Carbon stock in biomass in different land use systems on tropical peat in Jambi, Sumatra

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Material and Methods

- ## Deep peat site

Virgin peat swamp forest

Secondary Logged forest

Oil palm plantation (5 yrs)

- ## Shallow peat site

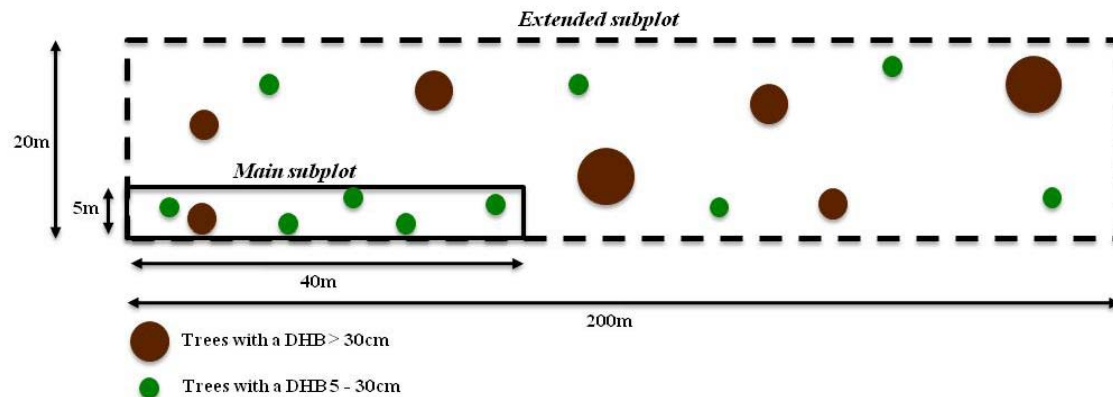Secondary Logged forest

Burnt forest

Oil palm plantation (5 yrs)

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Material and Methods

■ Above ground biomass

- Forest treatments

Chave et al. (2005)

$AGB = \rho * exp[-1.499+2.148*ln(DBH)+0.207*(ln(DBH)^2)-0.0281*(ln(DBH)^3)]$

- Oil palm treatments

Dewi et al. (2010)

$AGB = 0.0976 * (Height) + 0.0706$

Material and Methods

- Coarse Root Biomass
- Forest treatments
  - Coarse root sampling (> 2mm)
  - 27 randomized sample points in 1ha
  - At each point excavation (20cm x 20cm x 100cm)
  - Subsamples each 10cm depth

