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THE GATHERING STORM: IS CLIMATE CHANGE A SECURITY THREAT?

In April 2007 the UN Security Council held its first debate on climate change. Initiated by the United Kingdom,[1] then UK Foreign Secretary Beckett compared emerging climate change to the "gathering storm" before World War II:[2] "An unstable climate risks some of the drivers of conflict – such as migratory pressures and competition for resources – getting worse", increasing the chances of instability. The Chinese representative, Liu Zhenmin, however questioned "that the Security Council has neither the professional competence in handling climate change– nor is it the right decision-making place for extensive participation leading up to widely acceptable proposals."

The Security Council debate indicates that in recent years global warming has elevated to the top of the international security agenda, rivaling the threat of war. At the end of his term, former UN Secretary-General Kofi Annan referred to climate change as a "threat to peace and security", and stressed that the international community must devote just as much attention to climate change as it does to preventing war and the proliferation of weapons of mass destruction.[3] Annan's successor Ban Ki-Moon also warned that climate change may pose as much of a danger to the world as war.[4] With its 2007 peace award to Al Gore and the Intergovernmental Panel on Climate Change (IPCC), the Nobel Prize Committee has emphasized that extensive climate change "may induce large-scale migration and lead to greater competition for the earth's resources". These could result in "increased danger of violent conflicts and wars, within and between states."[5]

CLIMATE CHANGE AND SECURITY: THE EMERGING POLICY DEBATE

The potential threats and conflicts induced by global warming could indeed create new dividing lines in the international system. The differences between the British and Chinese representatives indicate a division on the responsibilities and impacts of global warming. In the view of many developing countries the main responsibility rests with the industrialized countries whose per-capita carbon emissions by far exceed those of developing countries. At the same time, many of the impacts of global warming will be felt most heavily in the Third World. This asymmetry did not prevent the Bush Administration – which has long denied emission reduction obligations for the United States – to request that emerging polluters such as India and China be part of the reduction game. While climate threats could be potential drivers for conflict in the international system they could also strengthen the need for more international collaboration to address the problem. Preventing the climate threat is seen by many as a unique opportunity for the international community to overcome conflicts and move towards cooperative global security against common threats.

A key aspect is how the industrialized countries handle their responsibility and how they respond to the emerging security threat. Europe is paying significant attention to the security

issues of climate change, in particular the German government. In her November 2006 security policy address, German Chancellor Angela Merkel emphasized "that conflicts over the distribution of increasingly scarce resources can cause ever greater unrest and violence, as can environmental problems. These are matters of oil and gas, of climatic changes, of potable water. All these aspects are the source of conflicts with a very high potential for violence."[6]

In June 2007 the European Council invited the High Representative and the European Commission to prepare a joint report that was presented in Spring 2008. The report concludes that climate change "is already having profound consequences for international security" which are not just of a "humanitarian nature" but include political and security risks that directly affect European interests: "Climate change is best viewed as a threat multiplier which exacerbates existing trends, tensions and instability. The core challenge is that climate change threatens to overburden states and regions which are already fragile and conflict prone."[7] Particular attention was given to climate change in the Arctic region, which creates easier access to the polar region and opens up new avenues for potential cooperation, but could also induce possible territorial disputes. Here the study refers to "different countries asserting various claims". Widely cited has been the raising of a Russian flag on the seabed at the North Pole, despite attempts by the Russian government to compare this with planting the American flag on the moon.

In the United States, *Hurricane Katrina* in 2005 as well as the hurricanes of 2008 have left a trail of destruction, sparking a debate whether the nation is prepared to major disasters. "If we do this badly at mobilizing national resources to deal with catastrophic events that we can actually model, and we actually had four or five days warning; Good Lord, how could we respond to a nuclear attack?" said Ben Wisner, an adviser to the United Nations on disaster risk, and a visiting professor at Oberlin College in Ohio. "What we found out with *Katrina* is that the country is still unable to deal with disaster," complained former New Hampshire Sen. Warren Rudman, who along with former Colorado Sen. Gary Hart chaired a commission about the dangers of terrorism prior to the September 11 attacks.[8]

These policy statements indicate that global warming may shift the coordinates of the international security debate. Rather than being a direct cause of war, climate change significantly affects the delicate balance between social and environmental systems in a way that undermines human security and societal stability with potentially grave consequences for international security.

