



Deepening the Food Crisis?

Climate change, food security and the right to food

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1 Climate change – a challenge to food security

Climate change threatens to worsen the already critical situation of global food security. The Fourth Assessment Report (FAR) of the Intergovernmental Panel on Climate Change (IPCC) has made a critical assessment of the possible impacts of climate change on agriculture, livestock and fishing. Poor and vulnerable people in developing countries who are already threatened by or suffering from hunger and malnutrition will be hit worst, as numerous studies and first hand experience show.

The steep and scandalous increase of the number of hungry people in the world from 852 million up to at least 1.05 billion people, which has been reported by the Food and Agriculture Organization (FAO) and various other UN agencies for the years 2007 to 2009, is extremely alarming. It needs to be countered by fast and effective corrective action at the local, national and international level. Sufficient food is still available. Overcoming hunger is not so much a question of increasing production (yet), but rather a question of political will to address hungry people's lacking (economic) access to food. Climate change bears the risk to further worsen poor people's access to food and water by leading to new price hikes. If the current trends of increasing global temperature, changing rainfall patterns, glacier melting, the rising of sea levels and more frequent and intense meteorological disasters such as droughts, floods and storms continue, global food production will be severely threatened in years and decades to come. While negative effects have already become increasingly visible in tropical and subtropical areas, in particular in Central, South and Southeast Asia as well as in drought and flood prone areas in Sub-Saharan Africa, many more agricultural regions, including temperate climates, might come under pressure in the near future.

From the food security perspective, climate change comes on top of already existing problems regarding food security in many world regions. It bears a huge potential to deepen the marginalization of vulnerable populations and to make hunger persistent instead

of overcoming it step by step as projected by the UN Millennium Development Goals (MDGs). Thus, climate change poses a big challenge to global, national and local food security. What is needed – technically, economically and politically – to ensure the realisation of the fundamental human right to adequate food and water today and tomorrow? How can agriculture adapt to changing climate conditions? How can the resilience of local as well as regional food production systems be improved?

In 2006, "Brot für die Welt" (Bread for the World) together with Diakonie Katastrophenhilfe (DKH, Humanitarian Aid Germany) and Germanwatch have initiated an intensive study process on the impacts of climate change on food security. As a result, a comprehensive study was published in 2008. The study focused on the particular risks for those persons and groups who are malnourished. It systematised how the global megatrend of climate change might impact on these marginalized groups. For this purpose a cover study and regional studies in Africa, Asia and Latin America were carried out. This paper presents an updated version of the conclusions from these studies.

Since the publication of the main study, the issues of climate change and food security have gained increased attention within the climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC), but also within other UN agencies. The FAO warns about the negative consequences, in particular for smallholder subsistence farmers in what are already marginalized regions of Africa, Asia and Latin America. In recent submissions to the UNFCCC, the FAO stresses the importance of the agricultural sector in combating climate change, but also the necessity of climate change mitigation and adaptation for achieving food security.

The impacts of climate change on human rights, and the relevance that human rights have for a future climate treaty, have long been neglected by the climate negotiations. At the climate change conference in Poznan (Poland) in December 2008, "Brot für die Welt", Germanwatch and Care International presented a submission

on a human rights-based approach to adaptation at a time where such an approach did not feature within the negotiations. Since then, especially non-governmental organizations (NGOs) have picked up on it and have started to integrate human rights as a principle which should guide a post 2012 climate treaty to be agreed upon at the UNFCCC conference in Copenhagen in December 2009. In view of the threat of more famine, the UN Human Rights Council (HRC) has also been discussing human rights and climate change at its Tenth Session in March 2009, based on a study that will be presented in Copenhagen. In June 2009 a panel discussion was held on this issue, the results of which should also feed into the UN climate negotiations.

However, to date these discussions largely remain separate, and integration and cooperation are only at the beginning. As a next step the different strands and actors need to be brought together and should continue their discussions. Coherence between policies on adaptation, food security and human rights needs to be improved and should incorporate rapidly growing knowledge on agriculture and climate change.

2 Changing climate conditions

The impacts of climate change are relevant for food security at the global, national and local levels. The IPCC Fourth Assessment Report (FAR) Working Group II summarized some major trends which show that many natural systems are affected by similar processes of climate change, particularly those related to temperature increase (IPCC 2007, 2007):

(1) There is high confidence that natural systems are affected on all continents by changes in snow, ice, and frozen ground, including permafrost. This conclusion includes the enlargement and increase of glacial lakes, increasing ground instability in permafrost regions, rock avalanches in mountain areas, as well as substantial changes in Arctic and Antarctic ecosystems.

(2) With regard to hydrological systems, there is high confidence that many glacier- and snow-fed-rivers will experience increased run-off and earlier spring peak discharge. A warming of lakes and rivers in many regions is projected.

(3) There is also high confidence that recent warming is strongly affecting terrestrial biological systems, with effects such as earlier timing of spring events, leaf-unfolding, bird migration, and egg-laying.

(4) Substantive new studies have shown that rising water temperatures will impact marine and freshwater biological systems. It will lead to range changes and earlier migrations of fish in rivers, and it will contribute to shifts in ranges and changes in algal, plankton and fish abundance in high-latitude oceans and high-altitude lakes.

(5) Climate zones will be forced upwards or polewards. Linear trends can go hand in hand with the quickly growing possibility of non-linear – and potentially catastrophic – changes. The relationship between the global climate and the earth system is a complex one, particularly due to the fact that climate and non climate drivers are interrelated.

Additionally, non-linear processes include several feedback loops, and these loops are very difficult to predict. The history of the earth shows that non-linear processes have happened quite often, particularly in the Holocene epoch (e.g. the last 10,000 years).

Ocean streams have frequently stalled abruptly, ice shields have suddenly melted, or monsoons have unexpectedly collapsed. Often small disruptions are sufficient to entail fundamental changes. Simulations based on the knowledge of abrupt climate change in the past and the scientific school of analyzing highly complex processes that was established in the 1970s support the finding that our climate and earth system might react to the increasing temperature from anthropogenic climate change with enormous magnitude.