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Material and Methods

- Coarse Root Biomass
- Forest treatments
  - "Tap root" sampling
  - Dominant species selected per treatment
  - Excavating and measuring root systems
  - Development of allometric equations to estimate tap root biomass
  - For trees with DBH > DBH range of allometry, root:shoot ratio calculated
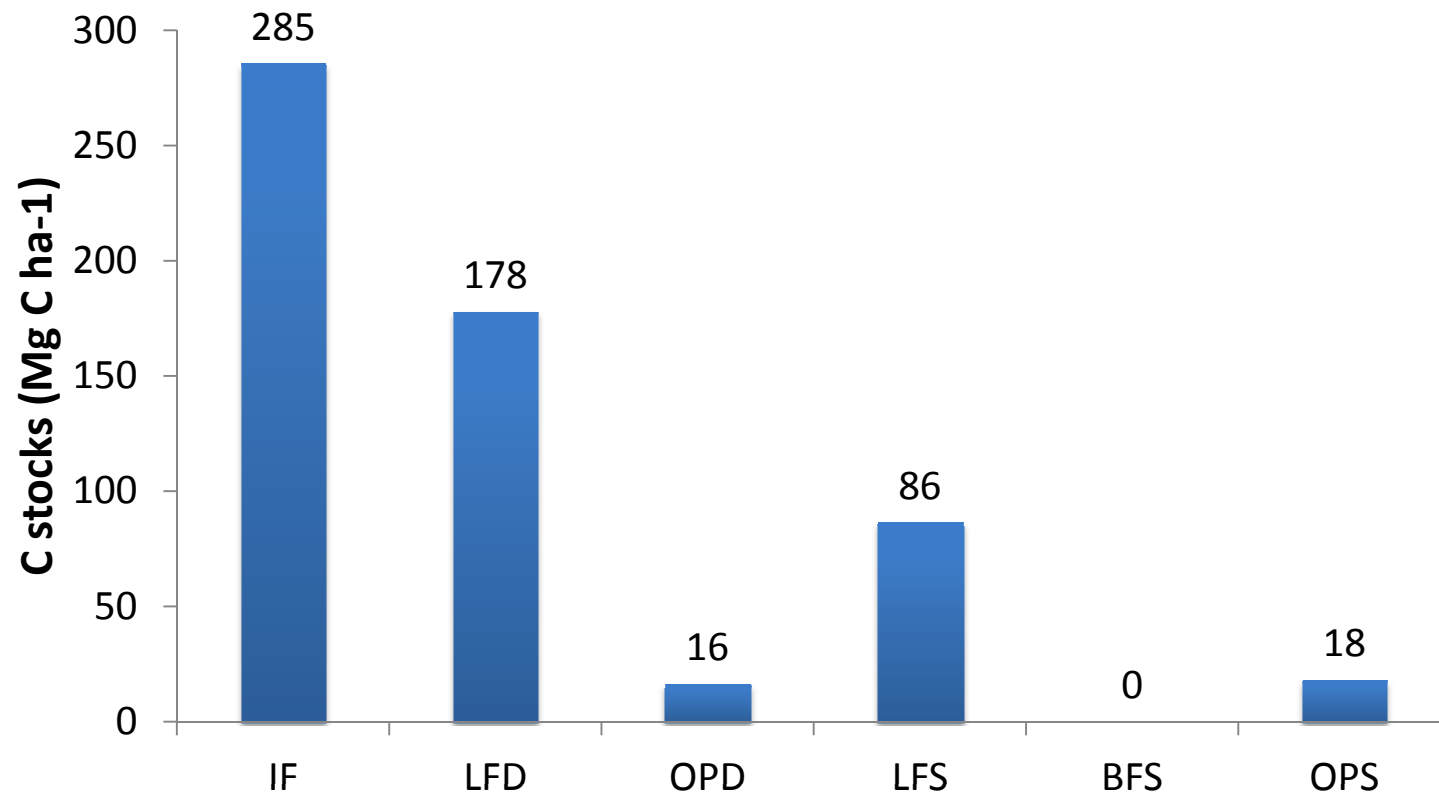
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Material and Methods

- Coarse Root Biomass
- Oil palm treatments
  - 3 randomly selected palms
  - Trench sampling (10cm x 300 cm x 50cm)
  - Subsamples each 10cm depth
  - Modeling of root biomass distribution
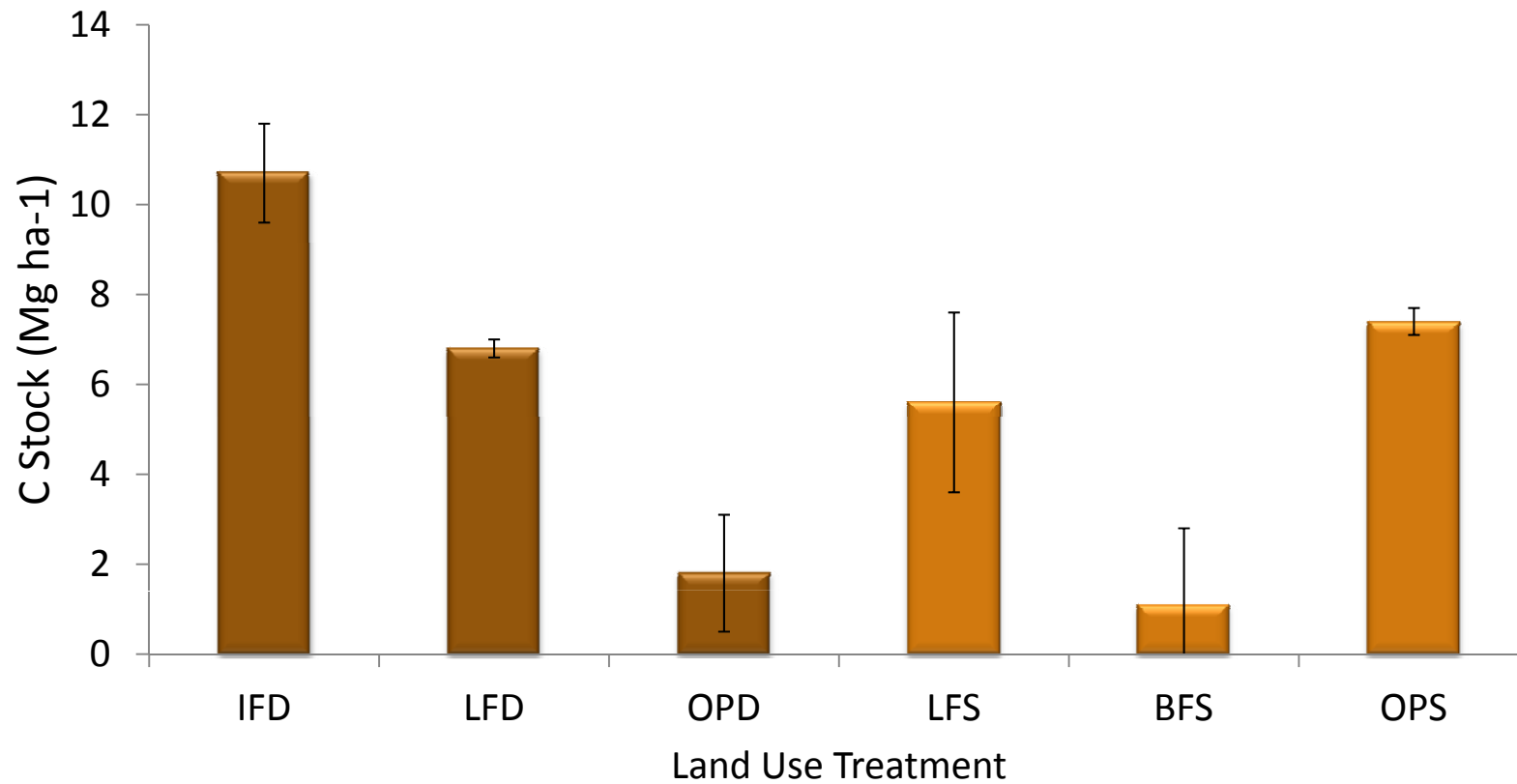 - Excavation of dead root systems

