Agricultural Carbon Accounting: Striking the Balance

Update and Direction Setting for Next Steps
March 2011 C-AGG Meeting

Outline

- Update on C-AGG Activities
- New Paper: “Agricultural Carbon Accounting”
  - System Design
  - Scale of Implementation
  - Delivery Process – Continuous Improvement
- Worksheets
  - Evaluating Options

X-AGG – Where We've Been?

- Getting Measureable Results – Congressional Process
- T-AGG – more focus on the technical potential; implementation and accounting issues
  - Literature Review, Synthesis Paper
  - Using biogeochemical models to quantify agricultural GHG projects
- M-AGG- benchmarking available agriculture quantification tools; focus on market access mechanisms
- N_2O protocol comparison process/panels
- 'P-AGG' [USDA-NRCS Pilots – will inform much]

White Paper:
"Agricultural Carbon Accounting: Systems to Measure, Monitor, Report and Verify GHG impacts from changes in Ag Practices"

Agricultural Carbon Accounting

- Building from current X-AGG Materials
  - C-AGG Principles
  - T-AGG Technical Papers
  - M-AGG Phase 1 and Phase 2 Reports
  - Key messaging from USDA
    - » Scale
    - » Cost
    - » Risk
  - Consider Programs - what does that mean for MRV?
  - Technical Guide Process

Need to understand fundamentally
how to engage with the agriculture sector.

Agricultural Carbon Accounting

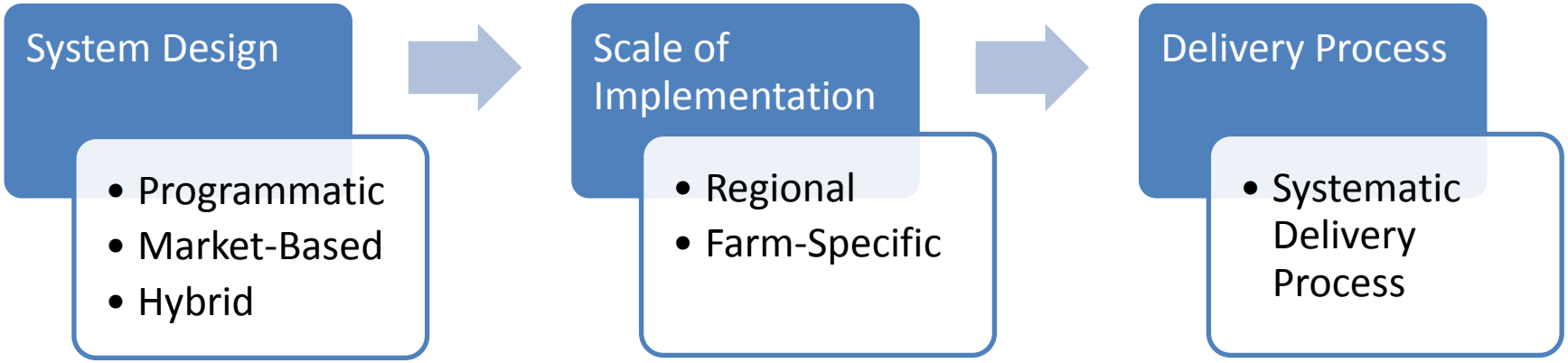
- Workshop – January 31st, 2011
  - Garth Boyd/Wiley Barbour from Camco – CDM
  - Karen Haugen-Kozyra from KHK Consulting – ISO 14064 pt II
  - Lydia Olander from Nicholas Institute – Regional Quantification
  - Keith Paustian from Colorado State University – Comet VR V2.0

Hot Button Issues

Additionality/Baseline
Definitions/Quantification
Permanence
Leakage/Project Boundary
Functional Equivalence
Uncertainty
Quantification method
Validation/Verification
Scale, Cost and Risk
Data needs and data collection
Knowledge/data gaps
Generalizations

Agricultural Carbon Accounting

- Three key elements identified for how to engage within Ag Sector



- Looking for insights into development approach for full engagement with Ag sector

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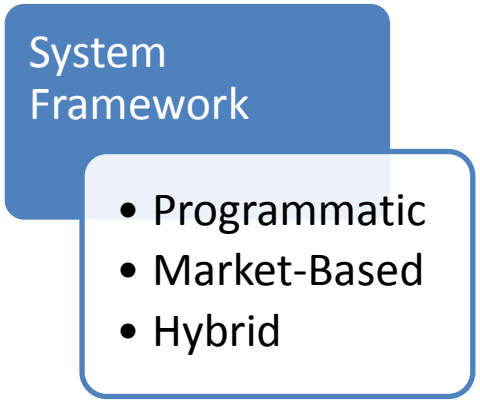

- Programmatic
  - Government run program (i.e. EQIP, CRP)
  - MRV for accountability/transparency
  - Credits not tradable/government purchase
- Market-Based
  - Analogous to CAR, VCS, ACR, AOS, CDM
  - Government involved in infrastructure
  - Industry to innovate/achieve ‘credit’
- Hybrid
  - Blend to bridge benefits of both approaches

