

A photograph showing a person standing in a forest of charred trees. The person is wearing a red loincloth and a white headband. They are holding a long wooden staff. The ground is covered in ash and charred wood. The trees are mostly dead and charred, with some green foliage visible in the background.

**Climate change
and forest-based
livelihoods**

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Cover photograph: Shifting agriculture in tropical dry forest – West coast of Madagascar. Photo by J. Blaser, 2002

Impressum

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Climate change and sustainable development: conventions and mechanisms

This issue of *InfoResources Focus* presents the opportunities and challenges offered by the United Nations Framework Convention on Climate Change (UNFCCC) with respect to forest-based livelihoods, and describes the political process of policy-making within the convention. The aim is to provide a broad overview of the different mechanisms defined in the Convention, as well as their possibilities and limitations, and thus enable our readers to better define their own views and expectations.

Climate change is today considered one of the major threats for sustainable development. It influences health, infrastructure, settlements, food security and agriculture, forests and marine ecosystems.

In the UNFCCC, adopted in 1992, the international community agreed on mitigation and adaptation as the two basic strategies to deal with climate change. These two strategies are complementary and non-exclusive. *Mitigation* refers to any human intervention designed to reduce the emission of greenhouse gases (GHG) at the source or to enhance sinks. *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (see Fig. 1).

United Nations Framework Convention on Climate Change
<http://unfccc.int/>

Livelihoods and climate change
www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf

Intergovernmental Panel on Climate Change (IPCC)
www.ipcc.ch

Boxed insert mentioned documents are annotated in the bibliography.

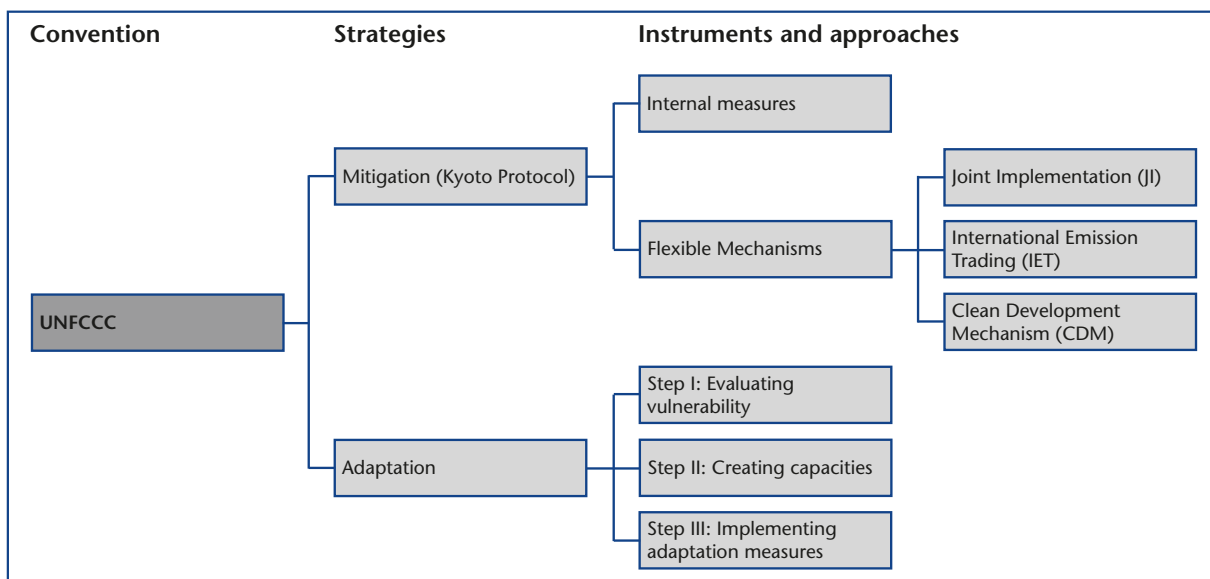


Fig. 1: Strategies and instruments within the UNFCCC (Robledo, 2004, in print)

Forests play a double role with regard to climate change. On the one hand, deforestation and non-sustainable forest management practices, especially in the tropics, are one of the major sources of greenhouse gas (GHG) emission. On the other hand, forest ecosystems can make a positive contribution to dealing with the problem of climate change. Forest ecosystems have the potential to sequester carbon from the atmosphere during the growing period and retain it in the biosphere (biomass and soil), thereby functioning as so-called sinks. In addition, reduction of deforestation and promotion of sustainable forest practices can significantly reduce current CO₂ emissions.

