REDD+ Task Force Seminar: Green Practices of Land-Based Industries in Reducing Carbon Emissions

Jakarta, 5 June 2012

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Agenda

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   - Strategic importance of palm oil to Indonesia
   - Multi-stakeholder collaboration
   - GAR FCP
2. Summary of HCS forest study findings
3. HCS forest study
4. Data analysis
5. Results and limitations of study
6. Strata descriptions and photographs
7. Conservation of HCS areas
8. Recommendations for future research
9. Conclusion

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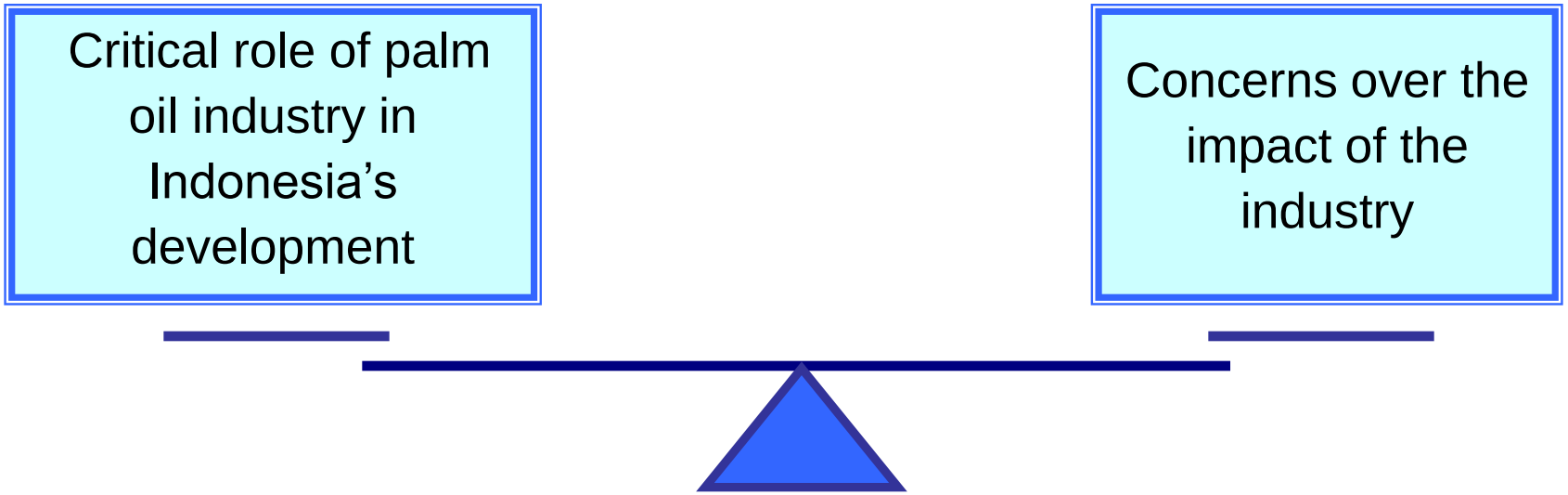
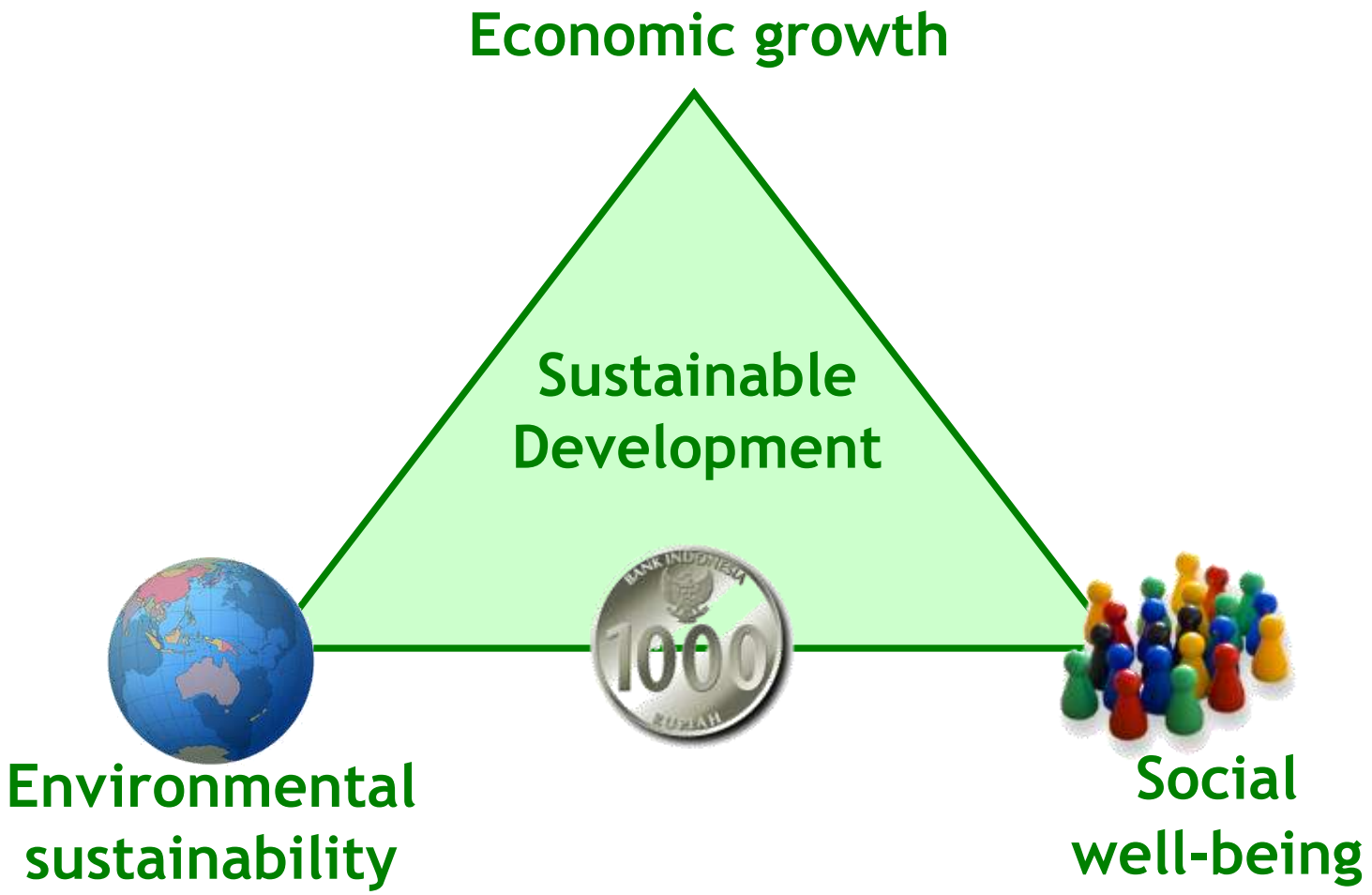
1. Introduction

