Facilitating an International Agreement on Climate Change:
Adaptation to Climate Change

A Proposal of the

GLOBAL LEADERSHIP *for* CLIMATE ACTION

Global Leadership for Climate Action

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About Global Leadership for Climate Action

Global Leadership for Climate Action (GLCA) is a high-level task force of world leaders committed to addressing climate change through international negotiations. A joint initiative of the United Nations Foundation and the Club of Madrid, GLCA consists of former heads of state and government as well as leaders in business, government, and civil society from more than 20 countries. Club of Madrid President Ricardo Lagos and United Nations Foundation President Timothy E. Wirth serve as GLCA Co-Chairs, and Mohamed El-Ashry serves as the group's facilitator and advisor.

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Summary

A joint initiative of the United Nations Foundation and the Club of Madrid, Global Leadership for Climate Action (GLCA) consists of former heads of state and government, as well as leaders in business, government, and civil society from more than 20 countries. In 2007, GLCA published *Framework for a Post-2012 Agreement on Climate Change*, which called for four negotiating pathways focused on mitigation, adaptation, technology, and finance. This paper focuses more specifically on adaptation and its links to development and poverty alleviation, with emphasis on action at the local level.

Climate change will have significant impacts on development, poverty alleviation, and the achievement of the Millennium Development Goals (MDGs). Hard-fought progress made in achieving these global goals may be slowed or even reversed by climate change as new threats emerge to water and food security, agricultural production, nutrition, and public health. Countries and regions that fail to adapt will contribute to global insecurity through the spread of disease, conflicts over resources, and a degradation of the economic system.

Given the far-ranging adverse impacts of climate change, adaptation must be an integral component of an effective strategy to address climate change, along with mitigation. The two are intricately linked—the more we mitigate, the less we have to adapt. However, even if substantial efforts are undertaken to reduce further greenhouse gas emissions, some degree of climate change is unavoidable and will lead to adverse impacts, some of which are already being felt. The world's poor, who have contributed the least to greenhouse gas emissions, will suffer the worst impacts of climate change and have the least capacity to adapt. Elementary principles of justice demand that the world's response strategies and adaptation funds give special priority to the poorest countries.

Adaptation is about building resilience and reducing vulnerability. Adaptation is not simply a matter of designing projects or putting together lists of measures to reduce the impacts of climate change. A national policy response should be anticipatory, not reactive, and should be anchored in a country's framework for economic growth and sustainable development, and integrated with its poverty reduction strategies. National governments bear

the responsibility to develop and implement integrated policies and programs that build the resilience and reduce the vulnerability of their populations, emphasizing preventive local actions, to manage the risks associated with the impacts of climate change.

The science is clear—climate impacts are being felt today, and greater impacts are unavoidable tomorrow. Adaptation is essential to reducing the human and social costs of climate change, and to development and poverty alleviation. Adaptation strategies abound that will yield benefits in their own right. There is no excuse for inaction.

KEY FINDINGS:

- Climate change provides both an obligation and an opportunity to reconfigure development strategies so that they meet the needs of the present generation without compromising future generations' abilities to meet their needs.

Recommendation: *We recommend that the Secretary-General of the United Nations establish an independent high-level task force to define a new vision for global sustainable development based on a low-carbon economy and to address the ability of global public policy and global governance to deal concurrently with the crises the world has witnessed in recent years.*

- The economies and people of many developing countries depend on ecosystem services in such areas as coastal zones, agriculture, forests, water, health, and infrastructure, and their capacity to mitigate and adapt is contingent on the resilience of these ecosystems.

Recommendation: *We support the recommendations of the Millennium Ecosystem Assessment, especially concerning payments for ecosystem services in critical areas. Methodologies for valuation of ecosystem services and for systems of payments should be developed and disseminated widely and a large scale initiative to reduce deforestation should be launched.*

- Climate change affects agriculture and food production in complex ways. It is a multiplier of known risks that have in the past rarely received sufficient attention or funding because they have fallen in the gap between disaster relief and development.

Recommendation: *Centers for Regional Adaptation in Agriculture to develop and widely disseminate technologies for adaptation (for example, salt- and drought-resistant crop cultivars) should be established by the Consultative Group on International Agricultural Research (CGIAR), especially in sub-Saharan Africa and South Asia.*

- Climate change threatens human health in ways that are numerous and profound. However, if the international community makes a serious commitment to help lower-income countries adapt to the health threats from climate change by improving basic health services, it will also help those countries address challenges that have been an ongoing scourge to their economies and their people.

Recommendation: *National governments bear the responsibility for the health of their populations and for long-term sustainability, but international financial support should be provided for strengthening developing countries' public health infrastructure and for building long-term institutional partnerships among multiple stakeholders.*

- National Adaptation Programmes of Action (NAPAs) are an essential first step for countries to identify priority activities that respond to their urgent and immediate needs to adapt to climate change—those for which further delay would increase vulnerability and/or costs.

Recommendation: *All developing countries that face negative impacts of climate change should prepare NAPAs. In addition, NAPAs and Poverty Reduction Strategy Papers should be integrated into national development plans.*

Recommendation: *We recommend that US$1 to $2 billion of additional official development assistance (ODA) be provided immediately by developed countries to help Least Developed Countries (especially in Africa), selected small island developing states (below a certain gross domestic product), and other most vulnerable developing countries that are already suffering from climate impacts. The funds could be provided as a special window in the fifth replenishment of the Global Environment Facility (GEF). The funds should be used for the implementation of NAPAs in the context of poverty alleviation strategies and plans, focus on actions at the local level, and help enhance the resilience of people and ecosystems. Funds should flow to community-level organizations, women's groups, and nongovernmental organizations (NGOs).*

Recommendation: *In the longer term, we recommend that a climate fund (or funding mechanism) be established in the context of a new and comprehensive climate agreement to support developing countries' actions related to mitigation and adaptation. It should include both public and private resources, starting at US$10 billion and growing to $50 billion per year. It should have an innovative structure and governance that is transparent and inclusive. In addition to ODA, it should consist of innovative and predictable sources of finance, including auction revenues from greenhouse gas markets and global market-based levies—for example, on international air travel and maritime freight transportation.*

- Without viable institutions and effective policy frameworks at the national and global levels, progress in mitigating and adapting to climate change will falter. Disseminating information, building knowledge, articulating needs, ensuring accountability, and transferring resources—all are guided by and happen through institutions.

Recommendation: *In the short term, we recommend the creation of no new global institutions for deployment of resources from existing funding channels, provided that accountability mechanisms and transparent decision making are established to overcome current lack of trust by donor and recipient countries. In the longer term, as funding increases and agendas expand, a new funding mechanism should be established to program resources at the 'macro' level and to monitor and evaluate impacts.*

Recommendation: *To improve coordination and reduce duplication of effort, UN agencies should seek to 'deliver as one' at the country level, as recommended by the UN High-Level Panel on System-Wide Coherence.*

I. INTRODUCTION

Climate change is one of humanity's greatest challenges, affecting both current and future generations. Without urgent and concerted action, it will damage fragile ecosystems, impede development efforts, increase risks to public health, frustrate poverty alleviation programs, and force large-scale migration from water- or food-scarce regions. The environmental, economic, and social costs of inaction will far exceed the cost of taking immediate steps to address climate change.