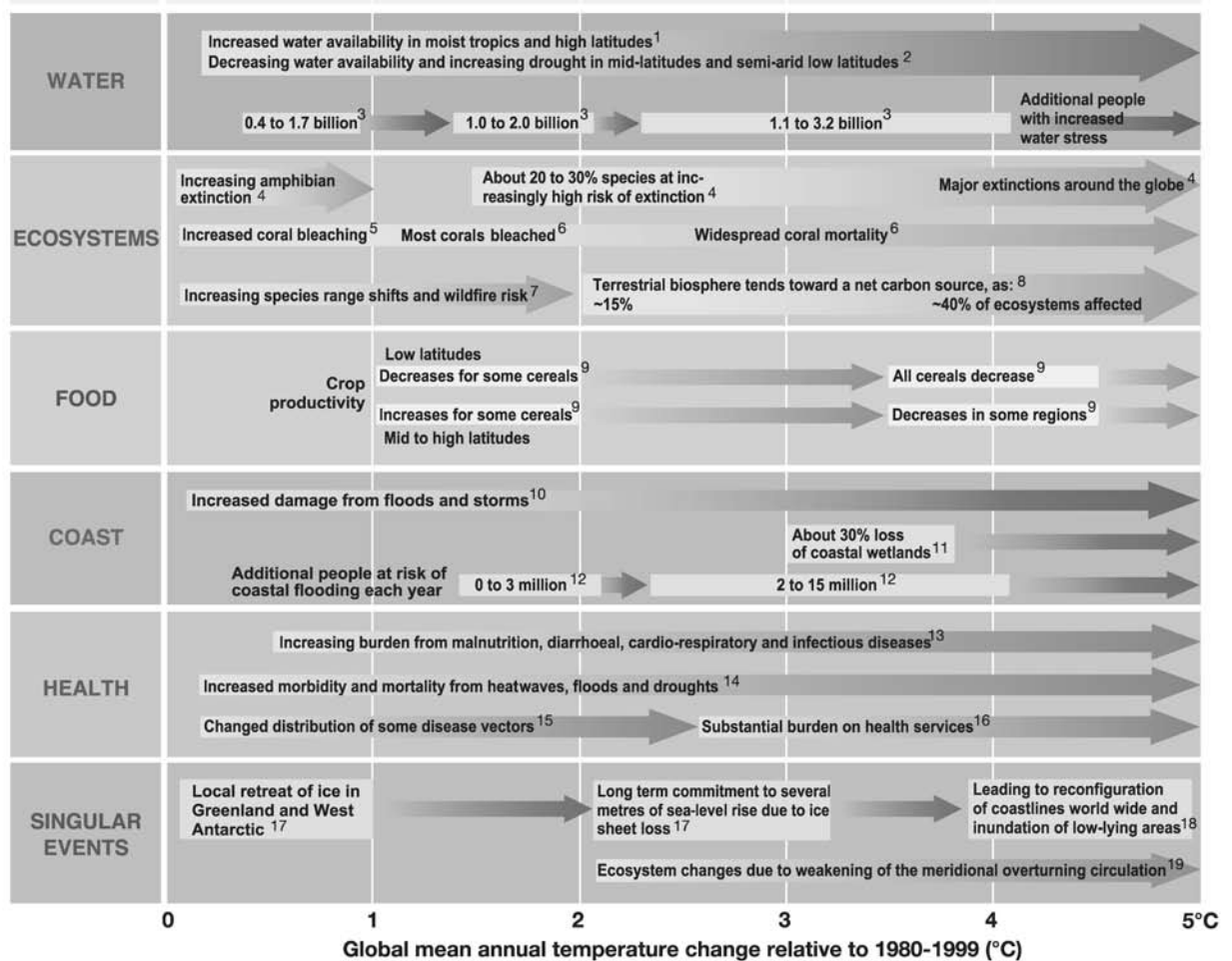
(6) Countries and groups of countries will be hit differently. Many studies indicate that the impacts of climate change will fall disproportionately upon developing countries and on the poor persons within all countries.

(7) Populations in developing countries are generally exposed to relatively high risks of adverse impacts from climate change (IPCC 2001, 12). It is anticipated that this will lead to higher levels of food insecurity in many vulnerable, developing countries. They will need support to cope with and finance the necessary adaptation measures.

The study of “Brot für die Welt” & partners is therefore based on the assumption that a two-dimensional response to climate change is necessary: avoiding the unmanageable and managing the unavoidable.

Avoiding the unmanageable means mitigating the impact of climate change and avoiding dangerous climate change from happening. An emerging consensus among scientists states that global warming must be limited to a temperature increase well below 2°C compared to pre-industrial levels. In order to reach that goal, industrialized countries need to take the lead in drastic emissions reductions. Globally a 50 to 85% reduction of emissions by 2050 is necessary and actual CO₂ emissions should start to decrease by 2017 at the latest.

Figure 1: Sectoral impacts of climate change at different levels of temperature increase



The 19 footnotes refer to the 19 chapters of the IPCC Working Group II report from 2007. See Parry et al. 2007

Source: Parry et al. 2007, 66

Managing the unavoidable means that sound adaptation policies are needed to deal with the inevitable consequences of climate change, some of which are already visible and immense.

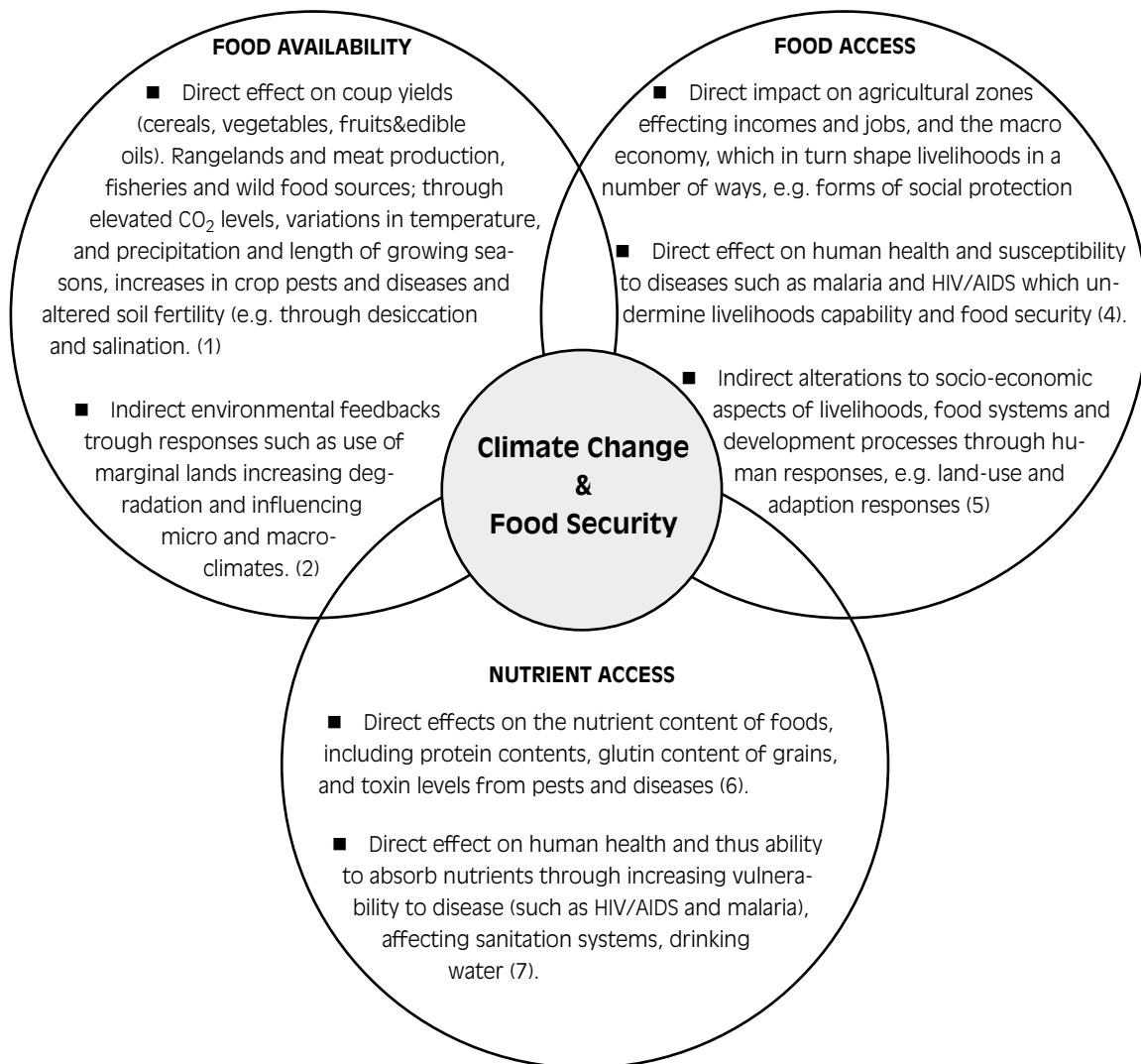
3 The impact of climate change on food security, and how to adapt to it

The impact of climate change will be particularly substantial for smallholder and subsistence farmers, who represent the majority of the people suffering from hunger. Their livelihood systems, particularly in low latitudes, will be affected by major changes due to climate change. The farming system will be affected by changes

in temperature and precipitation as well as elevation of CO₂ with impacts on yields of both food and cash crops. The productivity of livestock and fishery systems will also be affected, as well as potential income gained from collecting activities in forests. Figure 2 summarises the relationship between climate change impacts and food security for the rural poor.

The impact of climate change on food security will be substantive, and better regional and local assessments will further clarify these impacts at scales and scopes

Figure 2: Climate change and food security



Source: based on Boko et al. 2007, 455

Regional impacts of climate change on food security in Africa

In summarizing the Africa-related conclusions of the FAR, it becomes obvious that climate change has the potential to compromise the ability of many African societies to achieve the different MDGs and to improve food security. The IPCC expects that the area suitable for agriculture and the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, will decrease. The yields from rain-fed agriculture are expected to decrease by up to 50% in some countries already by 2020 (IPCC 2007, 13). Also, the number of people under increased water stress will significantly increase from 75 to 250 million people in the next 15 years (with a further increase until 2050). This will primarily take place in Southern and Northern Africa. In addition, local food supplies are projected to be negatively affected by decreasing fishery resources in large lakes. This result is due to rising water temperatures, which may be exacerbated by continued over-fishing.

In addition to the direct impacts of climate change on food security and the MDGs, recent research pays increasing attention to the role that water scarcity or reduced food availability play in the emergence of conflicts, often through increased competition over scarce resources. These may further aggravate the livelihoods of people. Climate change already represents an important cause for existing conflicts, as several experts have concluded for the Darfur conflict, where a long-term decline in rainfall significantly contributed to the scarcity

of available fresh water (Ban-Ki Moon, 2007). In the southern part of Africa, climate change is expected to further weaken the agricultural potentials of countries belonging to the poorest societies in the world. This would worsen the state of human security and strain the governments' capabilities.

The most vulnerable groups include smallholder farmers who rely on rain-fed agriculture, pastoralists, and the fishing communities. Communities across the continent have developed ways of dealing with impacts of climate related events over time. Drought and floods are not new to many communities in Africa. However, the increasing frequency and intensity of these events are rendering some of the strategies that have served communities well in the past inadequate.

For farmers, mixed cropping served as insurance against total crop failure; rotational cropping allowed for the rejuvenation of soils sustaining production at reasonable levels. Pastoralists migrated to better areas in times of drought, traded animals for cereals and other products from neighbouring communities, and kept animals with friends and relatives elsewhere as a form of insurance. With the rapid changes in climate in the recent past, some of the strategies are no longer viable, others might become ineffective in a quickly further changing climate. Furthermore there is evidence of the erosion of coping and adaptive strategies as a result of land-use changes and socio-political and cultural stresses.

that are suitable for developing coping mechanisms and adaptation strategies.

So far, the debate has been biased towards global food security concerns, i.e. the global balance of how much and where food can be produced. However, it is of the utmost importance that household effects are taken into consideration when predicting the impacts on hunger and malnutrition. Climate change will impact on people and groups already vulnerable to food insecurity, but new groups will also be affected by climate change.

Adaptation requires substantive investment in infrastructure such as dams, flood-resistant storage facilities, and techniques for reducing water loss in distribution systems, etc.. It requires monitoring weather extremes and developing disaster preparedness strategies. Higher prices for energy, agricultural inputs, water, and food imports must be expected. Capacity building in communities particularly at risk, as well as in national, regional, and local administrations is of utmost importance and will require resources. Considerable additional costs will be required for appropriate adaptation in develop-

Regional impacts of climate change on food security in Asia

In Asia a 2.0 to 4.5°C net global average surface warming is expected by the end of the present century. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical land regions (Christensen et al., 2007). Glaciers in Central Asia, Western Mongolia, North-West China, and the Tibetan Plateau are reportedly melting faster in recent years than ever before (Pu et al., 2004). Changes have also been observed in extreme climate events like the frequent occurrence of more intense rainfall, increasing frequency and intensity of floods, drought, and tropical cyclones.

The FAR of the IPCC projects an increased risk of hunger in South Asia due to a 30% decline in cereal yields. That might lead to 266 million Asians facing the risk of hunger in 2080. A decline of the net productivity of grassland and milk yields is predicted. The agricultural water demand will increase between 6 and 10% per 1°C rise in temperature. The water system might be strongly affected. Overall, a decline in water availability

is expected. Close to 1 billion people will be affected by this reduction in India and South Asia. The melting of the Himalaya glaciers will change the pattern of river runoff in the region. In coastal areas, the water quality might suffer from the intrusion of salt water, which might then also affect fish larvae abundance. Bangladesh (3), Vietnam (4) and India (7) are among the 10 most affected countries by extreme weather effects in the decadal Climate Risk Index (CRI) for 1997-2006 (Harmeling, 2007). In the future, food scarcity projections show that South and South-East Asia are highly vulnerable with high confidence, while East Asia is highly vulnerable with a very high degree of confidence. The densely populated mega deltas of Asia and relevant mega cities (e.g. Bangkok, Shanghai, Tianjin), are vulnerable to both direct effects of climate change and sea-level rise. 2,500 km² of mangroves in Asia are likely to be lost with 1 meter of sea-level rise. Approximately 1,000 km² of cultivated land and sea product culturing area in Bangladesh are likely to become salt marsh (Cruz et al., 2007).

ing countries. Cost estimates in the year 2007 ranged from at least 50 billion US Dollars (Oxfam) to 28-67 billion US Dollars by 2030 (UNFCCC) and even 86 billion US Dollars by 2015 (UNDP).

Due to climate change impacts and the resources required to adapt to them, resources that would have otherwise been available to realize the MDGs might come under threat to be diverted to adaptation measures. The realization of the MDGs might further be influenced by the direct impact of climate change on food, water, and health.

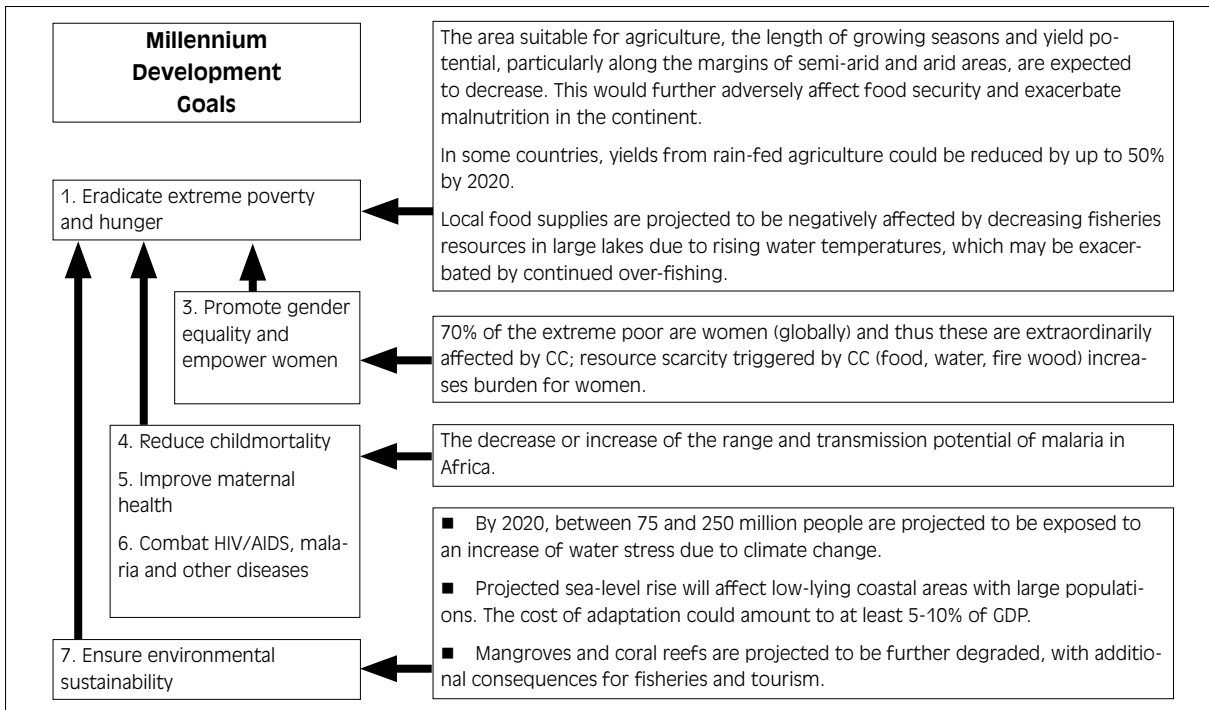
“How the world deals with climate change today will have a direct bearing on the human development prospects of a large section of humanity.” (UNDP 2007, 8. See Figure 3)

The recent rounds of climate negotiations have shown that the costs of adaptation and the present under-fund-

ing by the perpetrators of climate change remain a key contentious issue. This is true despite the goodwill of many developing and some developed countries to work jointly on developing a new climate regime. However, in the negotiations in Poznan in December 2008 and in Bonn in March and June 2009, the most developed countries – and among them the European Union (EU) – have not been willing to agree on concrete action for scaling up the financing for adaptation as well as support for technology transfer and climate change mitigation in developing countries.

At the same time there are encouraging examples from developing countries that show their willingness to take national action on combating climate change. South Africa was the first rapidly developing country to accept that their emissions have to peak between 2020 and 2035. In December 2008 Mexico announced a national target to reduce its emissions to 50% below 2002 levels by 2050.

Figure 3: Climate change impacts and the Millennium Development Goals in Africa



Source: Germanwatch illustration based on IPCC 2007b

Regional impacts of climate change on food security in Latin America

As in the other continents the yields of crops in Latin America can increase in temperate climates, while in dryer regions it is expected that climate change will foster processes of salinisation and the available area for crop land as well as for grazing land will shrink (Magrin et. al. 2007). Land use changes have occurred during the last years and have intensified the use of natural resources and exacerbated many of the processes of land degradation. The IPCC reports that almost three-quarter of the dry lands are moderately or severely affected by degradation processes.

Climate variability and extreme weather events have severely affected Latin America. The number of extreme events, be it hurricanes, flooding, or the Amazonian drought (2005), has been high during the past few years. But regular parameters are also changing. Increases in rainfall have been observed in South-East Brazil, Uruguay, the Argentinean Pampa, and some parts of Bolivia. While this has increased the flood frequency, it has also positively impacted upon crop yields. On

the other hand, a declining trend in precipitation has been observed in southern Chile, South-West Argentina, southern Peru, and western Central America. As a consequence of temperature increase, the IPCC notes that the trend in glacial retreat is accelerating, with the exception of the southern Andean region. This issue is critical for Peru, Bolivia, Colombia, and Ecuador, where water availability has already been compromised due to both consumption and hydro- power generation. It is expected that the net increase of people experiencing water stress due to climate change is likely to increase from 7 to 77 million (Magrin et al., 2007).

Climate change increases the risk that major parts of the Amazon could change from tropical rain forests to savannas in coming decades. This risk is higher in the eastern Amazon and in the tropical forests of central and southern Mexico. It could go hand in hand with the replacement of semi-arid vegetation by arid vegetation in parts of North-East Brazil and most of central and northern Mexico.

4 Climate change, the right to adequate food and how to assess vulnerability

The concept of “food security” is a key concept in the United Nations to measure the food and nutrition situation of people and groups. The latest standard definition used in the FAO reads as follows:

“Food security exists when all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. To achieve food security, all four of its components must be adequate. These are: availability, stability, accessibility, and utilization.” (FAO 2007, 6)

The study of “Brot für die Welt” & partners utilizes the differentiation of three levels of food security to describe groups and people that are vulnerable to the effects of climate change.

(1) Food security on a global scale is the level to analyse overall trends and to understand which effects climate change might have on agricultural production, fisheries and livestock production at the global level. It is important because these trends will translate into agricultural

prices and will influence decisions of producers worldwide.

(2) Food security on a national level: This is where most agricultural policy decisions are being made. It will be decided here if food security concerns are covered by imports and how much financial resources are made available for national agricultural policies. Central elements of adaptation policies will be defined at the national level.

(3) Food security on a household level: without a detailed look at the impacts on the household level, the analysis would lack an understanding of the difficulties and specific necessities each person faces with regard to food security. This knowledge is crucial in designing adequate adaptation policies that support those groups – particularly marginal producers and vulnerable consumers – which are most likely to become food insecure.

Around 80% of the hungry live in rural areas; half of them are smallholder peasants (see Table 1). This situation is expected to persist. While the urban poor are the fastest growing group of food insecure people, more than 50% of the hungry are projected to live in rural areas in 2050. The majority of these groups live in extremely marginal conditions. They often live in remote geographical locations, in ecologically vulnerable areas, or on slopes or drought-prone areas/rainforests etc..

Table 1: Typology of hunger

Food-producing households in higher-risk environments and remote areas	Roughly 50% of the hungry
Non-farm rural households	22% of the hungry
Poor urban households	20% of the hungry
Herders, fishers and forest-dependent households	8% of the hungry
Vulnerable Individuals	Vulnerable pregnant and nursing women and their infants, pre-school children, chronically ill or disabled
Affected people of extreme events	Approx. 60 million
HIV-related food insecurity	Number of food-insecure households with adults or children affected by HIV: ca. 150 million

Source: UN Millennium Project/UNDP 2003

They have difficulties in accessing means of transport, such as roads, and thus access to markets where they can sell their goods. Most have limited or no adequate access to extension services, credits, or insurance mechanisms. Absence of land reform forces poor and marginal farming households to use land highly exposed to catastrophes like floods or droughts. Usually, they are also politically marginalized, without a voice in local or national politics.

In order to deal adequately with the impact of climate change on food security, work has to start with a good analysis of those groups who are already particularly marginal today. Given the crucial role of marginalization in the food security debate, it is clear that agricultural and food production problems cannot be merely tackled at the technical level. The situation of the rural poor has been aggravated by the fact that rural areas were neglected in regional, national, and international policy making. For a long time, the policy focus was on investments in industry and urban infrastructure, causing budget allocations for rural areas to be substantially reduced—often by more than 50%. The same happened with bi- and multilateral aid budgets.

A recent study by the FAO and the Organisation for Economic Cooperation and Development (OECD) highlighted that food prices should decline from their recent peak, yet they will remain above the average of the past decade (OECD/FAO 2008).

The study summarized all of the factors that contribute to a long term scenario where increasing demand goes hand in hand with limits in food producing resources—particularly soil and water. While this scenario does not necessarily lead to scarcity of food in the coming years, it is an indication that prices for agricultural products will not decrease to the levels that prevailed during the last decades.

Climate change will affect several factors which influence the supply side. Governments have to deal with this challenge when designing policies to adapt to climate change and implementing the right to adequate food.