THE SCIENTIFIC ASSESSMENT OF GLOBAL WARMING

The potential risks of global warming have been addressed in detail in the 2007 Fourth Assessment Report of the IPCC which draws a comprehensive picture of the physical conditions, the magnitude and likelihood of impacts and the possible strategies for mitigating and adapting to climate change. For the IPCC "confidence has increased that some weather events and extremes will become more frequent, more widespread and/or more intense during the 21st century." Vulnerable systems include water resources, agriculture, forestry, human health, human settlements, energy systems, and the economy. The impacts are specific for each region and "spread from directly impacted areas and sectors to other areas and sectors through extensive and complex linkages."[9] The vulnerability of regions will be influenced by their adaptive capacities, including access to resources, information and technology, and by the stability and effectiveness of institutions.

Working Group I explains the physical basis and provides evidence for global warming. Anthropogenic emissions of greenhouse gases *(*carbon dioxide, methane and nitrous oxide) have increased since the beginning of industrialization and are responsible for the increase in global air and ocean temperatures, mainly due to the use of fossil fuels and other factors. The warming climate contributes to sea-level rise, in addition to the thermal expansion of sea water. Future warming will likely cause increased heat waves and heavy precipitation, and the wide-spread melting of snow and ice. While the report projects a maximum sea level rise of 81 cm during the 21st century, more recent data suggest that the rise could be twice that much, due to faster melting of glaciers and polar ice caps.

There are increasing concerns about "tipping points" beyond which climate change becomes more rapid and abrupt.[10] Examples are the potential loss of the Amazon rainforest, a shift in the Asian monsoon, the disintegration of the West-Antarctic icesheet or the shutdown of the North Atlantic thermohaline circulation that is keeping temperatures in Europe moderate. These effects are a reminder that the climate system is highly non-linear and complex and many of the uncertainties and feedbacks are not fully understood. Earth's history provides examples for drastic temperature changes within decades and strong changes in sea-level. For instance, the melting of the ice caps since the last ice age resulted in a rise in sea level of more than a hundred meters. Only a fraction of this would be beyond imagination in today's densely populated coastal regions. Moving into unknown domains of the climate system with several degrees temperature change is a prescription for likely disaster to many future generations.

IMPACTS AND VULNERABILITIES

The impacts of climate change on natural and social systems have been assessed in Working Group II of the IPCC Report. Species and ecosystems in all parts of the world (e.g. rainforests, coral reefs, fishery, Arctic ecosystems) will be severely affected and some show already stress symptoms. Drought-affected areas will likely increase, and water supplies stored in glaciers and snow cover in major mountain ranges such as the Andes and Himalayas will decline, jeopardizing water supply in large regions. Where natural resources are already in a critical stage, global warming tends to further degrade the environment as a source or sink of these resources.

By degrading the natural resource base, climate change will increase the environmental stress on human beings and social systems, including water resources, agriculture and food, forestry and fishery, human health and life, human settlements and migration, energy systems, industry, and financial services. A combination of the stress factors can lead to cascading effects. Some of the environmental changes could directly jeopardize human health and life, such as floods, storms, droughts and heat waves, others may gradually undermine the well-being over an extended period, such as food and water scarcity, diseases, weakened economic and ecological systems. Declining crop productivity will increase the risk of hunger and poverty. Extreme weather events and sea-level rise threaten large populations in coastal regions. Climate change-related exposures "are likely to affect the health status of millions of people, particularly those with low adaptive capacity."[11]