The global community took initial steps in 1992 (United Nations Framework Convention on Climate Change—UNFCCC) and then again in 1997 (Kyoto Protocol) to curb global greenhouse gas emissions. However, these efforts have produced only modest gains in a handful of countries. The resulting emission reductions are nowhere near what they should be in order to halt or slow the pace of climate change. On the contrary, emissions have been increasing in parallel with the growth of the world economy.

Over the last century, atmospheric concentrations of carbon dioxide have increased from a pre-industrial value of 278 parts per million to 385 parts per million in 2008, and the average global temperatures rose by 0.74 degree Celsius. According to scientists, this is the largest and fastest warming trend they have been able to discern in the Earth's history. With rising temperatures, the United Nations Intergovernmental Panel on Climate Change (IPCC) projects that the frequency of extreme events such as heat waves, droughts, and heavy rainfall events will increase, adversely affecting agriculture, forests, biodiversity, water resources, industry, human health, and settlements. Higher temperatures are expected to raise sea level through thermal expansion of the oceans and melting mountain glaciers and ice caps, including portions of the Greenland and Antarctic ice sheets.

In addition, increased concentrations of atmospheric carbon dioxide are causing the oceans to become more acidic, threatening the viability of fisheries and marine ecosystems, including coral reefs. These concentrations will not completely dissipate for thousands of years. The need for action to prevent further damage steadily grows more urgent.

Given the far-ranging adverse impacts of climate change, adaptation must be an integral component of an effective strategy to address climate change, along with mitigation. The two are intricately linked—the more we mitigate, the less we have to adapt. However, even if substantial efforts are undertaken to reduce further greenhouse gas emissions, some degree of climate change is unavoidable and will lead to adverse impacts, some of which are already being felt. The world's poor, who have contributed the least to greenhouse gas emissions, will suffer the worst impacts of climate change and have the least capacity to adapt. Elementary principles of justice demand

that the world's response strategies and adaptation funds give special priority to the poorest countries.

Adaptation is about building resilience and reducing vulnerability. Adaptation is not simply a matter of designing projects or putting together lists of measures to reduce the impacts of climate change. A national policy response should be anticipatory, not reactive, and should be anchored in a country's framework for economic growth and sustainable development, and integrated with its poverty reduction strategies. National governments bear the responsibility to develop and implement integrated policies and programs that build the resilience and reduce the vulnerability of their populations, emphasizing preventive local actions, to manage the risks associated with the impacts of climate change.

Information is crucial to planning for adaptation to climate change. Countries need the capacity and resources to track meteorological patterns, forecast impacts, and assess risk in order to make good decisions and provide timely information to their citizens. Capacity for monitoring and forecasting climate change can significantly affect livelihoods. For farmers, for example, having access to technologies for adaptation and knowing early about abrupt changes in rainfall patterns or temperature can make the difference between a bountiful harvest and crop failure.

Many Least Developed Countries (LDCs) and small island developing states have a high degree of physical exposure to climate change and a limited capacity to respond to the challenge of adaptation. Their disproportionate vulnerability creates a moral imperative for the developed world to provide immediate support for adaptation in these countries. Other developing countries, with less immediate exposure to impacts from climate change and with greater institutional and financial capacity to plan for adaptation, could work jointly with developed countries to mobilize financial assistance and to enhance their technical capacities to address the challenge of adaptation.

Global Leadership for Climate Action

Global Leadership for Climate Action (GLCA) in 2007 published *Framework for a Post-2012 Agreement on Climate Change*, which called for four negotiating pathways focused on mitigation, adaptation, technology, and finance and offered recommendations in each of those areas. GLCA's *2008* Update provided further elaboration on two of the pathways: technology and finance. This paper focuses on adaptation.

Bali Roadmap

In December 2007, shortly after the publication of GLCA's Framework, the Parties to the UNFCCC met in Bali, Indonesia, and adopted the historic Bali Roadmap, including the Bali Action Plan. The Bali Action Plan, consistent with

the recommendation in the GLCA Framework, identified adaptation as one of the key building blocks for a strengthened response to climate change, along with mitigation, technology, and financial resources.

The Bali Action Plan called for enhanced action on adaptation, including consideration of:

i. International cooperation to support implementation of adaptation actions, including through vulnerability assessments, prioritization of action, financial needs assessments, capacity building and response strategies, integration of adaptation actions into sectoral and national planning, specific projects and programmes, means to incentivize the implementation of adaptation actions, and other ways to enable climate-resilient development and reduce vulnerability of all Parties;

ii. Risk management and risk reduction strategies, including risk sharing and transfer mechanisms such as insurance;

iii. Disaster reduction strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change; and

iv. Economic diversification to build resilience.

Article iii of Decision 1(e) of the Bali Action Plan called also for consideration of innovative means of funding to assist developing countries that are particularly vulnerable to the adverse impacts of climate change in meeting the cost of adaptation.

In addition, the Conference of the Parties established an Adaptation Fund to finance projects and programs in developing countries. The Fund complements the other UNFCCC funds managed by the Global Environment Facility (GEF). It is supported by a secretariat (the GEF) and a trustee (the World Bank) and managed by a 16-member Board.

Progress in Poznan

At the 14th Conference of Parties to the UNFCCC held in Poznan, Poland, in December 2008, the most vital negotiations pertaining to adaptation centered on the Adaptation Fund. Although no agreement was reached with regard to "new and additional" resources or "innovative means of funding" for adaptation in developing countries, the Parties agreed to make the Adaptation Fund operational, providing direct access to developing countries in support of adaptation to climate change.

No progress was made on the demand by developing countries to increase financing for the Adaptation Fund by extending its funding sources, currently a share of the proceeds from the Clean Development Mechanism, to include a share of the proceeds from the Joint Implementation Mechanism and emissions trading.

Whether the agreement on structuring this small Adaptation Fund will pave the way toward a new global treaty remains to be seen. The core questions—how much developed countries will reduce their greenhouse gas emissions, what the rapidly industrializing countries will do to control their fast-growing emissions, and how the poorer countries will be assisted in their adaptation efforts—remain untouched.

II. RETHINKING DEVELOPMENT

Climate change will have significant impacts on development, poverty alleviation, and the achievement of the Millennium Development Goals (MDGs). Hard-fought progress made in achieving these global goals may be slowed or even reversed by climate change as new threats emerge to water and food security, agricultural production, nutrition, and public health. Countries and regions that fail to adapt will contribute to global insecurity through the spread of disease, conflicts over resources, and a degradation of the economic system.

