Opportunities for and limitations to local action

Climate change is likely to deeply affect the further development of African, Asian and Latin American countries. Most developing countries are located in the hot and often dry regions of the Earth, where global climate change will raise average temperatures even higher. This will lead to changing precipitation patterns, an increased variability of local climate and a higher frequency of extreme weather events such as droughts, floods, and tropical storms.

If the societies affected by climate change do not engage in anticipatory adaptation to its impacts, they are likely to suffer considerable political, economic and social consequences. As conflicts over access to land, freshwater and food will increase due to climate change and are likely to be exacerbated by migration, it is likely that these conflicts will lead to higher levels of internal violence (WBGU, 2007: *Climate change as a security risk. Summary for policymakers*, Berlin: WBGU, http://www.wbgu.de).

The impacts of climate change manifest themselves on the local level, and it is here that risks become tangible and adaptive measures have to be implemented. At the same time, policy changes and measures aimed at mitigating climate change may also have unintended effects on the welfare of developing countries. These risks can be systematized as follows (Eriksen, S. et al., 2007: *Climate Change Adaptation and Poverty Reduction: Key interactions and critical measures*, Oslo: University of Oslo, p. 7):

❶ Natural conditions may change within the next 20 or 30 years to an extent that it will be impossible to maintain present economic activities: the water volume of a river or lake basin may be reduced to a level so low as to be unable to supply sufficient water for both irrigated agriculture and hydroelectric plants, thus endangering electricity generation, food production and income security in the are.

❷ A community's vulnerability to climate change may be so strong that the community is unable either to cope with increased climate variability or to adapt to lasting climatic changes: a community's economic resources and social capital may be overstrained by a constant influx of migrants from other regions hard hit by climate change; the same is true for urban areas under pressure from environmental refugees from the countryside.

❸ Mitigation policies in industrialized countries may affect the livelihoods, and thus also the adaptive capacities, of developing countries: the decision of the US and the European Union to increasingly substitute biofuels for petrol in the transport sector has led to a sharp rise in imports either of agricultural commodities that can be processed into biofuels (e.g. corn from Mexico) or of biofuels as such (e.g. based on palmoil). This has had two effects: higher corn and tortilla prices in Mexico that have made life difficult for the urban poor and an increase in tropical deforestation to expand palmoil plantations in Indonesia.

Thus, not only the impacts of climate change as such but also mitigation strategies and adaptation decisions taken elsewhere pose risks to the welfare and livelihoods of the poor. Moreover, in many least developed countries (LDCs) climate-induced risks will be an additional burden on governance capacities already weakened by social unrest, high levels of poverty and pandemics such as HIV/AIDS.

Vulnerability to climate change is understood here as caused by social, political, economic and ecological framework conditions which constrain the capacity of all relevant actors (local population, govern-

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Climate change results in extreme weather events such as droughts and floods and increased tropical storms.

ments, public administrations, private sector) to cope with climate change and adapt to it. Vulnerability thus has strong links to a multidimensional understanding of poverty, which includes low levels of income and productivity, social marginalization, political exclusion and the environmental dimension. It is also possible to link vulnerability and varying adaptive capacities to the concept of governance, i.e. the formal and informal rules and regulations which define the capacity of governmental and non-governmental actors to engage collectively in effective problem-solving. As the example of climate change shows, today local and national decision-making and action are heavily constrained by global phenomena, and – through economic globalisation – also by asymmetric transnational economic power relations and globally defined rules for trade and production.

In order to reduce the three types of risk associated with climate change mentioned above, it is therefore necessary to clearly identify the causes of vulnerability on the local and national levels and to elaborate strategies for tackling them. These strategies will also include expectations and demands with regard to the contribution an evolving multilateral climate regime and other cooperative arrangements can make to increasing local coping and adaptive capacities in the South.

Priority areas of action

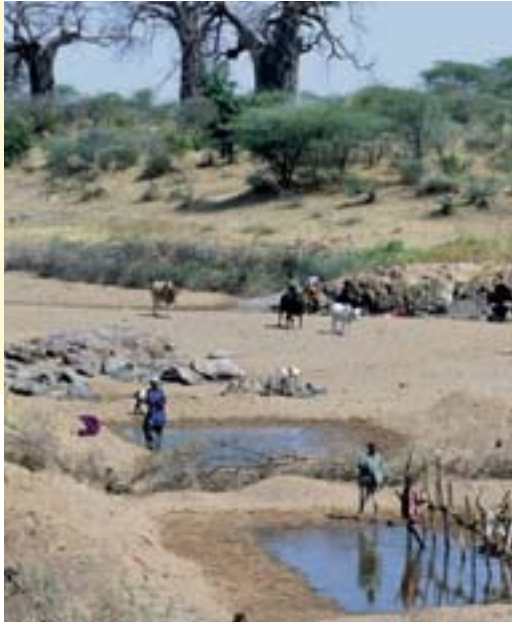
From the perspective of poverty reduction, the management of natural resources in the areas of agriculture, forestry and water should be given the first priority. Generally, in poor countries a high percentage of the population still live in the countryside, where its livelihoods depend to a large degree on rainfed agriculture. In most sub-Saharan African countries, there are more people living below the poverty line in rural areas than on the national average, the most extreme cases being Zambia (83 percent rural vs. 73 percent national poor) and Sierra Leone (79 percent vs. 70 percent). Nearly 75 percent of the total population in sub-Saharan Africa live on less than two dollars a day (World Bank, 2006. *World Development Indicators 06*, Washington DC: World Bank). This means that changing weather conditions are very likely to increase poverty in the countryside and make survival for the poor there even more precarious. Natural resource management includes:

- **Protection of the processes that enable resources to renew themselves.** In times of climate change, it is even more important to strengthen the natural resilience of ecosystems and their ability to render ecological and economic services. This includes the preservation of forests, coastal mangroves, wetlands, etc.
- **Adjustment of the rules governing natural resource use to changing conditions.** Decreasing rainfall, increased periods of drought and growing migration flows will require more secure and flexible rules for access to wells and land.
- **Adjustment of production systems to different climatic conditions.** Identification, evaluation and promotion of sustainable production systems better adapted to drought and floods and resistant to new pests and diseases; introduction of rainwater harvesting and construction of storage facilities in order to increase water availability; diversification of income sources, including off-farm opportunities.
- **Integrating economic efficiency and ecological sustainability into resource management.** Improvement of natural resource management systems towards more use efficiency, explicitly including the needs of ecosystems and future generations, and therefore measuring efficiency not purely in terms of the return on investment as achieved on the level of e.g. single farms (Neubert, S. et al., 2007: *Poverty Oriented Irrigation Policy in Kenya. Empirical results and suggestions for reform*, Discussion paper 12, Bonn: DIE).
- **Reconsideration of modernisation strategies**. Conventional strategies designed to increase the productivity and cash income of agriculture may no longer be sustainable, and may require a (re)turn towards pastoralism and forestry-based timber and non-timber income sources. Generally, the trade-off between diversification and risky specialisation needs more attention.

Adjustment of economic infrastructure planning to future climate change is nearly equally important, since e.g. roads and bridges resistant to frequent floods and heavy precipitation are a fundamental need for relief operations after an extreme weather event as well as for bringing support to remote communities. In the same vein, an improved communications network is important. These investments would also strengthen the resilience of remote communities to climate change by improving their market access.

Investment in social infrastructure such as health and education services is necessary for improving general adaptive capacities in rural and poor urban communities. Healthy persons are more productive, and educated persons are more likely to introduce technological innovations and be able to better participate in designing and implementing plans for early warning and relief in emergency situations.

Finally, it is necessary to invest in disaster prevention, including the establishment of early warning systems. Here, coordination between national and local levels of action is extremely important to strengthening local capacities for immediate action and reaction.



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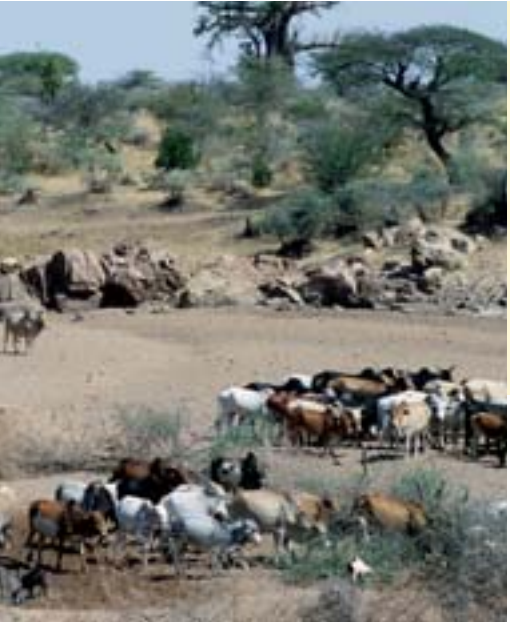
Levels of action

The measures mentioned in the previous section require activities on the local, national, regional and international level. Ideally, there should be coordination mechanisms between these levels in order to facilitate an efficient division of labour, share experiences and resources, and give support to lower levels and enable them to fulfil their functions (principle of subsidiarity). The principal objective has to be to strengthen local adaptive capacities.