Environmental changes caused by global warming not only affect human living conditions, but may also generate larger societal effects, either by threatening the infrastructures of society or by inducing responses and interaction patterns that aggravate the problem. The stronger the impact and the larger the affected region the more challenging it becomes for societies to absorb the consequences.The associated socioeconomic and political stress can undermine the functioning of communities, the effectiveness of institutions and the stability of societal structures. Confining the impacts will be difficult if extreme weather events become more intense and/or more frequent, and the consequences "spread from directly impacted areas and sectors to other areas and sectors through extensive and complex linkages."[12]

Whether societies are able to cope with the impacts and restrain the risks depends on their vulnerability which, is a function of the "character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity." [13] Vulnerable systems are more sensitive and susceptible to changing environmental conditions. Adaptation is understood as the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities". Adaptive capacity is a function of the economic, human and social capital of a society which in turn is influenced by poverty, state support, economic opportunities, technology, the effectiveness of decisionmaking, institutions and social cohesion.[14]

Societies which depend more on ecosystems services and agriculture, tend to be more vulnerable to climate stress. The stronger the impact and the larger the affected region the more challenging it becomes for societies to absorb the consequences. Large-scale and abrupt changes in the Earth System could have incalculable consequences on a continental scale.

The societal implications of climate change crucially depend on how human beings, populations, social systems and political institutions respond. Some responses facilitate adaptation and minimize the risks, others may cause more problems. For instance, migration as a possible response to environmental hardships could create more hotspots around the world, each becoming a possible nucleus for social unrest.

Global warming affects each world region differently. In parts of the world (notably in Africa, Asia and Latin America) the erosion of social order, state failure and violence could go hand in hand. In the worst-affected regions, climate change could aggravate violence and conflict, and spread to neighboring states, e.g. through refugee flows, ethnic links, environmental resource flows or arms exports. Such spillover effects can destabilize regions and expand the geographical extent of a crisis, overstretching global and regional governance structures. This can add to and intensify other problems such as state failure, the erosion of social order, and rising violence. In parts of the world, climate-induced risks could be further exacerbated by high population growth and density, inadequate freshwater supplies, strained agricultural resources, poor health services, economic decline and weak political institutions.

Countries and communities which feel currently immune to climate change impacts may become vulnerable later. Due to non-linear effects, an increase in global mean temperature above a certain threshold (such as 2 °C) may result in disproportionate impacts, such as reduction of agricultural output in Africa, South Asia or Central and South America. Some regions such as Bangladesh and the African Sahel are more vulnerable due to their geographic and socio-economic conditions and the lack of adaptation capabilities, as the IPCC notes:[15] "Poor communities can be especially vulnerable, in particular those concentrated in high-risk areas. They tend to have more limited adaptive capacities, and are more dependent on climate-sensitive resources such as local water and food supplies." Those with ample resources "will be more able to protect themselves against environmental degradation, relative to those living on the edge of subsistence who will be pushed further towards the limit of survival."[16] By affecting those who are already weak, equity becomes a critical issue of climate policy.

SOCIETAL INSTABILITIES AND SECURITY RISKS

Altogether, climate change could trigger a cycle of environmental degradation, economic decline, social unrest and political instability that could accumulate to become a security threat and aggravate conflicts. Complex couplings between multiple factors could further contribute to instability. For instance, due to water scarcity and soil degradation, agricultural yields could further drop, diminishing food supply. Extreme weather events put the economic infrastructure at risk, including industrial sites and production facilities as well as networks for transportation and supply of goods.