Results

- Above Ground C stocks in trees
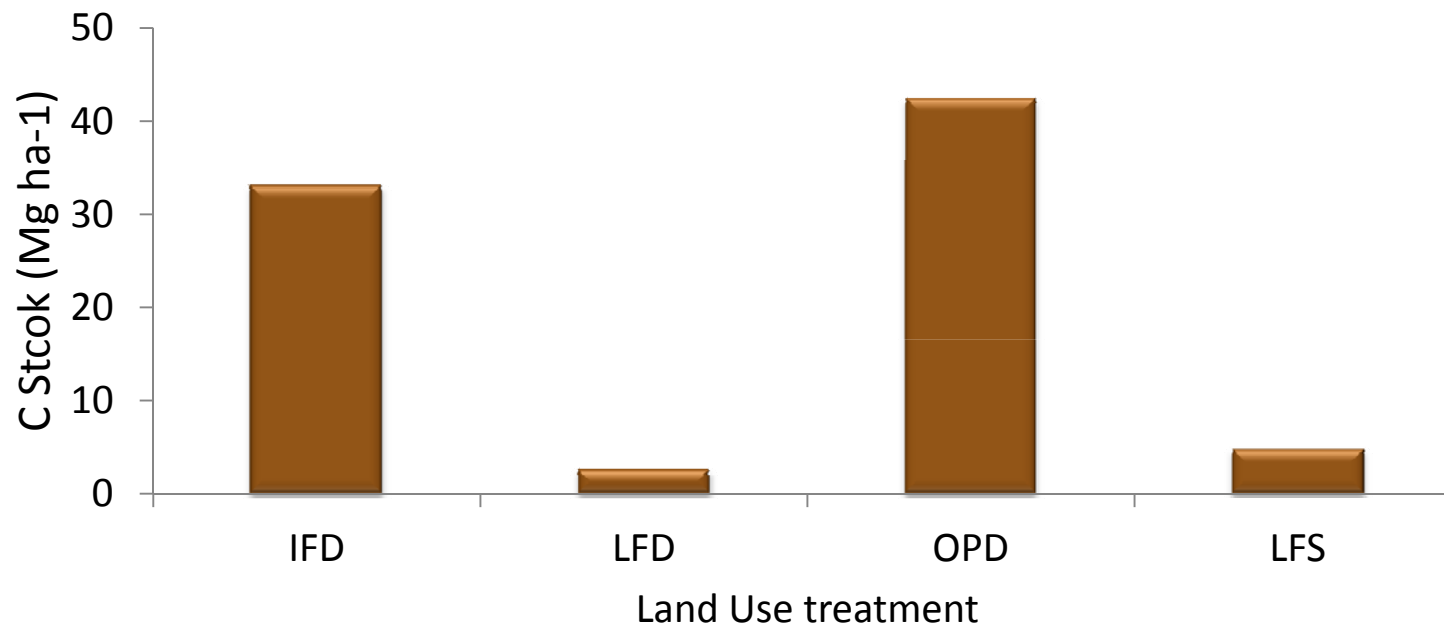
Results

