

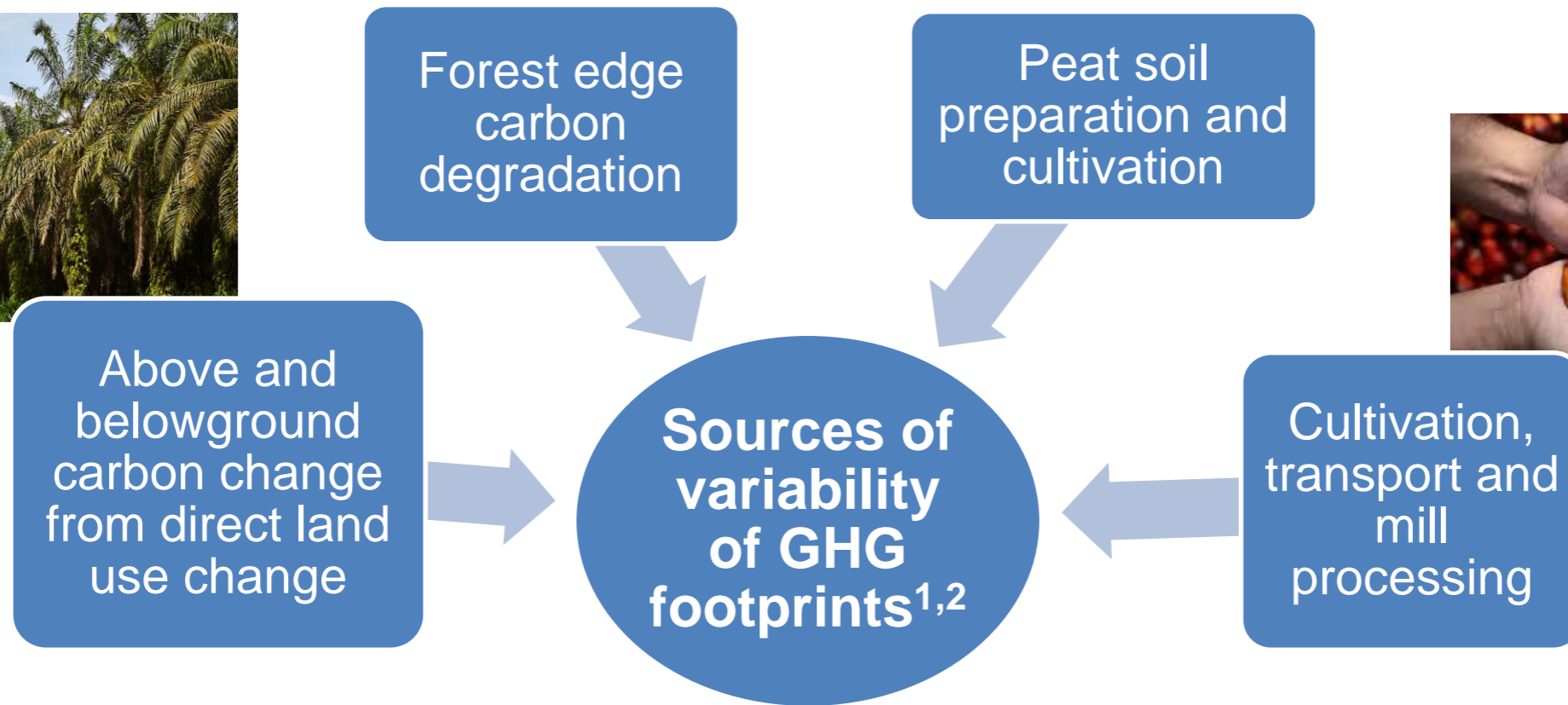
Preliminary results – Do not quote



Estimating the Variability of Greenhouse Gas Footprints of Crude Palm Oil production in Indonesia