Strategic importance of palm oil to Indonesia



Focus on working with multi-stakeholders to find solutions to sustainable palm oil production.

People, planet and profits

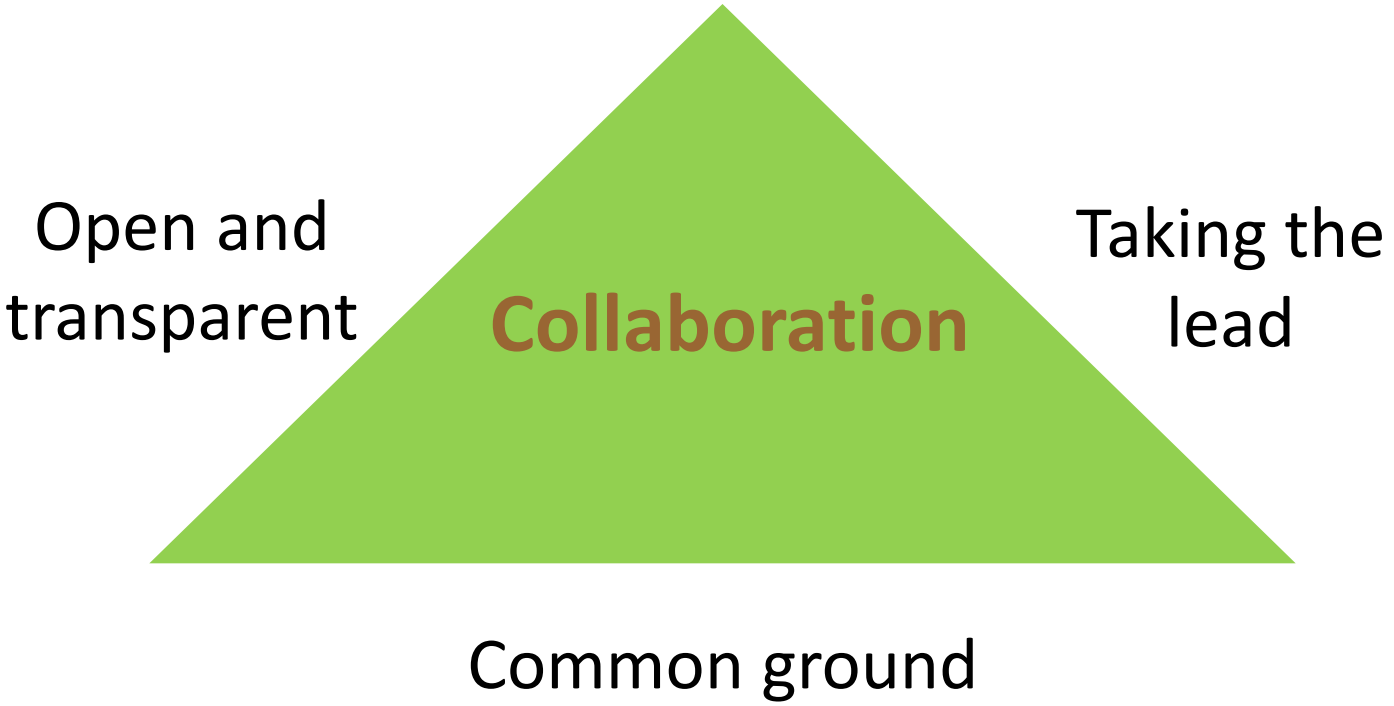


Multi-stakeholder collaboration

Golden Agri-Resources believes that multi-stakeholder collaboration is the only way to achieving solutions for sustainable palm oil production.




Multi-stakeholder collaboration



GAR Forest Conservation Policy

- Builds on GAR's pre-existing commitments.
- GAR's FCP in collaboration with The Forest Trust (TFT) to ensure that GAR has a no deforestation footprint. Various stakeholders including Greenpeace have provided inputs.
- FCP focuses on

No development on peat and high conservation value forest areas	No development on high carbon stock forests	Free prior informed consent	Comply all relevant laws and international certification P&C

GAR Forest Conservation Policy

- Holistic approach: Implemented Social and Community Engagement Policy (SCEP) and Yield Improvement Policy (YIP) in collaboration with TFT and other stakeholders.

- Ultimately, the conserved High Carbon Stock (HCS) area can revert to its natural ecological function as a forest.

- Applicable to all the plantations that GAR owns, manages or invests in regardless of the stake.




2. Summary of HCS forest study findings

Summary of HCS forest study findings

The findings of HCS forest study indicate that vegetation cover can be used to:

- Estimate the level of carbon stocks.
- Stratify into different classes to broadly represent different carbon stocks.

They also indicate that:

- This is a practical and robust method to identify HCS in GAR's concessions in Kalimantan.
- However, it needs further testing and field work as a reliable predictive tool for HCS forest across Indonesia.