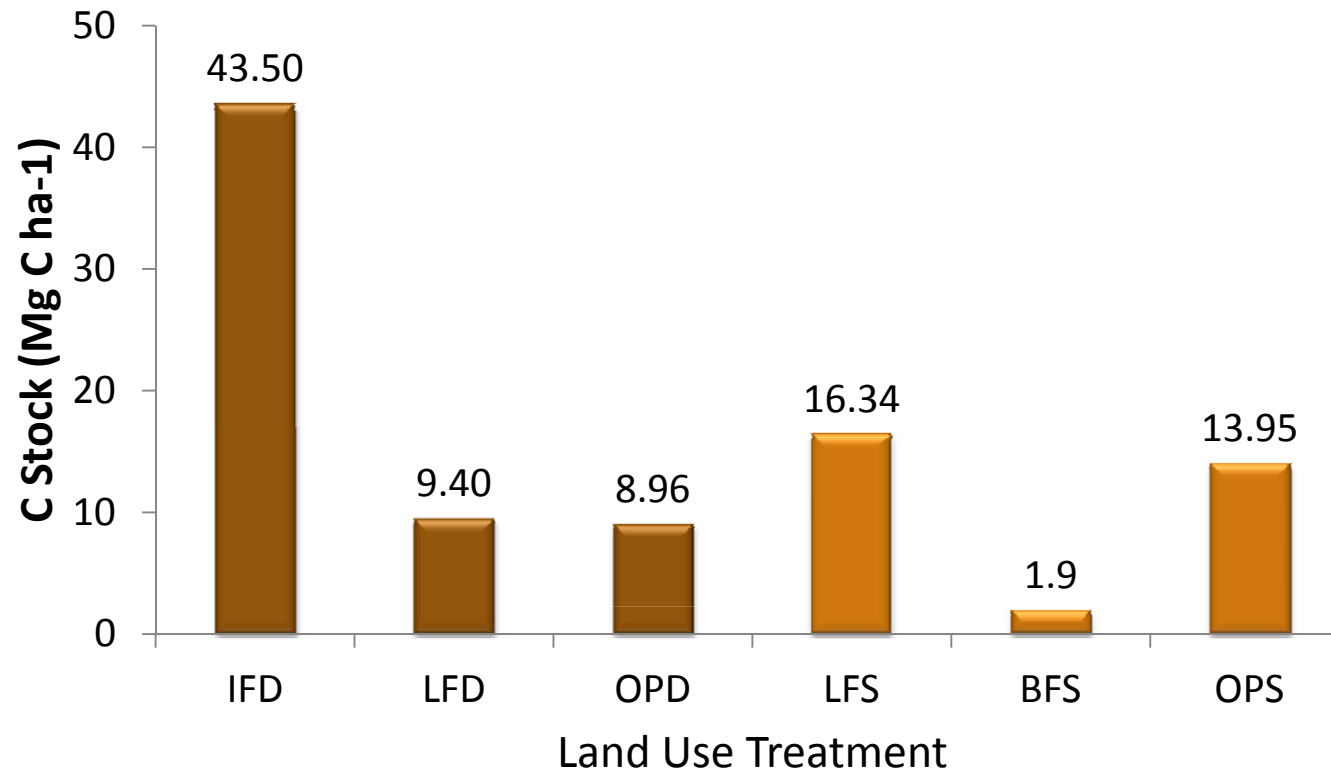- Coarse Root C stocks without "tap roots"

Results

- Coarse Root C stocks underneath the trunk ("tap roots")

