MANGLARES Y VERRA/VCS: EXPERIENCIAS CON INICIATIVAS FINANCIADAS POR LIVELIHOODS-DANONE

Bryan C. Foster, Ph.D.  26 September 2019
Standard comparison of VCS to UNFCCC Blue Carbon

Universal, quantifiable ecological service metric for forests
Performance-based payments
(1) General UNFCCC vs. specific VCS guidelines

Art 4.1(d) Paris Agreement NDCs
“parties shall promote sustainable management, promote and cooperate in the conservation and enhancement...of sinks and reservoirs of greenhouse gases (GHGs) not controlled by the Montreal Protocol including biomass, forests and oceans....”

Ad hoc Paris Agreement (APA) 3(b)
Information to facilitate Clarity, Transparency, and Understanding (ICTU) of NDCs

APA3(c)
Accounting for parties NDCs

APA5
Guidelines for Transparency Framework for action and support, and Assessment for Completeness

APA6
Global Stock Take sources of input and development of modalities
(2) Stock-difference VCS vs. gain-loss UNFCCC emission factor accounting

1) Stock-difference approach

\[ \Delta C = \frac{(C_{t2} - C_{t1})}{(t_2 - t_1)} \]

Where
- \( \Delta C \) = Anual carbon stock change in pool (tC/yr)
- \( C_{t1} \) = Carbon stock in pool at time \( t_1 \) (tC)
- \( C_{t2} \) = Carbon stock in pool at time \( t_2 \) (tC)

2) Gain-loss approach

\[ \Delta C = \Delta C_{\text{gain}} - \Delta C_{\text{loss}} \]

Where
- \( \Delta C \) = Anual carbon stock change in pool (tC/yr)
- \( \Delta C_{\text{gain}} \) = Anual gain in carbon (tC/yr)
- \( \Delta C_{\text{loss}} \) = Anual loss in carbon (tC/yr)

(3) Final step of payment for performance and MRV still inchoate for UNFCCC REDD+ projects
Comparison of global voluntary standards for AFOLU carbon offsets

<table>
<thead>
<tr>
<th>Standard</th>
<th>Plan Vivo</th>
<th>VCS &amp; CCB</th>
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</thead>
<tbody>
<tr>
<td>Market size</td>
<td>&lt;5% of transacted offsets per Forest Trends</td>
<td>&gt;80% of transacted offsets per Forest Trends</td>
</tr>
<tr>
<td>Market price</td>
<td>$10 USD/tonne CO$_2$e</td>
<td>$5 USD/tonne CO$_2$e</td>
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</tbody>
</table>
| Typical development costs (5 yrs.) | >$25,000 USD project develop  
> $10,000 USD auditing | >$100,000 USD project develop  
> $40,000 USD auditing |
| Typical project land area       | 500 HA for reforestation                      | 2,500 HA for reforestation                    |
| Project land ownership          | >67% legally owned by rural communities       | No restrictions could be government, NGO, private or community ownership |
| Co-benefits/safeguards          | Required and >60% of annual financial gains must go to communities | Optional unless CCB used and no financial gain distribution requirements |
Introduction to Verified Carbon Standard (VCS)

Phase 1: “validate project's compliance with applicable VCS rules”
Phase 2: “verify quantity of emission reductions or sequestration relative to baseline”
VCS Standard Elements

Project entities (financial proponent, technical developer, local implementer, auditor)
Project activities/interventions
Legal compliance and ownership
Biodiversity and social welfare safeguards
Impermanence risk buffer calculation

VCS Methodology Elements

Boundaries (geographical, temporal, carbon pools, GHGs (CO$_2$, CH$_4$, N$_2$O))
Baseline scenario
Additionality (VCS Tool VT001- credible LU alternatives, legal compliance, investment and other barriers, common practice analysis)

*Ex ante/ex post* baseline and project emissions and removals

Leakage calculation
Monitoring protocol
Avoided deforestation mangrove project activity

VM-0007: REDD+ methodology framework with peatland re-wetting or conservation (REDD-MF Wetlands Rewetting and Con. (WRC))

Reforestation mangrove project activity

AR-AM0014: Afforestation and reforestation of degraded mangrove habitats

VM-0033: Methodology for tidal wetland and seagrass restoration
Dominance of soil carbon stocks in mangroves

Global forest types

Dominican Republic mangrove types

Alongi, D. 2012

Kaufmann, J.B. et al., 2014
Soil carbon stock dominance due to allochthonous deposition and autochthonous accumulation