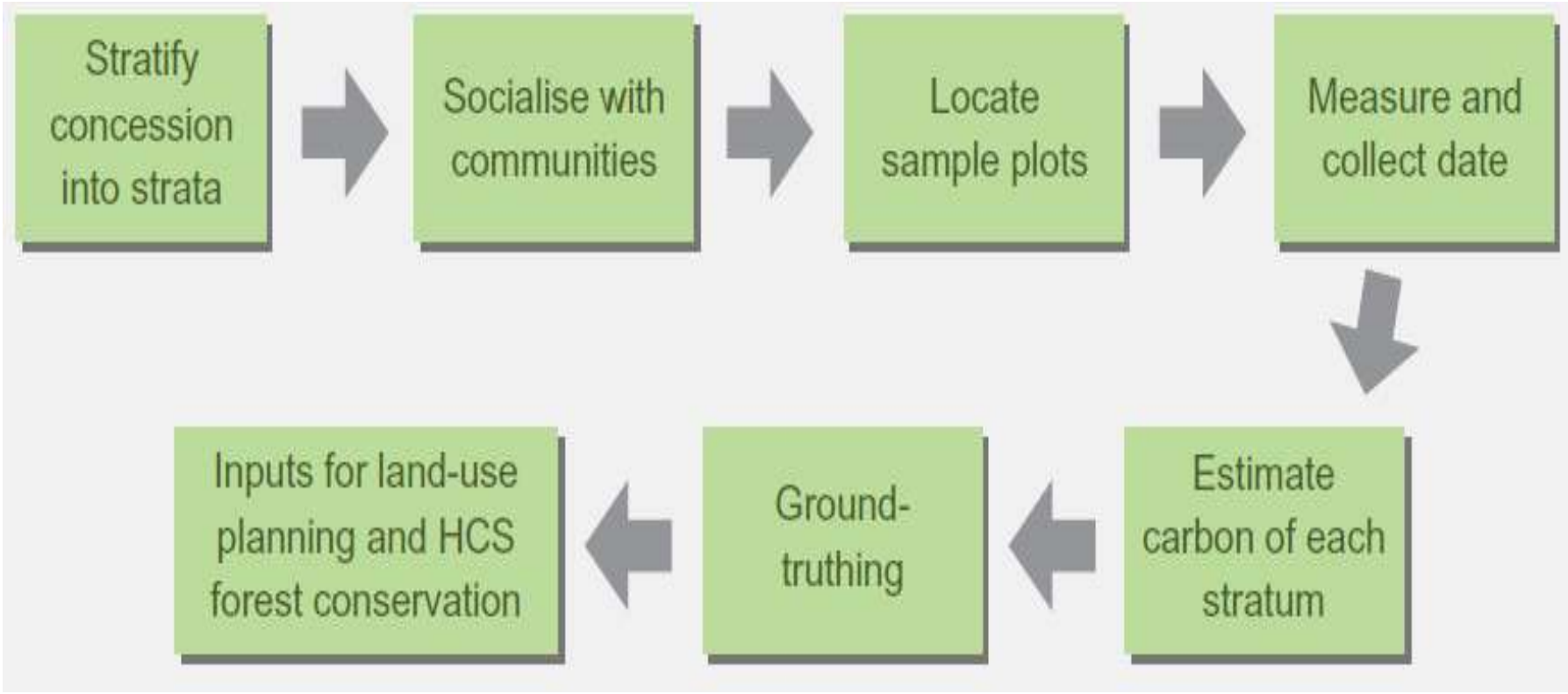
Summary of HCS forest study findings

Six strata can be identified:

- **HK3** – Remnant forest or advanced secondary forest close to primary condition;
- **HK2** – Remnant forest but more disturbed than High Density Forest;
- **HK1** – Appears to be remnant forest but highly disturbed and recovering (may contain plantation/mixed garden);
- **BT** – Mostly young re-growth forest, but with occasional patches of older forest within the stratum;
- **BM** – Recently cleared areas, some woody re-growth and grass-like ground cover;
- **LT** – Very recently cleared land with mostly grass or crops, few woody plants.

3. HCS forest study

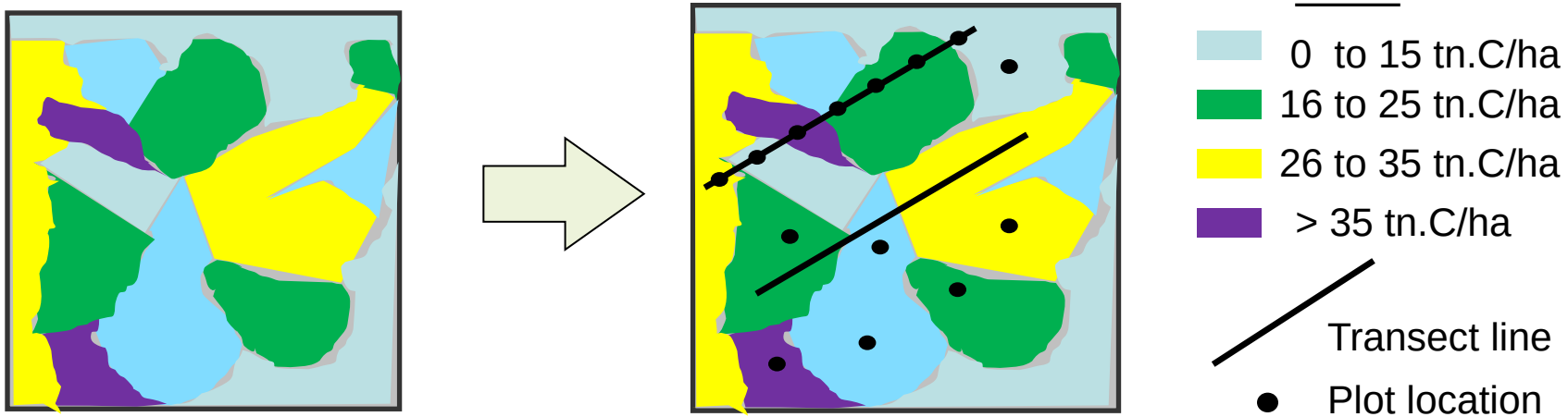
Methodology



Steps to identify HCS forest areas within concessions

Stratifying a concession

- A concession was initially stratified into 16 strata by vegetation or canopy density. This was later refined to 6 strata.
- Plots are located within each strata.
- Plots are located within the concession randomly within strata, and systematically along transects. This was later refined to only using random plots.
- Trees whose diameter at breast height (1.3m) $\geq$ 5cm are measured, then averaged to give a per hectare estimate of carbon value for each strata.
- Develop an interpretation key to interpret satellite into 6 strata.



