Initial vegetation structure and composition in the logged tropical rainforest of the SAFE Project, Sabah, Malaysia

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Background

The impacts of fragmentation on the structure, functioning and biodiversity of tropical forests are not well understood in Southeast Asia. Here, we report initial data on the structure and composition of the vegetation in different land use types within the lowland forest of the SAFE Project Area, Sabah, Malaysia.

Objectives

The main objective is to determine effects of different forest structure on seedling recruitment specifically on growth, mortality and survival.

Methods

- Permanent sampling plots (5 m x 5 m with 2 x 2 m central subplots) were established in four blocks of fragmented forest (A, C, D & E), two blocks of continuous logged forest (LF1 & LF2) and two of primary old growth forest (OG1 & OG2).
- In total 84 plots were surveyed covering an area of 0.21 ha. All plants including lianas above 10 cm height and 1 cm DBH were identified, mapped and measured for height and diameter.
- We also estimated the cover of different vegetation types. Repeated observations are planned approximately every six months for the duration of the project.

Study area

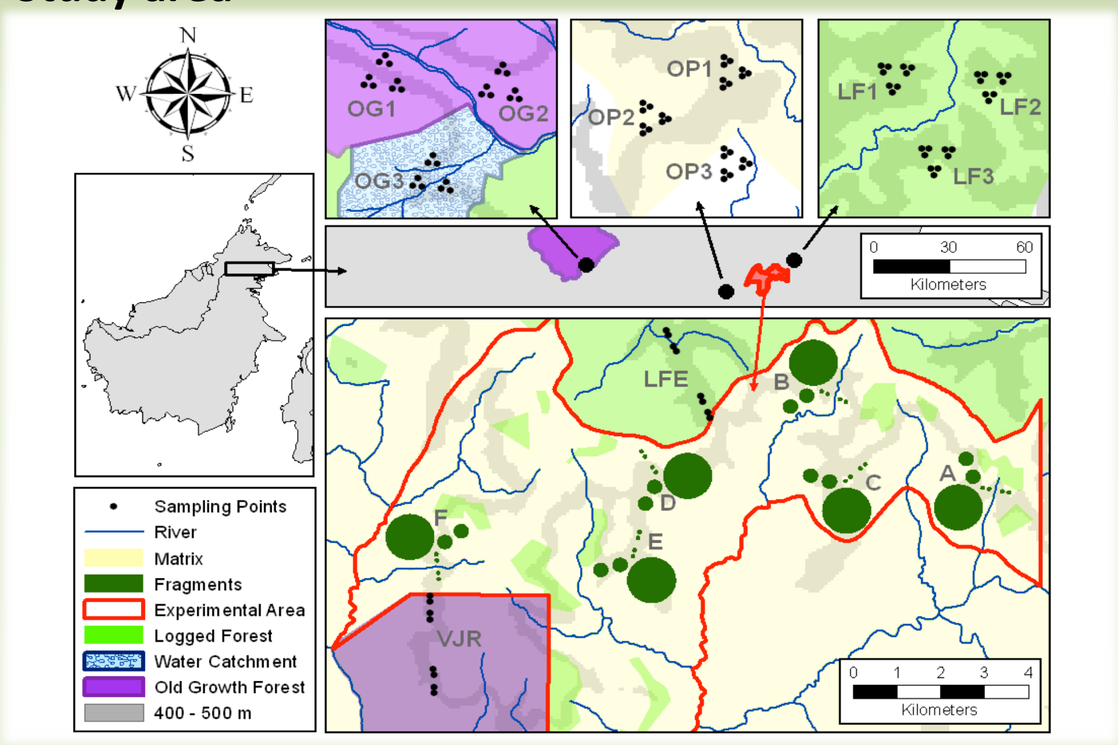

Figure 1: The SAFE project (SW Sabah, Northern Borneo, Malaysia) provides an experimental gradient of forest modification encompassing (OG) old growth forest, (OP) oil palm plantation, (LF) logged forest and (LFE) its edge, (VJR) Virgin Jungle Reserve and six blocks of fragmented forest: A, B, C, D, E and F (Ewers *et al.* 2011).

Results

We sampled 2,249 seedlings that belonged to 65 plant families.