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- Considerations
  - Cost of system
    - » Government
    - » Industry
  - Speed of implementation
  - Scale of uptake/penetration
  - Value to the producer
  - Flexibility/innovation
  - Outcome
    - » GHG benefit achieved

System Framework

- Programmatic
- Market-Based
- Hybrid

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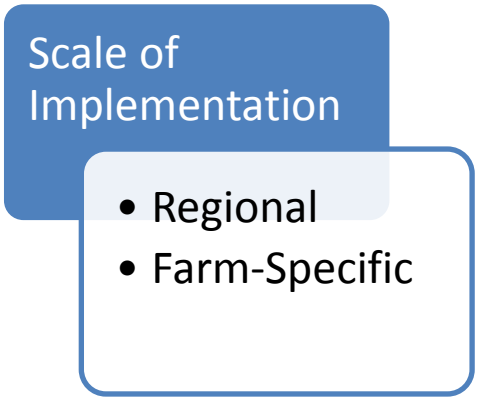

- Regional
  - Application of models over given area
    - » Similar soils, livestock, cropping, etc
    - » May not reflect spatial/temporal variability of GHG dynamics
    - » MRV processes are locked-down/standardized
- Farm-Specific
  - Application of model over a given farm
    - » Site-level data inputs to capture variability
    - » Additional flexibility in management practices
    - » MRV restricted within model application

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Scale of Implementation

- Regional
- Farm-Specific

- Considerations
  - MRV costs based on data requirements
  - Oversight/model review costs
  - Uncertainty / verifiability
  - Accuracy and precision
  - Operational costs
  - Ease of aggregation
  - ‘Value’ to the producers

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	Regional Scale	Farm Scale
Data Availability	Uses regional databases Extrapolate model results Useful where lack of data/	Uses detailed farm input data Experimental data calibrate model Requires regional research
Quantification	Expert run to develop regionally explicit emissions factors Control on scale-up and uncertainty quantification to ensure conservativeness	Project level application for baseline and project practices More user-defined inputs Challenge to maintain transparency and consistency
Uncertainty	Quantified at the regional scale	Monitoring may allow finer scale uncertainty in future.
Accuracy	Lower accuracy Regional management data aggregated self-reported	Higher accuracy - if farm level data has specific alignment with models
Flexibility	Less flexible Combined practices can be modeled	More flexible in combining practices and capturing farm level management variability

Agricultural Carbon Accounting

	Regional Scale	Farm Scale
Verifiability	Standardized and transparent approach Typically verify practice and standard farm records for proof	Can be more complex Greater farm level data input Information on model sensitivity would be helpful.
Cost	Cost burden on program Less transaction costs on the project developer	Cost to program for quantification method and alignment Cost to project developer for MRV
Risk	Risk managed by program Expert generated emission factors Greater control over protocol factors that can lead to risk	Increased flexibility / complexity Increased risk of inconsistent application Program will need explicit guidance on implementation.
Profit to project	May be greater due to low MRV cost	Depends on MRV requirements
Ease of aggregation	Aggregation process greatly simplified	Greater level of detail needed and possible complexity for MRV

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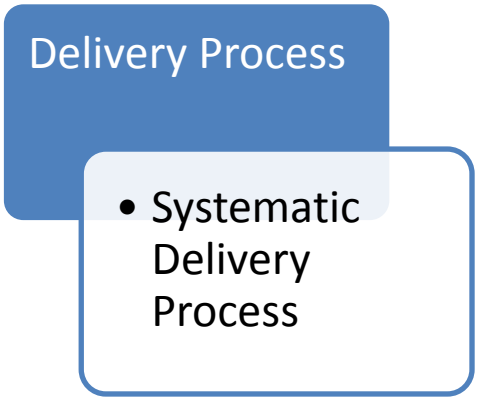

- Process for agricultural project types must achieve same criteria:
  - Real, Verifiable, Additional, Permanent, etc.
- Process should adhere to other principles GHG emissions framework:
  - Anchor in rigorous measurement, verification and reporting (MRV)
  - Conform with best practice guidance in terms of standards for quantification (e.g. ISO 14064 pt II)
  - Commit to continual improvement as science develops and from experience gained in implementation
  - Provide a similar basis for verification to ensure comparable rigor with other project types, but without significantly increased cost