Even if the UNFCCC recognises both the enhancement of sinks and reduction of emissions as possible ways of dealing with climate change, forestry activities eligible within the Kyoto Protocol are different for developing and for industrialised countries (see chapter on mitigation p. 5).

Sustainable management of forest ecosystems can significantly contribute to increasing the adaptive capacity of both the ecological and the social system, while improving food security and water supply or promoting a better social organisation.

However, successful implementation of mitigation and adaptation strategies requires that both natural processes, such as carbon fixation in different pools, and socio-economic aspects be taken into account. Forests are an important resource base of rural livelihoods. The dynamics between the five assets — natural, socio-political, human, physical and financial — that belong to each livelihood determine the management of natural resources and its sustainability. The assets also determine people's ability to respond to the impacts of climate change and to implement activities intended to reduce GHG emissions.

The enhancement of sustainable forest-based livelihoods should therefore form the basis of any adaptation and mitigation efforts.

Poverty and Climate Change

<http://lnweb18.worldbank.org/ESSD/enext.nsf/46ByDocName/KeyThemesVulnerabilityandAdaptationPovertyandClimateChange>

Definition of livelihoods: "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base". (Carney, 1998, page 4)

Livelihoods and Climate Change

www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf

Strategies within the UNFCCC

Mitigation of climate change

The Kyoto Protocol acknowledges two ways of reducing GHG emissions, namely, internal measures in each of the Annex I countries, such as the use of renewable energy or reduction of private transport in cars, and the implementation of flexible mechanisms.

The following three flexible mechanisms are defined in the Kyoto Protocol: Joint Implementation, International Emissions Trading, and the so-called Clean Development Mechanism. In the context of climate change, forestry, and development, the Clean Development Mechanism (CDM) is the most relevant instrument. It allows Annex I countries to obtain emission reduction units by implementing emission reduction projects in countries not listed in Annex I (mostly developing countries).

A CDM project must consist of the following seven steps:

- Design of the project
- Validation
- Registration
- Implementation and Monitoring
- Verification
- Certification
- Issuing of Certified Emission Reductions (CER).

CDM projects involve four parties: Project developers, Designated Operational Entities, Designated National Authorities, and a CD Executive Board.

Ever since the adoption of the Kyoto Protocol, the role of Land-Use, Land-Use Change and Forestry (LULUCF) activities in reducing GHG emissions has been an important element in the negotiations. During the 7th session of the Conference of Parties (COP 7) in Marrakech in 2001, the use of LULUCF activities for both internal measures in Annex I countries and Joint Implementation was restricted by Decisions 11/CP.7 and 17/CP.7. Two years later, during the COP 9 in Milan, the modalities and procedures for forestry activities under the CDM were defined (Decision 19/CP.9).

There are several important differences in eligibility and modalities depending on the country in which forestry activities are to be implemented. In Annex I countries a wide range of activities are eligible: Afforestation, reforestation, reduction of deforestation, revegetation, forest management, cropland management and grazing land management (see glossary for definitions). For CDM projects, until 2012 the only activities eligible are afforestation and reforestation.

The Kyoto Protocol was adopted in 1997 at the third Conference of the Parties of the UNFCCC (COP). This protocol defines commitments, mechanisms and general rules for the emission's reduction of greenhouse gases in the Annex I countries (mostly industrialised countries). The Kyoto Protocol defines also the period 2008–2012 as the first commitment period. Even if the protocol has not been ratified yet it is the most important instrument regarding the mitigation strategy.

Countries listed in Annex I of the Convention: Australia, Austria, Belarus, Belgium, United Kingdom of Great Britain and Northern Ireland, Bulgaria, Canada, Czechoslovakia, Denmark, European Economic Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great, United States.