In parts of the world the erosion of social order, state failure and violence go hand in hand. Food insecurity in one country may further increase competition of resources and force population to migrate into neighbor countries. In some cases, climate change could interact with other forces to degenerate into armed conflicts, in other cases the suffering of people may strengthen the readiness to help and cooperate. For instance, the tragedy facing the Inuit culture and society or the expected flooding of small-island states have strengthened international support for emission reductions. Conflicts may spread to neighboring states, e.g. through refugee flows, ethnic links, environmental resource flows or arms exports. Such spillover effects can destabilize regions and expand the geographical extent of a crisis, overstretching global and regional governance structures.

In less wealthy regions climate change adds to already stressing conditions – high population growth, inadequate freshwater supplies, strained agricultural resources, poor health services, economic decline and weak political institutions–and becomes an additional obstacle to economic growth, development and political stability.[17] Weak, poor and fragile states, which are unable to cope with climate impacts, will be most affected, thereby increasing the risk of conflicts. In societies on the edge to instability the marginal impact of climate change can make a big difference. "Failing states" with weak governance structures have inadequate management and problem solving capacities and cannot guarantee the core functions of government,

including law, public order and the monopoly on the use of force, all of which are pillars of security and stability. In weak or failing states climate change could overstretch the already limited capacity of governments to respond effectively to the challenges they face. A government that is unable to meet the needs of its population as a whole or to provide protection against hardships could trigger frustration, lead to tensions between different ethnic and religious groups within countries and to political radicalization. This could destabilize countries and even entire regions.[18]

The most serious climate risks and conflicts are expected in poor countries which are vulnerable to climate change and have less access to capital to invest in adaptation, but more wealthy countries are not immune. While the impacts on some developed countries may be moderate or even positive at small temperature changes (greater agricultural productivity, reduced winter heating bills, fewer winter deaths), they will likely become more damaging at higher temperatures as predicted towards the end of this century.

The security implications of climate change also depend on the meaning of security which has continuously evolved since the Cold War. Security during the bilateral East-West conflict was reduced to military force assessments. In the emerging new world *disorder*, a large number of actors and interconnected factors shape the security discourse, including political, military, economic, technological, health and environmental dimensions. The concept of ecological security[19] transforms environmental problems into security threats, but was criticized as too broad and unspecific, partly because it would allow the military to expand its instruments into environmental policy.[20]

While national and international security has been largely the domain of governments and the military, the concept of "human security" is centered on the security and welfare of human beings. It focuses on "shielding people from critical and pervasive threats and empowering them to take charge of their lives".[21] If the impacts affect the whole society, they may also become an issue for national, international or global security. Some of the described climate impacts may indeed force governments and the UN Security Council to take actions, some of which could involve the military (e.g. for disaster management, in response to massive refugee flows, or in conflicts induced by environmental stress). That does not imply that global warming is predominantly a threat for national or international security or that it will lead to a military confrontation between major powers.

CLIMATE CHANGE: A THREAT MULTIPLIER?

As the IPCC and other studies stress, climate change poses an unprecedented threat to humanity and the impacts will be felt in many parts of the world. Will the vicious cycle from environmental stresses to social disruption also become a breeding ground for violence, conflict and security threats? The IPCC gives only minor attention to this issue, pointing to the stresses arising from, for example, "current climate hazards, poverty and unequal access to resources, food insecurity, trends in economic globalization, conflict, and incidence of disease such as HIV/AIDS."[22] More explicit is the Stern Review:[23] "Climate-related shocks have sparked violent conflict in the past, and conflict is a serious risk in areas such as West Africa, the Nile Basin, and Central Asia."

