High Carbon Stock Approach –
Putting No Deforestation into Practice

By Grant Rosoman, HCSA co-chair
17th May 2018, Accra
“The HCS Approach is the first practical, field-tested methodology for distinguishing forest areas (humid tropics) that should be protected from degraded lands that may be developed, through an integrated land use planning approach.”
Origins of the HCS Approach
• Global climate and biodiversity crisis – tropical deforestation for commodities – public concern & NGO campaigns on brands.

• Triggered by Nestle No Deforestation commitment, methodology initially developed through a collaboration between private sector, NGOs and technical experts.

• Initially just to identify natural forest but quickly evolved to a comprehensive but practical land use planning tool that integrates with other tools.

• Started with Palm Oil in Indonesia, but is now cross-commodity and cross-regional.
A short history

- 2009  Corporate No Deforestation commitments
  - Early methodology development and pilots in 2011/12
  - Wider pilot implementation: Asia, Pacific, Africa
  - HCSA Steering Group formed 2014
  - HCS+ process & convergence to one global in 2016
  - Collaborations: HCVRN, RSPO, research, ....
  - Revision of toolkit & launch v2 May 2017
  - Integration with HCV (November 2017)
  - 10 countries, millions ha of HCS forest identified
What is the HCS Approach?

**Practical methodology based on the latest science**
Incorporates the latest scientific research and feedback from on-the-ground trials, and is a practical tool for practitioners and companies to distinguish and protect viable forest areas to implement No/Zero Deforestation.

**An integrative process: HCS, HCV & FPIC**
Combines HCS, HCV and FPIC approaches into an efficient, unified process that will deliver robust land use planning on the ground while being more cost-effective for producers and developers and less onerous and confusing for local stakeholders.

**Adaptive: evolving and expanding horizons**
Continuously evolving to ensure incorporation of the latest scientific research and key issues, and that it is eventually implementable by smallholders and can continue to expand across different regions and commodities. The goal is also for the approach to be integrated into auditable frameworks and requirements, such as the Roundtable on Sustainable Palm Oil Principles & Criteria.
Government commitments to address deforestation and HCS forest conservation

“We need to increase our forest cover, including #HighCarbonStock,” said Ricardo Calderon, Ministry of Environment, Philippines at #APRS2018

Indonesian Essential Ecosystem Areas regulations
Liberia: joint agreement (LOI) between governments of Liberia and Norway, allowing only companies with ambitious zero deforestation commitments to do business in Liberia, including HCS and HCV

Malaysia: a jurisdictional approach is being implemented in the state of Sabah including HVC and HCS assessments over the whole state

Gabon: joint agreement (LOI) between governments of Gabon, Norway and CAFI that if implemented would protect 98% of Gabon’s forests

Papua New Guinea Declaration on Sustainable Palm Oil (draft): “We commit to identifying and protecting the vital parts of our natural heritage by adopting locally-adapted tools such as the High Conservation Values (HCV) and High Carbon Stock (HCS) concepts... “

India: Finance commission incorporating forest area and HCV
Multi-stakeholder governance and collaboration - HCS Approach Steering Group
HIGH CARBON STOCK APPROACH
ORGANIZATIONAL STRUCTURE
6 March 2018
## HCS Approach State-of-Play

<table>
<thead>
<tr>
<th>Number of registered HCSA assessments submitted for review</th>
<th>Total land Area of assessments submitted for review (ha)</th>
<th>Area of identified HCS forest in assessments submitted for review (ha)</th>
<th>Additional impact through temporary prevention of deforestation (ha) including via NDPEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>2,338,259</td>
<td>548,520</td>
<td>1.4 – 7 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Palm 106,956</td>
<td>Asia 1 – 6.2 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulpwood 441,564</td>
<td>Africa 400,000 – 800,000</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Steering Group members</th>
<th>Sectors</th>
<th>Countries</th>
<th>Toolkit and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Palm, pulpwood/timber, rubber, cocoa (beginning)</td>
<td>Liberia, Nigeria, Sierra Leone, Ghana, Gabon, Indonesia, Malaysia, Philippines, PNG, Solomon Is</td>
<td>Toolkit v1 Toolkit v2 (May 18) HCV/HCS Integrated Guidance</td>
</tr>
</tbody>
</table>
Scope of the HCS Approach
Key objective – achieving No Deforestation - which areas are natural forest and which are degraded land?
A unified global methodology – HCS Approach Toolkit v2.0
“For the HCS Approach to be successful, and for forests to be conserved, local communities must be engaged and active in the process from the beginning.”
**Phase 1:** uses remote sensing and ground survey data to develop a map of potential HCS forest areas in a particular development area.