The Marrakech Accords (2001) restricted the use of forestry activities to mitigate climate change for both industrialised and developing countries.

Glossary to Forest and Climate Change
www.intercooperation.ch/offers/download/glossary-forest-climate-change/view

Carbon, Forests and People
www.iucn.org/dbtw-wpd/edocs/FR-LL-001.pdf

Alternative financing model for sustainable forest management in San Nicolas (Colombia). This project seeks to curb the degradation of natural forest resources on an area of 72 367 ha by means of a financing model. This financing model combines sustainable management of natural forests with alternative sources of financing, such as contributions by various industrial sectors and possible incorporation of the forest sector into the context of the Clean Development Mechanism.

www.tropicalforests.ch/project.php?id=18

Climate, Forests and People Information Desk
www.iucn.org/themes/carbon/

“The degree to which a system is susceptible to, or unable to cope with the adverse effects of climate change, including climate variability and extremes, is called vulnerability”.

Apart from eligibility, there are other important differences between forestry activities in Annex I countries and in non-Annex I countries. These differences regard limitations accountability of emission reductions or sinks resulting from forestry activities, as well as approved modalities and procedures. Activities within the CDM are strictly regulated: I) it must be proven that they contribute to achieving sustainable development, II) they must be additional, III) credits from these projects expire after a determined time span and are not accounted as definitive, IV) documentation on many issues is required, including, among others, an analysis of the project's socio-economic and environmental impacts (impacts on biodiversity and natural ecosystems), a legal title to the land, and the right of access to carbon.

The capacity of each country to design and implement forestry activities to mitigate climate change depends on factors like institutional and legal framework, technological development, social acceptance of innovations, or the state of knowledge. It is obvious that this capacity differs deeply not only between Annex I and non-Annex I parties, but between countries and regions in general.

Experiences made during the past ten years in both industrialised and developing countries have demonstrated that there exists, indeed, a potential to mitigate climate change and promote sustainable livelihoods through forestry activities. However, these activities also imply considerable risks and uncertainties relating not only to the question of how long carbon can remain in the biosphere (permanence), but also to other matters, such as accuracy in the accountability of carbon fluxes, the issue of leakage, transaction costs, equity, and negative socio-economic or environmental impacts in both industrialised and developing countries.

Many of the decisions regulating forestry activities will be renegotiated after the first commitment period (2008–2012). In order to improve the agreements, it will be necessary to gather experience and knowledge of the actual potential and risks of forestry activities to mitigate climate change and promote sustainable development, as well as risk management strategies. This kind of experience can serve as input for future negotiations and ensure adequate use of forestry activities in mitigating climate change.

Adaptation to climate change

Adaptation in the context of climate change refers to any adjustment in natural or human systems in response to actual or expected impacts of climate change aimed at moderating harm or exploiting beneficial opportunities. The process of adaptation has been defined as consisting of three major steps, namely, assessment of vulnerability to climate change, creation of capacities at the international, national and local levels, and promotion of adaptation measures. These steps are dynamic and interrelated.

Changes in the climatic system, especially changes in temperature and rainfall patterns and the increment in frequency and magnitude of climatic extreme events (e.g. droughts, hurricanes), affect natural resources and social systems. Rural communities and, in particular, poor people with livelihoods that are highly dependent on ecosystem services and products are more vulnerable to these changes. Enhancing the resilience of social and natural systems is one way to cope with and adapt to the adverse effects of climatic changes.

Enhancing resilience to climate change of forest based livelihoods implies going beyond management practices to an increment in overall sustainability. A review of development projects undertaken by Intercooperation, IUCN, IISD, and SEI-B showed that sustainable livelihoods and natural resource management contribute to building community resilience. However, there is little experience with projects specifically designed to reduce vulnerability.

Adaptation must be seen in a broad context of overall development. This means that adaptation to climate change should become one of the factors to be considered in any development project. Up to present, major efforts have been made to understand vulnerability to climate change of social and natural systems at the regional level. At the local level, impact assessment is not as well determined. However, new projects to promote sustainable management and reduce vulnerability that are being developed on the basis of current results carry the conviction that the improvement of the adaptive capacity of poor people to future changes should be recognised as a guiding principle in global development strategies.