Since the impacts of climate change are so far-reaching, adaptation strategies must encompass a wide range of policy areas and economic sectors, involving many diverse approaches and actions that contribute to building the resilience of people and countries and address the multiple drivers of vulnerability, including poverty. Effective adaptation will require broader planning and implementation capacity in all relevant government departments in developing countries—not just in departments of environment. This complexity presents a challenge for designing effective adaptation strategies and gives rise to debates about what constitutes adaptation, how it should be paid for, and how best to integrate it into national and international development priorities.

In its recent report, the International Commission on Climate Change and Development said, "Development that can be sustained in a world changed by climate must be enabled by building the adaptive capacity of people and defining appropriate technical adaptive measures. Adaptive capacity results from reduced poverty and human development. Adaptive measures require the institutional infrastructure that development brings." Toward that end, the Commission called for a rapid transition to a low-carbon global economy that would create new jobs and business opportunities: "New green growth investment opportunities are necessary to respond to the urgent and growing needs for climate change adaptation."

Climate change thus provides both an obligation and an opportunity to reconfigure development strategies so that they meet the needs of the present generation without compromising future generations' abilities to meet their needs. Accordingly, adaptation strategies should be evaluated by the following four principles:

- *Scale:* Match responses to the growing numbers of people in danger.
- *Speed:* Waste no time because climate change is happening faster than predicted.

- *Focus:* Manage risk, build the resilience of the world's poorest citizens, and enhance the ecosystem functions upon which those citizens depend.
- *Integration:* Recognize the relationships between environment, development, and climate change, and manage synergies and trade-offs between mitigation and adaptation.

Recommendation: *We recommend that the Secretary-General of the United Nations establish an independent high-level task force to define a new vision for global sustainable development based on a low-carbon economy and to propose ways and means for implementation. The Task Force should address the interconnections between the crises the world has witnessed in recent years—financial, food, water, energy, and climate—and the ability of global public policy and global governance to deal with them concurrently.*

III. BUILDING RESILIENCE AND REDUCING VULNERABILITY

Climate change increases risk, particularly for those who rely on weather patterns, soils, water, and other natural resources for their livelihoods—including more than one billion of the world's poor. The magnitude, timing, and location of these climate impacts are inherently unpredictable. The threats are not likely to be new; they will, in most cases, be magnifications of existing threats.

Given these uncertainties, adaptation strategies should be based on 'upstream' interventions that will yield benefits regardless of specific, climate-related events. Examples of such win-win strategies include developing more diverse crop strains tolerant of a variety of different conditions (heat, drought, salt, etc.); bolstering social capital and resilience; increasing storage capacity for fresh water by building reservoirs or recharging aquifers; creating early warning systems and preparedness plans; improving public health infrastructure; and bolstering disease surveillance. These strategies will be valuable regardless of the exact impacts of climate change at a particular time or location.

The following sections address adaptation in key sectors that are crucial to sustainable development: ecosystems and natural resources, food and agriculture, and health. They are closely linked; for example, the degradation of ecosystems affects water availability for agriculture and food production, thus affecting nutrition and public health. National adaptation and sustainable development plans should deal with all of these sectors in an integrated manner.

Ecosystems and Natural Resources

Climate change will destabilize and degrade many ecosystems that are already threatened by destruction and overuse, and result in direct and severe impacts on those who depend on them for their livelihoods. Unlike the wealthy, poor people often lack access to alternative services and are highly exposed to ecosystem changes that could result in droughts, floods, and famine. The poor often live in locations that are vulnerable to environmental threats, and lack financial and institutional buffers against these dangers. Climate change can lead to ecosystem failure and large-scale population displacement.

The degradation of ecosystems disproportionately affects children and women who are increasingly playing a key role as heads of households and primary producers of food. Women and young girls in marginal areas tend to be more susceptible to the effects of environmental degradation because they are often responsible for harvesting natural resources such as fuel wood and water to meet basic family needs. Empowering women and providing them with adequate access to education, credit, health care, and reproductive services will not only reduce their vulnerability, but also improve the well-being of their communities.

The Millennium Ecosystem Assessment (MEA), published in 2005, assessed the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems. The MEA made it clear that human actions are depleting Earth's natural capital, "putting such strains on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted." The MEA recommended that a system of payments for ecosystem services be established and that land and water rights be clarified.

Win-win policies can be designed that protect the climate and enhance ecosystems. For example, an initiative to reduce deforestation and to promote reforestation and the recovery of degraded lands would achieve multiple objectives: sequestering carbon from the atmosphere; strengthening ecosystems and biodiversity; expanding food production; and providing employment, principally to the poor and to indigenous people.

The economies and people of many developing countries depend on ecosystem services, and their capacity to mitigate and adapt is contingent on the resilience of these ecosystems. Adaptation strategies will play a key role in strengthening the resilience of communities affected by climate change in such areas as coastal zones, agriculture, forests, water, health, and infrastructure—each of which presents its own challenges and involves a variety of stakeholders. As a result, these strategies need to be flexible and form part of a broader framework that includes integrated coastal zone management, integrated water resource management, and the search for a new generation of resilient crops and vaccines to prevent the transmission of infectious diseases.

Recommendation: *We support the recommendations of the Millennium Ecosystem Assessment, especially concerning payments for ecosystem services in critical areas. Methodologies for valuation of ecosystem services and for systems of payments should be developed and disseminated widely. Local scientists in developing countries should be supported for monitoring and research to apply such methodologies in their own countries.*

We also recommend the launch of a large-scale international initiative to reduce deforestation and to promote reforestation and the recovery of degraded lands.

Food and Agriculture

Climate change is a serious threat to food security in many developing countries, adversely affecting food availability, access to food, stability of food supplies, and food utilization. The impacts of climate change on food security will differ across regions and over time and, most importantly, will depend on

the level of socio-economic development that a country has reached as the effects of climate change set in.

The poorest communities have the least capacity to adapt to the impacts of climate change. In these vulnerable communities, climate change could erase the gains from many years of development efforts, causing repeated food crises, threatening large populations with chronic hunger and disease, and leading to environmental refugees as well as civil strife in already unstable regions. Some 70 percent of the world's poorest people live in rural areas, particularly in Asia and Africa, where subsistence farmers depend on rain for their harvests; accordingly, effective adaptation to climate change in these areas will be critical to attaining the MDGs by 2015.