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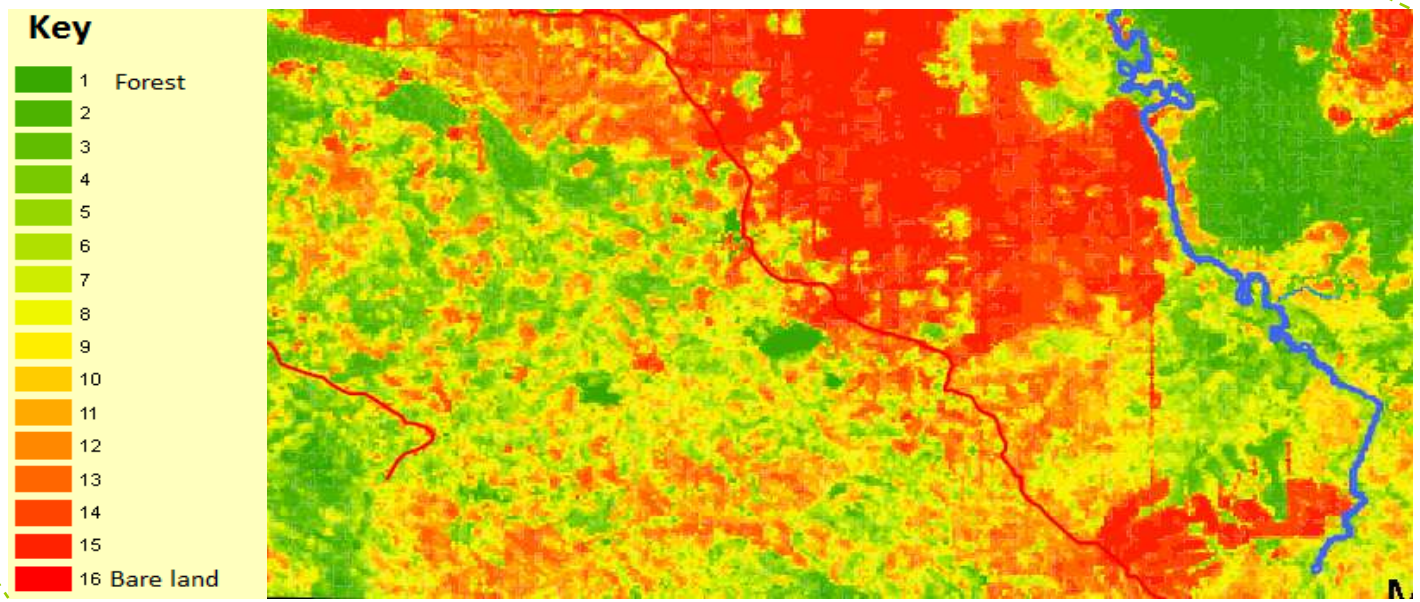
Stratification

PT KPC
satellite image

After
unsupervised
classification
process



Socialisation

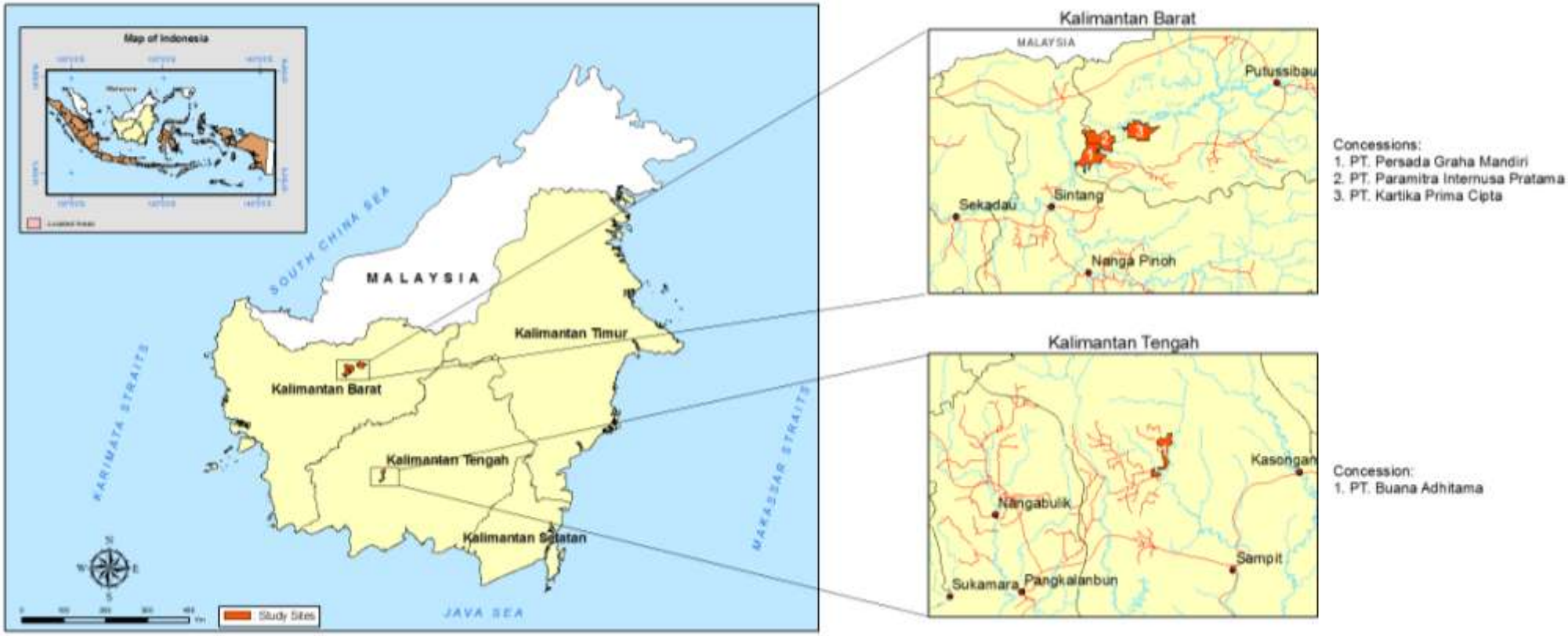
- Palm oil development activities often occur on areas occupied by local communities.