Adaptation to climate change must be seen as a long-term process bringing together local and traditional knowledge and external expertise. Adaptation should be aimed at combining promotion of a functioning national institutional framework, better access to market opportunities for ecosystem goods and services, wider use of improved technologies, and increased participation and empowerment of local communities.

Vertical integration of the local, national and global levels, as well as horizontal integration across socio-economic sectors calls for multi-stakeholder approaches. Models and scenario development that integrate climate change data with socio-economic and natural ecosystem data can be a valuable instrument to facilitate decision-making processes.

Additionally, bilateral development cooperation or global funds such as the GEF that are important financial sources for adaptation activities should promote a long-term, development-oriented approach.

"Resilience provides the capacity to absorb shocks while maintaining function. When change occurs, resilience provides the components for renewal and reorganisation". (Gunderson and Holling, 2002; Berkes...[et al.], 2002)

Alternative possibilities include, among others, access to insurance payments and relocation. However, these possibilities are out of range for people with poor livelihoods.

Livelihoods and Climate Change
www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf

Global Environment Facility (GEF)
www.gefweb.org

International policy-making

Milan: Implications of the COP 9 decisions

With contributions by Renato Marioni (RM) and Javier Blanco (JB)

Renato Marioni, Swiss delegate to the UNFCCC, LULUCF, seco

Javier Blanco, Colombian delegate to the UNFCCC until 2003, former director of the Economic Analysis Unit of the Colombian Ministry of Environment, Housing and Territorial Development

During the last Conference of the Parties, held in Milan in December 2003, decisions regarding mitigation and adaptation were taken. Some of them, such as Decision 19/CP.9, are directly related to forestry activities, while others cover more general themes.

The implications of these decisions can be very different from country to country. In an effort to understand these differences we have asked a delegate each from an Annex I and from a non-Annex I country about their impressions of the decisions and the effects they have. Their answers are presented here.

The present article does not pretend to commit any country or delegation to the answers given here. We simply intend to present how delegates with a profound experience of the UNFCCC negotiations interpret the possible effects of the decisions taken in Milan.

Which of the issues mentioned in Decision 19/CP.9 on "Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol" is most critical with regard to implementation, and why?

RM: Afforestation and reforestation project activities have distinct features in comparison to other projects under the CDM. These are (I) the permanence issues in view of an effective climate protection and (II) the social and environmental impacts potentially caused by these projects. Having social and environmental safeguards as well as enough incentives to implement forestry activities will be a great challenge.

JB: The most critical issue to implement with regard to Decision 19/CP.9 is the development and approval of baselines and monitoring methodologies. Experience gained during the implementation of energy projects suggests that the methodological work done by the Executive Board (EB) is of key importance for project initiation. The challenge for the EB (and the Methodological Panel) will be to approve methodologies that are sound and, at the same time, feasible and cost-efficient with regard to implementation.

At the national level, prior to the COP 9 decisions, local communities placed great expectations in the benefits of afforestation and reforestation projects. The most critical issue will be to set up institutional frameworks (Government, NGO's, Municipalities, and Regional Authorities) to develop projects jointly with local communities.

Which are the major issues of concern with regard to adaptation?

RM: The relation between the emitted GHG and the distribution of impacts could cause a problem. Poor regions, countries and islands may be strongly affected by adverse effects of climate change, whereas industrialised countries, who cause the great bulk of GHG emissions, have less negative impacts. Developed countries have to share the burden of adaptation measures elsewhere in order to internalise the very direct implications of a changing climate. Non-Annex I (developing) countries need assistance that would enable them to reduce exposure to present climate variability and to increase their adaptive capacity to long-term climate change threats. Furthermore, it is still uncertain how adaptation will contribute to combating the negative effects of climate change. Mitigation cannot be replaced by adaptation.

JB: The process is not moving forward although there have been some advances in assessing vulnerability to climate change. Discussions focus on the “additionality” of adaptation measures, their cost-effectiveness, and the amount of resources required. Climate Change is not an abrupt process but a very slow one. Countries should try to identify already ongoing processes, and institutions who deal with impacts related to climate change should assess their own capacity. Development of adaptation measures should be based on ongoing processes and institutional capacities and not start from zero.