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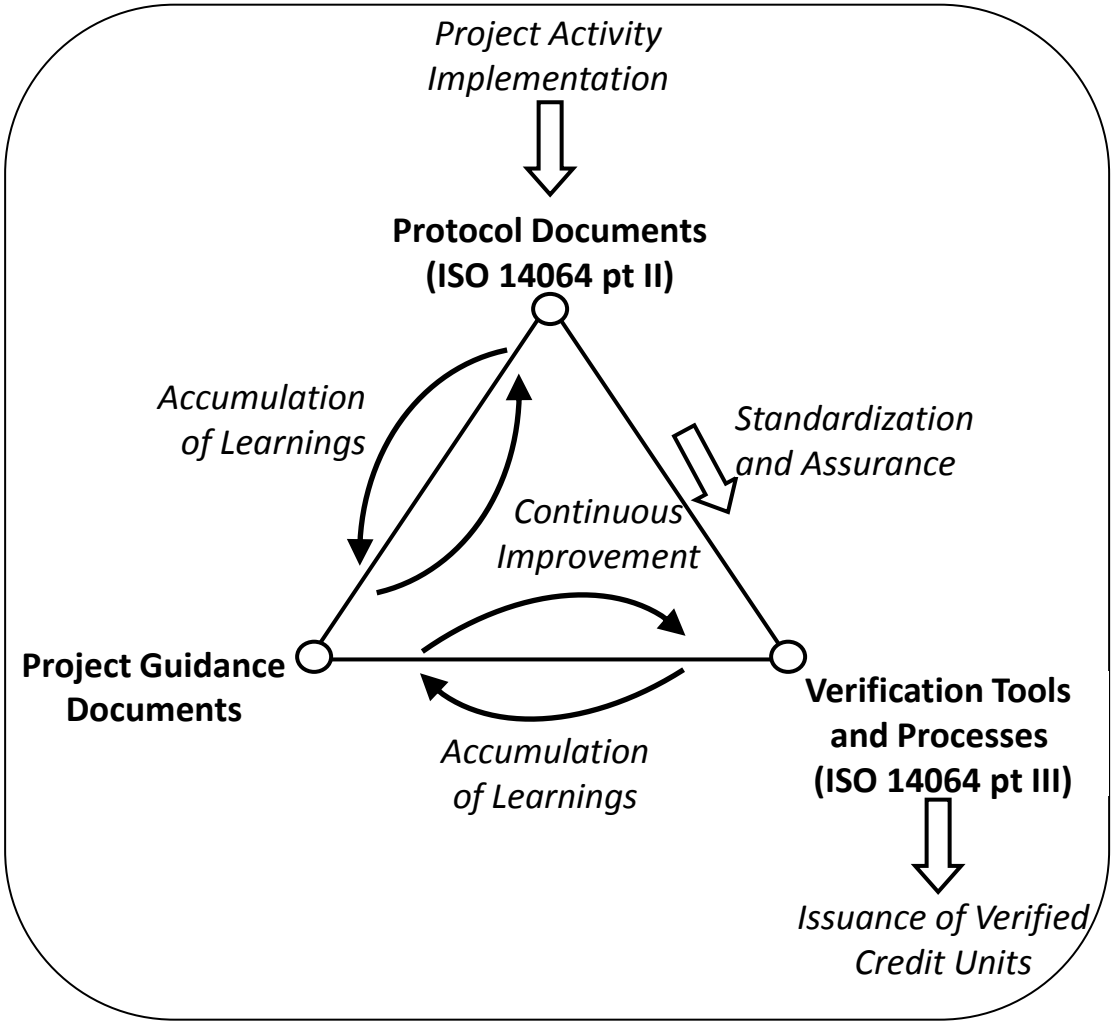

- Common approach
  - No matter early decision points
  - Ties in with principles of C-AGG, M-AGG, T-AGG
  - Build active 'knowledge network' to match with growing body of research

Promotes need for early-action regardless of framework and scale:

- Build Protocols
- Accumulate Tools/Guidance
- Audits for Continuous Improvement

Worksheets:
Extending Paper

Worksheets: Extending the Paper

- Seeking to qualitative review of decision points against key selected criteria
  - Evaluate each issue relative to two scales

    Program <----------> Market

    Regional <----------> Farm-Scale
  - Criteria as follows

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- Results to be accumulated to assist with completing the paper
  - Aggregation of input to inform review
  - No attribution of results

Scale

(a) Uptake and interest

Defined relative to the likelihood of producer participation (consider all sizes/types of operations)

Program

Market

Regional-Scale

Farm-Scale

Scale

(b) Flexibility

Defined as the ability for producers to innovate and participate within the system.

Program

Market

Regional-Scale

Farm-Scale

Scale

(c) Aggregation

Defined as the ability for aggregation to provide access for producers while maintaining system integrity.

Scale

(d) Other

Define:

Cost

(a) Value to the producer

Defined as yielding the highest values to the producer based on costs and value of emission reduction.

Cost

(b) Monitoring, Reporting and Verification:

Defined as the costs for MRV as paid for by the producer, aggregator or project developer

Cost

(c) Set-Up/Operations/Evaluation:

Defined as the system costs as seen by the government agency administering the system

Cost

(d) Other

Define:

Program

Market

Regional-Scale

Farm-Scale

Risk

(a) Uncertainty

Defined as the uncertainty embedded with the assessed emission reductions.

Program

Market

Regional-Scale

Farm-Scale

Risk

(b) Accuracy

Defined as the accuracy of the emission reductions assessed.

Program

Market

Regional-Scale

Farm-Scale

Risk

(c) Verifiability

Defined as the risks associated with the verification of the GHG emission benefits.

Risk

(d) Other

Define: