Standards for a Sustainable Future

Addressing current barriers in agricultural carbon project development and emerging opportunities

October 2020

Agenda

1. Opportunity for SLM carbon projects
2. Barriers to SLM carbon project development
3. Overview of new IALM Methodology

VERRA

Standards for a Sustainable Future

Verra catalyzes **measurable climate action and sustainable development outcomes** by driving large-scale investment to activities that reduce emissions, improve livelihoods, and protect nature.

Verified Carbon Standard

Jurisdictional & Nested REDD+

California Offset Project Registry

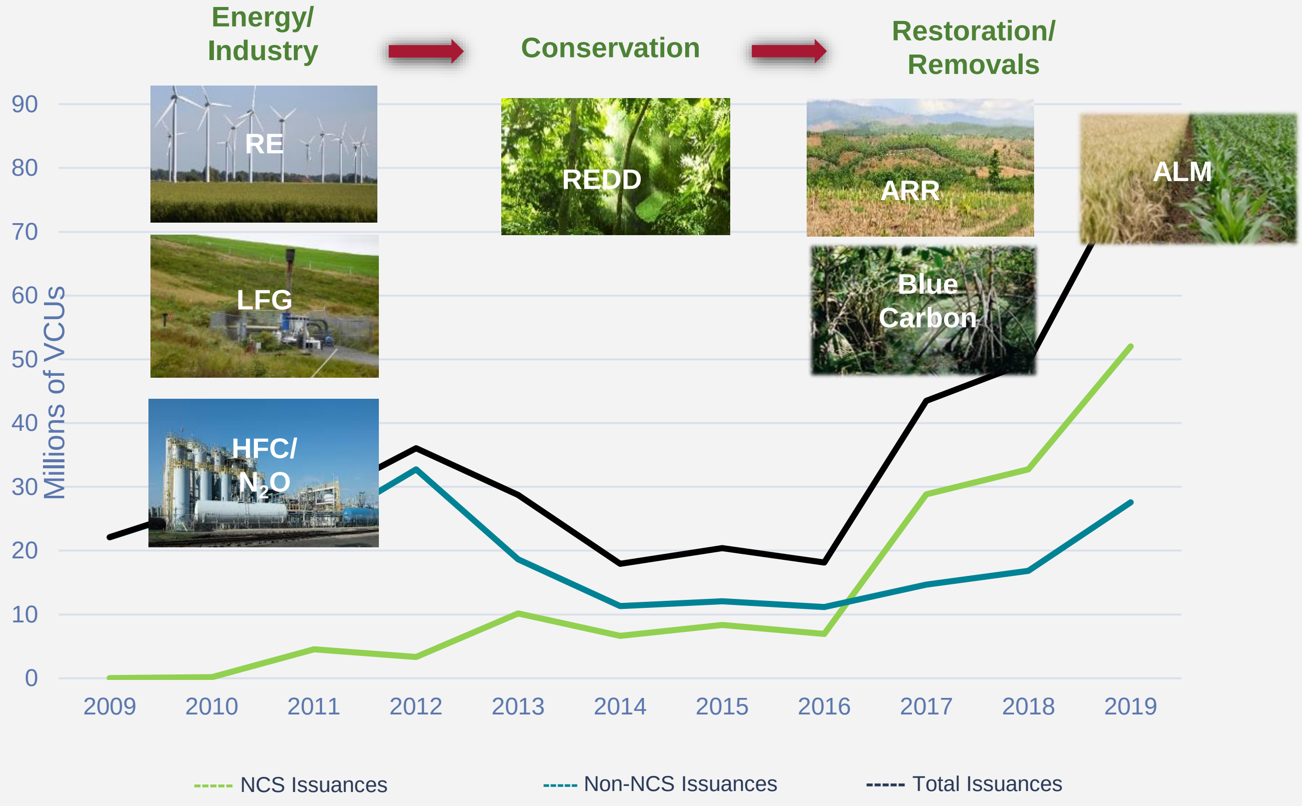
Climate, Community & Biodiversity Standards

Sustainable Development Verified Impact Standard

LANDSCALE

Plastic Waste Reduction Standard

Rise of Natural Climate Solutions – by VCS credits issued



More than just carbon…

More efficient farming practices

Photo: Wildlife Works Carbon, Kasigau REDD+ project

Additional sources of income

Photo: South Pole, Kariba REDD+ project

Jobs, such as protecting forests

Photo: Wildlife Works Carbon, Kasigau REDD+ project

Schools

Photo: South Pole, Kariba REDD+ project

Clean water

Photo: South Pole, Kariba REDD+ project

1. Discussion questions – demand

- Are you also experiencing demand for SLM carbon projects?
- From public sector? Private sector?
- Removals, reductions or both?

Complexities of SLM carbon projects

- Multiple GHG pathways
  - SOC, CO_2, N_2O, CH_4
- Interactions between SLM practices
- Diverse GHG quantification approaches
  - Measurement
  - Modeling
- Numerous land managers

Barriers to SLM project development

- Non-permanence risk
  - E.g., reversal to conventional management
- Grouping lands/ land managers
- Technical expertise
  - E.g., process-based biogeochemical models
- Uncertainty
- Costs

2. Discussion questions – barriers

- What other barriers do you see to SLM carbon projects? What are potential solutions?
- With respect to monitoring, what are the major barriers for SLM carbon project development?
- What approaches and technologies can we utilize to address those?