The Conference of the Parties should develop clear guidelines and rules aimed to identify the added value of adaptation strategies that could then be financed, or focused upon, by the multilateral process.

Which role should bilateral cooperation in LULUCF projects play?

RM: The implementation of bilateral LULUCF projects between entities of Parties is a long learning process with high transaction costs but a lot of benefits: On the one hand, the needs of the host country can be better met, on the other hand, sustainable development is directly promoted.

JB: Bilateral cooperation could play a very important role in collaboration with local NGOs and communities to formulate and implement LULUCF projects by reducing transaction costs, facilitating technological transfer, and fostering formal institutions and association mechanisms. The Marrakech Accords capped the demand side of LULUCF credits, thus allocating LULUCF credit shares to each Annex I party. Bilateral cooperation could also be a straightforward mechanism to contribute a country’s share to projects in developing countries, thereby assuring high quality projects.

Which role should bilateral cooperation play in the implementation of adaptation strategies with regard to natural resource management?

RM: Enhancement of a system's adaptive capacity reduces vulnerabilities and promotes sustainable development. With regard to bilateral cooperation, therefore, it is highly recommendable that planned adaptation measures include actions targeting particular aspects of natural resource management, especially in agriculture, water resources, and coastal zone applications. Moreover, environment and natural resource issues (local, regional and global) need to be taken into account in adaptation planning and when integrating adaptation strategies with natural hazard reduction and disaster prevention.

JB: The main potential area of contribution of bilateral cooperation is the systematic observation and monitoring of natural resources that are most vulnerable to climate change. In this regard, cooperation could facilitate technical support and finance. On the other hand, natural resource management in developing countries is very closely linked with rural communities and their specific circumstances. Bilateral cooperation could facilitate similar experiences among various developing countries.

Switzerland: Swiss Climate Change Policy, the UNFCCC and its Kyoto Protocol

In collaboration with José Romero

José Romero, Swiss Agency for the Environment, Forests and Landscape (SAEFL)

Within the UNFCCC, decisions are taken by consensus. This system implies a challenging negotiation process, both within each country and at the international level. Policy regarding climate change affects many sectors of society. Therefore, countries need to undergo an internal process in order to define their position at the national level. This process can differ between countries depending on their institutional framework, resources, and national priorities. In the following, we will present the framework within which Switzerland reaches national agreement and defines its policy. It exemplifies the complexity of the national processes that precede the even more complex international negotiation process.

The Swiss position on climate change — in particular regarding the UNFCCC and its Kyoto Protocol — is determined by Switzerland's domestic policy in this area. Core elements of the Swiss climate policy are the 1999 Constitution and the Federal law on CO₂. This law, which entered into force in May 2000, stipulates an overall target of 10% reduction of energy-related CO₂ emissions by 2010 compared to 1990 levels. It relies on various sectoral policies (e.g. energy, transport, etc.). The Swiss national and international climate policies are closely coordinated, since the protection of the global environment — in particular global climate — is one of the priorities of Swiss foreign policy.

Switzerland has participated in the multilateral process on climate change since 1991. During the Kyoto Protocol negotiations, Switzerland advocated the adoption of substantive quantified targets for all industrialised countries.

The institutional arrangement for climate policy in Switzerland involves numerous departments (ministries), with overall leadership and coordination centred at the Swiss Agency for the Environment, Forests and Landscape (SAEFL). Interdepartmental coordination is placed under the strategic authority of the directors of the relevant offices and coordinated by the director of SAEFL. The operational level is assured by a group of experts from the various offices and is coordinated by the SAEFL. This group of experts includes representatives of federal offices from various departments such as the Office for Energy, the Federal Office for Spatial Development, the State Secretariat for Economic Affairs, the Directorate of International Law, the Federal Office for Civil Aviation, the Office for Agriculture, the Agency for Development and Cooperation, the Swiss Meteorological Institute and the Directorate of Political Affairs.

The expert group elaborates the Swiss position for the negotiations within the Conference of the Parties of the UNFCCC, and proposes the composition of the delegation to the COP. Based on these proposals the Federal Council (i.e., the Swiss government) gives a mandate to the negotiating delegation.

