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CARBON STOCK IN NATURAL REGENERATION OF BURNT LOWLAND MIXED DIPTEROCARP FOREST, EAST KALIMANTAN: THREE DECADES AFTER INITIAL MAJOR FIRE

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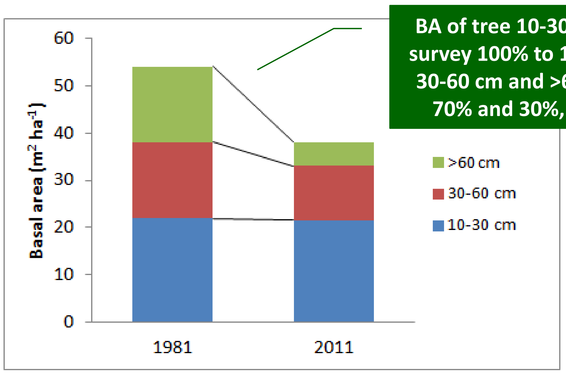
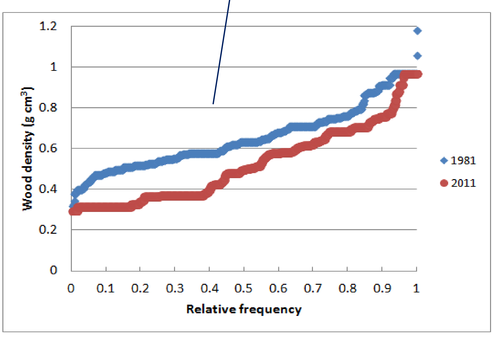
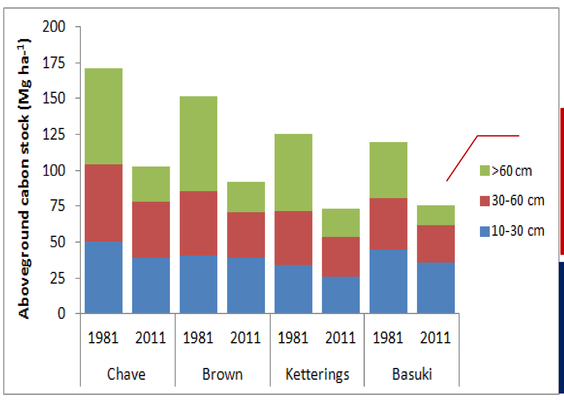


BA of tree 10-30 cm DBH 2011 survey 100% to 1981, but trees 30-60 cm and >60 cm DBH are 70% and 30%, respectively

Medium value of wood density shifted from 0.63 to 0.5 g cm^{-3}





Chave, Ketterings and Basuki (included wood density):
Carbon stock of tree 10-30 cm DBH of 2011 survey 80% to 1981, but trees 30-60 cm and 10-30 cm DBH are 70% and 35%

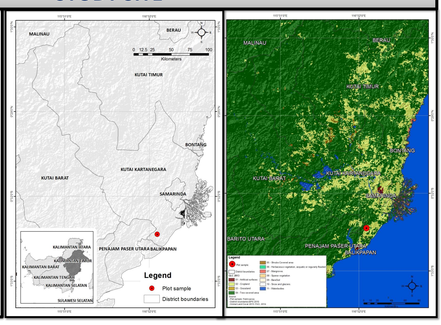
Brown (excluded wood density):
Carbon stock of tree 10-30 cm DBH of 2011 survey 95% to 1981, but trees 30-60 cm and 10-30 cm DBH are 70% and 30%

INTRODUCTION

Repeated forest fires (in 1983 and 1998) have reduced the tree population in the lowland mixed Dipterocarp forest, by 95% in 1.8 hectare sampled long-term establishment permanent plot in Samboja Research Forest, East Kalimantan. The remains of 5% were trees more than 40 cm DBH. Well managed forest through preventing fires, logging and encroaching, natural regeneration is occurring in the burnt area both by recovery of pre-fire species and recruitment of incoming new colonizing. Natural regeneration of burnt forest is highly potential area on enhancing carbon stock. The objectives of the research is to estimate carbon stock in natural regeneration of burnt area after thirty years.

STUDY SITE

Samboja Research Forest (SRF) established 1978 in 504 ha lowland Dipterocarp forest and expanded with another 3000 ha of logged-over forest in 1991. Currently, 504 ha covered by forest (undisturbed and disturbed by fires) and another 3000 ha of shrubs and grasslands. Since 2011, SRF managed by BALITEK KSDA, FORDA, Ministry of Environment and Forestry.



METHODS

1981 and 2011 surveys in 1.8 hectare area (150 m x 120 m). All trees above 10 cm DBH enumerated, stem diameter and tree height were measured, tree position mapped, leaves sample collected and identified. Wood density of each species reffered to (http://db.worldagroforestry.org/wd).

Data analysis: (1) calculate tree basal area on 1981 and 2011 survey; (2) estimate tree biomass in four allometric equations (Chave *et al*. 2005; Ketterings *et al*. 2001; Brown 1997; Basuki *et al*. 2009); (3) estimate carbon stock based on 46% of carbon content; (4) constructed wood density cumulative frequency

CONCLUSIONS

Thirty years after initial major fire:

- Basal area of tree 10-30 cm DBH 100%, tree 30-60 cm DBH 70% and tree >60 cm DBH 30%
- Carbon stock of tree 10-30 cm DBH 80%, tree 30-60 cm DBH 70% and tree > 60 cm DBH 35% when wood density variable used in the calculation, but 15% higher for tree 10-30 cm DBH and 5% higher for tree > 60 cm DBH when without wood density value
- Median value of wood density decrease from 0.63 to 0.5 g cm^{-3}
- Included wood density to estimate carbon stock is recommended to reduce the error due to changing on forest species composition

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