There is an extensive literature on the link between environmental change and conflict that goes back to the early 1990s. Thomas Homer-Dixon identi?ed four interrelated effects of environmental degradation – reduced agricultural production, economic decline, population displacement, and disruption of social relations – all of which may contribute to various forms of violence and conflict.[24] Since then several research groups have studied these effects for a number of case studies.[25] The Environmental Change and Security Program at the Woodrow Wilson Center for instance points out that environmental challenges "can contribute to conflict or exacerbate other causes such as poverty, migration, and infectious diseases" but "managing environmental issues and natural resources can also build confidence and contribute to peace by facilitating cooperation across lines of tension."[26] Jon Barnett argues that the environment–con?ict hypothesis is theoretically rather than empirically driven.[27] There is some empirical evidence that environmental degradation and resource competition have indeed

contributed to violence and conflict in the past, when combined with other conflict-amplifying factors. The review of 73 empirically recorded "environmental conflicts" which occurred between 1980 and 2005 showed that these were limited to a regional scope and did not present any serious threat to international security.[28]

The links between climate change, environmental degradation, human responses, societal instability and conflict are even more complicated. The research literature offers different explanations without sufficient evidence to support a clear causal relationship between climate change and the security and conflict impacts.[29] More recent studies argue that the consequences of climate change will be so severe that they would likely have security implications

In a 2003 paper, Peter Schwartz and Doug Randall sketched a dramatic scenario where abrupt climate change would change the geopolitical environment and, as a consequence of the reduced availability of food, water and energy, lead up to major wars and the spread of nuclear weapons: "Nations with the resources to do so may build virtual fortresses around their countries, preserving resources for themselves. Less fortunate nations especially those with ancient enmities with their neighbors, may initiate in struggles for access to food, clean water, or energy."[30] The study raises concerns that with less energy supply "nuclear energy will become a critical source of power, and this will accelerate nuclear proliferation". The same authors, together with Nils Gilman, in a later study for the Global Business Network, conclude that climate change "poses unique challenges to U.S. national security and interests."[31]

The *CNA Corporation*, a U.S.-based think tank, and the Military Advisory Board, a blue-ribbon panel of retired admirals and generals identified climate change as a "threat multiplier of instability", making already fragile regions more vulnerable to tension, the spread of disease and conflicts over food and water.[32] Such regions could become possible breeding grounds for extremism and terrorism. The threat could affect Americans at home, impact U.S. military operations and heighten global tensions. The report recommends to integrate climate change into U.S. national security strategy and the *National Intelligence Estimate* "to help stabilize climate change at levels that will avoid significant disruption to global security and stability."

A report of the Washington-based Center for Strategic and International Studies, including former CIA director James Woolsey and Nobel laureate Thomas Schelling, concluded that climate change "has the potential to be one of the greatest national security challenges that this or any other generation of policy makers is likely to confront."[33] Global warming could "destabilize virtually every aspect of modern life", and is likely to breed new conflicts and magnify existing problems. Even a moderate global average temperature rise of 1.3 °C by 2040 could induce a multitude of national security implications, such as the spread of disease, large-scale migrations, heightened tensions; and resource conflicts. More severe climate change with a temperature rise of 2.6 °C by 2040 could induce massive nonlinear societal events and armed conflict between nations over resources; even nuclear war. The catastrophic scenario (temperature rise of 5.6 °C by 2100), would pose almost inconceivable challenges for human society on a global scale.[34]

A comprehensive assessment of the security risks of climate change has been prepared in a report by the German Advisory Council on Global Change. The consequences "could well trigger national and international distributional conflicts and intensify problems already hard to manage such as state failure, the erosion of social order, and rising violence." On the contrary, climate change could also unite the international community to set the course for avoiding dangerous anthropogenic interference with the climate system by adopting a dynamic and globally coordinated climate policy.[35]

The initially mentioned European Commission report also refers to climate change as a "threat multiplier", identifying political and security risks which would directly affect European interests. These include resource conflicts and tension over energy supply; economic damage and risk to coastal cities and critical infrastructure; loss of territory, border disputes and environmentally-induced migration. Altogether these factors could create situations of fragility and radicalization, and increase the pressure on international governance.[36]

Some of these risks are highlighted in Table 1, with reference to a few regional cases, for four main conflict constellations: degradation of freshwater resources, food insecurity, disasters and migration.