Sources of Variability

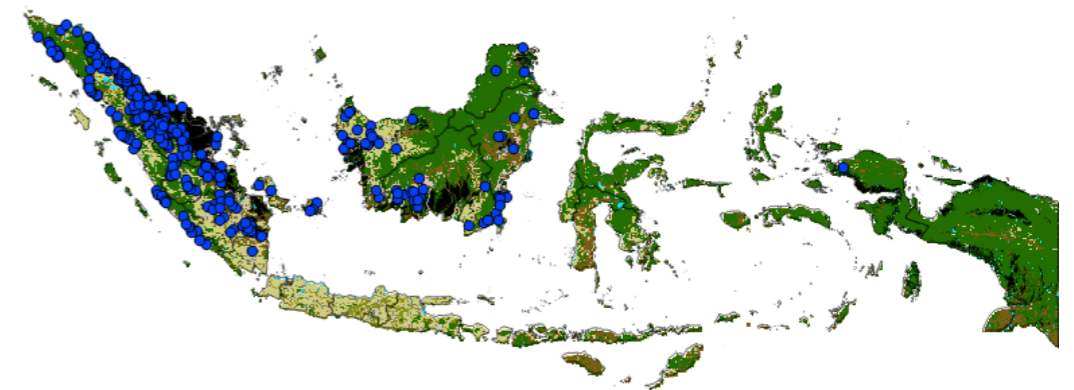




Goal

To quantify the spatial variability of greenhouse gas (GHG) footprints of current palm oil production (year 2015) in Indonesia, expressed as $t\ CO_2\text{-eq}\ t^{-1}$ crude palm oil (CPO) for each palm oil mill.

Geographical scope	Per mill
Production area	~10.1Mha
Scenarios for analysis	1) Province 2) Country 3) Island





Methods

Spatially explicit

- Land cover map (MoF)³
- Peat map (GFW)⁴
- Mill distribution (GFW)⁵
- Yield map (Earthstat)⁶



1. Carbon stock change and edge effects

- Baccini biomass map for non-forest classes⁷

Forest carbon edge effect model⁸

- Allocating carbon loss beyond plantation area
- 25 years amortization period
- IPCC root: shoot ratios⁹