The SAEFL is the seat of the secretariat and the registry for the use of the flexible mechanisms of the Kyoto Protocol. It also coordinates the preparation of Swiss national communication, as well as the national greenhouse gas inventory. For this purpose, the SAEFL establishes links with other offices, the cantons, the private sector, scientific academies, and non-governmental organisations.

Recommended readings

The following list features a documented and targeted selection of print documents and internet sites of relevance to "Climate change and forest-based livelihoods". For easier reading they have been listed by title in alphabetic order in four rubrics.



Overview and general context



Policies and strategies



Methods and instruments



Case studies

Many documents are available online and can be downloaded (accessed on 1st July 2004). The others are part of InfoResources' documentation. For more information on this issue and the publications, please contact us by e-mail at: info@inforesources.ch



Emma L. Tompkins, W. Neil Adger

Building resilience to climate change through adaptive management of natural resources

2003, Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, 23 p., www.tyndall.ac.uk/publications/working_papers/wp27.pdf

Climate change is a reality. The question today is how to minimise short-term and long-term costs of climate change. The options available to decision makers are "adaptation" and "mitigation" responses. This paper proposes that sustainable development can be enhanced by building community and institutional resilience. The authors present an example of community adaptive ecosystem management for the natural resources of a marine reef environment through resilience and a flexible decision-making process. The authors suggest that including all stakeholders in a participatory decision-making process could enhance management.



Government of Canada, IEEP, Intercooperation, IUCN, SDC, UNEP

Carbon, forests and people: Towards the integrated management of carbon sequestration, the environment and sustainable livelihoods

2002, IUCN, 42 p., www.iucn.org/dbtw-wpd/edocs/FR-LL-001.pdf

This publication gives an overview of the opportunities for carbon sequestration projects or activities in forestry and agriculture in both industrialised and developing countries. It delivers an analysis of the various approaches with their possible repercussions on a given project. It underlines the aspects necessary to ensure that climate change mitigation measures related to forest and other land-use types induce equitable and cost-effective sustainable development benefits.

Alain Albrecht, Serigne T. Kandji

Carbon sequestration in tropical agroforestry systems

In: *Agriculture, Ecosystems and Environment* 99 (2003) 15–27

Long rotation systems such as agroforestry, home-gardens and boundary plantings can sequester sizable quantities of Carbon in plant biomass and in long-lasting wood products. Soil Carbon sequestration constitutes another realistic option that can be achieved within agroforestry systems. However, a number of shortcomings need to be emphasised, such as land use and land cover, the poor performance of trees and crops on substandard soils and in dry environments, as well as pests and diseases. The authors point out that more work is needed to improve methods for estimating Carbon stocks and trace gas balances such as N₂O and CH₄, and to determine net benefits of agroforestry systems for the atmosphere.



International Institute for Sustainable Development (IISD)

Climate change

www.iisd.org/climate

See also *Climate Change Knowledge Network*, www.cckn.net

IISD's website reflects its commitment to defining a framework for global action in response to climate change since the Convention on Climate Change (UNFCCC) in 1992. For the process of negotiating the UNFCCC and the Kyoto Protocol, IISD has ensured that the voices of developing countries are heard and has provided neutral reporting on key international meetings. This bibliographical material is accessible on the website. Through its Climate Change Knowledge Network (CCKN), IISD collaborates with partners to create global strategies that address particular climate change issues.



Jekwu Ikeme

Climate change adaptation deficiencies in developing countries: The case of Sub-Saharan Africa

In: *Mitigation and Adaptation Strategies for Global Change* 8 (2003) 29–52

Despite low greenhouse gas emissions, Sub-Saharan Africa demonstrates a high vulnerability to climate change. In SSA, agriculture accounts for $\frac{2}{3}$ to more than $\frac{3}{4}$ of the GDPs, exports and labour and the countries show weaknesses affecting their "adaptational preparedness". The author highlights the lack of recognition of the need to adapt, as well as poor incentives. Ikeme judges them steadily declining for ODA and possibly insufficient with regard to the new GEF funds, as they are not mandatory. He proposes to initiate an "aggressive" capacity building process in SSA, and to take into account institutional and infrastructure deficiencies, as well as global economic reforms. Effective adaptation policy and programmes should be incorporated into policies regarding forests, water resources, coastal zone management, public health, infrastructure, and human settlement.