**Phase 2:** Classification and analysis of patches using HCS Decision Tree and to develop proposed Integrated Conservation Land Use Plan.

**Phase 3:** Long term protection of HCS forest areas through: Management and Monitoring, Benefits and Incentives for Communities, Financing of Conservation and Community Incentives.
Optical or LiDAR imagery?

Degraded Forest (Green tone, Rough texture)
Water Body (DarkBlue tone)
Bare Land (Red to pink tone)
Forest Plantation (Dark Green tone, smooth texture, regular pattern)
Oil Palm Plant (Light green tone, regular pattern)
Coconut Plantation Mix with Shrub
Degraded Forest mix with Rubber
Main Road

Peat Swamp Forest – Types and degradation
Primary Peat Swamp Forest
Secondary Peat Swamp Forest
Primary Low Pole Peat Swamp Forest

Lowland Forest – Degradation levels
Primary Lowland Forest
Secondary Lowland Forest
Shrubland
Phase 1: Using Remote Sensing Data to Stratify Vegetation

A combined unsupervised and supervised analysis of optical data using visual attributes to provisionally stratify vegetation into 6 classes

Or, alternatively LiDAR to determine vegetation height and then biomass
Field plots: species, height and DBH data to estimate Above Ground Biomass

- Nested plots measure AGB in trees >5cm DBH
- Carbon estimated using global (Chave et al. 2014) or locally appropriate allometric
- Alternative plot designs possible
“Because field sampling activities will likely lead to direct interactions with community members, local communities should already be informed about the HCS Approach and process before the collection of ground truthing data, LiDAR calibration or forest inventory plots.”
**HCS Forest Stratification**

**POTENTIAL HCS AREAS**

- **High-Density Forest (HDF/HK3)**
  Remnant forest or advanced secondary forest close to primary

- **Medium Density Forest (MDF/HK2)**
  Remnant forest but more disturbed than HK3

- **Low Density Forest (LDF/HK1)**
  Appears to be remnant forest but highly disturbed and recovering
  [may contain plantation/mixed]

- **Young Regenerating Forest (YRF)**
  Mostly young regrowth forest, but with occasional patches of older

- **Scrub (S)**
  Recently cleared areas, some woody regrowth and grass-like ground cover

**MAY BE DEVELOPED**

- **Cleared/Open Land (OL)**
  Very recently cleared land with mostly grass or crops, few woody plants
MDF: Medium Density Forest (Indonesia)
Low Density Forest (LDF) (Liberia)
YRF: Young Regenerating Forest (Indonesia)
Scrub (S) (Indonesia)
**Phase 1:** uses remote sensing and ground survey data to develop a map of potential HCS forest areas in a particular development area.

**Phase 2:** Classification and analysis of patches using HCS Decision Tree and to develop proposed Integrated Conservation and Land Use Plan.

**Phase 3:** Long term protection of HCS forest areas through: Management and Monitoring, Benefits and Incentives for Communities, Financing of Conservation and Community Incentives.
Decision Tree to analyse HCS forest patches and propose an Integrated Conservation and Land Use Plan
PHASE 1 Output: VEGETATION STRATIFICATION – based on view from above and field plots
Phase Two: HCS forest patch analysis Decision Tree – patch prioritisation
Phase Two: Decision Tree – patch prioritisation and connectivity
Phase Two: Decision Tree – risk analysis and integrate with HCV & Peat areas
PHASE 2: Decision Tree – patch swaps and Integrated Conservation and Land Use Plan
Key challenge for HCS Approach – relatively easy to identify HCS forest areas but difficult to achieve their conservation.

Innovations in progress by companies: e.g. joint conservation with communities.

Need mechanisms for protection of HCS forest such as community forest permit, conservation as part of production.

Key need identified of a finance mechanism to channel support for incentives & benefits, and alternative conservation/development for communities.

HCS forest/HCV area management and monitoring.
Key issues under development

Smallholders

High Forest Cover Landscapes

HCS forest conservation support
HCS forest conservation: develop and support innovative financing mechanisms, in particular from the supply chain

HFCL

Agreed direction:
[HFLC = > 80% forest cover]

- Methodology will not to be adapted to allow deforestation but accepted that there are 'legacy cases' to be addressed
- This may include limited conversion of identified HCS (Young Regenerating Forest), if permitted following application of the Toolkit, Decision Tree and ICLUP process, and mutually agreed with local communities
- Support alternative options to the large-scale plantation model based on mutually agreed dialogues and decision making processes with local communities.
- These options will include both development and conservation models. The Working Group will look for incentives to make these alternative options viable
• Piloting and trialing an adapted/simplified HCS Approach for small farmers - palm oil, and the rubber, and cocoa