- Must engage these communities before any development can take place through FPIC process and compensation through an open and transparent process.

- As our HCS forest study involved areas that are not yet developed and could still belong to local communities, it is important to ensure that they understood and gave their consent for the fieldwork.

- We also recognise that, like HCV areas, community support is vital to the successful conservation of HCS areas.

Location of fieldwork

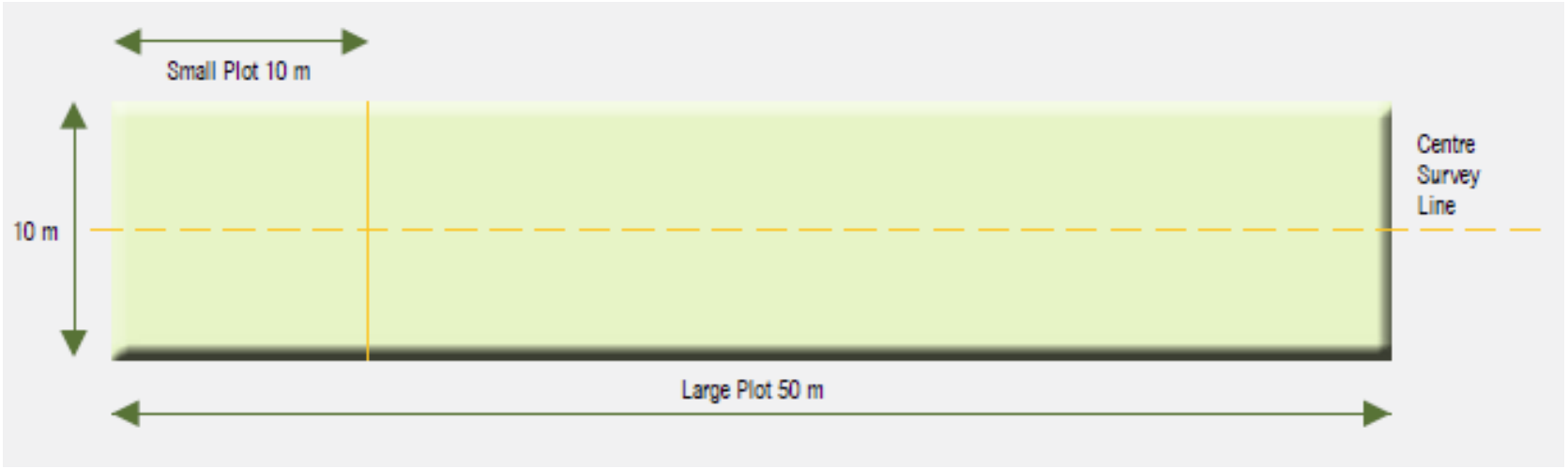


Sampling

- Identified sample plots to measure AGB in trees $\geq$ 5 cm DBH.
- Focused the sample plots on the strata that we expected would overlap the provisional threshold of 35 tC/ha.
- The coefficient of variance for the target strata was calculated using the Winrock Terrestrial Sampling Calculator with a 5% sampling error.

Design of sample plot

- Used a rectangular nested design.
- A smaller 10 m by 10 m plot, where trees with DBH ≥ 5 cm and < 20 cm measured.
- A larger 10 m by 50 m large plot where all trees with DBH ≥ 20 cm measured.



Schematic of the plot design used during the field inventory

Plot details

- Two different techniques used in designing the 431 plots measured.

Period	Concession	Plots measured
Feb - Jun	PT KPC	254
	PT PIP	61
Jul - Oct	PT PGM	11
	PT BAT	105

Plot details

The two different techniques are:

- Transect Plots

  - Plots are systematically located every 200 m across transect lines drawn across the concession.

- Random plots

  - Plots were randomly located across the concessions and within targeted strata, although some random plots were not measured as they were inaccessible.

  - To navigate to these plots, we used a hand-held GPS.