Table 1. **Cases of environmental security**[37]

Water stress and conflict		
• Water scarcity undermines human security and heightens competition for water and land resources. • Water has been a factor in many conflicts below level of interstate war • In many cases water scarcity strengthens cooperation. • Transboundary water agreements and institutions were robust against changing political conditions (e.g. Israel-Jordan, Mekong Committee, Indus River Commission).	**Middle East** • Water crisis of the rivers Nile, Euphrates and Jordan. • Link between arid climate, water demand/supply imbalance, and confrontation • Water scarcity intertwined with regional conflicts caused by political differences. • Interstate "Water Wars" have been questioned. • Increased droughts from global warming undermine conditions for peace and human security. • Progress in water talks connected to Middle East Peace Process.	**Central Asia** • IPCC projects sharp temperature rise • Up to 90 percent of water resources used for irrigated farming. • Agriculture (20–40 percent of GDP) and electricity (relies on hydropower) depend on glacier meltwater from mountain ranges. • Some glaciers already declined, about 20 percent of some glaciers may disappear by 2050. • Closed markets, social disparities and weak state structures are unable to cope with water changes. • Previous struggles over land and water resources were aggravated by ethnic disputes, separatist movements or religious-fundamentalist groups.
Land use conflicts and food insecurity		
• More than 850 million people undernourished worldwide • Agricultural areas overexploited in many regions. • Reduction of arable land, water shortages, diminishing food and fish stocks increase flooding and droughts threaten food security • Reduced agricultural productivity with global warming reinforced by desertification, soil salinization or water scarcity. • Food insecurity fuels existing conflicts over depleting resources	**Africa** • Food production per capita declined over 20 years. • By 2020 yields from rain-fed agriculture could decline up to 50 percent in parts of Africa • Food crises impair livelihoods of subsistence farmers, increase unemployment and migration, undermine economic performance of weak states, exacerbate societal destabilization and violent conflicts. • Extreme weather events diminish yields, degrade of soils and decrease per-capita food production • Migration from rural to urban areas creates slums in cities, becoming breeding grounds for crime and violence. • Marginalized people could join riots and armed rebel groups, leading to destabilization, civil war, ethnic conflict.	• One third of African population lives in arid regions, one-third in sub-Saharan Africa is malnourished. • 1994 Genocide in Rwanda: soil degradation, population growth and unequal land distribution contributed to existing ethnic rivalries and power struggle. • Darfur, Sudan: in the dry season Arabic herders from north migrate south in search of water and grazing for cattle into fields of African farmers, contributing to existing tensions. • UNEP Sudan Post-Conflict Environmental Assessment of 2007: Darfur is a "tragic example of the social breakdown that can result from ecological collapse".
Natural disasters		
• Extreme weather events and natural disasters (e.g. droughts, heat waves, wildfires, flash floods, storms) to occur more frequently and intensely.	**Hurricane *Katrina*** • Villages and cities over large areas flooded, houses, business and industrial facilities damaged. • 90 percent of oil refinery capacity in Gulf of Mexico down.	• 2003 European heatwave: more than 35,000 people died, agricultural losses $15 billion.