2. Peat fire and drainage

- Estimated from IPCC emission factors¹⁰

3. Cultivation, transport and mill processing

- Default technologies from Agri-footprint¹¹
- No methane capture

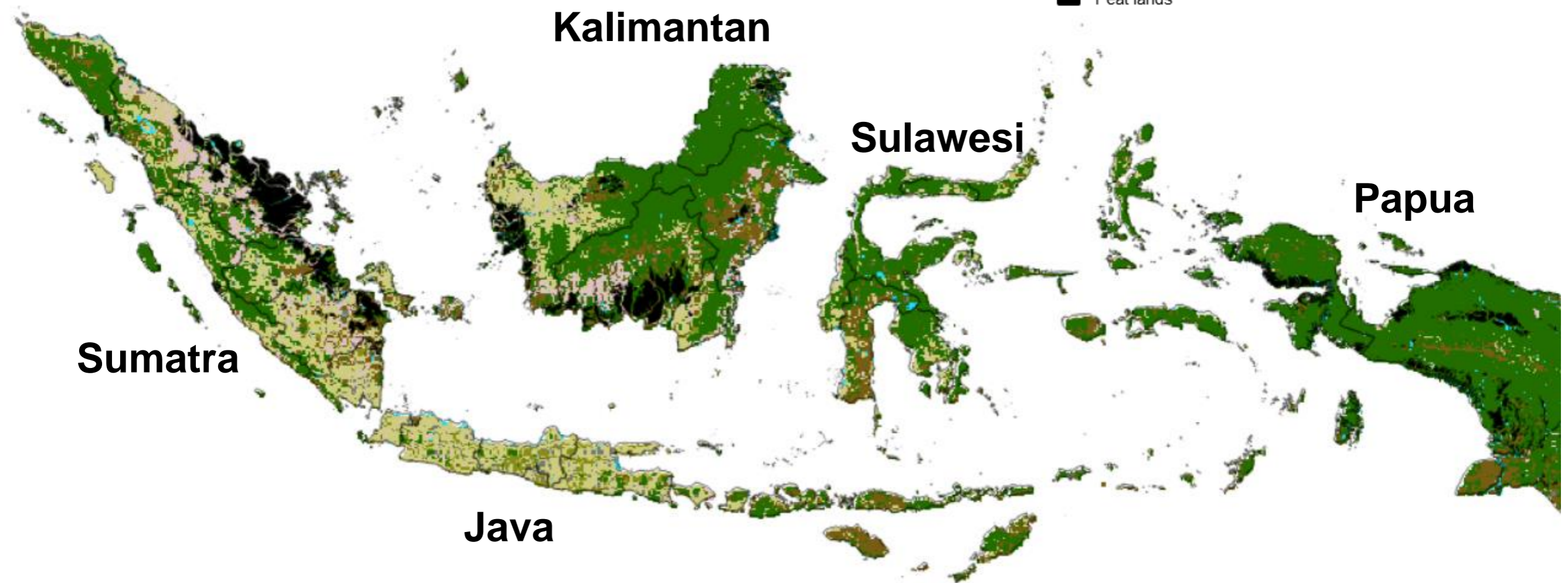
Preliminary results – Do not quote

Estimated mill GHG footprints – current CPO production



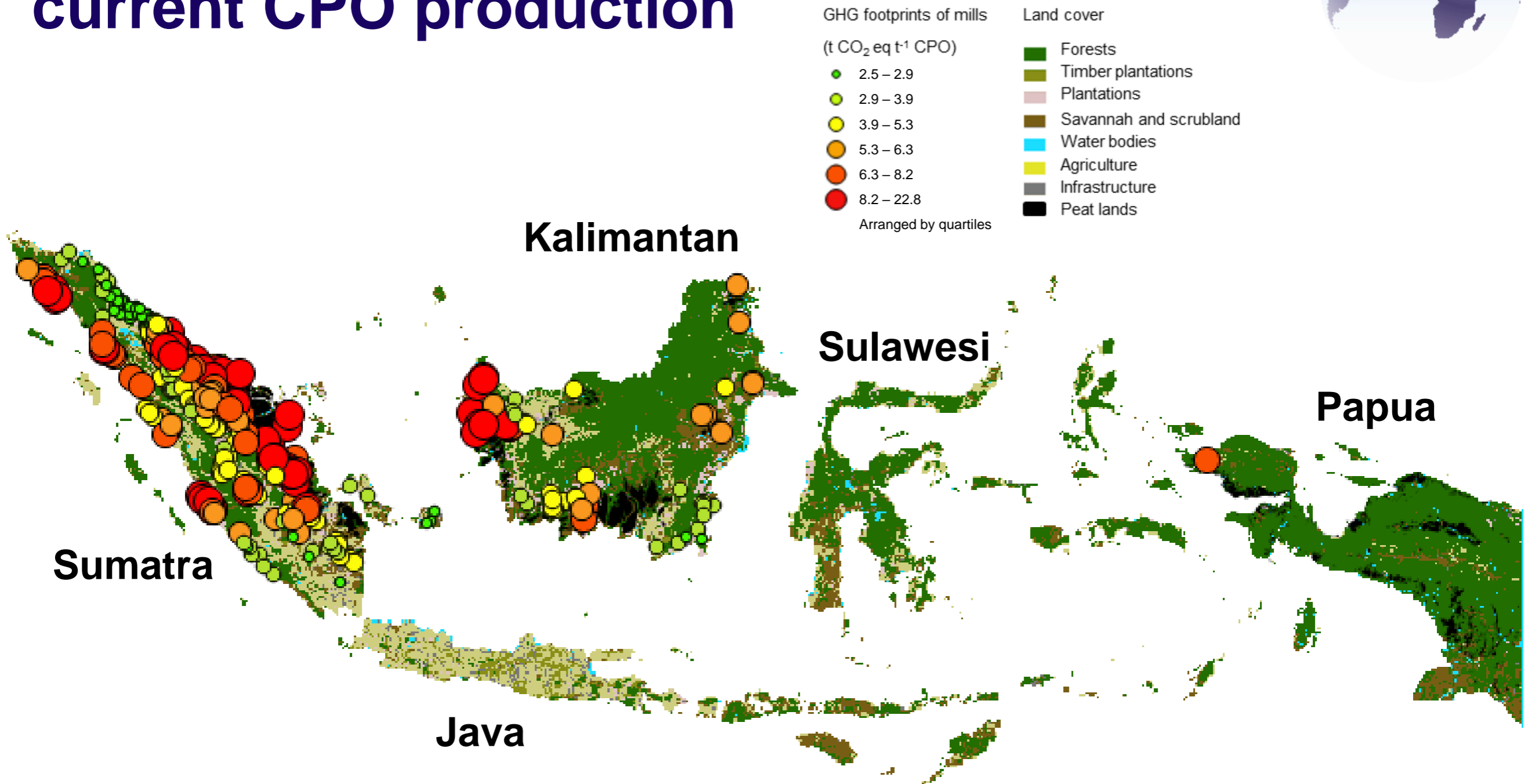
Land cover

- Forests
- Timber plantations
- Plantations
- Savannah and scrubland
- Water bodies
- Agriculture
- Infrastructure
- Peat lands