Soil carbon burial rates in mangroves globally (n=34)
829 +/- 143 SE g CO$_2$e/m$^2$/yr

McLeod D. 2011

Serrano, O. et al. 2019

Howard et al., 2014

McLeod D. 2011
<table>
<thead>
<tr>
<th>Project</th>
<th>Standard, methodology, participants</th>
<th>Project size</th>
<th>Leakage and impermanence risk buffers</th>
<th>Normalized offset quantities verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangrove restoration grouped project, Senegal</td>
<td>AR-AM0014, Livelihoods, Oceanium (NGO), AGRESTA, SCS &amp; Tuv-Sud, APX</td>
<td>10,415 HA, national government ownership</td>
<td>0%, 10%</td>
<td>2009-14</td>
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<td>141,631 tons CO2e=</td>
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<td>28,326 tons CO2e/yr=</td>
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<td>2.7 t CO2e/ha/yr</td>
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<td>2014-17</td>
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<td>123,906 tons CO2e=</td>
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<td>41,302 tons CO2e/yr=</td>
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<td>4 t CO2e/ha/yr</td>
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<td>Mangrove restoration in Aech and North Sumatra, Indonesia</td>
<td>CCB, AR-AM0014, Livelihoods, YAGSU (NGO), UNIQUE, SCS, APX</td>
<td>5,106 HA, community ownership</td>
<td>0%, 13%</td>
<td>2011-15</td>
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<td>125,391 tons CO2e=</td>
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<td>31,348 tons CO2e/yr=</td>
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<td>6.2 t CO2e/ha/yr</td>
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<td>Reforestation of degraded mangrove lands, Myanmar</td>
<td>AR-AM0014, Worldview International Foundation, village conservation committees, Prime Carbon Co, RINA, APX</td>
<td>2,147 HA, regional government ownership</td>
<td>0%, 10%</td>
<td>2015-18</td>
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<td>31,744 tons CO2e=</td>
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<td>10,581 tons CO2e/yr=</td>
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<td>5 t CO2e/ha/yr</td>
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<td>India Sunderbans mangrove restoration</td>
<td>AR-AM0014, Livelihoods, NEWS (NGO), UNIQUE, SCS, APX</td>
<td>4,404 HA, national government ownership</td>
<td>0%, 15%</td>
<td>2010-15</td>
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<td>75,081 tons CO2e=</td>
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<td>15,016 tons CO2e/yr=</td>
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<td>3.4 t CO2e/ha/yr</td>
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India Sunderbans Mangrove Restoration
- 20-30 ppt salinity
- 4-6 meter tides
- 5,000 TPHA to 2,500 TPHA
- Avicennia spp. at coastal Interface to Rhizophora spp.
  Upland
Illustration of project implementation

2. Community involvement – nursery establishment and replanting
Illustration of project implementation

1. Community sensitization and planning of restoration activities
Illustration of project implementation

3. Maintenance and monitoring (community based)
PROJECT BENEFITS

▪ Women trained on planting and management earn USD $50-$250 per month
▪ +17% increase in fish/shrimp (since project start)
▪ Sea/ river shoreline protection—644 km protected
▪ Reduction of salination of inland freshwater reservoirs and rice paddies
▪ Restoring UNESCO world heritage biodiversity site including endangered tiger populations
Planting scheme and community monitoring forms
Fig. 9.4 Participatory EMR Monitoring - Data Sheet

Village: __________________________ Site: __________________________
Data Keeper: ______________________ Group: _______________________
Date: ____/____/____ Time: _____ a.m./p.m. Months After Initial Rehab: Time Zero +

Eco and Hydrological Indicators:

A1 - Density of Recruits

A2 - Diversity of Recruits

B1 - Fish & Shrimp Populations

B2 - Population of Molluscs

B3 - Population of Mangrove Crab (Scylla spp.)

B4 - Population of Uca and Sesarmid Crabs

C1 - Dike Wall Condition

C2 - Tidal Creek Formation

Standing Water at Low Tide

Well-formed Tidal Drainage
Measuring live tree biomass (emission factor) in mangroves

Protocols for the measurement, monitoring and reporting of structure, biomass and carbon stocks in mangrove forests

J. Boone Kauffman
Daniel C. Donato
Tally rule ≥ 5 or 10 cm DBH

Tally rule ≥ 40 or 50 cm DBH
- Emission factor measurement training
- Development of jurisdictional accounting framework
- VCS project develop. viability analysis, PD, MR, audit prep.

UNIQUE
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