Climate change affects agriculture and food production in complex ways. It affects food production directly through changes in agro-ecological conditions and indirectly by influencing growth and distribution of incomes, and thus demand for agricultural products. According to the IPCC, the adverse impacts of climate change on agriculture will occur predominantly in the tropics and subtropics, in sub-Saharan Africa, and to a lesser extent in South Asia. Yields from rain-fed agriculture in some African countries could fall by 50 percent by 2020. In some South Asian countries, a substantial reduction in crop yields from rain-fed agriculture could also occur. In Central and South Asia, crop yields could fall by up to 30 percent by 2050, and India could lose 18 percent of its rain-fed cereal production. In addition, freshwater availability in these regions is projected to decrease, and coastal areas will be at the greatest risk due to increased flooding. Sea level rise in Bangladesh, for example, is expected to affect more than 13 million people with a 16 percent reduction in national rice production.

Farmers have always adapted to changing weather conditions by using a variety of production methods; maintaining biodiversity, for example, can prevent land degradation in the face of erratic rainfall. Adaptive measures such as switching crop varieties, introducing more suitable crops, shifting agricultural production from one location to another, and shifting from crops to grazing can often be undertaken by individual farmers. However, such local coping capacities might be limited, especially in poorer communities, creating a need for interventions by national governments and extension services.

Climate change is primarily a multiplier of known risks that have in the past rarely received sufficient attention or funding because they have fallen in the gap between disaster relief and development. The World Bank, for example, the largest investor in agriculture, has in the past paid little attention to food security. Similarly, the current architecture of the United Nations in addressing food security is weak and needs strengthening. There is much overlap between three UN agencies—the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), and the World Food Programme (WFP)—

leading to duplication of efforts. Recently, these agencies were evaluated, and they are in the process of restructuring. This provides an opportunity for a more effective division of labor related to climate change.

The Consultative Group on International Agricultural Research (CGIAR) is a global partnership working on cutting-edge science to foster agricultural growth. The CGIAR Centers and their partners have been helping farmers improve their production and cope with the effects of climate variability and severe weather for nearly three decades. CGIAR is well positioned to assist developing country farmers who face economic and environmental constraints given the impacts of climate change. In 2008, CGIAR members agreed to "revitalize" the organization and improve cooperation in order to reduce poverty and hunger, improve human health, and enhance ecosystem resilience through high-quality research, with specific objectives relating to climate change.

Recommendation: *Centers for Regional Adaptation in Agriculture to develop and widely disseminate technologies for adaptation (for example, salt- and drought-resistant crop cultivars) should be established by the Consultative Group on International Agricultural Research. Priority should be given to the establishment of such centers in the most vulnerable regions of sub-Saharan Africa and South Asia. In the meantime, existing CGIAR Centers should collaborate on appropriate technologies for farmers and policy advice for governments, with a focus on adaptation to climate change.*

Health

Global climate change threatens human health in ways that are numerous and profound. Many parts of the world will experience more extreme events such as droughts, heat waves, altered exposure to infectious disease, and more frequent natural disasters that will put added strain on an already overstressed health system. Moreover, climate change threatens the bases of public health around the globe: sufficient food and nutrition, safe water for drinking and sanitation, and secure homes to live in. It will make the MDGs that much harder to achieve.

Many low-income countries with populations at the greatest risk from climate change are already overwhelmed with existing public health challenges from treatable conditions such as malnutrition, diarrhea, acute respiratory infections, malaria, and other infectious diseases. Diverting limited personnel and resources away from these ongoing problems to address future threats from climate change could make things worse instead of better. However, if the international community makes a serious commitment to help lower-income countries adapt to the health threats from climate change through improving basic health services, it will also help those countries address challenges that have been an ongoing scourge to their economies and their people.

The greatest health impact of climate change may be its impact on global nutrition. It has been estimated that at least one-third of the burden of disease in poor countries is due to malnutrition, and roughly 16 percent of the global burden of disease is attributable to childhood malnutrition. Most experts agree that climate change will exacerbate water scarcity and threaten agricultural productivity and global food production.

Climate change is expected to alter exposure to infectious disease in many different ways. Waterborne disease outbreaks caused by a variety of organisms are more common following extreme precipitation events, and these events are expected to become more frequent. Food poisoning events increase with higher ambient temperatures and may also become more common with climate change. In addition, the distribution of vector-borne diseases, which affect nearly half the human population, is expected to change as a result of changes in temperature, humidity, and soil moisture. While there is still some debate about the net impact of climate change on the distribution of these diseases, there is little debate that they are likely to spread into regions where they have not been historically endemic. In other areas, diseases that occur seasonally will begin to occur year-round. Even if there is no net increase in the number of people exposed to vector-borne diseases, which is unlikely, the redistribution of these diseases will mean that populations previously unexposed will become exposed and will be particularly vulnerable.

There is also strong consensus that rising global temperatures, combined with increased temperature variability, will cause more extreme heat events, particularly in higher northern latitudes. As with many of the health threats associated with climate change, the threat of extreme heat events is exacerbated by other ongoing trends. The demographic trends of urbanization and aging populations in the developed world will add to the threat of extreme heat events. As a result of these trends, events such the European heat wave in the summer of 2003, which killed between 30,000 and 55,000 people, are expected to become more frequent.

The health impacts of climate change have a number of important characteristics that must be taken into account when framing appropriate adaptation responses. In particular:

- They are likely to be significant, impacting hundreds of millions of people.
- They are largely preventable, if adequate resources can be mobilized.
- The impacts will be experienced disproportionately by vulnerable populations in resource-constrained, low-income countries.

Because even the most sophisticated climate change models will be incapable of predicting biophysical changes in specific locations with great accuracy, improved

surveillance will be increasingly important. Since conditions can change, sometimes fairly rapidly, it will be important to gather and analyze information about field conditions across a variety of sectors. Surveillance of crop productivity, in-stream flow rates and water tables, food consumption and rates of malnutrition, and population movements will be as important to track as changing distributions of vector-borne disease, water-related disease, and other infectious diseases. These types of surveillance will be an important part of improving early warnings of climate impacts so that resources can be targeted to address emerging threats.

Human **population growth** will also increase vulnerability to many of the most worrisome health impacts of climate change. Food scarcity, water scarcity, vulnerability to natural disasters and infectious disease, and population displacement are all exacerbated by rapid population growth. Population growth is the fastest among the poorer segments that reside in vulnerable regions. Targeted human development policies and programs, including better access to education, credit, health care, and reproductive services for women, will improve livelihoods and reduce social pressures.

Finally, there is an urgent need for more **research** to model the health impacts of climate change in specific locations, evaluate approaches to reducing vulnerability, and perform analyses of the cost-effectiveness of different adaptation approaches. There are many outstanding questions about how best to manage the relocation of millions of people or how to improve social capital and community action in developing country mega-cities where 70 percent of residents live in slums. There is a need to combine long-range weather forecasting with modeling of ecosystem services, such as food and water generation, and land cover analysis to provide early warning of water scarcity, food scarcity, and epidemic disease. These types of research will need aggressive support to have an impact.