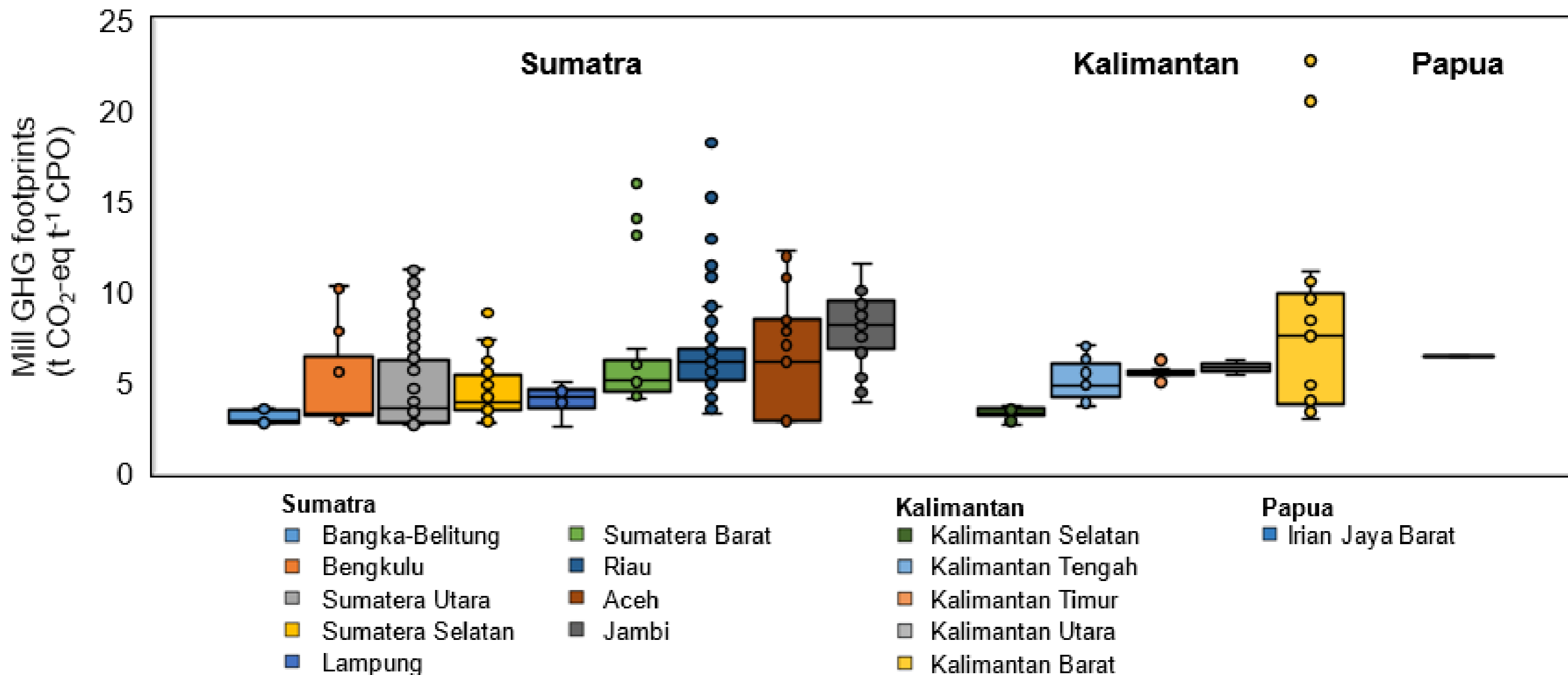


Preliminary results – Do not quote

Estimated mill GHG footprints – current CPO production

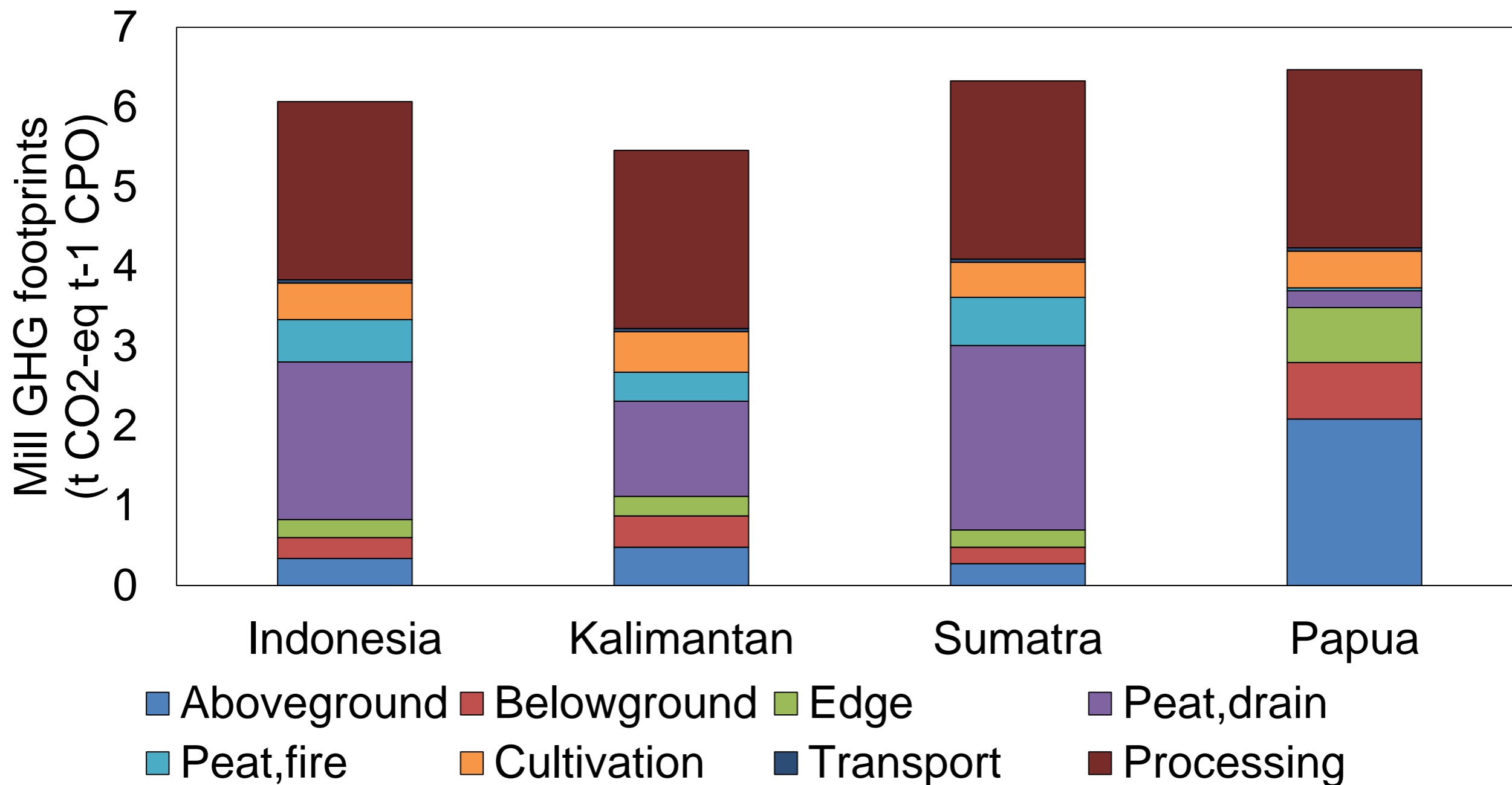


Variability of estimated mill GHG footprints – by province



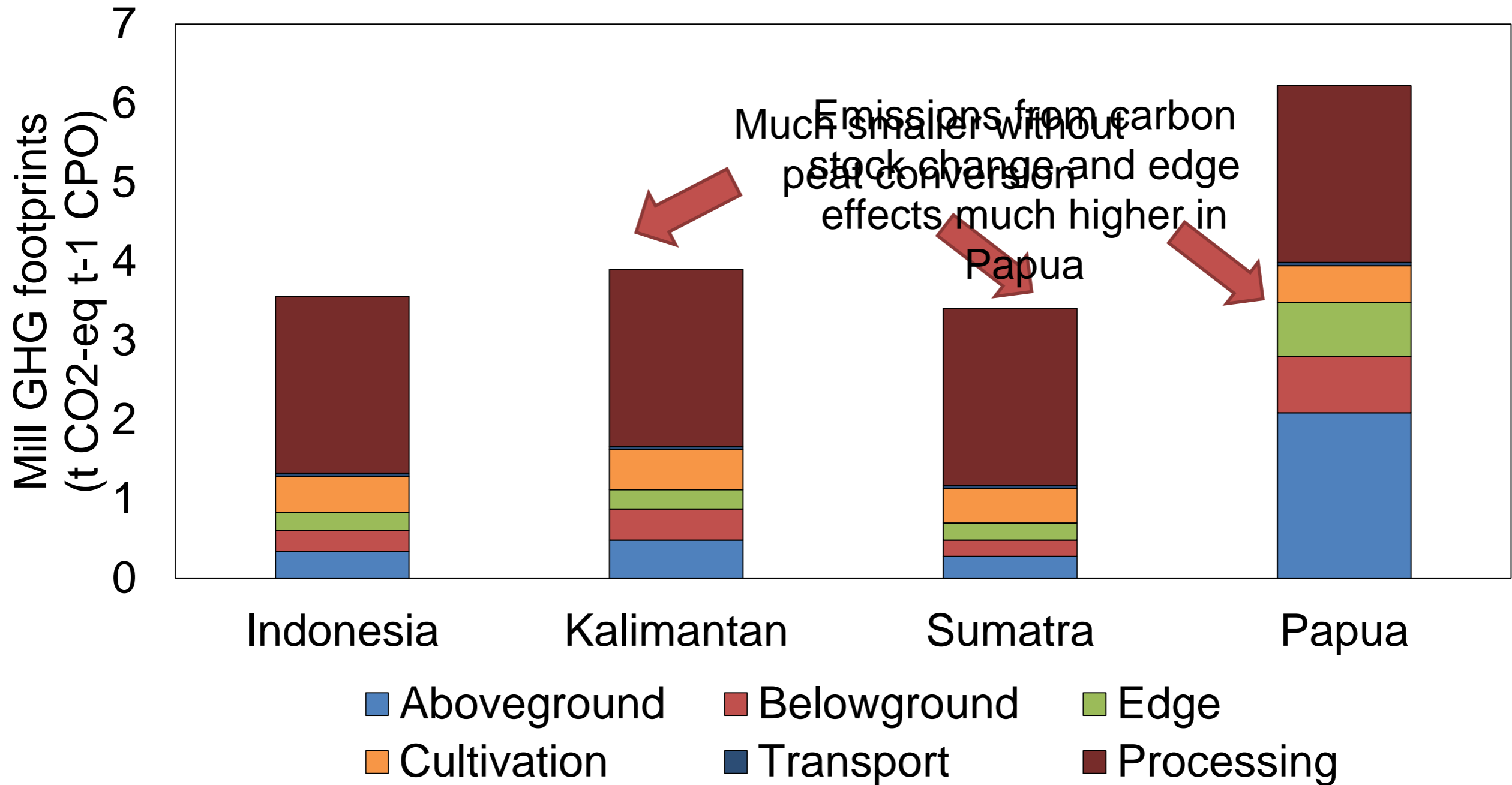


Contributors to average mill GHG footprint



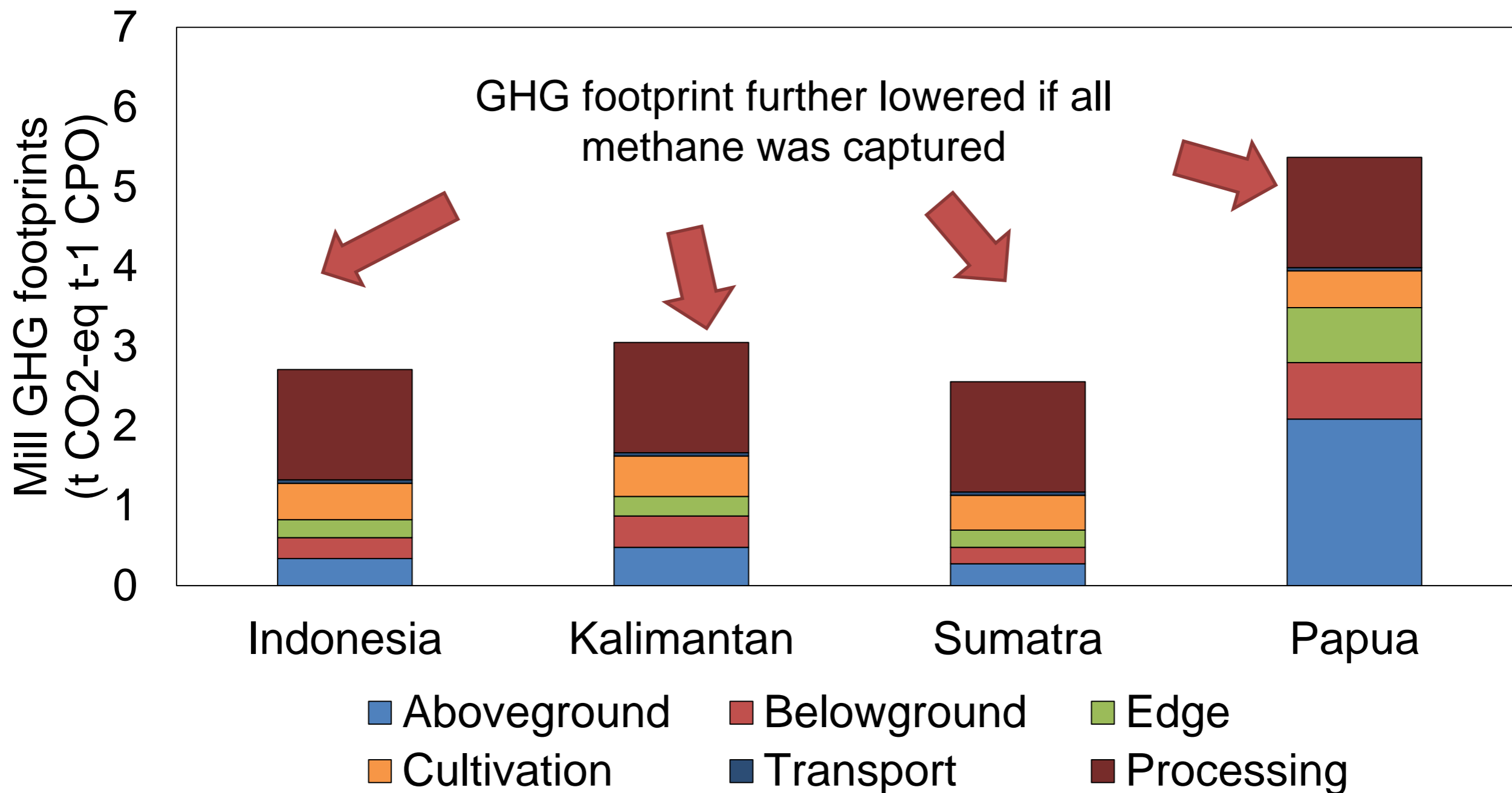


Contributors to average mill GHG footprint





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Take home messages

- GHG footprints of CPO production are characterized by high variability: from 2.5 t CO₂ eq t⁻¹ CPO in Lampung to 22.8 t CO₂ eq t⁻¹ CPO in Kalimantan Barat.
- Highlights importance of peat soils and historical land use change
- Opportunities for improvement: methane capture, peat management
- Need mill level data (RSPO)
- Sourcing location matters!



Acknowledgements



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Thank you for your attention.



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