IUCN, UNEP, WWF

Climate, forests and people information desk

www.iucn.org/themes/carbon/

This internet platform offers a lot of precious information for the various stakeholders mentioned. It explains what investors and project managers need to know about Clean Development Mechanism (CDM) carbon forestry. For the former, market opportunities and investment risks are analysed; for the latter, potential environmental and socio-economic impacts are described. The essential steps of the CDM project cycle are explained, as well as the state of the negotiations of CDM and their consequences for developing countries. Case studies and further references complete this interesting approach.





Joyotee Smith, Sara J. Scherr

Forest carbon and local livelihoods: Assessment of opportunities and policy recommendations

2002, CIFOR, 45 p., www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-037.pdf

This publication analyses the benefits and risks for stakeholders involved in big forest plantations, small forests, agroforestry, natural regeneration, community forest management, and forest conservation. Opportunities and problems are presented for each of the contexts, but generally the initiatives at local level bring more benefit for the communities. The authors show that CDM projects at the local level will probably generate a lower environmental impact, less removal of carbon emissions out of the project limit, and more carbon management credits than the big forest plantation projects.



Rachel Masika

Gender, development and climate change

2002, Oxfam, 112 p.

Through gender analysis based on various case studies, this book shows the importance of the gender dimensions of climate change. Contributions originate in different continents and cover various levels, from global climate change negotiations to disaster responses to mitigation and adaptation initiatives at the local level. The analysis of different vulnerabilities, risks, and coping strategies of poor women and men in the face of environmental degradation and increased livelihood insecurity yields good tools to ensure equitable outcomes for women and men with regard to policy and implementation.



Carmenza Robledo [compiled by]

Glossary to forest and climate change

2004, Grey literature paper, 4 p., www.intercooperation.ch/offers/download/glossary-forest-climate-change/view

This paper provides the official definitions for mitigation and the concepts and terminology regarding adaptation included in the UNFCCC decisions in the Adaptation Policy Framework.



Evelyn L. Wright, Jon D. Erickson

Incorporating catastrophes into integrated assessment: Science, impacts, and adaptation

In: *Climatic Change* 57 (2003) 265–286, www.uvm.edu/~jdericks/pubs/Climatic_Change.pdf

The authors review the current state of scientific understanding with regard to three major geophysical catastrophes—runaway greenhouse, rapid sea level rise, and ocean circulation change. They focus on the implications of these hazards for integrated assessment (IA) modelling. Based on the results of the model, the authors explain the implications for climate economics, particularly with regard to discounting, damage assessment, and adaptation. Finally the authors present their conclusions regarding several significant sources of climate change damages that need to be evaluated, as well as the potential implications of such evaluations both in developing integrated assessment models and in climate economy.

IPPC Secretariat

Intergovernmental Panel on Climate Change (IPCC)

www.ipcc.ch

The Intergovernmental Panel on Climate Change has been established by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP) in 1998. Its aim is to assess scientific, technical, and socio-economic information relevant for the understanding of climate change, the potential impacts of this knowledge, and options for adaptation and mitigation. Its assessment is mainly based on peer-reviewed and published scientific literature. From 1990 up to now, three Assessment Reports have been published; the fourth one is to leave press in 2007. A particularly interesting feature of this site is the access to all kind of graphics regarding climate change, press releases, and speeches.



IISD, Intercooperation, IUCN, SEI, SDC

Livelihoods and climate change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty

2003, 24 p., www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf

This publication, prepared by the Task Force on Climate Change, Vulnerable Communities and Adaptation, emphasises the importance to integrate four dimensions in adaptation strategy that are usually thought of in separate terms, namely, disaster risk reduction, climate and climate change, environmental management, and poverty reduction. The paper presents keystone concepts (vulnerability, resilience, livelihood, etc...) and their interactions. The authors suggest that adaptation measures should be based on the livelihood activities of poor and vulnerable communities. The focus of adaptation strategy is thus centred on the objective of reducing poverty. This "bottom-up" approach is illustrated by case studies in different contexts (Vietnam, Sudan, Central America, India).