Recommendation: *To reduce the burden on countries in coordinating donor efforts, the international community should support developing countries in formulating country-led agreements that rally all development assistance partners around one country-led health plan and one monitoring and evaluation framework. National governments bear the responsibility for the health of their populations and for long-term sustainability, but international financial support should be provided for strengthening developing countries' public health infrastructure and for building long-term institutional partnerships between nongovernmental organizations (NGOs), universities, and government-led health care systems in developing and developed countries to improve access to primary health care, strengthen health systems, provide better health education, and improve research capacity in developing countries.*

IV. ADAPTATION PLANNING

In most developing countries, adaptation planning has been a marginal activity, focused on building infrastructure intended to provide protection against extreme climate events. While infrastructure is a critical area, adaptation strategies should be much broader. Climate change risk assessments should be built into all aspects of policy planning at appropriate levels—local, national, and regional. A focus on macro-level approaches to adaptation, although they play an important role in reducing vulnerability to climate change, runs the risk of ignoring the concerns of the most vulnerable people. These large-scale interventions must be combined with community-based adaptation initiatives in order for the global adaptation response to be effective. For countries with limited governance capacity, this is an immense task that requires transformational changes involving far-reaching reforms across all sectors of the economy. For some countries, these changes, in turn, need to be facilitated through international measures.

Creating adaptive capacity requires that funds move efficiently to address local impacts. Effective adaptation requires participatory democracy, functioning institutions, and transparency at all levels. People at risk must have access to information, and be able to voice their views and concerns. They need markets that work for them. They need to be able to trade and build their assets, with an accountable and responsible government.

According to the International Commission on Climate Change and Development, effective adaptation strategies require coherent and coordinated policies and cooperation among governments, civil society, and the private sector. Because impacts are local and contextual, the principle of subsidiarity should apply. The bulk of responsibility will fall on local and national governments supported by international actions to provide appropriate capacities and resources.

Implementing National Adaptation Programmes of Action

In 2001 the Parties to the UNFCCC provided a process for the LDCs to identify priority activities that respond to their urgent and immediate needs to adapt to climate change—those for which further delay would increase vulnerability and/or costs at a later stage. These National Adaptation Programmes of Action (NAPAs) are also intended to develop a framework for bringing adaptation into the mainstream of national planning. As of October 2008, the UNFCCC had received NAPAs from 38 LDCs, with support from the GEF's Least Developed Countries Fund. Oxfam has estimated that the cost of implementing the NAPAs for all 49 LDCs is between US$1.1 and $2.2 billion.

In its *2008* Update, GLCA recommended that NAPAs be strengthened and Poverty Reduction Strategy Papers (PRSPs) updated to include analyses of countries' climate change risks and vulnerabilities, to identify priorities for reducing vulnerability, and to provide estimates of financing needs. Integrating NAPAs and PRSPs will help to ensure that climate concerns are incorporated into broader national goals for addressing poverty and creating sustainable economic growth. Such harmonization will minimize duplications and the associated transaction costs. It will also avoid the threat of maladaptation that leads to a greater vulnerability to climate change.

While many LDCs have developed NAPAs, other countries that face destructive impacts from climate change and need to mobilize support to plan for adaptation should also consider preparing NAPAs. Funds should be made available immediately to help the most vulnerable countries implement their NAPAs, as noted in the following section.

Recommendation: *All developing countries that face negative impacts of climate change and need support and assistance for adaptation should prepare NAPAs. In addition, NAPAs and PRSPs should be integrated in national development plans in order to ensure people's access to resources such as information, land, forests, and funds, and to establish mechanisms for monitoring and accountability, including through civil society organizations.*

V. FINANCE

Financial Needs

Although there is uncertainty about the cost of adaptation, the scale of financing needed is significant. As indicated in Table 1, several calculations based on rough assumptions have attempted to estimate the cost of adaptation in developing countries. These estimates range from US$9 to $86 billion per year.

Table 1: Annual Adaptation Costs in Developing Countries (US$ billion)

	Assessment Year	Estimated Cost	Time Frame
UNDP	2007	$86	2015
UNFCCC	2007	$28-$67	2030
Oxfam	2007	$50	Present
World Bank	2006	$9-$41	Present

Sources: Human Development Report, UNDP (2007); Economic Aspects of Adaptation to Climate Change: Costs, Benefits, and Policy Instruments, OECD (2008)

According to Article 4.4 of the UNFCCC, "developed countries are required to assist developing countries in meeting the costs of adaptation to the adverse effects of climate change." Developing countries regard funding for adaptation as indicative of historical responsibility and argue that resources for adaptation should be additional to Official Development Assistance (ODA).

However, one recent analysis found that developing countries have received less than 10 percent of the funds promised by developed countries to help them adapt to the impacts of climate change. The poorest countries have received the least help, with Africa, the poorest continent, getting less than 12 percent of all the climate change-related funds spent globally in the last four years. Although developed countries have together pledged nearly US$18 billion in the last seven years, and despite world leaders' rhetoric that the financing is vital, less than US$0.9 billion has been disbursed, and long delays are plaguing many funds.

This lack of action has caused concern among international negotiators, who have warned that a new global agreement on climate change is at risk if developed countries do not make the necessary funding available to address adaptation in developing countries. The failure to act is fostering deep distrust between developed and developing nations, and adaptation funding is crucial to rebuilding trust.

Financial Crisis

While little progress was made at the 2008 climate talks in Poznan, and negotiations on a new climate agreement are continuing, the concurrent global financial crisis and threat of a global recession have called into question the feasibility of raising significant financial resources for climate action, including adaptation, around the world. Climate change, however, will not wait for the resolution of the financial crisis.

We recognize the challenge of generating financial support for adaptation at the requisite level. On the other hand, the financial crisis has shown that hundreds of billions, even trillions, of dollars of public funds can be mobilized in a very short time. What is required for climate action is on the order of tens of billions of dollars. A small percentage of the funding in national "stimulus" packages would go a long way towards addressing climate change now.

As some global leaders have pointed, the financial crisis should not be used as an excuse for inaction on climate change. Addressing climate change at the requisite scale can be an integral part of the solution to the financial crisis. The transition to a low-carbon economy can support global recovery by creating new jobs and opportunities across a wide range of industries and services.

Additional international and domestic sources and mechanisms for both public and private finance must be put in place to finance and provide incentives for the global transition to a low-carbon economy and to help cover the costs of adaptation. All governments have an obligation to establish a supportive framework for low-carbon growth that maximizes local resource mobilization and ownership.

Available Funding

Currently, the main sources of adaptation funding include dedicated multilateral and bilateral adaptation funds as part of ODA, and dedicated domestic resources in developing countries.

a. Dedicated Multilateral Funds

The most important multilateral funds include:

GEF Funds: As of June 2008, total resources pledged for existing adaptation funds (Least Developed Countries Fund, Special Climate Change Fund, and GEF Trust Fund Special Priority on Adaptation) were US$320 million, while the amount disbursed was US$154 million (see Table 2).