Plot details

Strata	Concession				Total
	PT Buana Adhitama	PT Kartika Prima Cipta	PT Persada Graha Mandiri	PT Paramitra Internusa Pratama	
High Density Forest (HK3)	3	9	0	0	12
Medium Density Forest (HK2)	4	5	1	0	10
Low Density Forest (HK1)	29	19	8	13	69
Old Scrub (BT)	39	39	2	13	93
Young Scrub (BM)	20	62	0	9	91
Cleared/Open Land (LT)	10	97	0	24	131
Plantation	0	23	0	2	25
Total	**105**	**254**	**11**	**61**	**431**

Total plots visited in each of the four concessions under each stratum

4. Data analysis

Allometric

- Estimated a tree's biomass by its DBH using a generic allometric (Brown 1997) for Tropical Moist Forests

$$\textbf{Biomass} = 42.69 - 12.800*DBH + 1.242*DBH^2$$

- To calculate the amount of carbon per plot, we used a carbon conversion factor of 0.47 (IPCC 2006) and converted kilograms of biomass to tonnes of molecular carbon per tree.

- After the tree carbon weight was summed for each plot, we calculated the amount of carbon per plot which we then extrapolated to a per hectare figure basis and expressed as tonnes per hectare.

Data checking

Removed 114 anomalous plots from the final analysis.

Reasons	Number
Areas where there were recent human activity subsequent to the satellite mapping such as timber harvesting	12 plots
Areas in transition from forest to open land or vice versa	14 plots
Areas with poor visibility of satellite images due to cloud cover	3 plots
Areas where there were plantations, rice fields, or mixed gardens	85 plots

Data checking

317 plots were used for final analysis.

Strata	Concession				Total
	PT Buana Adhitama	PT Kartika Prima Cipta	PT Persada Graha Mandiri	PT Paramitra Internusa Pratama	
High Density Forest (HK3)	3	9	0	0	12
Medium Density Forest (HK2)	4	5	1	0	10
Low Density Forest (HK1)	28	15	8	13	64
Old Scrub (BT)	38	24	2	13	77
Young Scrub (BM)	20	34	0	9	63
Cleared/Open Land (LT)	10	70	0	11	91
Total	**103**	**157**	**11**	**46**	**317**

Number of plots per stratum included in the final data analysis

Data extrapolation

- Calculated carbon values for each stratum by averaging plot data to produce a mean carbon value for each stratum.

- 90 percent confidence level to calculate the weighted average.

5. Results and limitations of study

Results: Weighted average carbon stock

- Indicate that carbon stock declines correspondingly to a decline in vegetation canopy density.

- Support the use of vegetation canopy cover to estimate the average carbon stock and therefore as a useful way to define and map HCS.

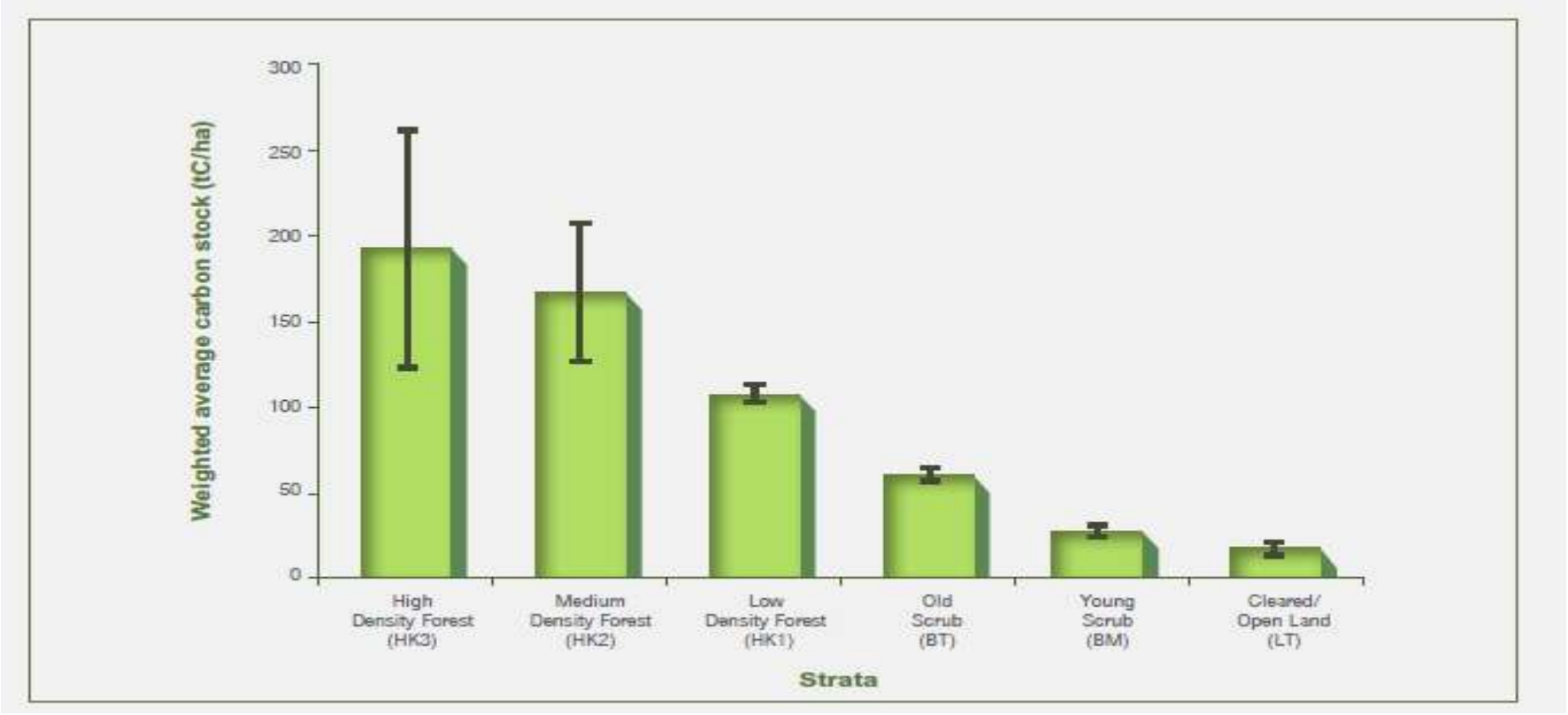
In addition, results indicate:

- Similarities in the carbon stock of strata across the different concessions.

- Differences in the carbon stock between strata.

Results: Weighted average carbon stock

By plotting the weighted average carbon stock of the various strata, we noticed that some of the strata's carbon values overlap.



Weighted average carbon stock of the various strata

Results: Analysis of variance

Conducted analysis of variance:

- There are no significant differences between HK3 and HK2.
- There are no significant differences between BM and LT.
- Other pairs of strata are significantly different from each other, such as between HK1 and BT, and between BM and HK3.

6. Strata descriptions and photographs

Strata descriptions

The following are qualitative descriptions that have been developed by the technical team.

- **HK3** – Remnant forest or advanced secondary forest close to primary condition;
- **HK2** – Remnant forest but more disturbed than High Density Forest;
- **HK1 -** Appears to be remnant forest but highly disturbed and recovering (may contain plantation/mixed garden);
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High Density Forest: HK3






Medium Density Forest: HK2






Low Density Forest: HK1






Old Scrub: BT






Young Scrub: BM






Cleared/Open Land: LT






Limitations of study

- Not all AGB measured.
- Not a full biological survey.
- Limited to areas permitted by communities.
- Quality of satellite images.
- Human error in interpreting images.
- Insufficient ground truthing.

7. Conservation of HCS areas

Conservation of HCS areas: patches and isolated HCS areas

- Found patches of varying size and degree of isolation for the different strata throughout the concessions.
- Studies indicate that the size, shape, connectivity, and quality of these forest patches affect viability of these patches to regenerate into an ecologically functioning natural forest.
- Key principles to guide the analysis and patch selection process and to provide on-going monitoring and management.
- Maximise the overall size of a patch.
- Maximise the “core area” of a patch (area of forests relatively unaffected by “edge” effects).
- Maximise the degree of connectedness between patches and create corridors and linkages between patches.

Conservation of HCS areas: Broader social and management issues

- Determining the legal status of HCS conservation areas.

- Managing the impact of the HCS conservation areas on oil palm plantation design and management.

- Obtaining FPIC from local communities.
- Local communities' support and involvement is vital.

- Using oil palm plantation design to support inter-rotation connectivity between patches of conserved HCS forests to facilitate movement of animals.

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8. Recommendations for future research

Recommendations for future research

- To conduct more research on the stratification methodology if it is to be used in other parts of Indonesia.
- To update the methodology to improve the accuracy and reliability of the outcomes; example, allometric equations that include species-specific wood densities etc.
- To consider using other technology such as LiDAR or high resolution imagery to provide better quality data.
- To consider how potential carbon can be better incorporated into the HCS forest study.
- To finding equitable solutions to the legal challenges and incentives to conserve HCS forests.

9. Conclusion

Conclusion

HCS Findings:	1. Facilitate GAR's commitment to ensure no deforestation footprint.
2. Indicate a practical and robust method to identify HCS in GAR's concessions in Kalimantan.	3. Further testing and fieldwork would be required for the methodology to be used as a reliable predictive tool for HCS forests across Indonesia.

Next steps

Upon gathering the required input and feedback from all stakeholders and with guidance from the REDD+ Task Force, GAR intends to develop its action plans for how it will proceed further with this methodology and will announce this in due course.

1. The Team (GAR, Smart, TFT and Greenpeace)
    - Presenting the findings.
    - Holding wider discussions.
    - Gathering feedback on study and outcomes.

2. GAR's action plan
    - Upon gathering the required input and feedback from all stakeholders, GAR intends to develop its action plans for how it will proceed further with this methodology and will announce this in due course.

Next steps

3. To be successful, all stakeholders must work together:

- Local communities - Multi-stakeholder collaboration to find solutions to convince local communities on value of conservation.
- Government - Support to establish and implement land swap process.
- Industry - Support of key industry players.

Thank you

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