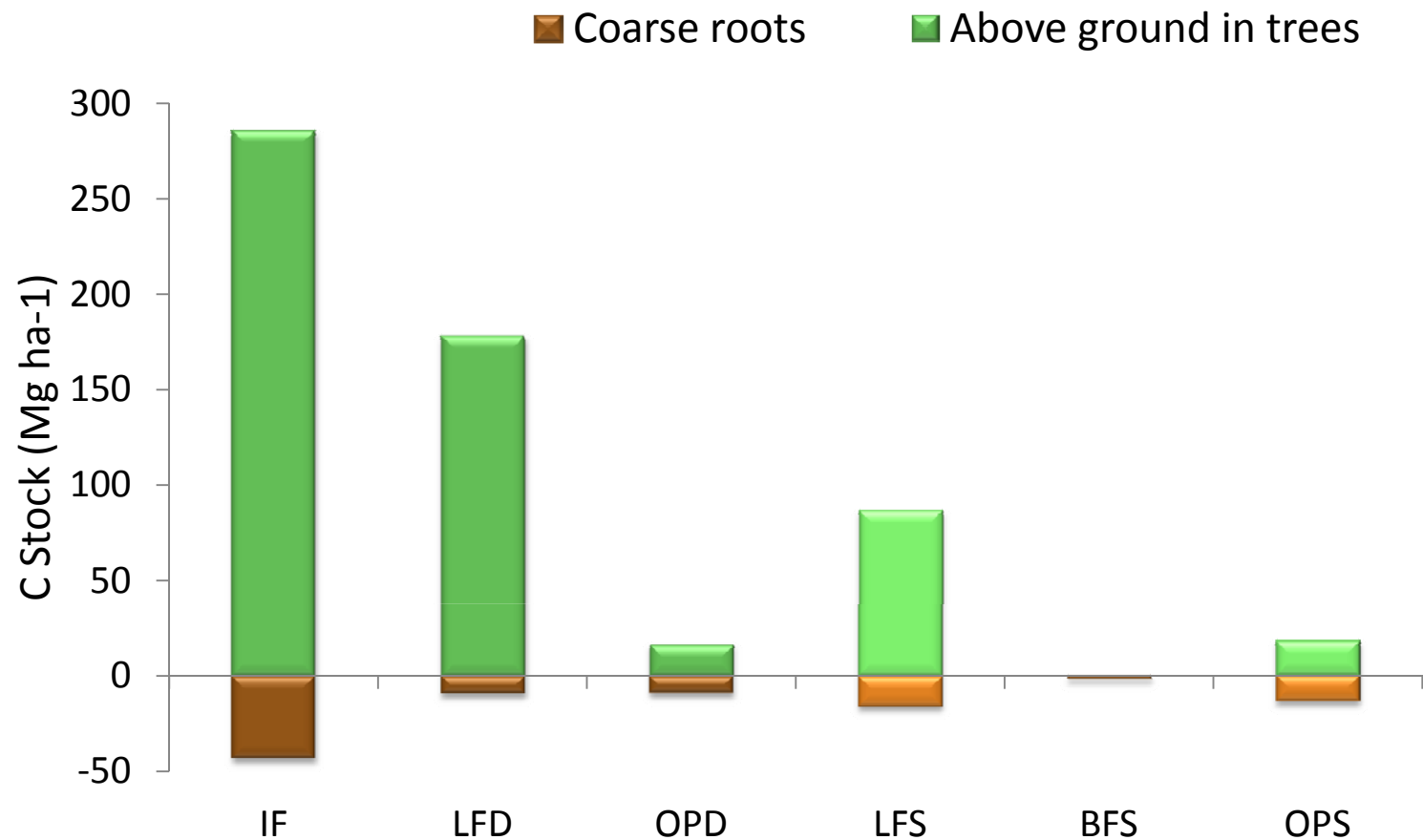| Allometric equation	R^2	n	RSE
DW=exp(-5.95145+4.9996*logDBH-0.76694*(logDBH^2))	0.50733	18	0.1634

Results

- Total Coarse Root C Stock

Results

- Total C Stock in Biomass of the tress

Discussion & Conclusion

- $\neq$ LF treatments (187 Mg C ha^{-1} on deep peat site, 103 Mg C ha^{-1} on shallow peat site): $\neq$ logging intensity

- $\neq$ OP treatments (25 Mg C ha^{-1} on deep peat site, 32 Mg C ha^{-1} on shallow peat site): $\neq$ in plot history, water table fluctuation, occurrence of termites and *sufetula* spp.

- AGB C stocks in trees in the range of values found in the literature

- 1st study assessing C stocks in coarse roots of ecosystems on peat

- Total C loss from peat swamp forest conversion into OP very large: 304 Mg C ha^{-1}

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Thank you
Terima kasih

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