Table 2: UNFCCC Adaptation Funds in Operation (US$ Million)

Fund	Pledged	Received
LDC Fund	$180	$91.8
SCCF	$90	$59.9
GEF Trust Fund	$50	$50.0
Total	$320	$201.7

Source: Financing Adaptation: Opportunities for Innovation and Experimentation, WRI (2008)

The majority of this funding has gone toward impact assessments, capacity building, technical assistance for pilot demonstration activities, and knowledge transfer to facilitate the inclusion of adaptation concerns in development planning.

World Bank Funds: As of November 2008, developed countries had pledged to contribute US$6.3 billion to the Climate Technology Fund and the Strategic Climate Fund—also known as the Climate Investment Funds (CIF) of the World Bank, which also include an adaptation component called the Pilot Program for Climate Resilience (PPCR). However, of the total, only US$240 million has been pledged specifically for the PPCR.

Adaptation Fund: The Adaptation Fund of the Kyoto Protocol was established to finance adaptation projects and programs in developing countries that are Parties to the Kyoto Protocol. It will be financed with a 2 percent share of the proceeds from the sale of certified emissions reductions under the Clean Development Mechanism (CDM), yielding between US$80 and $300 million per year until 2012. In addition, the fund can receive donations.

b. Dedicated Bilateral Funds

International Climate Initiative (ICI) of Germany: In 2008, the German government auctioned 8.8 percent of its allowable emission permits to businesses, setting aside approximately 30 percent of the revenue to finance domestic and international climate action. Of the resulting €400 million per year, €120 million per year is earmarked for developing countries and countries in transition. Of this, half is intended for adaptation and biodiversity projects.

Adaptation to Climate Change Initiative of Australia: Australia will invest AUD$150 million over three years, including AUD$35 million in 2008-2009, to meet high-priority climate adaptation needs in vulnerable countries. The program focuses on the Pacific island countries and East Timor, but includes targeted assistance to other countries.

Cool Earth Partnership of Japan: Japan has pledged US$10 billion (JPY 1,250 billion) over five years to support developing countries that are already making efforts to reduce greenhouse gas emissions. Up to US$2 billion (about US$400 million per year) will be provided for adaptation and improved access to clean energy in developing countries that are vulnerable to the adverse effects of climate change (e.g., African and Pacific island countries).

c. Dedicated Domestic Resources

Some developing countries that are already experiencing climate change impacts have begun to set up their own funds for adaptation. For example, Bangladesh has allocated US$40 million from its national budget to create a Trust Fund on Climate Change, inviting donors to contribute. The UK government has pledged US$132 million to this fund. The money will support measures such as protecting houses, schools, and farms against flooding, and introducing new crop strains. A similar fund is under development in Bolivia. In addition, Sri Lanka has put in place an environmental levy that will, in part, fund adaptation.

Sources of New Funding

ODA and other public funds are unlikely to provide the "new and additional" resources required to finance the adaptation efforts of all developing countries. The current level of available funding is an order of magnitude below even the most conservative of the cost estimates. It is also scattered across different sources and is allocated with no clear coordination. Without a significant increase in financial support for adaptation and better coordination of international efforts, the world will fail to deliver what is urgently needed to cope with climate change in countries that are highly vulnerable to its impacts, such as the LDCs, small island developing states, and disaster-prone African countries.

Currently, all international adaptation funding mechanisms—except the Kyoto Protocol Adaptation Fund—are replenished through ODA-type contributions that are allocated from donor country national budgets. Mainstreaming attention to climate change in ODA is necessary. An increase in ODA funds earmarked specifically for adaptation, reflecting the importance of incorporating climate risk into development efforts, is also essential, but it will not be sufficient to meet the needs of countries. Many Parties to the UNFCCC have argued that supplementary financing should be additional to ODA and that innovative sources of funding should be found. Accordingly, the Bali Action Plan called for new and additional, as well as "adequate, predictable, and sustainable" financing to support action on mitigation, adaptation, and technology cooperation in developing countries.

A number of new sources of funding have been proposed by the Parties to the UNFCCC and are listed in the Annex. Below we highlight three possible sources that are "adequate, predictable, and sustainable."

Auctioning International Emissions Trading Allowances: International Emissions Trading (IET) is the system of trade in Assigned Amount Units (AAUs), or emission allowances, established as one of the flexible mechanisms under the Kyoto Protocol. Norway has proposed that a small portion of AAUs could be withheld from national quota allocation and auctioned (directly or through a tax on issuance of the AAUs) by an appropriate international institution. Auctioning two percent of AAUs (similar to the CDM levy) would generate between US$15 and $25 billion per year. The resulting revenue could then be placed in a fund to support climate action, including adaptation in developing countries.

International Air Passenger Adaptation Levy (IAPAL): Maldives has proposed, on behalf of the LDCs, an adaptation solidarity levy on international air passengers, following the successful example of the Leading Group on Solidarity Levies to Fund Development. This levy would provide funding for adaptation activities in the poorest and most vulnerable countries and communities. The revenue from the levy would go to the Kyoto Protocol Adaptation Fund.

In line with the solidarity levy for HIV/AIDS, the proposal is to establish a small passenger charge for all international flights—differentiated with respect to the class of travel—to raise between US$8 billion and $10 billion annually for adaptation in the first five years of operation, and considerably more in the longer term. This would constitute a significant step toward ensuring adequate financing for adaptation in developing countries. The level and travel class differentiation of the levy would be based on the formula of the Solidarity levy, which at present is US$6 per economy trip, and US$62 per business/first class trip. The levy is to be collected by airlines from their passengers at the point of sale and transferred by the airline to a dedicated account of the Adaptation Fund. Being international and dependent only on the evolution of air travel demand and not on bilateral replenishment, the funds would be new and additional, as well as significantly more predictable than traditional funding mechanisms.

International Maritime Emission Reduction Scheme (IMERS): IMERS is a 'cap-and-charge' scheme as opposed to cap-and-trade, based on a carbon levy on fuel for international shipping that recognizes different national circumstances. First endorsed by Norway and other developed countries in 2007, IMERS is consistent with India's proposal for a marine haulage levy and the proposal by LDCs to finance adaptation with the

revenue from such a levy. It is also consistent with Nicaragua's proposal for a levy on maritime transport freight (on behalf of Guatemala, Dominican Republic, Honduras, and Panama). Applied worldwide and collected centrally, IMERS would raise approximately US$10 billion annually for climate action in developing countries while reducing currently unregulated carbon dioxide emissions from international shipping.

