Carbon, climate change and coalitions:

REDD for SADC countries

Introduction

In keeping with its origin in the year of the Rio Earth Summit and the signing of the UNFCCC, the SADC Treaty of 1992 postulates as one of its objectives "achieving sustainable utilization of natural resources and effective protection of the environment". The SADC program on forests acknowledges the "high dependence of the poor on forests", and "it is imperative for forestry to focus on poverty reduction and environmental protection". REDD, the new international initiative under UNFCCC on "Reducing Emissions from Deforestation in Developing Countries" appears tailored to these goals. REDD can ultimately succeed only, if forests are conserved or utilized sustainably and support rural livelihoods and poverty eradication. For SADC, REDD offers a potentially rewarding opportunity to fill this objective with life.

Coalitions and Africa's carbon cycle

With 192 UNFCCC Parties, and many regional processes/ institutions, even a sub-regional organization like SADC stands little chance to successfully embed its specific concerns into an eventual post-Kyoto agreement. SADC might therefore align itself in the negotiations with other groups, such as the African Group, or sub-regional African groups, such as COMESA (Common Market for Eastern and Southern Africa), ECOWAS (Economic Community of West African States), or COMIFAC (Central African Forestry Commission), who also aim to shape REDD to include specific provisions for Africa.

Very high greenhouse gas emissions from the land use sector are one common African feature. The continent contributes only 3% and 5%, respectively, to global fossil fuel C, or all greenhouse gas emissions. On the other hand,

- it adds 34% of global forest area losses (4.36 Mha) and 21% of all biomass carbon losses from forests (0.33 Gt)[1]
- its net C-emissions from land use change, mostly deforestation, amount to 180% of fossil C- emissions
- the biomass carbon losses from deforestation alone, excluding soil carbon, exceed fossil fuel emissions by 70%
- combined C-fluxes from deforestation, deforestation fires and fuel wood, even excluding shifting cultivation, account for 75% of all African C- emissions[2].

REDD, from the African perspective, must offer alternatives to forest conversion and biomass burning within and outside of forests. The link to fuel wood as quasi sole energy source must be broken. As one possible option, photovoltaic panels might save forests. .

[1] Calculated over all countries with a net loss in forest area or forest biomass carbon, excluding countries with a net gain of forest area

[2] Appendix I compiles more data on Africa's carbon cycle and land use emissions.

Annual precipitation in Africa correlates particularly strongly with annual Net Primary Productivity (NPP). The IPCC's Fourth Assessment Report (AR4) projects less annual precipitation and frequent droughts for many areas in Africa. Given the very high dependency of much of Africa's population on the land and rainfall, declining productivity of crops, grasslands and forests will regionally threaten livelihoods and food security with repercussions on forest conservation. Globally, since soil respiration is less sensitive to water deficits than NPP, the sink strength of Africa's ecosystems will drastically decrease, further aggravating climate change. From the continent's own and from the global perspective, REDD must contain particularly strong provisions for stabilizing and ameliorating livelihoods and food security.

Tropical forests countries in Africa and other tropical regions also share a powerful new argument for forest conservation, if we widen the focus on mere carbon sequestration to the combined effects of geochemical and geophysical factors that determine Global Warming. Via high rates of carbon fixation, their reflective properties (albedo), and their high rates of evaporation tropical forests cool the region and the entire planet particularly effectively. In contrast, forested landscapes in temperate and particularly boreal forests may actually promote net warming[3]. Pronounced feedback mechanisms between land cover and climate change is particularly pronounced for Africa making forest conservation and extension of forests a global priority.

Climate changes in SADC countries

An eventual regime for REDD and possible coalitions on the road to achieving it must match the future climate in Southern Africa.