• Disasters generate large fatalities, economic and social costs, temporary collapse of state functions. • Regions at high risk from storm and flood disasters often have weak economic and political capacities for adaptation and crisis management. • Storm and flood disasters along densely populated east coasts of India and China intensify migration pressure. • Abrupt and large-scale climate changes provoke economic and social instability on a global scale.	• About 1,800 people lost their lives in New Orleans, hundreds of thousands fled homes. • "First documented mass movement of climate refugees" (Earth Policy Institute) • Infrastructure devastated: water, food, energy, transportation, communications and sanitation • Breakdown of public order, chaos, lawlessness • Poor people most affected (few financial resources, no insurance against disasters).	
Environmental migration		
• Rising number of environmental migrants induced by climate change. • High migrations from high-risk locations, e.g. coastal and riverine areas. • Most affected people remain within national borders in the southern hemisphere. • Migratory pressure on Europe from sub-Saharan Africa and Arab world, North America from Caribbean, Central and South America. • Migration pressure from flooded regions or dry areas in China on neighbor countries, e.g. Russia. • Migration provokes conflict in transit and target regions, driving competition with resident population for scarce resources (land, accommodation, water, employment, social services).	**South and East Asia** • Populated mega-deltas at greatest risk due to increased flooding from ocean and/or rivers. • Climate change aggravates human insecurity in Bangladesh: more than 600,000 persons died due to cyclones, storm surges and floods since the 1960s. • One meter sea-level rise could inundate one sixth of Bangladesh and displace 40 million people. • Migration of impoverished people provoked violent clashes in Bangladesh and neighbor countries. • Climate change threatens social and political stability. • Improved warning systems and shelters reduce number of deaths.	

TOWARDS CLIMATE SECURITY

Whether societies are able to cope with the impacts and restrain the risks of climate change depends on their responses and abilities to solve associated problems. Some responses to climate change may rather aggravate the problem, by inducing additional security issues. For instance, the revival of nuclear power to prevent climate change might raise concerns about nuclear proliferation and other risks for safety and security. The rapid and unsustainable growth of biofuels for carbon emission reduction could aggravate land use conflicts and increase food insecurity. If the military finds a justification in fighting the impacts of global warming, this would hardly be a sustainable solution to the climate problem.

For the time being, preventing dangerous climate change is more an issue of science and engineering as well politics and the economy than of the military. Rather than triggering a vicious cycle between environmental destruction, underdevelopment and war, it is important to foster the positive links between sustainable development and peace. As the WGBU report

points out, climate change could also unite the international community by adopting a dynamic and globally coordinated climate policy.

The 2007 Nobel Peace Prize to Al Gore and the IPCC is a sign that the international community recognizes the relationship between environment and peace. Implementing solutions requires joint efforts by the international community to help stabilize climate change at levels that will avoid disruption of global security and stability. The potential impacts provide strong arguments for the developed world to take the lead in achieving the ultimate goal of the UN Framework Convention on Climate Change (UNFCCC) to "prevent dangerous anthropogenic interference with the climate system". With the formula of "common but differentiated responsibilities" the UNFCCC assigned different roles for industrialized and developing countries in climate policy. The largest emitters of greenhouse gases have a particular responsibility as well as the power to reach an agreement on actually reducing emissions to a level that keeps the risks within limits. The stakes are high for signing a post-2012 agreement at the Copenhagen climate summit by end of 2009.

To overcome diverging interests in post-Kyoto agreements, it is important to build coalitions for preventing dangerous climate change. A North-South conflict can be avoided if cooperative solutions are in the best interest of both sides. As has been demonstrated by the IPCC, the Stern Review and others a wide range of options is available to move towards cooperative solutions. To address the security risks, integrated approaches are required as part of a preventive security policy.[38] A global climate regime is possible that provides an equitable balance of costs and risks and allows sustainable development for those in greatest need.

Progress in high emitting countries is essential. The European Commission report on climate security concludes that it is in Europe's self interest to address the security implications of climate change by considering the full range of EU instruments alongside mitigation and adaptation policies on all levels: at the level of the EU, in bilateral relations and at the multilateral level, in mutually supportive ways.[39] While the Bush Administration did not give priority to climate policy, individual states like California pursued more aggressive policies. Several senators requested a *National Intelligence Estimate* to assess whether and how climate change might pose a national security threat. A bill for a Climate Security Act was introduced in 2007 and 2008 that – among others – would create a "cap and trade" program that limits total U.S. emissions of carbon dioxide and gives credits to companies able to cut their emissions through increased energy efficiency or cleaner technology. With the new administration of President Barack Obama there are great hopes that the United States will take a more active role in establishing effective policies towards energy and climate security.

Notes

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