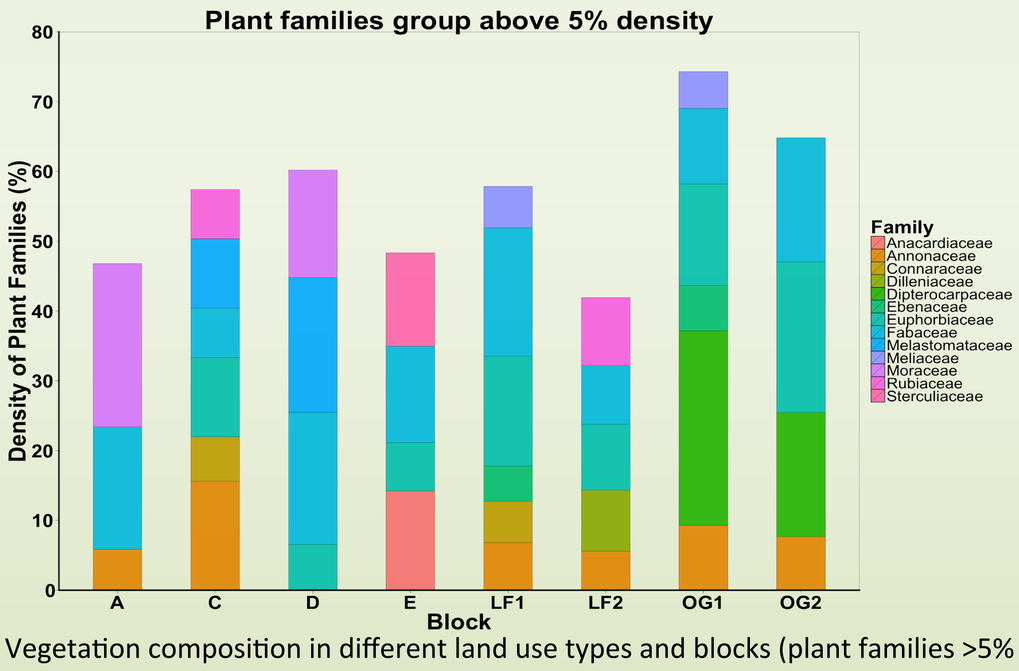

Figure 2: Vegetation composition in different land use types and blocks (plant families >5% of total). The Fabaceae, Euphorbiaceae and Annonaceae were recorded in most of blocks, the Dipterocarpaceae were dominant in the primary forest.

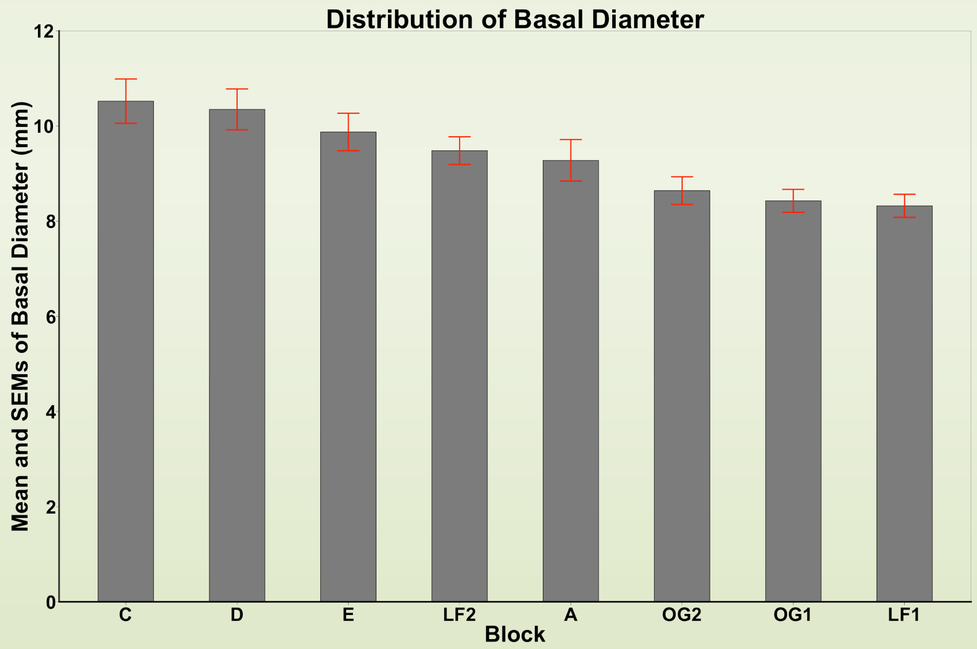

Figure 4: Basal diameter of seedlings in different land use types and blocks (with SEMs). Seedling diameters were less variable between land use types than some other response variables.