Table 1: AR4 projections for Southern Africa

Season	Temperature change (^{0}C)			Precipitation change (%)			Extremely warm seasons (probability)	Extremely wet seasons (probability)	Extremely dry seasons (probability)
months	min.	med.	max.	min	med.	max			
JJA	1.9	3.4	4.8	-43	-23	-7	100	0.01	0.23
DJF	1.8	3.1	4.7	-6	0	10	100	0.11	0
annual	1.9	3.4	4.8	-12	-4	6	100	0.04	0.13

Table1 compiles IPCC's projected climate parameters for Southern Africa for the last decade of this century. Warming is likely to exceed the global average. Likely or very likely, floods, costal inundations and severe storms with on average 20 % higher intensities will become more frequent in South Eastern Africa. South Western Africa will experience aggravated water stress

[3] Bonan, G.B. 2008. Forests and climate change: Forcings, feedbacks and the climate benefits of forests. Science 320:1444-1449

during the austral winter. Among the impacts are dune field activation, desertification in sub-humid and semi-arid zones, added health risks from malaria (aggravated by deforestation) and meningitis (boosted by dust, low humidity).

Forest ecosystems will shrink or entirely loose suitable sites. Many species will shift their range; productivity will likely decrease. Heightened fire risk, forest pests and diseases, increased anthropogenic deforestation, loss of plant and animal species and decline of mangroves are further impacts of projected climatic changes. With very high confidence, Southern African ecosystems already change faster than anticipated. Unfortunately, recent extreme events, such as the floods in Namibia, bear out IPCC predictions.

Adaptation of African societies to rapidly advancing climate change is a major topic of the UNFCCC regime, ongoing negotiations and related processes. However, the necessity to adapting its forests to drastic climatic changes has so far been essentially overlooked. We can only hope to curb emissions from deforestation and degradation and enhance carbon stocks in well-adapted forests. By definition, adaptation of forests requires monitoring, planning and sustainable management, elements that, as shown below, are also among the prerequisites for REDD. The concept for REDD must widen to include adaptation.

Carbon and SADC forests

REDD, originally conceived to cover deforestation only, has become a misnomer during past negotiations. Not only does REDD now also cover "forest degradation",[4] but the Bali Action plan also foresees conservation and enhancement of forest carbon stocks and sustainable forest management as options for "REDD+". Thus, countries may benefit from REDD even if deforestation has ceased and forest carbon stocks increase. From SADC's point of view, eventual rules for REDD should match the state and dynamics of its forests.

SADC members rank among the ten countries with largest forest area (DRC), among the highest forest cover countries (Seychelles), but Zambia, Tanzania, DRC, and Zimbabwe are also among the ten countries with largest annual net losses of forest area during the 2000-2005 period. An annual net loss in forest area of approximately 2 Mha in SADC translates into forest biomass carbon losses of annually 177 Mt C, about 10% of the global total[5]. With 105 t C/ ha, average biomass carbon density in SADC forests is high. With the exception of South Africa, Swaziland and Mauritius, net losses of forest area prevail. Limiting REDD to deforestation would therefore eliminate potential benefits for some member countries.

In addition, forest carbon stocks in all standing forests tend to increase after previous natural and anthropogenic disturbances and logging. Under Art. 3.4 of the Kyoto Protocol, industrialized countries can opt to claim the carbon sequestration of their own re-growing forests as carbon offsets for national industrial emissions up to certain limits. For reasons of equity, developing

[4] An unfortunate and misleading choice of term; REDD does not cover internationally defined forest degradation, but merely the attrition of forest carbon stocks.

[5] calculated over all countries with a net loss of biomass carbon stocks

countries should have the same option, that is, they may chose to benefit not only from reduced deforestation, but also from enhancing carbon stocks in their forests through forest conservation and natural re-growth or deliberate management choices.

Assuming an average carbon price of $20 / t C, each percentage of reduced deforestation alone would annually produce total net benefits of $32 Mio. for SADC countries. Highest gross revenues from reduced carbon emissions would accrue to DRC, Tanzania, Madagascar, Angola and Zimbabwe. Can this potential revenue cover the costs of reducing deforestation and enhancing carbon stocks through sustainable management? Interestingly, SADC countries could benefit from increasing the carbon stocks of their standing forests. An annual increase of only one percent would produce an annual gross revenues of $ 7.5 billion.