• Materials and tools for engagement with communities on conservation and forest protection – HCS forest, HCV

• Supply chain survey to assess current and possible support for smallholders, an incentives and benefits to communities for HCS forest conservation

• Piloting expanded ‘social requirements’ – Sth Sumatra & Liberia

• Social Requirements/Guidelines brought into the toolkit
• HCS Approach: a practical, global, science-based, & integrative land use planning tool to implement No Deforestation/conversion in the tropics

• Millions of ha rainforest prevented from conversion, 10 Asia Pacific & African countries, cross-commodity and over 500,000 ha in process of being protected

• Innovative multi-stakeholder initiatives: collaboration with HCV Resource Network, POIG (Palm Oil Innovation Group), RSPO, and to support government commitments (GHG emissions reductions, Low Carbon Development, NDCs, SDGs)

• Forthcoming innovations for: smallholders, fund for protection of HCV/HCS forest, large-scale HCS forest mapping for risk and jurisdictional, broader social requirements and in high forest cover landscapes.
Thank You

For more information including HCSA Toolkit
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Supplementary Slides
“The HCS Approach represents a breakthrough in this conservation challenge. It was developed to implement commitments to halt deforestation while ensuring the rights and livelihoods of local peoples are respected.”
Seven African Nations signed the Marrakesh Declaration that included identifying and protecting HCS and HCV:
- Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Ghana, Liberia, the Republic of Congo and Sierra Leone

E. Promote an oil palm sector that secures the long-term survival of Africa's unique biodiversity and globally important ecosystems and ecosystem services, including our tropical forests. We commit to identifying and protecting the vital parts of our natural heritage by adopting locally-adapted tools such as the High Conservation Values (HCV) and High Carbon Stock (HCS) concepts and also ensuring that plantation planning and management strives to secure and protect these important biodiversity zones inside plantations.
Areas of Important Ecosystem Value hereinafter referred to as Essential Ecosystem Areas (KEE)

Ecosystems outside Nature Reserve Area (Kawasan Suaka Alam) and / or Nature Conservation Area (Kawasan Pelestarian Alam) which have important ecological values critical to support the sustainability of the protected areas through biodiversity conservation effort for society welfare and quality of life of human being.

Scope:
- Status: Protected Forest (Hutan Lindung), Production Forest, Area for other Uses (APL)
- Under: local government, organizations & community management

Source: DG Nature Resource and Ecosystem Conservation – MoEF Indonesia
About 80% of important (endangered) wildlife are found outside conservation areas in lowland areas (World Bank Report 2005)

Gap Analysis Ministry of Forestry: in 2010, Indonesia has about 105 million ha of important ecosystems and ecosystem buffer / terrestrial buffer which are located outside KSA / KPA.

The management of conservation forest areas should be supported by conservation efforts in the surrounding areas (buffer zones)

Law 23/2014 authorizes regions for the management of important ecosystems and buffer zones of KSA and KPA

KEE Protection Management and Monitoring Implementation Guidelines are needed

Source: DG Nature Resource and Ecosystem Conservation – MoEF Indonesia
Forest Conservation in India

- Previous Finance Commission formulas not reflective of the true value of forests
- Study commissioned by 14th Finance Commission to modify grants-in-aid formula

**13th Finance Commission**
- Single Indicator Formula – Forest Area/Cover incl. Canopy Density

**14th Finance Commission**
- Multi-Criteria Formula – Nationally Appropriate HCV Forests Index

Methodological Framework
Integrated HCV-HCS Framework - from November 2016
How does HCV fit into “zero deforestation” commitments?

- HCV approach protects “critically important” or “outstandingly significant” values, including primary forest
- But not all forests are considered HCV (e.g. degraded forest)
- High Carbon Stock Approach (HCSA) protects non-HCV forests but integrates with HCV and FPIC/livelihoods
- HCSA works with HCV approach to achieve zero deforestation
Using HCV and HCSA together

HCV and HCSA can be used together to identify HCVs and forests in a proposed farm or plantation and protect them.

Using the HCV Approach makes sure forest and non-forest HCVs, including social and cultural values, are identified and protected.

Using the HCS Approach makes sure non-HCV forests with high carbon and biodiversity values are identified and protected.

1. The HCS Approach is designed for use in fragmented humid tropical forest landscapes, such as those found in Indonesia and Malaysia. It is not necessarily applicable in highly-forested regions, such as some highly-forested countries in West Africa.
Plantation companies and farmers that have committed to protecting both HCVs and HCS forests can have HCV and HCS assessments done at the same time.

**Integrated HCV-HCS assessment**

1. HCV assessors are licensed by the HCV Resource Network’s (HCVRN) Assessor Licensing Scheme (ALS). Since August 2017, HCS-only assessments have no longer been permitted.
Phase One: steps in procedure for Vegetation Stratification

Phase 1:
Making the first indicative HCS forest map

Output: potential HCS forest identified

Phase 2:
Analysing HCS patches and creating an indicative conservation/development map

Used as one input to Phase 2
<table>
<thead>
<tr>
<th>Land cover classes</th>
<th>Trees with DBH &gt; 30 cm</th>
<th>Canopy closure</th>
<th>Estimated molecular C t/ha</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>HDF</td>
<td>&gt;50</td>
<td>&gt;150</td>
<td>Dominated by trees with diameter &gt;30 cm. Dominance of climax species, e.g. Dipterocarpus</td>
</tr>
<tr>
<td></td>
<td>MDF</td>
<td>40-50/ha</td>
<td>90-150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LDF</td>
<td>30-40/ha</td>
<td>75-90</td>
<td></td>
</tr>
<tr>
<td>YRF</td>
<td>15-30/ha</td>
<td>30-40%</td>
<td>35-75</td>
<td>Dominated by trees with diameter 10-30 cm and with higher frequency of pioneer species, e.g. Macaranga</td>
</tr>
<tr>
<td>S</td>
<td>5-15</td>
<td>&lt;20%</td>
<td>15-35</td>
<td>Dominated by low scrub with limited canopy closure. Areas of tall grass and fern. Few trees which are predominantly pioneer species trees. Occasional patches of older trees.</td>
</tr>
<tr>
<td>OL</td>
<td>0-5</td>
<td>0%</td>
<td>0-15</td>
<td></td>
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Over 35 years of forest patch research in the tropics....
Conservation science underpins the HCS forest patch analysis decision tree

<table>
<thead>
<tr>
<th>Key Forest Patch Factor</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Edge effect distance</td>
<td>100 m</td>
</tr>
<tr>
<td>2. Minimum viable HCS forest patch core area</td>
<td>10 ha</td>
</tr>
<tr>
<td>3. High Priority Patch (HPP)</td>
<td>&gt;100 ha core area</td>
</tr>
<tr>
<td>4. Medium Priority Patch (MPP)</td>
<td>Between 10-100 ha core area</td>
</tr>
<tr>
<td>5. Low Priority Patch (LPP)</td>
<td>&lt;10 ha core area</td>
</tr>
<tr>
<td>6. Patch connectivity between HPPs (including outside development area)</td>
<td>200 m</td>
</tr>
<tr>
<td>7. Patch connectivity to HPPs (including outside development area)</td>
<td>200 m</td>
</tr>
<tr>
<td>8. Patch connectivity to HCV 1-4 areas (including outside development area)</td>
<td>200 m</td>
</tr>
</tbody>
</table>
Forest patch edge effects and ‘core’

Connectivity, stepping stones and corridors

A cluster of stepping stones is optimal

Fragments with no connectivity

Stepping stones

A corridor also provides for movement of interior species

Connectivity in the landscape
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Distance/Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>HCS forest analysis external buffer</td>
<td>1 km around the development area</td>
</tr>
<tr>
<td>10.</td>
<td>High-risk zone</td>
<td>&lt;2 km from a village or settlement</td>
</tr>
<tr>
<td>11.</td>
<td>High-risk zone</td>
<td>&lt;1 km from road or other risk factor</td>
</tr>
<tr>
<td>12.</td>
<td>MPP or LPP patch priority for conservation</td>
<td>&gt;10 ha of High, Medium or Low Density Forest</td>
</tr>
<tr>
<td>13.</td>
<td>High Forest Cover Landscape</td>
<td>&gt;80% forest cover</td>
</tr>
<tr>
<td>14.</td>
<td>Medium Forest Cover Landscape</td>
<td>30 to 80% forest cover</td>
</tr>
<tr>
<td>15.</td>
<td>Low Forest Cover Landscape</td>
<td>&lt;30% forest cover</td>
</tr>
<tr>
<td>16.</td>
<td>Minimum distance for consideration of landscape connectivity</td>
<td>5 km from development area boundary</td>
</tr>
</tbody>
</table>
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@Highcarbonstock Or see HCSA video at:
www.highcarbonstock.org/communications-resources-presentations/
• Key challenge for HCS Approach – easy to identify, difficult to protect
• Fund being considered
• Focus on incentives & benefits, and alternative conservation/development for communities
• HCS forest/HCV area management and monitoring