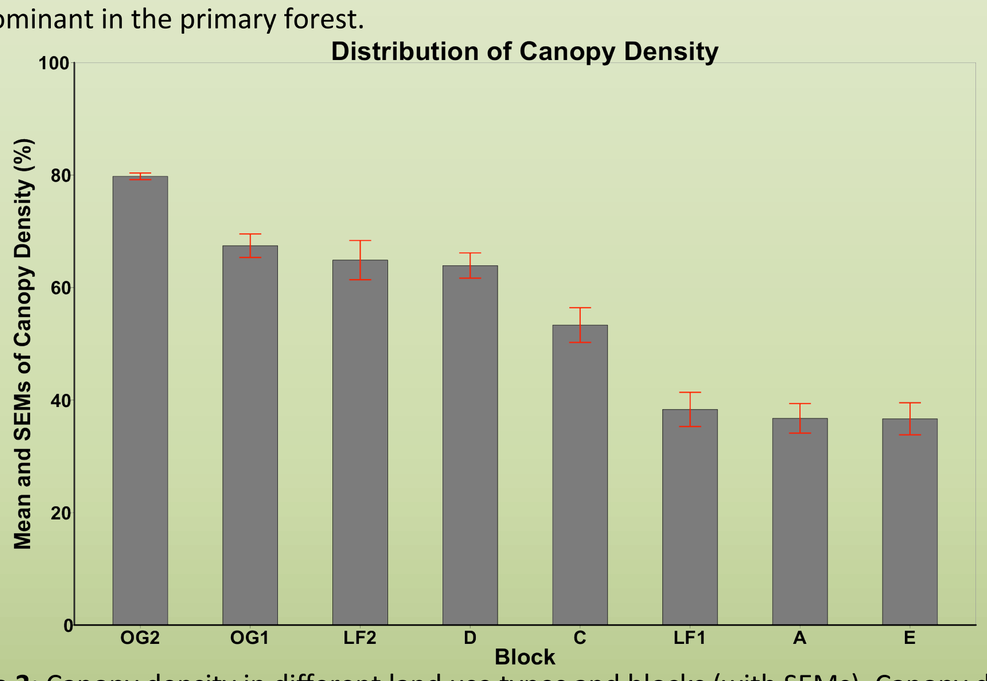

Figure 3: Canopy density in different land use types and blocks (with SEMs). Canopy density was higher in the old growth than in some of the disturbed and fragmented forest types.

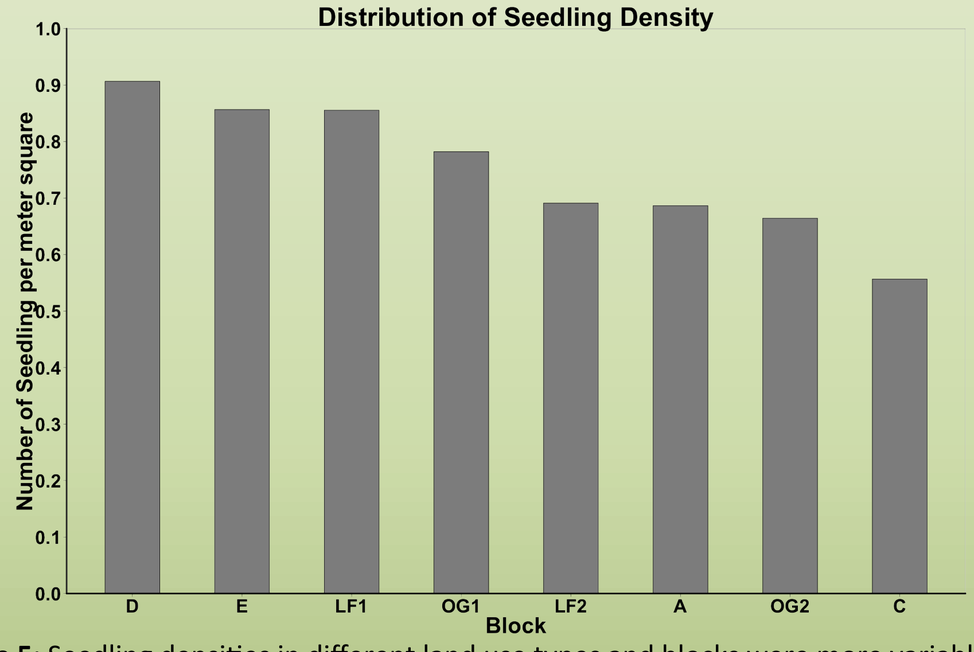

Figure 5: Seedling densities in different land use types and blocks were more variable than total seedling basal areas.

Conclusions

Forest fragmentation and disturbance had the expected impact on canopy cover. However, some other response variables were highly variable and showed less clear patterns with land use type. Future repeated samples will track the development of these patterns and also allow the analysis of seedling growth and survival.

Further information: On this study, contact Hamzah Tangki hamzah.tangki@uzh.ch. Overall SAFE Project, see www.safeproject.net

Reference

Ewers, R. M., R. K. Didham, L. Fahrig, G. Ferraz, A. Hector, R. D. Holt, V. Kapos, G. Reynolds, W. Sinun, J. L. Snaddon, and E. C. Turner. 2011. A large-scale forest fragmentation experiment: the Stability of Altered Forest Ecosystems Project. Philosophical Transactions of the Royal Society B-Biological Sciences **366**:3292-3302.