Forests are not excludable. REDD necessitates sustainable forest management and conservation. In addition to formidable obstacles created by established African land use and threatened livelihoods, outlined above, current management of SADC forests, like that of most developing country forests, is very rudimentary. Information on forest area, growing stock and biomass is frequently outdated and only based on large scale remote sensing without ground surveys. Many developing countries relied on expert estimates only. In SADC countries, the area-weighted average last forest inventory year is 1989; 68% of the forest area information is based on remote sensing; one third of SADC countries rely on expert estimates.

Given this state of information on forests, not even carbon inventory and accounting for REDD for emissions from deforestation is currently practical. Moreover, necessary policies and interventions to curb deforestation in the forest- and adjoining sectors cannot be crafted without reliable information on the state and trends of national forests and related sectors. Regarding carbon stock enhancement within standing forests, Figure 1 indicates, that most SADC countries do not have data on carbon stock changes within their standing forests at all. Instead, they assume constant carbon stocks, indicated by the strictly linear relation between percentage area and carbon stock changes.

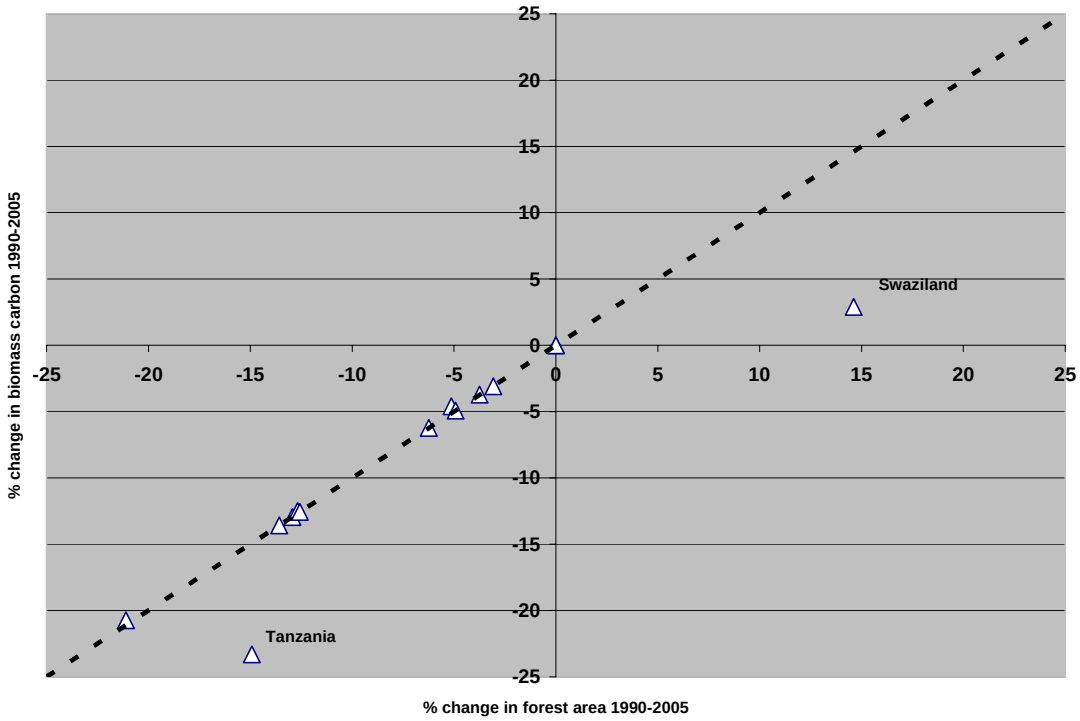

Figure 1: percentage change in forest biomass carbon as a function of percentage change in forest area for SADC countries.

The current state of management and conservation appears equally rudimentary. Available information for ITTO-countries[6], including for DRC, may be representative for SADC countries (Figure2). Many countries have not even created a permanent forest estate, the most basic prerequisite for sustainable forest management. Only less than 10% of the total forest area is covered by a management plan, another basic necessity. Less than 3% of the forest area of ITTO countries is managed or conserved sustainably.

Given this discouraging state of forest management and conservation in developing countries, a Herculean effort will be required to build capacities, remedy proximate and underlying causes of deforestation and degradation, introduce SFM and implement REDD. Obviously, up-front carbon payments will not suffice to create the prerequisites for REDD. A phase of major financial and technology transfers and capacity building will be prerequisite, before carbon market mechanisms can eventually be applied.

