

# The Effects of Liana Presence and Forest Structure on Vertical Profiles of fPAR in Tropical Dry Forests

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This project investigated the effects of lianas and forest structure on understory light availability in a Costa Rican tropical dry forest (TDF). Lianas are non-woody plants that rely on surrounding trees for structural support, and are found in successional forests following disturbance events. The forests in this study were cleared for agriculture and industry from 1950 to 1980. Since the 1980s, new political and economic priorities contributed to the regrowth and conservation of large areas of TDF. Research is now focused on documenting TDF recovery and characterizing parameters such as the fraction of photosynthetically active radiation (fPAR), the amount of sunlight absorbed by leaves. In this project, vertical profiles of fPAR were measured and compared between sites with lianas and sites without in the TDFs of Santa Rosa National Park, Costa Rica. Simultaneous measurements of fPAR were collected by erecting a 9 m tall pole, with quantum sensors mounted at 1 m intervals. In-situ lidar and field measurements were used to determine forest structure and liana abundance. Preliminary analysis suggests that fPAR is different in forests with lianas compared to forests without. There is less photosynthetic light available in liana-infested forests, particularly at heights of 1-3 m. Waveform lidar data and vertical fPAR profiles show correlation with height. Overall, lianas alter both the vertical structure and photosynthetic light available in successional TDFs. Conclusions drawn from this study contribute to an understanding of how past deforestation can influence present and future TDF development.