

# Electronic Supplementary Material

Ecosystem Resilience and Land-Use Governance: Remote Sensing Insights  
for Environmental Management in a Tropical Dry Forest

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## Supplementary Tables and Figures

Table S1: Description of orbital and climate data collections used (2004–2024).

Parameter	Product/Sensor	Resolution	Source
Vegetation Indices	MOD13A1 V6.1	500 m	NASA LP DAAC
Reflectance	MOD09A1 V6.1	500 m	NASA LP DAAC
Surface Temp. (LST)	MOD11A2 V6.1	1 km	NASA LP DAAC
Evapotranspiration	MOD16A2GF V6.1	500 m	NASA LP DAAC
Precipitation	CHIRPS Daily	0.05°	UCSB-CHG
Climate Variables	ERA5-Land	0.1°	ECMWF
Land Use	MapBiomass Col. 8.0	30 m	MapBiomass

Table S2: Maximum Light Use Efficiency ( $\varepsilon_{max}$ ) parameters used in the CASA model for land cover classes (IGBP).

IGBP Code	Land Cover Class	$\varepsilon_{max}$ ( $gC \cdot MJ^{-1}$ )
1	Evergreen Needleleaf Forest (ENF)	0.962
2	Evergreen Broadleaf Forest (EBF)	1.268
3	Deciduous Needleleaf Forest (DNF)	1.086
4	Deciduous Broadleaf Forest (DBF)	1.165
5	Mixed Forest	1.051
6	Closed Shrublands	1.281
7	Open Shrublands	0.841
8	Woody Savannas	1.239
9	Savannas	1.206
10	Grasslands	0.860
12	Croplands	1.044
14	Cropland/Natural Vegetation Mosaics	1.044

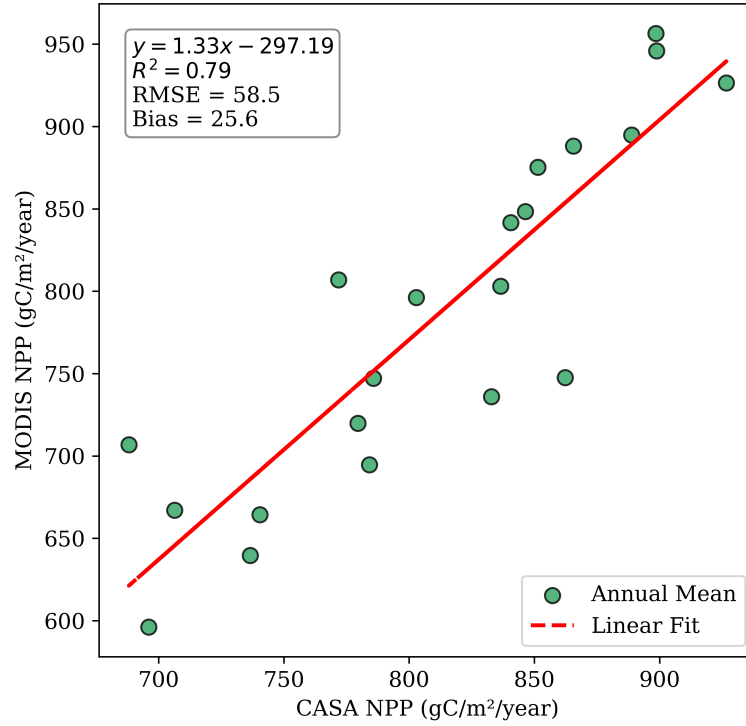


Figure S1: Cross-validation of the estimated CASA model versus MOD17A3HGF product.

Table S3: Top 10 Most Conserved Protected Areas based on Restoration Status.

Rank	Area Name	Governance Type	Total Area (ha)	Restoration (%)
1	Jatobá	Quilombola Territory	197	100.00
2	Comunidade Aroeira	Quilombola Territory	567	100.00
3	Floresta Nac. de Sobral	Conservation Unit	591	100.00
4	Maacos	Quilombola Territory	961	100.00
5	Pitombeira	Quilombola Territory	345	100.00
6	Capoeiras	Quilombola Territory	887	100.00
7	Res. Extrativista Batoque	Conservation Unit	99	100.00
8	Engenho Bonfim	Quilombola Territory	74	100.00
9	Sabonete	Quilombola Territory	1,897	98.70
10	Brutos	Quilombola Territory	1,281	98.08

Table S4: Top 10 Most Degraded Protected Areas based on Degradation Status.

<b>Rank</b>	<b>Area Name</b>	<b>Governance Type</b>	<b>Total Area (ha)</b>	<b>Degradation (%)</b>
1	Vicentes	Quilombola Territory	345	100.00
2	Massacara	Indigenous Land	8,082	100.00
3	Karapotó	Indigenous Land	1,060	100.00
4	Catuabo	Quilombola Territory	887	100.00
5	Tuxá de Inajá	Indigenous Land	123	100.00
6	Kapinawá	Indigenous Land	12,444	98.42
7	Araça/Pato/Retiro	Quilombola Territory	19,244	94.75
8	Lagoa do Peixe	Quilombola Territory	6,530	94.34
9	Xukuru de Cimbres	Indigenous Land	1,158	93.62
10	Sítio Arruda	Quilombola Territory	370	93.33