In the course of this major global effort and with advancing climate change, REDD must mutate from pure mitigation to planned adaptation of forests, of developing countries, and, most importantly, of North-South relationships.

[6] ITTO.2006. Status of tropical forest management.

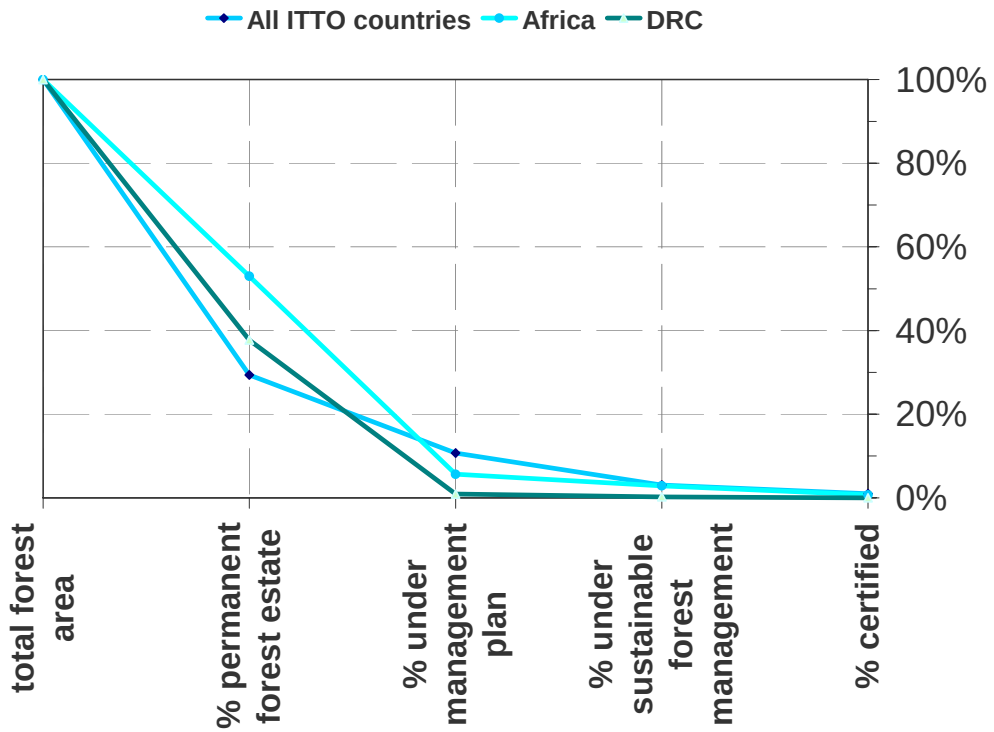

Figure 2: Status of forest management according to ITTO for its member countries, for African members, and for one SADC member country (DRC)

Appendix 1

	Global total	Africa total	Ratio
Land area (10^8 ha)	148.8	30.2	0.2
Population (10^9)	6.38	0.87	0.14
Fossil fuel C-emissions	6.2	0.2	0.32
All GHG emissions without LULUCF	9.17	0.44	0.048
Soil carbon	1600	200	0.13
Biomass carbon	610	80	0.13
Net land use change emissions	1.7	0.36	0.21
Emissions from all biomass burning	2.9	1.1	0.37
Deforestation fires	0.36	0.07	0.19
shifting cultivation fires	0.6	0.24	0.41
fuel wood	0.51	0.16	0.32
Shifting cultivation fires	0.6	0.24	0.41
Deforestation fire emissions	0.36	0.07	0.19
CH_4 from fire	0.02	0.005	0.33
CO from fire	0.27	0.09	0.32
Non-methane volatile organic compounds from fire	0.15	0.05	0.33

Sources: C.A. Williams et al. 2007. Africa and the global carbon cycle. Carbon Balance and management 2007, 2:3
FAO, 2006. Global Forest Resource Assessment. Rome.
UNFCCC. 2005. Synthesis of initial national communications from NAI countries
WRI.2005. Navigating the numbers.
(carbon data in Gt C; subcategories might not sum to 100% due to various sources and omissions of some categories)