Horst Korn... [et al.]

Options for adaptation to climate change

In: 2003, UNEP, *Interlinkages between biological diversity and climate change*, p. 75–84 (in pdf p. 82–94), www.biodiv.org/doc/publications/cbd-ts-10.pdf

This selected chapter of the last CBD technical series report aims to clarify linkages between adaptation measures to climate change and biodiversity concerns. At the same time, the article gives a good overview of the "common wisdom" recognised at the international negotiation level. Along with the reduction of other pressures on biodiversity, a major adaptation measure is to counter habitat fragmentation by establishing biological corridors between protected areas, particularly in forests. Some possible adaptation measures (physical barriers, increased uses of pesticides or other changes in agriculture and aquaculture) may have negative impacts on biodiversity, while biodiversity may in turn contribute to adaptation. Water regulation is amongst the main issues and may be improved through forestry, as well as inland water, agriculture, and grasslands management and through conservation. Finally, some interesting information gaps are mentioned, such as the lacking clarification of the relations between elevated levels of CO₂, plant growth and forest functioning, and the effects of energy activities (wind, water, solar, biomass) on biodiversity.



World Bank... [et al.]



Poverty and climate change: Reducing the vulnerability of the poor through adaptation

2003, *World Bank*, 3 parts, 73 p.

<http://Inweb18.worldbank.org/ESSD/envext.nsf/46ByDocName/KeyThemesVulnerabilityandAdaptationPovertyandClimateChange>

The impacts of climate change and the vulnerability of poor communities to climate change vary greatly. However, climate change is generally superimposed on existing vulnerabilities. Based on this fact, adaptation efforts need to be strengthened in the context of poverty reduction. Part 2 of this report makes six main recommendations for the various stakeholders at the policy and implementation levels.

Reinhard Madlener, Carmenza Robledo... [et al.]



A sustainability framework for enhancing the long-term success of LULUCF projects

2004, *ETHZ*, 26 p., www.cepe.ethz.ch/download/cepe_wp/CEPE_WP29.pdf

This article aims to define, clarify and structure the relevant social, economic and environmental issues to be addressed, and to give examples of indicators that ought to be included in planning, design, implementation, monitoring, and ex post evaluation of LULUCF projects. This is achieved by providing a conceptual framework for assessing the sustainability of LULUCF projects which can be used as a checklist when dealing with concrete projects, and which, in principle, is applicable to both Annex I and non-Annex I countries. Finally, the authors give a set of recommendations on how to further develop and promote the proposed framework.

Henrik Hasselknippe



Systems for carbon trading: an overview

In: *Climate Policy* 382 (2003) 43–57

This paper focuses on the increasing number of regional, national, and international systems for trading and transfer of green house gas emission allowances and emission reduction credits. A full overview of all existing trading schemes and proposals is given, showing the outreach and judicial nature of the systems, the range and nature of emission reduction or credit purchase targets, allocation methods, links to external systems, and possibilities for the use of project-based credits. A comparative assessment is performed on a number of design criteria. The systems covered in the analysis display a considerable variation regarding key design criteria.

Reimund Schwarze, John O. Niles, Jacob Olander



Understanding and managing leakage in forest-based greenhouse gas mitigation projects

2002, *Published on-line*, 20 p., www.ghgprotocol.org/docs/carbon-leak.pdf

The phenomenon of leakage is complex. It can be significant compared to the scale of planned GHG changes in mitigation projects, and it constitutes a key challenge to climate change policy formulation. Based on a review of the literature on leakage and paying special attention to LULUCF projects in developing countries, the paper points out options for responding to leakage. On project level, such options include careful site selection, good project design, leakage contracts, and monitoring. On policy level, several tools can be used to address leakage, such as discounting, project-eligibility criteria, and "aggregate baselines". Project-level and macro-level approaches can manage leakage. They are already used in LULUCF pilot projects on the ground, although not for long enough periods to make robust conclusions.

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