On the local level, training, financial resources and empowerment are crucial in several respects. First, a better-trained local administration will be able to better understand the effects of climatic changes and use the knowledge and material resources available elsewhere to invest in local adaptation. A decentralization of financial resources will give local administration the autonomy to implement local adaptation measures. And finally, empowered civil society organisations will be able to monitor local public administrations, voice local needs and be a valuable partner in local adaptation activities. Especially in places where conflict over local livelihood resources is already intense and the use of violence is



Decreasing rainfall, increased periods of drought and growing migration flows will require more secure and flexible rules for access to wells and land.

widespread, local informal and formal arrangements for peacekeeping and conflict resolution are very important in order to strengthen environmental and social resilience (Eriksen, S. / K. Ulsrud / J. Lind / B. Muok, 2006: *The urgent need to increase adaptive capacities. Evidence from Kenyan drylands,* ACTS, Conflicts and Adaptation Policy Brief 2).

On the national level, it would be important to introduce and/or improve mechanisms for the coordination of policies and strategies between different departments and between the national, provincial and local level. As far as the preparation and implementation of strategies for adapting to climate change are concerned, two avenues of action should be pursued: first, it is necessary to raise general awareness and understanding of what climate change means for the population of a country, its regions and its economic sectors. On this basis, it will be easier to mainstream climate change concerns in all relevant policy fields. Second, rather than designing stand-alone plans for adaptation to climate change, it is recommendable to focus on the implementation of existing plans for improving natural resource management (Agrawala, S. (ed), 2005: *Bridge over troubled waters. Linking climate change and development,* Paris: OECD). This means that adaptation to climate change should be integrated e.g. into Poverty Reduction Strategy Papers (PRSPs), National Action Plans to Combat Desertification as well as plans to reduce deforestation and improve water management.

On the international level, we can distinguish between the support required from the international community in terms of improving global regimes and what needs to change in development cooperation in order to enhance local adaptive capacities. The most important global regimes are those related directly to climate change and world agricultural trade. A future global climate regime needs to fulfil two basic requirements: effective policies for reducing greenhouse gas emissions from all major emitters and a financial mechanism which channels considerably more funds towards adaptive measures in developing countries. These additional funds will constitute an opportunity and a challenge for institutions in partner countries as well as for development agencies. At the same time, it is necessary to make progress regarding the reform of world agricultural markets in order to generate opportunities for market access and production incentives in the developing countries. As liberalization can have extremely adverse effects on food-importing LDCs, it is important to establish compensation mechanisms for these countries, especially since in many LDCs dependence on food imports may increase owing to climate change (WBGU, 2007, p. 10).

Today, most of the Official Development Assistance (ODA) earmarked for climate change goes to mitigation activities, e.g. energy efficiency and renewable energy. Very little is explicitly allocated for adaptation measures. At the same time, many activities financed by ODA are climate-sensitive: A recent OECD study estimated shares between ten and even sixty percent (Agrawala 2005, p. 67). Evidently, the share is higher the more a given country is exposed to climate change in general and the more ODA is focused on climate-sensitive sectors. The climate-sensitivity of ODA is expected to increase especially in LDCs. This means that development agencies are confronted with the same challenge as national public administration: to mainstream climate change across all departments, to stop considering it an issue for environmental departments alone, and to identify the trade-offs between development and climate objectives. Tools to be developed and introduced in this respect should assist development planners to screen climate risks and to include measures designed to mitigate risks and deal with unavoidable extreme events. This will be especially necessary in planning infrastructure projects with a long life span as well as in the case of pro-poor growth policies which promote technological and social change and thus bring about long-term structural change with uncertain outcomes. Here, simultaneous preventive approaches and measures conceived as safeguards for the protection of ecosystem services are very important.

Knowledge gaps

Mainstreaming climate change into policymaking and development is made difficult by a number of serious knowledge gaps (Mortimore, M. / A. Maxwell, 2006. *Climate change: enhancing adaptive capacity,* NRSP Brief, London: DFID). To reduce these gaps is one of the important tasks of international cooperation in development and in science. The gaps include:

- **Uncertainty of climate information (macro vs. micro).** Significant progress has been made in observing global climate changes and attributing them to their causes as well as in the projection of future climate changes and their impacts on sectors and world regions. But climate change projections still have a quite high degree of uncertainty when it comes to particular locations, and it is e.g. easier to project temperature than precipitation. Development activities, however, are sensitive to changes in local climate, and credible projections are often lacking for such changes, especially in developing countries; this lack of data also contributes to uncertainty about impacts of climate change on food security and the further spread of vector-borne diseases at local and regional levels;
- **Broader impacts of technology diffusion.** New technologies are often designed with objectives defined in a rather limited way, e.g. improvement of productivity/efficiency, often without paying proper heed to factors like their more general effects on livelihood systems or on their capacity to adapt to climate change;
- **Factors influencing innovation generation and diffusion of technologies in the use of natural resources.** These factors are likely to be influenced widely by local and national political economies, including conflict constellations, which will also be influential in dealing with adaptation to climate change;
- **How to deal with long-term cumulative ecosystem change.** It is unclear whether the capacities needed to manage deep environmental change are the same as those needed to manage increased climate variability.