

### B11

#### Biodiversity enrichment in oil palm plantations: ecological and socio-economic impacts

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#### Background

Transformation of natural rainforest into large-scale monocultural oil palm plantations has led to dramatic losses in biodiversity and in ecological functioning. Re-establishing diverse habitats by restoring ecological multi-functionality will sooner or later become necessary. The ecological and economical processes that may hamper or facilitate re-establishment of diverse habitats, however, are largely unknown.



#### Objectives

- to increase the biodiversity within an oil palm plantation by planting tree islands
- to find out how enrichment planting affects
  - ecosystem functioning
  - plant & animal diversity
  - the productivity of oil palms

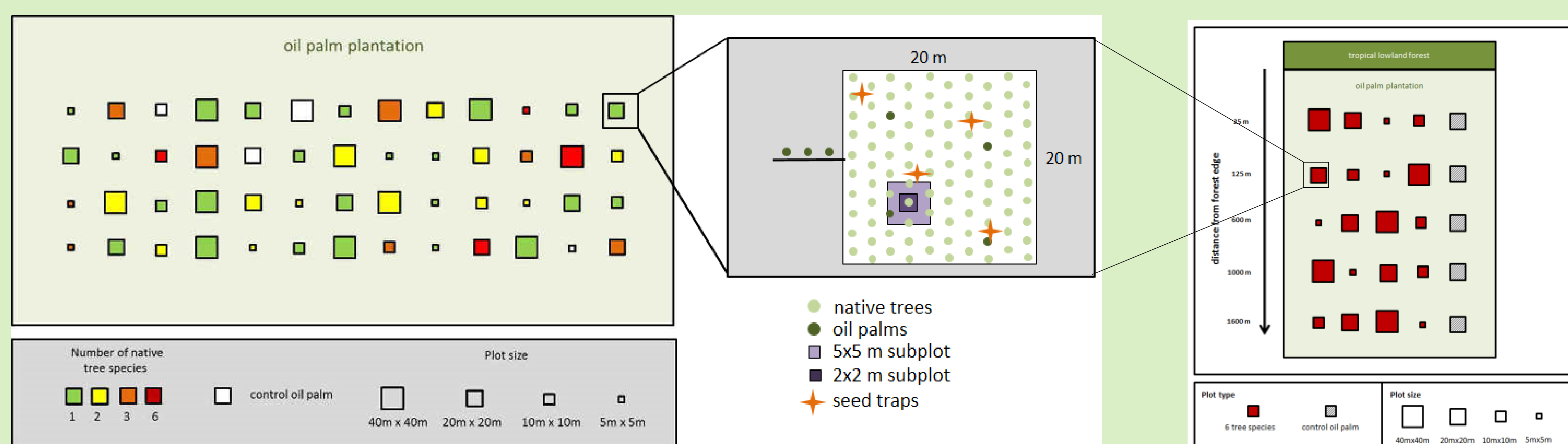
#### Underlying hypotheses

- Enrichment planting results in higher diversity and ecosystem functioning compared to the surrounding oil palm plantation
- Diversity and quantity of seed rain, species diversity of associated plants, insects and birds
  - a) increase with initial tree species diversity
  - b) increase with increasing plot size (over time)
  - c) and decrease with increasing distance to forest

#### Main questions:

- Can biodiversity and associated ecosystem services (biological pest control, enhanced pollination) be restored by enrichment planting?
- Under which planting strategies do enhanced ecosystem services positively affect oil palm economics?

### The experimental design



#### a) PT. Humus Indo: Variation of plot size and species composition and diversity

- Total area of plots: 2.76 ha
- Number of plots: 52 (48 with planted trees, 4 control)
- Plot sizes: 40m x 40m, 20m x 20m, 10m x 10m, 5m x 5m
- Species diversity levels: 1, 2, 3, 6
- Number of palms to be cut: ~210
- Number of trees to be planted: 6,372

#### b) PTPN VI: Variation of plot size and distance to forest

- Total area of plots: 1.26 ha
- Number of plots: 25 (20 with planted trees, 5 control)
- Plot sizes: 40x40 m, 20x20 m, 10 m x 10 m, 5 m x 5 m
- Species diversity level: 6
- Number of palms to be cut: ~80
- Number of trees to be planted: 2,655

**Outlook:** Tree planting and baseline data collection will start in the beginning of November this year.