Simulated NPP (g C m⁻² yr⁻¹) for the 12 studied species using PFT- (left side) and species-specific traits (right side). The grey color corresponds to simulated NPP values below the 100 g C m⁻² yr⁻¹ threshold and the black circles to occurrence data as provided by [55,56]. Simulations were obtained with CRU historical climate data for the reference 1980-1999 period.



100 - 150 < 100

Lophira alata



Musanga cecropioides



Nauclea diderrichii



Pericopsis elata



Pterocarpus soyauxii



Pycnanthus angolensis



Symphonia globulifera



Uapaca guineensis



Information about the selected CMIP5 global climate models.

Modelling group (Institute ID)	Model name	Spatial resolution	Reference
Canadian Centre for Climate Modelling and Analysis	CanESM2	2.8° lat x 2.8° lon	[65]
(CCCMA)			
Community Earth System Model Contributors (NSF-	CESM1-BGC	0.94° lat x 1.25° lon	[64]
DOE-NCAR)			
Centre National de Recherches Météorologiques /	CNRM-CM5	1.4° lat x 1.4° lon	[62]
Centre Européen de Recherche et Formation Avancée en			
Calcul Scientifique (CNRM-CERFACS)			
Commonwealth Scientific and Industrial Research	CSIRO-	1.85° lat x 1.85° lon	[66]
Organization in collaboration with Queensland Climate	Mk3.6.0		
Change Centre of Excellence (CSIRO-QCCCE)			
Institute for Numerical Mathematics (INM)	INMCM4	1.5° lat x 2.0° lon	[67]
Max Planck Institute for Meteorology (MPI-M)	MPI-ESM-LR	1.85° lat x 1.85° lon	[63]
	MPI-ESM-MR		

Figure 1. Annual mean temperature anomalies (°C) between the 2080-2099 period and the reference 1980-1999 period for the 7 selected GCMs under the RCP4.5 scenario (left side) and the RCP8.5 scenario (right side).





Figure 2. Annual precipitation anomalies (mm yr⁻¹) between the 2080-2099 period and the reference 1980-1999 period for the 7 selected GCMs under the RCP4.5 scenario (left side) and the RCP8.5 scenario (right side).





Figure 1. Lost area in the species current distribution (%) between the 2080-2099 period and the reference 1980-1999 period, considering NPP values above the presence threshold of 100 g C m⁻² yr⁻¹. Results obtained with the seven climate projections under the RCP4.5 (left side) and RCP8.5 (right side) scenarios, and three CO₂ configurations assuming respectively a CO₂ constant [330] (top), a CO₂ variable downregulated [down] (mid) and a CO₂ variable [var] (bottom), and species-specific morpho-physiological traits.





CO2 variable downregulated [down] configuration



CO2 variable [var] configuration



Figure 2. Expansion area beyond the current distribution (%) between the 2080-2099 period and the reference 1980-1999 period, considering NPP values above the presence threshold of 100 g C m⁻² yr⁻¹. Results obtained with the seven climate projections under the RCP4.5 (left side) and RCP8.5 (right side) scenarios, and three CO₂ configurations assuming respectively a CO₂ constant [330] (top), a CO₂ variable downregulated [down] (mid) and a CO₂ variable [var] (bottom), and species-specific morpho-physiological traits.



CO₂ constant [330] configuration

CO2 variable [var] configuration



Figure 3. Species biomass change on current distribution (%) between the 2080-2099 period and the reference 1980-1999 period. Results obtained with the seven climate projections under the RCP4.5 (left side) and RCP8.5 (right side) scenarios, and three CO₂ configurations assuming respectively a CO₂ constant [330] (top), a CO₂ variable downregulated [down] (mid) and a CO₂ variable [var] (bottom), and species-specific morphophysiological traits.

CO₂ constant [330] configuration



Changes in biomass per unit area (g C m⁻²) between 2080-2099 and the reference 1980-1999 period for the 12 studied species. The magnitude of change is expressed as a multiple of the spatial average of the 1980-1999 biomass standard deviation $\bar{\sigma}$ over the species current distribution area [48]. Biomasses correspond here to the ensemble mean of the results obtained with the seven climate projections under the RCP8.5 scenario and with species-specific morpho-physiological traits. Two different atmospheric CO₂ configurations are tested: a CO₂ constant [330] configuration (left side) and a CO₂ variable [var] configuration (right side). Disappearance of species is indicated in red, expansion in blue and preservation in green colors. Biomass increase and decrease over the preserved range are respectively in dark and light greens.

Ceiba pentandra ($\bar{\sigma}$ = 306 g C m⁻²)







Elaeis guineensis ($\bar{\sigma}$ = 591 g C m⁻²)



Guibourtia demeusei ($\bar{\sigma}$ = 1016 g C m⁻²)



Lophira alata ($\bar{\sigma}$ = 694 g C m⁻²)



Musanga cecropioides ($\bar{\sigma}$ = 828 g C m⁻²)



Nauclea diderrichii ($\bar{\sigma}$ = 667 g C m⁻²)



Pericopsis elata ($\bar{\sigma}$ = 720 g C m⁻²)



Pterocarpus soyauxii ($\bar{\sigma}$ = 662 g C m⁻²)



Pycnanthus angolensis ($\bar{\sigma}$ = 702 g C m⁻²)



Symphonia globulifera ($\bar{\sigma}$ = 712 g C m⁻²)



Uapaca guineensis ($\bar{\sigma}$ = 598 g C m⁻²)

