

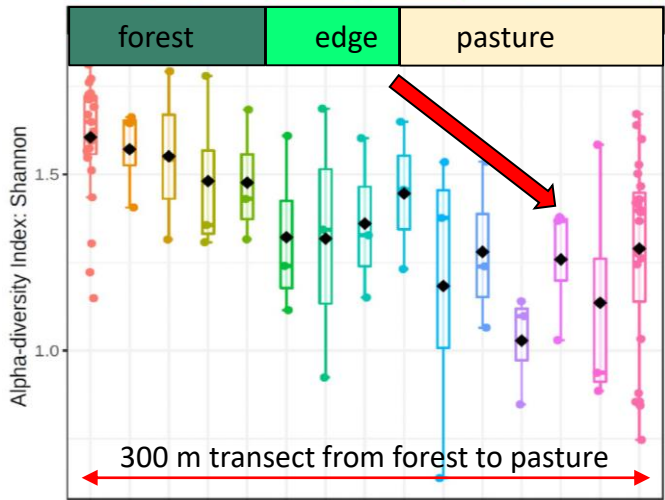
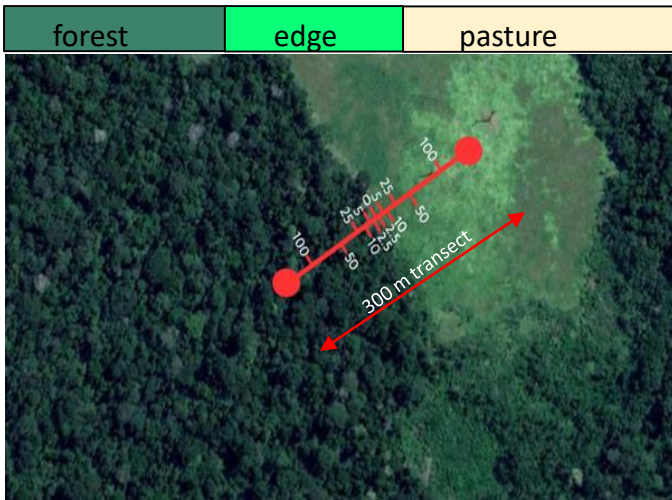
# Functional Diversity in Soil Enhances Ecosystem Resilience

The **Amazonian rainforest** is the hotspot of the diversity of biota and their functions in ecosystems.

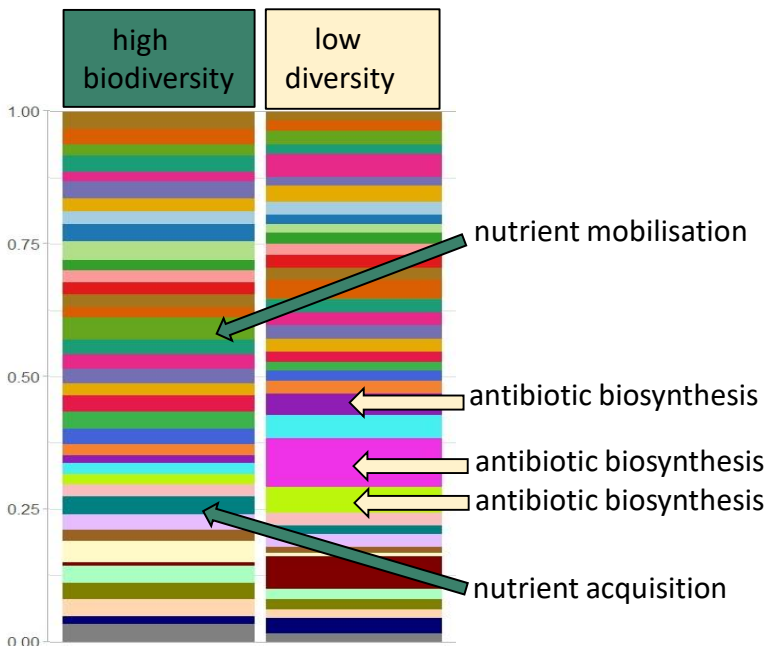
Microbes fulfill **functions** and secure biogenic processes in soils, thereby, increase **soil resilience**.

**Highly biodiverse systems** offer more niches, and, consequently, have a **higher functional diversity**.

**Low biodiverse systems**, e.g. pastures, **degrade** fast under tropical conditions, presumably due to the **decline of the microbial functionality**.



**Fig. 1. Left:** Aerial image of a low biodiverse pasture located within a primary forest, which is highly biodiverse, and the soil sampling scheme (red). **Right:** Diversity of fungi, who are key players in nutrient acquisition is clearly reduced along this transect. Data from our sites in Pando, Bolivia.



**Fig. 2.** Relative abundance of bacterial functions detected by gene sequencing shows a distinct increase of genes related to stress response, e.g. antibiotic synthesis and the loss of typical ecosystem functionalities in low biodiverse systems as compared to highly biodiverse systems.



**Fig. 3.** Low biodiverse systems degrade, presumably due to the loss of the microbial functionality. This leads to increasing forest clearings to replace lost productivity. The new arneys will degrade after short time, too. This leads to the **release of greenhouse gas emissions in a vicious cycle**.

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