

# Functional ecology of Malagasy central Highlands's grasslands

- Background: Variability in tree cover across Madagascar central highlands grassland-savanna mosaic
- Statistical question: Does shade influence Malagasy central highland's grass species root biomass?
- Mechanistic question: How does change in light availability influence grass aboveground growth?



# Statistical question: Does shade influence Malagasy central highland's grass species root biomass?

**Hypothesis:** Shade decreases root biomass which might affect grass species persistence within the landscape after disturbances

**Response variable:** Root biomass

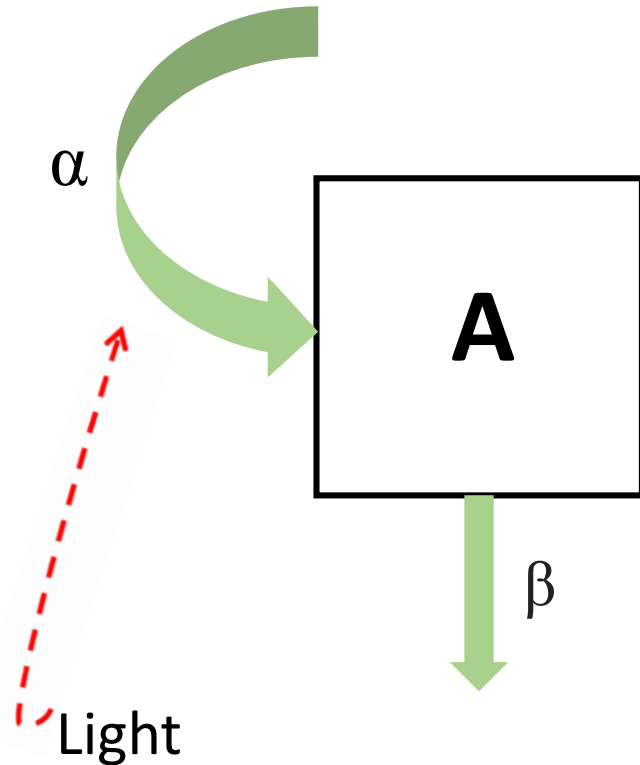
**Predictor variable:** Shade

**Family:** Gaussian



**R code:** `lmer(root ~ shade + (1 | Species | Replicate))`

Mechanistic question: How does change in light availability influence grass aboveground growth?



**State**

A: Aboveground biomass

**Processes**

- $\alpha$ : Photosynthesis
- $\beta$ : Photorespiration

$$\frac{dA}{dt} = \alpha AL - \beta A$$

# NEXT STEPS

- Determine how changes in environment affect grasses resistance to fire.
- Conduct field studies to determine the diversity of grass and forb species and fit mechanistic model of their dynamic over time.