VM0042 Methodology for Improved Ag Land Management

https://verra.org/methodology/vm0042-methodology-for-improved-agricultural-land-management-v1-0/

- Applies project-based approaches to additionality and baselines
- Global applicability to cropland and grazing land
- Requires periodic, direct soil measurement, but also allows use of models
- Comprehensive project boundary, including SOC, CO2, N2O, and CH4
- Highly scalable by allowing grouped projects which cover a diverse portfolio of fields
- Allows improvement in models and methods over time without methodology updates

Unique Features of Methodology

Application of dynamic baseline and robust modeling procedures increase accuracy

- Responsive to climate and agricultural market variability
- Periodic “true-up” of modeled SOC with re-measurements every 5 years or less

Well suited for application to grouped projects

- GHG Quantification: Measurement and monitoring occurs on selected *sample units*
- Additionality: Barriers to change in agricultural practice addressed at *project* scale not for each individual project instance

Project Boundary – C pools

Pool	Included?
AG + BG woody biomass	Optional
Wood products	Optional
Non-woody biomass	No
Deadwood	No
Litter	No
Soil organic carbon	Yes – Major carbon pool affected by project activity that is expected to increase in the project scenario

Project Boundary – GHG Sources

Source	CO_2	CH_4	N_2O
Fossil fuel	*Included*		
Methanogenesis		*Included*	
Enteric fermentation		*Included*	
Manure deposition		*Included*	*Included*
Nitrogen fertilizers			*Included*
Nitrogen-fixing species			*Included*
Biomass burning		*Included*	*Included*

Where increase in GHG emissions from any source or decrease in stock in any carbon pool is less than 5% total net project GHG emission reductions/removals source or pool is *de minimis*

Methodology Applicability Conditions

- Project introduces/implements one or more new agricultural practices in project:
- Reduce **fertilizer** (organic or inorganic) application
- Improve **water management/irrigation**
- Reduce **tillage**/improve **residue management**
- Improve **crop planting** and **harvesting**
- Improve **grazing** practices
- Land is cropland or grassland, no clearing of native ecosystems 10 years prior to project
- No sustained reduction in productivity, sustained displacement of pre-existing productive activity, or significant displacement of livestock
- Project activity cannot occur on wetlands
- Biochar allowed but only from feedstocks otherwise decaying aerobically/anaerobically

Demonstration of Additionality

- Two-step project method for demonstration of additionality

1. Identify barriers that would prevent the implementation of a change in pre-existing practice, e.g.

- Traditional equipment and technology;
- Attitudes towards risk;
- Openness to new ideas; and
- Grower identity.

2. Demonstrate that the adoption of the suite of proposed project activities is not common practice

- Weighted average adoption rate of the three (or more) predominant proposed project activities within the project spatial boundary **below 20%**

Methodology Quantification Approaches

GHG flux measured and monitored on selected sample units

Quantification approaches allow mix-and-match approach for different pools and sources

- **Approach 1: Measure and Model**
- Acceptable model is used to estimate GHG flux based on edaphic characteristics and actual agricultural practices implemented, measured initial SOC stocks, and climatic conditions in sample fields

- **Approach 2: Measure and Re-Measure** (requires a SOC performance benchmark)**
- Direct measurement used to quantify changes in SOC stocks

- **Approach 3: Default IPCC emissions factors**
- Calculated following IPCC guidance using equations in methodology

Baseline Scenario Development

Counterfactual continuation of historical practices

- **Assess pre-existing practices** over a minimum of 3 years including at least one complete crop rotation where applicable

- Collect qualitative and quantitative data
- Crop planting and harvesting
- Nitrogen fertilizer application
- Tillage and/or residue management
- Water management/irrigation
- Grazing practices

- Develop **schedule of activities** applied in the baseline scenario from $t = 1$ repeating every x years through the end of the first baseline period

Data Collection for Biophysical Model Inputs

- Initial soil organic carbon stock and bulk density
- Determined *ex ante*
- Directly measured at $t = 0$ or modeled to $t = 0$ with measurements collected within 5 years of $t = 0$ or determined at $t = 0$ via emerging technology (e.g. remote sensing) with known uncertainty

- Other soil properties as required by model (e.g. clay fraction)
- Determined *ex ante*
- Directly measured or determined from published data with known uncertainty

- Climate variables
- Continuously monitored
- Measured at continuously-monitored weather station within 50 km of the sample field or from a synthetic weather station (e.g. PRISM)

Uncertainty

Flexibility in GHG quantification requires rigorous uncertainty accounting

Sample error + **Measurement error** + **Model prediction error** = UNC_t

Sample error	Measurement error	Model prediction error	UNC_t
Error from sampling and reporting only a subset of the project	Error from the method used for measurement is included to provide flexibility in using new technologies	Estimated from validation data external to the project	**If >15% @95% confidence, linear deduction applied to all emission reductions**

More robust approach than employed in other soil methodologies

Uncertainty deduction applied if total uncertainty exceeds 15% at 95% confidence

Design-based approach, with flexibility in:

Choice of sample units (and, relatedly, whether to cluster sampling at the level of fields or farms)

Whether and how to stratify

Choice of technology used and ability to account for precision

3. Discussion questions – IALM meth

- Do you see the IALM meth as applicable in your context/ region?
- What challenges may there be in using this meth?
- Is there a need for a measured as well as modeled approach to SOC quantification?

Thank you!

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