Under IMERS, a carbon levy would be charged on fuel used for carrying cargo to destinations with emission reduction commitments. The levy would be set at the average market price for carbon. All of the revenue raised would be disbursed to climate change action, comprising: (1) emissions mitigation, mainly through reducing emissions from deforestation and forest degradation, including conservation (REDD+); (2) climate adaptation in developing countries; and (3) technology development and transfer in the maritime sector. The anticipated price impact of the scheme on final consumers is only about a 0.1 percent increase in the price of imported goods to developed countries (equivalent to an extra US$1 for every US$1,000 of imported goods). There is no expected impact on imports to developing countries. Given that roughly 60 percent of global maritime emissions would be subject to the levy at the start of the scheme (based on developed countries' share of worldwide imports), a levy at the price of US$15 per metric ton of carbon dioxide would raise approximately US$10 billion in 2013.

A Two-Step Approach

We envision a two-step approach to mobilizing "new and additional" funds for adaptation. The first step would provide immediate funding for implementation of the NAPAs in the poorest and hardest-hit countries. This would help narrow the 'trust gap' between developed and developing countries and serve as a building block toward a long-term approach to adaptation within the context of a new and comprehensive agreement on climate change.

Recommendation: *We recommend that US$1 to $2 billion of additional ODA be provided immediately by developed countries to help LDCs (especially in Africa), selected small island developing states (below a certain gross domestic product), and other most vulnerable developing countries that are already suffering from climate impacts. The funds could be provided as a special window in the fifth replenishment of the GEF and should be available for use prior to the effective date of a new global climate agreement (i.e., during the 2010 to 2012 period). The GEF would co-finance adaptation action in targeted countries with the LDC Fund of the UNFCCC and the Adaptation Fund of the Kyoto Protocol in order to maximize impacts and avoid fragmentation and duplication.*

The funds should be used for the implementation of NAPAs in the context of poverty alleviation strategies and plans, focus on actions at the local level, and help enhance the resilience of people and ecosystems. Funds should flow to community-level organizations, women's groups, and NGOs.

Recommendation: *In the longer term, we recommend that a climate fund (or funding mechanism) be established in the context of a new and comprehensive climate agreement to support developing countries' action for mitigation and adaptation. It should include both public and private resources, starting at US$10 billion and growing to $50 billion per year. It should have an innovative structure and governance that is transparent and inclusive. In addition to ODA, it should consist of innovative and predictable sources of finance, including auctioning revenues from greenhouse gas markets and global market-based levies, such as from international air travel levy schemes and maritime emissions reduction.*

VI. INSTITUTIONS

Funding is a necessary, but not sufficient, ingredient in successfully addressing the climate challenge, including adaptation. Without viable institutions and effective policy frameworks at the national and global levels, progress in climate mitigation and adaptation will falter.

The International Commission on Climate Change and Development (Commission) concluded that adaptation cannot be effective without effective and accountable organizations and institutions. Disseminating information, building knowledge, articulating needs, ensuring accountability, exchanging goods and services, and transferring resources all are needed for adaptation, and all are guided by and happen through institutions.

Adaptation to climate change is highly local, but support from national governments, international donors, and NGOs will be necessary to reduce vulnerability, identify and fill gaps in adaptation planning, and prevent maladaptation, as well as to ease the impact of climate variability and change on the vulnerable.

Effective global environmental governance is important, but the world's institutions and systems have not kept up with the growing complexity of environmental threats. No global mechanism currently exists to foster international cooperation on adaptation and to set priorities for the existing funds to function in a coordinated manner.

Existing institutions can be used in the short term for the deployment of financial resources, modifying them to better manage knowledge and services. In the longer term, as funding increases and agendas expand, new institutions will be needed.

Local and National Institutions

The highest political and organizational levels should lead national policy coordination for adaptation, climate risk management, disaster risk reduction, poverty alleviation, and human development.

Local institutions know their communities and should have the main responsibility for identifying the poor and vulnerable, and supporting them in building safe rural and urban settlements, according to the Commission. These institutions should ensure that locally appropriate information about best practices for risk management and adaptation reaches the poorest and most vulnerable citizens through extension services. They should be able to manage public goods effectively, in cooperation with the private sector, and should be stakeholder-driven to move resources efficiently from global to local levels, develop community-based strategies, and maximize local resource mobilization.

Global Institutions

There is a need for international institutions, including the multilateral development banks and the United Nations, to change and adapt themselves to climate change and foster broader long-term coordination. For example, all international financial institutions should incorporate consideration of climate change explicitly into their lending strategies.

It is also important to build scientific knowledge and capacity for climate change research in low-income countries. The United Nations Environment Programme (UNEP), in partnership with other UN agencies, has proposed a Global Climate Change Adaptation Network for enhancing adaptive capacity of developing countries by mobilizing knowledge and technologies. UNDP is also helping governments increase their adaptive capacity through activities to integrate climate risks into country programs and national development. In addition, UNDP supports sub-national authorities in their planning for a future that is more resilient to climate change.

Because adaptation is based mainly on local actions, international organizations must become more skilled at reaching the local level directly and working through local governments and civil society organizations. The GEF Small Grants Program can provide valuable lessons and experience regarding international support for effective local action.

We endorse the following recommendations of the Commission with regard to the United Nations:

- The UNFCCC Secretariat should focus on inter-governmental debate and policy setting, not on regulatory, financial, or operational functions. Regulatory services, the scaling up of carbon trading, and the provision of global corporate guidance (as distinct from political guidance) should be entrusted to a new regulatory institution that would also effectively provide the LDCs with access to carbon markets.
- The UN should create a focal point for sharing the expertise of its programs and agencies on issues ranging from water and crop management to insurance and disaster risk reduction.
- The UN, international organizations (including civil society), and governments should work together to quickly and drastically scale up national, regional, and international systems for disaster response and preparedness. The new system should have a standby financial mechanism that would be triggered automatically by a major event, assuring rapid response. It should facilitate recovery through a focus on vulnerability reduction; promote risk transfer, including social

transfers and insurance products; and invest in staff with the creativity and capacity to handle surprises. It should strengthen national and regional capacities.

- Governments should support the efforts of the UN Secretary-General to strengthen coordination among UN agencies, funds, and programs. The Secretary-General should continue to keep climate change issues at the top of government and governance agendas, encouraging and maintaining political will.

Recommendation: *In the short term, we recommend the creation of no new global institutions for deployment of resources from existing funding channels, provided that accountability mechanisms and transparent decision making are established to overcome current lack of trust by donor and recipient countries. In the longer term, we recommend the establishment of a new funding mechanism with an innovative structure and inclusive governance to manage multiple sources of funding and ensure accountability to the UNFCCC. This funding mechanism would program resources at a 'macro' level and provide disbursements that reflect countries' priorities through existing operational channels. The funding mechanism would also monitor and evaluate progress, and adjust its policies according to changing scientific information about climate change and its impacts, as well as lessons learned.*

Recommendation: *To improve coordination and reduce duplication of effort, UN agencies should seek to 'deliver as one' at the country level, as recommended by the UN High-Level Panel on System-Wide Coherence.*

VII. CONCLUSION

At the International Scientific Congress on Climate Change in Copenhagen in March 2009, 2,500 scientists agreed on several key findings. With regard to emissions, they said, "Recent observations confirm that, given high rates of observed emissions, the worst-case IPCC scenario trajectories (or even worse) are being realized." With regard to climate impacts, they said, "Recent observations show that societies are highly vulnerable to even modest levels of climate change, with poor nations and communities particularly at risk." As a result, they concluded, "There is no excuse for inaction."