The human right to adequate food is part of the International Covenant on Economic, Social and Cultural Rights (ICESCR). The Committee on Economic, Social and Cultural Rights defines as follows:

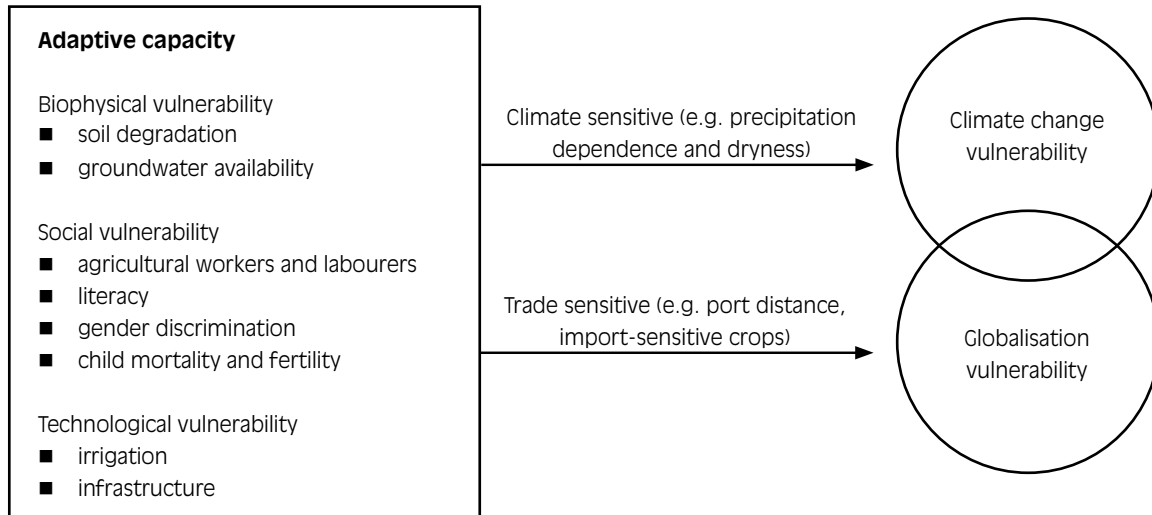
“The right to adequate food is realized when every man, woman and child, alone or in community with others, have physical and economic access at all times to adequate food or means for its procurement.” (CESCR 2002)

It was further elaborated in the “Voluntary guidelines on the implementation of the right to adequate food in the context of national food security” developed in November 2004 by the FAO-Council (FAO 2004). Under the human rights conventions, governments have the obligation to respect, protect, and fulfil the right to adequate food, particularly for the most vulnerable groups. In addition, it includes criteria for transparency and non-discrimination as well as recourse mechanisms.

It is important to clarify the relationship between the terms, food security, the right to adequate food and the food sovereignty concept. While food security describes a goal, the right to adequate food obliges governments to respond to the problem of hunger and malnutrition. A human rights-based monitoring system measures the level of fulfilment of the human rights obligations through governments. It also analyses whether governments use their respective resources adequately and most reasonably to fully guarantee these rights while a food security monitoring system analyses how many and to what degree people are malnourished. A third term gaining prominence within debates of civil society organizations dealing with issues such as hunger, malnutrition, and rural development is food sovereignty. Food sovereignty is a political concept primarily developed in the context of La Via Campesina, a global small holder farmers movement. Food sovereignty has been developed as a concept to protest against the neglect of rural areas and rural development in national and international policies.

Agriculture, forestry, and fisheries are all sensitive to climatic conditions. Climate change will thus affect the

Figure 4: Elements of vulnerability profiles



Source: based on TERI 2003

income of vulnerable groups that depend on resources and products derived from these sectors. The scale of the direct adverse and positive effects varies with the specific geographical situation. However, macro-level projections are not sufficient to identify the most vulnerable groups within regions or countries. Vulnerability assessments on the national and community levels are crucial for developing adequate responses to food insecurity. Assessing the vulnerability of a region or a community with regard to non-climate stressors is the necessary first step. It then must be widened by considering vulnerabilities towards climate-related factors (see Figure 4). This will result in general assessments of vulnerability to climate change, but may also be translated into sector-specific climate change risk assessments, for example with regard to food security.

Climate change will impact on groups which have already been at the risk of food insecurity, but it will also affect new groups who are to become vulnerable due to changing climate conditions in their region. Many vulnerable groups have already developed traditional strategies to increase resilience, but their ability to adapt to climate change is often restricted because of their extremely limited coping capacities.

5 Resilience and response capacities in developing countries

Adapting to climate change is a huge challenge for developing countries. The IPCC report shows that poorer countries are most vulnerable to climate change. Their limited resilience and response capacities are one important reason for this particular affectedness. Adaptation covers very different fields such as meteorological services, early warning systems, disaster risk management, extension services, infrastructure and many others. Adaptation in agriculture is another important area, covering necessary changes in the use of agricultural crops and varieties, irrigation and watershed management, soil protection, pest control and land use techniques. Poor smallholder farmers are in particular need to improve their coping capacity. It is thus important to differentiate adaptation at the different levels and define

what can be done at the household level, locally, by national governments, or with international support.

Analytically, the IPCC further differentiates between two categories of adaptation:

“Autonomous adaptation, which is the ongoing implementation of existing knowledge and technology in response to the changes in climate experienced, and planned adaptation, which is the increase in adaptive capacity by mobilizing institutions and policies to establish or strengthen conditions favourable for effective adaptation and investment in new technologies and infrastructure.” (Easterling et al. 2007, 294)

The advantage of this IPCC differentiation is that it looks into the coping strategies and capacities available locally to adjust to the changing circumstances without

Table 2: Adaptation measures in key vulnerable sectors highlighted in national communications of developing countries

Vulnerable sectors	Reactive adaptation	Anticipatory adaptation
Water resources	<ul style="list-style-type: none"> Protection of groundwater resources Improved management and maintenance of existing water supply systems Protection of water catchment areas Improved water supply Groundwater and rainwater harvesting and desalination 	<ul style="list-style-type: none"> Better use of recycled water Conservation of water catchment areas Improved system of water management Water policy reform including pricing and irrigation policies Development of flood controls and drought monitoring
Agriculture and food security	<ul style="list-style-type: none"> Erosion control Dam construction for irrigation Changes in fertilizer use and application Introduction of new crops Soil fertility maintenance Changes in planting and harvesting times Switch to different cultivars Educational and outreach programs on conservation and management of soil and water 	<ul style="list-style-type: none"> Development of tolerant/resistant crops (to drought, salt, insect/pests) Research and development Soil-water management Diversification and intensification of food and plantation crops Policy measures, tax incentives/subsidies, free market Development of early warning systems

