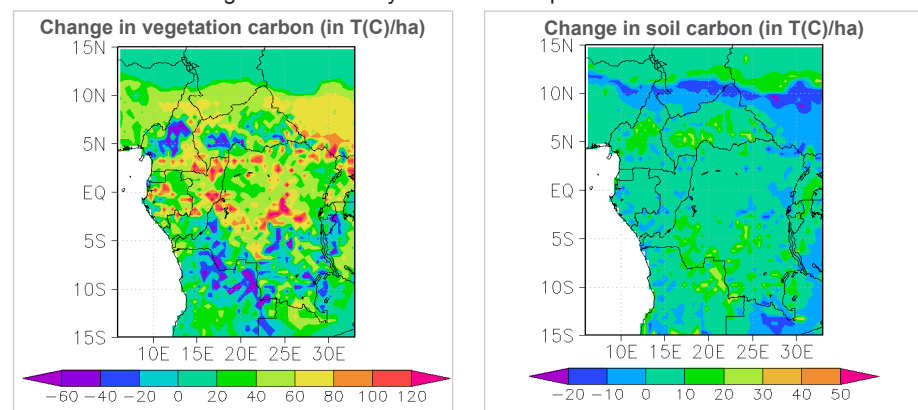
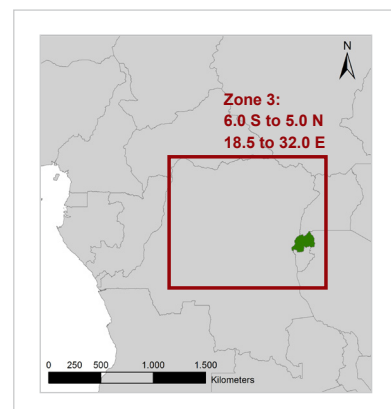


Fact-Sheet - Forestry - Rwanda - Zone 3

Maps of projected changes - Maps show the projection of change over this century (mean of the period 2071-2100 compared to the mean of the period 1961-1990) under the "High" emission scenario and for all available projections combined. In the left panel, changes in potential vegetation carbon are shown and in the right panel, changes in potential soil carbon. Changes in total ecosystem carbon equals the sum of these two.



Definition of Zone 3 - The map below indicates the position of Zone 3 (red rectangle), representing the central regions with the mainly tropical rainforest climates and mainly a bimodal rain-regime. All values presented in this fact-sheet are changes spatially averaged over the whole zone. As Rwanda falls completely within Zone 3, projected changes for this zone are assumed to be representative for the country.



List of projected changes - Tables show the mean of projected changes over the first and second half of this century. Uncertainty around these means is not specified but variable, depending on the climate model used and dependence on the assumed sensitivity of vegetation growth to atmospheric CO₂.

Simulated potential ecosystem carbon (T(C)/ha) for the year 2000, and simulated total changes till 2050 and till 2100, respectively (T(C)/ha)	Today	Projected changes			
		Low emission scenario		High emission scenario	
	2000	till 2050	till 2100	till 2050	till 2100
Vegetation carbon	148.26	+11.86	+18.64	+36.46	+43.52
Soil carbon	76.94	+6.18	+5.39	+4.7	+4.91
Total carbon	225.2	+18.04	+24.03	+41.16	+48.43

Data and method - The projected ecosystem carbon change signals are based on the LPJ-mI Dynamic Global Vegetation model (DGVM) forced by the bias-corrected ECHAM global climate change projections. Although it is scientifically weak to provide only one value for projected changes (e.g. the mean), which we do here, in the case of ecosystem carbon changes there are too many uncertainties to calculate a "likely range" or "confidence interval". Instead we present the area-averaged mean change, based upon only one climate model, the ECHAM scenario, as this was the one giving most consistent results. We also verified the sensitivity of the DGVM to atmospheric CO₂ concentration change, because very little is known about the real CO₂ dependence of forests. This sensitivity study showed that if CO₂ dependence would be much smaller, the projected increases in ecosystem carbon will also be much less. Therefore the uncertainty ranges of the mean increases shown are large, often up to 50-100%. What is clearly needed is a large-scale experimental study to determine this sensitivity. Projected changes in the climate are assessed for two different greenhouse gas emission scenarios: the "Low" scenario is based upon the SRES B1 (IPCC-AR4) scenario; the "High" scenario is based upon the SRES A2 (IPCC-AR4) scenario.

Simulated potential Net Primary Production (NPP, T(C)/(ha*yr)) for the year 2000, and simulated changes till 2050 and till 2100, respectively (T(C)/(ha*yr))	Today	Projected changes			
		Low emission scenario		High emission scenario	
	2000	till 2050	till 2100	till 2050	till 2100
Tropical Evergreen forest	5.11	+0.47	+0.06	+0.58	+0.9
Seasonal forest	4.62	+1.25	+1.71	+1.72	+2.66
Natural Grassland	1.07	+0.27	+0.16	+0.01	+0.1

Key adaptation options

In specific areas where ecosystems are shown to be at risk of degradation, conservation measures should be put in place. According to these computer simulations, there is no need to prepare for large-scale **climate-induced** degradation of tropical evergreen forests, but one should keep in mind that the current forecasts are very uncertain. Possible climate change mitigation measures, within UNFCCC (e.g., REDD+) or otherwise, seem relatively feasible.

Key findings for Zone 3:

- It is likely that biomass (vegetation carbon) in this zone will increase.
- It is likely that soil carbon in this zone will increase.
- It is likely that total ecosystem carbon in this zone will increase.
- The increase is mainly the consequence of increasing atmospheric CO₂ concentrations. If CO₂ increase would be less than expected OR if vegetation sensitivity to CO₂ would be less than assumed in the vegetation models, the increase in vegetation, soil and ecosystem carbon would also be less.
- The proportion evergreen and seasonal forests as well as of natural grasslands will increase, in this case that means that productivity of all three will increase.
- According to the models and the predicted climate, it is unlikely that as a consequence of climate change, the natural vegetation in the region will strongly degrade.

Further details can be found in the "Impacts Report" and the "Adaptation Report" in the report section of the final project document - also available online under www.giz.de and www.comifac.org