The 2007 report on climate change by the scientific research society Sigma Xi was subtitled "Avoiding the Unmanageable and Managing the Unavoidable," with the first part of that phrase describing the mitigation challenge and the second part adaptation. The science is clear—climate impacts are being felt today, and greater impacts are unavoidable tomorrow. Adaptation—building resilience and reducing vulnerability—is essential to reducing the human and social costs of climate change, and to development and poverty alleviation. Adaptation strategies abound that will yield benefits in their own right. Indeed, there is no excuse for inaction.

Annex

Proposed Sources of New Funding for Adaptation

Source of Funds	Estimated Revenue	Proposing Parties
Auctioning Permits and Extending Adaptation Levy to International Emissions Trading Scheme (IET) of the Kyoto Protocol	*US$15 to $25 billion per year* *A share of this revenue would be earmarked for adaptation.*	Norway
International Air Passenger Adaptation Levy (IAPAL)	*US$8 to $10 billion per year in the first five years and more in the longer term.*	Maldives on behalf of LDCs
International Maritime Emission Reduction Scheme (IMERS)	*US$10 billion per year from 2013 at the price of US$15 per metric ton of carbon dioxide* *A share of this revenue would be earmarked for adaptation.*	Endorsed by Norway and some other developed countries; consistent with proposals by India, LDCs, and Nicaragua (on behalf of Guatemala, Dominican Republic, Honduras, and Panama)
World Climate Change Fund (Green Fund)		Mexico
Additional 'Earmarked' ODA	*US$185 billion per year* *A share of this revenue would support adaptation.*	China

Key Features

IET is the system of trade in assigned amount units (AAUs) or emission allowances established under the Kyoto Protocol. Under this proposal, a small portion of AAUs would be withheld from national quota allocations and auctioned (directly or through a tax on issuance of the AAUs) by an appropriate international institution.

Auctioning two percent of AAUs (similar to the CDM levy) would generate between US $15 and $25 billion per year. The resulting revenue could then be placed in a fund to support climate action, including adaptation in developing countries.

Following the example of the French Leading Group on Solidarity Levies to Fund Development, a small passenger levy would be charged for all international flights, differentiated by class of travel. The class differentiation of the levy would be based on the formula of the French levy, which at present is US$6 per economy trip and US$62 per business/first class trip. The revenue from the levy would go to the Kyoto Protocol Adaptation Fund.

IMERS is a based on a carbon levy on fuel for international shipping that recognizes different national circumstances. The levy would be set at the average market price for carbon. The anticipated price impact of the scheme is only about a 0.1 percent increase in the price of imported goods to developed countries. There is no expected impact on imports to developing countries.

100 percent of revenue raised would be disbursed to climate change action, comprising: (1) mitigation, mainly through reducing emissions from deforestation and forest degradation; (2) climate adaptation in developing countries; and (3) technology development and transfer in the maritime sector.

Given that roughly 60 percent of global maritime emissions would be subject to the levy at the start of the scheme—based on developed countries' share of worldwide imports—a levy of US$15 per ton of carbon dioxide would raise approximately US$10 billion in 2013.

The Green Fund is a multilateral fund that complements existing mechanisms in support of mitigation and adaptation as well as transfer and diffusion of clean technologies. All countries would contribute to and benefit from this Fund. Differentiation of responsibilities and capabilities among countries would be determined through the use of three indicators: greenhouse gas emissions, population, and gross domestic product. It may be possible for LDCs to benefit from the Fund without making a contribution to it.

All contributions to the Fund would be subject to a double levy. The first levy would feed into the Adaptation Fund of the Kyoto Protocol and the second levy would enable the development of a Clean Technology Fund.

Developed countries would provide 0.5 percent of total gross domestic product to developing countries in additional ODA to support climate change actions.

Source of Funds	Estimated Revenue	Proposing Parties
Auction of Emissions Allowances	*€50 billion by 2020 (US$80 billion)* *US$22 billion in 2010* *A share of this revenue would support adaptation.*	European Union
Global Carbon Adaptation Tax	*US$48.5 billion per year in 2010 of which US$18.4 billion would be allocated to adaptation.*	Switzerland
Global Climate Financing Mechanism (GCFM)		European Commission and World Bank
Burden Sharing Mechanism	*US$39.6 million per year*	Tuvalu

Key Features

Auctioning of 100 percent of certificates by the EU Emission Trading Scheme.

Auctioning of international shipping and aviation allowances at US$23.6 per metric ton of carbon dioxide.

A uniform global tax of US$2 per metric ton of carbon dioxide would be imposed on all fossil fuel emissions, leading to a burden of about 0.5 US cents per liter of liquid fuel.

The scheme proposes a basic tax exemption of 1.5 tons of carbon dioxide equivalent per capita, to take into account common but differentiated responsibilities. This free emission allowance exempts low-emission countries while countries with higher emission levels make a greater contribution. Further, countries with high per capita incomes contribute a larger share than countries with lower incomes. Consequently, the proposed tax scheme results in a net transfer of resources from rich to poor countries.

Total revenues would amount to US$48.5 billion in 2010. Of this amount, US$18.4 billion would be allocated to a proposed Multilateral Adaptation Fund. The share of contributions from the industrialized countries to this fund would be 76 percent.

Similar to the International Finance Facility for Immunization, which has raised US$4 billion over 20 years, a proposed GCFM would make large upfront ODA disbursements for adaptation by borrowing from private capital markets. The funds generated by issuing a bond would be used as grants to immediately help the poorest countries, including LDCs and small island developing states, address climate change. Annual repayments could come from future ODA commitments, from carbon-linked revenue, or from another innovative source such as the airline ticket levy.

A special 'Collection Authority' would be created under the UNFCCC Conference of the Parties to collect:

a. 0.01 percent levy on international airfares and maritime transport freight charges operated by the nationals of developed countries (excluding economies in transition); and

b. 0.001 percent levy on international airfares and maritime transport freight charges operated by developing country nationals.

Exemptions to (a) and (b) would apply to all flights and maritime freight to and from LDCs and small island developing states (irrespective of whether the airlines or freight are owned by developed or developing country nationals). The funds collected would be channeled through the Least Developed Countries Fund and the Special Climate Change Fund (both under the UNFCCC and operated by the GEF) for adaptation projects. Based on freight cost data for 2005, the expected annual revenue, at these proposed levels, would be US$37 million from nationals of developed countries (excluding economies in transition), and US$2.6 million from developing country nationals.

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