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Vulnerable sectors	Reactive adaptation	Anticipatory adaptation
Human health	Public health management reform Improved housing and living conditions Improved emergency response	Development of early warning system Better and/or improved disease/vector surveillance and monitoring Improvement of environmental quality Changes in urban and housing design
Terrestrial ecosystems	Improvement of management systems including control of deforestation, reforestation and afforestation Promoting agro forestry to improve forest goods and services Development/improvement of national forest fire management plans Improvement of carbon storage in forests	Creation of parks/reserves, protected areas and biodiversity corridors Identification/development of species resistant to climate change Better assessment of the vulnerability of ecosystems Monitoring of species Development and maintenance of seed banks Including socioeconomic factors in management policy
Coastal zones and marine ecosystems	Protection of economic infrastructure Public awareness to enhance protection of coastal and marine ecosystems Building sea walls and beach reinforcement Improvement of carbon storage in forests Protection and conservation of coral reefs, mangroves, sea grass and littoral vegetation	Integrated coastal zone management Better coastal planning and zoning Development of legislation for coastal protection Research and monitoring of coasts and coastal ecosystems

Source: based on UNFCCC 2008, 31

any government interference. This perspective helps to also identify the need for planned interventions as the available coping capacities might be very limited.

Reflecting knowledge on projected impacts of climate change on different sectors enables the identification of likely priority actions for adaptation from a top-down perspective. Initiated and supported by the UNFCCC process, least developed countries (LDCs) have started or even finished elaborating National Adaptation Programs of Action (NAPAs). The guidelines agreed upon under the UNFCCC specifically underline the objective to identify and address the most urgent adaptation needs and priority projects. In principle, these should be developed in a participatory process (UNFCCC 2001).

However, these guidelines are much less concrete than the procedural elements from the FAO voluntary guidelines on the implementation of the right to adequate food. Nevertheless, these NAPAs serve as the best and most recent starting point when looking at adaptation priorities. They also provide a reference when assessing likely costs of adaptation, although they only concern the most urgent adaptation needs. Developing countries also highlight some adaptation measures in key vulnerable sectors in their national communications to the UNFCCC (for agriculture see Table 2).

Weather risks destabilise households and countries and create food insecurity. Floods, cyclones, and droughts have been a major cause of hunger affecting more than

30 million people since 2000 in the Southern African Development Community (SADC). Governments and donors only react to these shocks rather than proactively manage the risks. These emergency reactions have been criticized for being ad hoc and, at times, untimely. They are even credited with destabilizing local food markets. Similarly, many highly-exposed developing country governments do not have the means to finance the recovery costs of catastrophic disasters. Least-developed countries can hardly afford the technical analyses and other start-up costs for insurance systems. Scaling up will prove costly, especially since disaster risks, unlike health or accident, affect whole regions simultaneously and thus require spatial diversification, reinsurance and/or large capital reserves. Thus, it is very important that risk management mechanisms – including innovative insurance mechanisms – play a role in the UNFCCC negotiations.

6 Response capacity at the local and community level

Impact analyses underline the importance of studying specific family situations, because livelihood systems are typically complex and include a number of interfering factors. For example, several crops and livestock species are involved in intercropping systems, and many smallholder livelihoods are comprised of a variety of income sources such as the use of wild resources from forests, remittances, and other non-agricultural income strategies. Government support can also play a role, but so far many of the smallholder farmers are faced with a marginalization process in national and international agricultural policies. Therefore, support is often unavailable or insufficient. Effective adaptation policies should start here and support coping and adaptation strategies of poorer groups in rural and urban environments.

The literature on local and community-based adaptation policies is increasing, and several studies are avail-

able which provide a good overview of policy options for adaptation at the local level. One example is a case study carried out in Bangladesh. It has developed a useful typology to describe different policy measures and policy areas that need to be involved in local adaptation measures to climate change (FAO and ADPC 2006, 66f. See also Table 3).

The authors show that successful local adaptation to climate variability and change is not an easy task. Rather, it requires multiple pathways with well planned and inter-related short- and long-term measures. The task ahead in designing meaningful adaptation policies at local levels is the need to find the right combination of these factors. This should give answers to the expected changes in the “geo-physical settings” as well as the necessary adjustments in the “livelihood systems”.

Adaptation policies need to be embedded appropriately in the local context and should be oriented towards the most vulnerable groups. One of the strengths of using a rights-based approach in the design of adaptation policies

Table 3: Policy options for the design of local adaptation policies

Type of measures	Examples
Adopting physical adaptive measures	Excavation, re-excavation of canals, miniponds, irrigation, storage facilities for retaining rain water
Adjusting existing agricultural practices	Adjustment of cropping patterns, selection of drought-tolerant crop varieties; better storage of seeds and food; dry seedbeds, or adopting alternative, cash crops such as mango and jujube
Adjusting socio-economic activities	Livelihood diversification, market facilitation, small-scale cottage industries, integration of traditional knowledge
Strengthening local institutions	Self-help programs, capacity building and awareness raising for local institutions
Strengthening formal institutional structures	Local disaster management committees and financing institutions; formulating policy to catalyze enhancement of adaptive livelihood opportunities
Creating awareness and advocacy	
Supporting better research	Farm links to new or improved crops including drought tolerant varieties, and other conducive and adaptive technologies

Source: FAO and ADPC 2006

is that it helps to set up procedural guarantees for the affected communities and people to ensure participation including access to relevant information (transparency) and the right to complain. The second strength is that a rights-based approach requests a specific outcome. Gov-

ernments have to prove that their policy and budget decisions are focused towards the most vulnerable groups and that no group is excluded. Governments must prove that their own adaptation policies do no harm, i.e. deprive people of access to food or water.

A rights-based approach to adaptation

This paper has discussed the impact of climate change on the enjoyment of human rights related to food security, particularly the right to adequate food. What are the core elements of a rights-based strategy to adaptation policies that can be drawn from the results?

(1) A human rights-based approach has to cover both sets of human rights: civil and political (CP-rights) and economic, social, and cultural rights (ESC-rights).

