progress in poverty reduction and the achievement of the MDGs (WHO, 2005).

Indeed, climate change is probably the greatest development challenge facing the resource-poor countries that do not have the means to adapt and respond effectively. The impacts of climate change are likely to accentuate the existing development challenges faced by the poorest nations, and the poor in those countries are going to be most seriously affected. Assessment reports by the IPCC have consistently warned that global warming will wreak havoc on the world's poor that are most vulnerable but have contributed least to the causes of global warming (IPCC, 2007; IPCC, 1997). For example, the poor in African countries are likely to be hardest hit by the effects of climate change, because they depend on climate-sensitive sectors for livelihoods, such as rain-fed agriculture and coastal fishing³. The report of the Blair Commission on Africa (Commission on Africa, 2005) stressed that climate change-induced threats to agricultural productivity and food security, health, water and energy security will undermine Africa's ability to develop. The United Nations Development Programme (UNDP) 2007 Human

³ There are already reports of climate change/global warming leading to oceanic acidification and increase in surface water temperatures, which is affecting fish stocks and threatening the livelihoods of small-scale climate change affecting fishing stocks and threatening the livelihoods of small-scale fishing communities along the west coast of South Africa (Inter Press Service News Agency, 2009).

Development Report (UNDP, 2007) warned that the world's poor face the most immediate and severe costs of climate change and the threat of "unprecedented reversals" in poverty reduction and health. According to the report, "climate shocks", such as droughts, floods and storms, are already among the factors driving poverty.

From a global perspective, the 'poverty pathway' linking climate change and health clearly raises issues of equity and justice which are integral to global governance. It is the world's poor who are most vulnerable in terms of impact of climate change on their well-being, yet they are least responsible for its cause. In Africa, the poorest continent, one finds that it is the poorest people in the region who are among the earliest and the hardest hit by the negative consequences of climate change. Africa is commonly considered to be in the frontline for climate change impacts and a barometer for how poorly the world is performing to avoid negative consequences.

Infectious Diseases

Extreme weather conditions and natural disasters due to climate change, as well as ecosystem degradation brought about by man harming his environment (e.g. deforestation, air pollution and carbon emission), can aggravate and prolong the burden of disease. The spread of HIV/AIDS in SSA which has reached pandemic proportions in Africa is a case in point. HIV/AIDS and climate change are two of the most important long wave global issues on the international agenda at present, and likely to be there in the foreseeable future. The two concerns share similarities in terms of medium and long-run impact on human development and its sustainability, and they interact to intensify this impact. It has been shown that the severity of the impact of climate change on HIV/AIDS is influenced by the location and timing of the interaction between the two (UNEP/UNAIDS, 2008). Populations with currently high HIV prevalence rates are likely to be more vulnerable to a worsening or prolongation of the HIV/AIDS epidemic due to climate change. This places the people of the southern African sub-region - the area which is worst affected by HIV/AIDS in the continent - at the greatest risk to the interaction of climate change and HIV/AIDS. In the past decade, several countries in this sub-region, such as Angola, Mozambique, Zambia, Zimbabwe, Malawi, have been affected by one or more of the environmental hazards that have been linked to the impact of climate change – droughts, water shortages, floods and coastal storms and hurricanes. Droughts are disastrous for food production because many countries in the Africa depend on rain-fed agriculture, and have limited capacity and resources to cope when the rains do not come. Floods and rising sea levels could render millions homeless in the region and precipitate the spread of vector borne and other infectious diseases.

Food insecurity

One of the most important pathways through which climate change interacts with health in poor countries and communities is through the negative consequences for food security. Temperature and rainfall variation due to climate change affects agricultural production and productivity. The majority of the world's poor people rely on local ecosystems (e.g. rain-fed agriculture and plants and animals from the forest) as the dominant source of staple food production and to support their livelihoods. In 2002, about 15 million people in southern Africa were affected by drought and food insecurity

brought about mainly by change in rainfall levels and patterns. Many communities in the sub-region are today struggling to cope with rainfall variability; it is estimated that in the half century, 1950-2000, summer rainfall over southern Africa declined by 20 per cent (IDS/Tearfund, 2006) .

Consider the case of Malawi in the present decade. Famine in 2001, brought about by drought and crop failures, led rural people to eat whatever they can lay their hands on and drink unclean water, resulting in diarrhoeal diseases. The situation was repeated in 2005 when there were inadequate rains and not enough drinking water in the country. Then in 2006, there were floods which destroyed food crops and contaminated fresh water which led to starvation and outbreak of vector borne diseases. In all of these emergencies, those worst affected were poor people, including many who were already afflicted with HIV/AIDS which Oxfam described as a ‘double disaster’ in terms creating an “an additional layer of vulnerability and leading to increases in opportunistic infections” (Oxfam,2008, p.1). Current decline in global food security, and higher food prices – also partly attributable to climate change – is causing disproportionate nutritional harm to the poor and to children, migrants and other groups vulnerable to the transmission of infectious diseases.

Displacement of populations and forced migration

Extreme weather conditions and natural disasters due to climate change could lead to population displacement and forced migration as people move in search of more hospitable and secure locations. Climate change impacts have precipitated temporary and sometimes permanent movement of people in developing countries, with serious repercussions for their health and well-being (Myers, 1997; Stern, 2007; Reuveny, 2007). Movements of population triggered by climate change-induced factors, such as droughts and floods, increase the risk on health and vulnerability to the transmission of infectious diseases. It has been observed that the risk of contracting HIV is higher among migrants and refugees, because of their vulnerability: for example, the need to provide sex in exchange for money, shelter or protection exposes female migrants to coercive and unsafe sex with multiple partners, as do the engagement of male foreign migrant workers in transactional sex. (Spiegel et al, 2007; Samuels and Spraos, 2008; UNEP/UNAIDS, 2008).

In addition to the adverse health effects on displaced and mobile populations, climate change-related disasters could reduce existing human capital stock through mortality and emigration, which itself could affect the effectiveness of the delivery of health and basic services when and where most needed such as during emergencies. The confluence of increased risk of poor health and reduced human capital due to climate change is likely to worsen per capita poverty in the case of resource-poor countries and disadvantaged communities.

Competition for resources and distortion in resource-allocation

Apart from aggravating and prolonging the burden of disease, natural disasters and ecosystem degradation can over-stretch the demands on natural and financial resources required for maintaining health and livelihoods, eventually leading to increased competition for those resources. The effects of temperature and rainfall changes on basic human needs is already causing shortages in the supply of fresh water in many parts of the world, leading to increasing competition for this most important basic human resource need (Bates et al, 2008). Increased competition for diminishing water and food resources will be catastrophic for the poorest that are most vulnerable, and could even entail enormous financial costs for countries that are already very poor.

The necessity of responding to the impact of climate change on livelihood and infrastructure could divert scarce public funds away from productive activities and the provision of basic social services. Public expenditure on climate change-related humanitarian crisis and disaster management and reconstruction is likely to have a huge opportunity cost in terms of alternative investments in vital development programmes and basic social services. The fiscal implication of poor countries responding to the effects of climate change could undermine the achievement of the Millennium Development Goals (MDGs) set by the United Nations in 2000 with the aim of substantially reducing extreme poverty worldwide by 2015.

Responding to the Interactions of Climate Change, Health and Human Development: Current Status and Prospect

Action by the World Health Organisation (WHO)

In a report entitled 'Climate Change and Health' which was presented to its Executive Board in January 2009, the WHO made the assertion that: "There is a strong, global, scientific consensus that warming of the climate system is a fact and is affecting human health" (WHO, 2008). Based on growing evidence of the link between the two issues, the organization's World Health Assembly had adopted a resolution in May 2008 requesting the WHO Director-General to consult with member states on the preparation of a "workplan for scaling up WHO's technical support to Member States for assessing and addressing the implications of climate change for health and health systems".⁴ WHO has accordingly put together a global workplan to assess and address the implications of climate change for health and health systems. Although the workplan is perceived by the WHO as a common framework for action by all countries, it recognizes differences in climate, level of socio-economic development, culture, health system and health status between regions and countries. Accordingly, the consultative process for implementing actions contained in the WHO workplan had been organized on regional basis and indications are that the problem of climate change and health interactions will be most severe in the less developed regions and countries that do not have the capacity and resources to cope with the health risks associated with the impacts of climate change. The workplan was therefore designed particularly to support health systems in low- and middle-income countries and small island states, where vulnerability to the impacts of climate change is further compounded by lack of ability to introduce climate-change adaptation and mitigation strategies and policies.

⁴ WHO, World Health Assembly Resolution WHA61.19 on Climate Change and Health

As part of its implementation of its workplan, WHO has launched a global campaign to raise awareness of the effects of climate change on health and to ensure that health is fully considered in the negotiations leading to and at the Copenhagen conference. The WHO believes that greater awareness about the effects of climate change on health is vital both for prompting actions to reduce greenhouse gas emissions and supporting strategies central to climate change adaptation programmes. As part of its preparation for Copenhagen, WHO is working in partnership with other UN organizations at the global level, and with sectors other than health such as energy, agriculture, transport at national and regional levels, in order to ensure that health protection and health promotion objectives are incorporated into climate change adaptation and mitigation policies at all levels. The global coverage of the WHO workplan should facilitate the sharing of knowledge and exchange of information on good practices in both reducing vulnerability to climate change and improving health status.

Negotiating an International Agenda: The United Nations Framework Convention on Climate Change (UNFCCC)

The international community will meet in Copenhagen in December 2009 at the 15th Conference of the Parties to the UNFCCC to negotiate the successor to the Kyoto Protocol. Experience from the implementation of Kyoto suggests that negotiating an international agenda to control global warming and provide assistance for adaptation to climate change to the satisfaction of every one concerned will not be easy, but there are reasons to believe that progress can be achieved in Copenhagen. A unilateral approach to adaptation assistance was established at the UN Nairobi conference in 2006, and this was largely endorsed by the Bali UN Climate Change Conference in December 2007 which brought together countries that are parties to the UNFCCC. At the Bali conference, both developed and developing countries agreed to negotiate a new treaty on climate change by end of 2009 – the successor to the Kyoto Protocol. The Bush administration of the United States, which had all but in name repudiated the Kyoto Protocol that was signed by its predecessor the Clinton administration, agreed in Bali to the principle of emission limits and showed an interest in supporting new multilateral programmes to finance clean energy technology and protect the environment, including forest conservation. The new Obama administration is strongly committed to clean energy and green environment, and will certainly move the agenda faster and further than its predecessor. There is a precedent in the US that gives rise to optimism. Twenty years ago, the US under Ronald Reagan provided global leadership in the negotiation of the Montreal Protocol to address the problem of ozone depletion.⁵ The European Union (EU) has proposed new emission regulations that are ahead of the US. China and India have acknowledged the need for emission limits that they regard as consistent with their rapid industrialization and growth strategies.

Copenhagen will be an opportunity for both developed and developing countries to address the negative impacts of climate change by committing themselves to a low

⁵ The Montreal Protocol was ratified by the US Senate and ultimately by nearly 200 countries and territories, and has proved largely successful in limiting and phasing out ozone-depleting chemicals.

carbon future and support for adaptation including integrating vulnerability reduction into wider policies. Moving poor countries on to low carbon development will require large-scale financial and technical assistance, as well as incentives to replace fossil-fuel systems with clean energy technology such as solar and wind power. Financing adaptation to climate change will be costly for most African and some other developing countries, and could even threaten past development gains in some areas. The developed countries would have to help the poorer developing countries in meeting this cost. This seems fair from both an equity and social justice standpoints, because, as already observed, the less developed and poor countries that have contributed the least to global warming will be most affected by the impacts of climate change. It is hoped that Copenhagen will result in the setting up of an 'Adaptation Fund' that will be financed by the successor to the Clean Development Mechanism (CDM) that was established within the framework of the Kyoto Protocol.⁶

In addition to focusing on projections of climate change impacts around meteorology, energy and environmental issues, there is also a need for the Copenhagen conference to put the spotlight on human development issues around health and poverty reduction. In the same vein, agreement should be reached in Copenhagen that will extend the provision of financial and technical assistance for adaptation to include impacts of climate change on health and related development objectives. This will require collaboration at the international level on a range of policies needed to tackle climate change as a *current* global concern with significant development implications. Since the IPCC has declared global warming to be a global crisis affecting all nations in common, it would be in the interest of both rich and poor nations to act collectively to promote the rapid diffusion of low carbon and clean energy technologies, in accordance with the economic concept of 'global public goods'.

The provision of financial and technical assistance to developing countries for adaptation to climate change should go beyond the introduction of low and clean energy sources to include, for example, assistance for addressing the damaging link between devastation of natural resources which provide food and medicines for the poor in developing countries, on the one hand, and whose depletion leads to food insecurity and disease, on the other. This underlines why policies on deforestation should be part of the next climate change agreement that will be struck through in Copenhagen, and why action on this should be shaped and led by the nations from the developing regions where forests are important to livelihoods and human well-being.

Conclusions: Integration of Health, Human Development and Climate Change - Innovations in Global Governance

In terms of innovations in global governance, there is a need to work on all fronts to increase the momentum for international action. This involves working through the developed countries (G8 led by the US and the EU); with the emerging and leading

⁶ The CDM allows rich countries with emission reduction commitments to invest in developing countries projects for emission reduction that are less costly than home-country projects – so-called 'carbon credits' and 'off-setting of carbon footprints'.

developing economies (G20); and with individual countries, towards a common global agenda and action plan. Such a common and binding global deal can be achieved only through the formal UN process, which underlines the importance of the December 2009 Copenhagen summit on the UNFCCC. If Copenhagen is successful in terms of reaching an agreement along the lines of the wider agenda indicated above, and in uniting the world behind a common position for avoiding climate-change-linked environmental catastrophe and humanitarian disaster; and if the global community acts quickly with the right type of global institutional support and improved governance of global institutions – with the richer countries taking responsibility and leading the way, then there is a good reason for believing that the UNFCCC may provide pathways for effectively addressing climate change-linked health and related poverty problems.

A number of innovations are required for integrating governance of climate change adaptation with concerns of global health governance. First, climate change should be recognized as a *contemporary* challenge that includes present global priority development issues such as poverty, food insecurity and health. Second, the emphasis of climate change governance should be on a promoting *proactive* responses as a priority, rather than reactive: for example, efforts should be focused on helping society and particularly local communities in developing countries to have a better understanding of main climate change risks and how they impact on livelihoods, and to encourage strong participation of the local population in policy and action plan to reduce vulnerability. Third, based on a policy framework that integrates health and climate change links, there should be investment in longer-term health-climate change resilience building efforts, including reinforcing and making use of existing health infrastructures and institutions to undertake climate change adaptation activities. Fourth, given the moral implications of the imbalances between those adversely affected by climate change and those responsible for the problem, there is a need to increase development assistance from rich to poor countries for adaptation to the effects of climate change. Copenhagen presents an opportunity to achieve this on an adequate and sustainable basis, as well as to achieve poverty reduction within a climate change adaptation programme. The UNFCCC should be strengthened by incorporating key components of human development, such as food security, health and human security, into its negotiation and agreement.

Rather than just focusing on avoiding the negative consequences of climate change and setting targets for greater use of new energy technologies, the outcomes of Copenhagen should also cover aspects of the above-mentioned governance innovations. Apart from agreeing to fund adaptation to climate change in developing countries, Copenhagen should provide the foundation for encouraging governments of developing countries and their development partners to integrate climate variability and climate risk factors into health and development planning. Such a wider and development-oriented UNFCCC agreement would be the basis for enhancing the capacity of developing countries to positively adapt to climate changes in a manner that complements their aspiration to achieve long-term sustainable development. Needless to say, desirable outcomes of Copenhagen should be complemented by change in the governance and decision-making structures of relevant global multilateral institutions to reflect a new conceptualization of global governance in a changing world order.

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