(2) Human rights create entitlements of persons vis-à-vis their government. These entitlements can be legally claimed, and are a good tool in holding governments accountable. Complaint procedures need to be accessible for everyone.

(3) A rights-based framework better describes government obligations and develops criteria for designing and evaluating policy processes, including on adaptation. A human rights-based framework requires governments to follow standards at all different levels of activities.

(4) It is important to note that not all persons suffering from hunger are automatically victims of violations through government policies. The impact of climate change might be so monumental in one country or region that the government will not have the means to adequately help all affected persons to adapt.

Therefore, hunger, as a result of natural disasters cannot automatically be judged as a violation of the right to adequate food. A violation can only be identified when hunger is caused because of the government's failure to develop a minimum response system for disaster-

preparedness, when the adaptation measures are not oriented towards those most in need, or when the government is not using the available resources.

(5) A rights-based assessment and framework must not only look into the obligations and responsibilities of national governments, but should also assess the potential impact of government policy on persons living in another country. International support is required for poor countries in the implementation of national adaptation measures, because poorer countries will suffer substantially from climate change and must cope with a high burden of adaptation needs.

(6) Human rights are individual entitlements. They set limits on the restrictions and deprivations that individuals can permissibly bear. Adaptation policies should be designed in a way that at least the core content of human rights is being realized.

(7) A rights-based framework can be a helpful tool to complement climate change adaptation policies. It can help to assess resulting risks of climate change and their possible impact on the fulfilment of human rights of those people who are affected by climate change. A rights-based framework can give orientation in designing adaptation policies in a way that human rights are promoted and protected. It allows individual rights holders to make a rights based assessment of (adaptation) policy measures and to judge if these policies had a positive, negative or no impact on them and their adaptation needs towards climate change. If used properly, a rights based approach has a good potential to ensure and improve the quality of adaptation policies.

7 Response capacity at the international level

rights-based framework is one very promising option to help measure progress, review government activities, and to generate resources.

A particular priority focus and massive support schemes for the long neglected and marginalized majority of agricultural producers – smallholder peasants – are needed now and even more in the future, when the accelerating climate change will hit more and more regions. Support must be directed towards them in a sensitive, coherent and meaningful way, combined with micro-credits, extension services and trainings aiming at improving the production system, securing livelihoods, fostering climate resilience and leading out of poverty.

Development cooperation has a crucial role to play in all stages of adaptation policies. Bi- and multilateral development co-operation can help to integrate adaptation into policy development. Capacity must be built at all stages of the adaptation process in developing countries, from disaster preparation and early warning to insurance schemes and policy design issues. Other stakeholders, such as the scientific community and NGOs, should become integral parts of adaptation planning. Each of these institutions can help to best design adaptation policies. NGOs are often those who reach out to vulnerable groups much better than governmental or international institutions. Hence they can contribute by using their experience in project management and implementation and also by mobilizing knowledge.

The financing of adaptation measures will also need adequate international support. A clear recommendation from this study is that a reliable financial-based mechanism must be created within the UN-climate negotiations if the unavoidable impacts of climate change are to be managed. Substantial additional financial resources are needed to cope with the expected adaptation needs for developing countries. However, more aid does not necessarily mean that more funds will reach the most vulnerable groups. This is one reason why the UNFCCC negotiations must discuss which international and national frameworks are most appropriate for targeted adaptation. Adaptation measures need to be properly designed and focus on particularly vulnerable groups. The

8 Conclusions and recommendations

Most likely the impacts of climate change will increase hunger and hinder poverty reduction policies, through changes in precipitation, water availability, the spread of diseases and the increase in extreme weather events. Food security and the human right to food will thus be heavily affected by climate change. Most vulnerable to the impacts will be developing countries in general and in Sub-Sahara Africa, South and Southeast Asia, and the South Pacific region in particular.

Within these and other affected countries it is the poor people in particular who are most vulnerable towards climate change, e.g. the rural poor, indigenous communities, outcasts, women, children and elderly people. For many of these smallholder and subsistence farmers, landless workers, women, people living with HIV and AIDS, indigenous people and the urban poor, climate change comes as additional stress factor on top of a variety of other poverty factors. Accordingly, climate change bears the risk to further deepen rather than overcome geographical, societal, economic and political marginalization. It is therefore of the utmost importance to design adaptation policies, frameworks and programs in a way that the priority focus is put on the needs of the most vulnerable people. This includes important aspects such as stakeholder participation, community based bottom up approaches and cultural appropriateness.

Adaptation policies related to food security need to be tackled at the global, national and local level. Developing countries need broad international support in order to adequately implement adaptation policies, covering a broad range from infrastructural measures to raising awareness and elaborating and disseminating climate-related information.

Industrialized countries need to make financial commitments in compensation for the damage caused by climate change. This should happen through international funds governed under the UNFCCC umbrella, especially the UN Adaptation Fund, but also new instruments

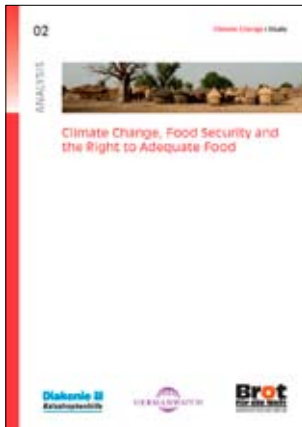
such as insurance schemes. National governments need to mainstream adaptation into all government policies. They also need to make sure that the most vulnerable groups within their country are identified and supported in their adaptation.

The UNFCCC should make a strong reference to human rights and especially the right to food as guiding principles for a new climate treaty. It would partly shift the focus of adaptation policies from national states to the individual people who are threatened by climate change in a way that might become existential. The human rights approach establishes procedural standards for government policies. It also supports vulnerable groups and individuals in holding their government accountable to fulfil their respective obligations towards the people who have individual rights to adequate food, water, health, housing etc.. In conclusion, rights-based adaptation policies are one good tool to ensure that money earmarked for adaptation is spent reasonably. The Office of the High Commissioner for Human Rights, the Food and Agriculture organization and the UNFCCC should cooperate more closely and develop a guideline, which helps governments to design adaptation policies accordingly.

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