

# C-AGG Comments on USDA GHG Accounting Report

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TO: Marlen Eve, USDA Climate Change Program Office

FROM: Debbie Reed, Executive Director  
Coalition on Agricultural Greenhouse Gases (C-AGG)

SUBJECT: C-AGG Response to USDA Federal Register Notice of Public Comment Period for the Report on ***Science-Based Methods for Entity-Scale Quantification of Greenhouse Gas Sources and Sinks from Agriculture and Forestry Practices***

DATE: November 11, 2013

C-AGG appreciates the opportunity to provide comment on the USDA **GHG Quantification Report**, and looks forward to continued interactions with USDA on this very important topic. The Coalition on Agricultural Greenhouse Gases (C-AGG) is a multi-stakeholder coalition of agricultural producers, scientists, methodology experts and developers, carbon investors, voluntary registries, and environmental ngo's, and project developers that fosters a fact-based discourse on the development and adoption of policies, programs, methodologies, protocols and tools for voluntary GHG emission reductions and carbon sequestration from the agricultural sector. C-AGG's primary objective is to incentivize voluntary GHG emissions reductions opportunities for agricultural producers at a scale that matters, while enhancing productivity and income generation opportunities and benefiting society.

C-AGG supports continued USDA investments in systems and tools to support agricultural sector engagement in GHG mitigation opportunities, and stakeholder engagement in the development of these systems and tools is essential.

C-AGG submitted preliminary comments to USDA prior to the report release, based on discussions at our July, 2013 meeting in Detroit, MI. Those comments, submitted August 19, 2013, are summarized below for ease of reference:

- (1) USDA's 2012 interim ***Report of Greenhouse Gas Accounting for Agriculture and Forestry Sectors***, lists tools, calculators, guidelines and process-based models for GHG accounting from the land sector, but confusion remains among stakeholders in agricultural GHG mitigation space as to which tools are more appropriate for use, and when, and relative advantages/disadvantages of each – including for USDA's tools. This information would inform the developing capacity to either integrate or selectively apply within a program platform the appropriate model to most accurately estimate GHG flux for certain agricultural applications.
- (2) USDA's tools, calculators, guidelines and models should be integrated and cross-referenced to make them more consistent and compatible; their underlying codes and

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models should be transparent and user friendly; and their data entry portals should be linked to allow data entered into one to upload to others.

- (3) **COMET-FARM** is a valuable, user-friendly (“farmer friendly”) web-based tool that offers an introductory experience for agricultural producers to better understand the GHG impact of their operations, and how changes in practices can reduce GHG or enhance sequestration, as well as enhance operational efficiency. It would provide more utility to project developers if it could be transparently apportioned into GHG sources and GHG sinks.
- (4) The **GHG Quantification Tool** (dubbed by USDA and ICF International as the **Q-Tool**) was discussed at our July 2013 C-AGG meeting, and we are quite interested in the tool, which we understand will be compatible with USDA and EPA national GHG inventories, but we have many questions about the tool and how it might relate to COMET-FARM, as well as the target date for its release.
  - a. There is confusion regarding the differences and/or linkages between COMET-FARM and the Q-Tool, and the intended applications and audiences for each, and whether results from each will be similar or significantly different, including uncertainty factors for estimates from each.
  - b. COMET-FARM and the Q-Tool use different N<sub>2</sub>O estimation approaches, and C-AGG suggests one common approach be utilized.
  - c. C-AGG suggests a nested tool approach, such that COMET-FARM be considered an introductory tool; and that the Q-Tool be considered a next, higher level tool with greater accuracy (but which would auto-populate with COMET-FARM data. Different nested tools might also address different farming systems, for instance specialty crops, commodities, and livestock. Otherwise, it might be best to just have one tool rather than both; or, better define different uses/users for each tool.
- (5) C-AGG commends USDA for investments in GHG tools and calculators to date, and recommends that USDA develop GHG emissions baselines scenarios for conventional farming practices, using historical data when available, and when not available, using a hybrid IPCC Tier 2/Tier 3 approach.

We do hope that these comments are useful to USDA. Further, in response to publication of the draft report ***Science-Based Methods for Entity-Scale Quantification of Greenhouse Gas Sources and Sinks from Agriculture and Forestry practices***, published August 27, 2013 in the Federal Register for public comment, C-AGG offers the following additional comments, questions, and suggestions, which build upon the earlier suggestions and feedback as summarized above.

- ***The Report is Comprehensive and of Great Utility:*** The Report (and the underlying documents used to develop the report) is quite comprehensive in the identification of existing tools, calculators, and models to estimate GHG emissions from agriculture and forestry, and identifies a standard set of science-based, state-of-the-art methods to estimate GHG emissions from land use and land use change associated with agricultural and forestry practices.

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- Given that USDA has indicated to C-AGG that the report is a current snapshot of the best available science, and will require updating over time, it would be helpful to understand the planned process for updating the report and the methods, including the tool. This will be important for potential consideration of use by project and protocol developers, as well as registries, policymakers, and other stakeholders.
- **Q-Tool:** The Report makes brief mention of the development of an associated USDA GHG Estimation Tool (on page ES-2); is this reference to the above-referenced **Q-Tool** that will provide the interface for the methodology described in the Report? If yes, will more information on the development of this tool be forthcoming, including timing and process of development, and whether public comments specific to the Report and the Methodology (based on the comment period to which this response was developed) will be incorporated prior to its development?
- **Intended Audience:** The report states that the intended audience is “...USDA, landowners, and other stakeholders to assist them in evaluating the GHG impacts of their management decisions;” and that “This report will be used within the Department, and by farmers, ranchers, and forest-land owners.” An associated web-based tool, as previously mentioned, might make the methodology useful for farmers, ranchers, and forest-land owners, but as written, the Report is quite technical and complex, and while it is likely of utility to USDA and “other stakeholders” such as project developers, GHG registries and policymakers, we do not see that it useful to or accessible to landowners or agricultural producers.
- **Policy Uses of the Report and Methodology:**
  - The report notes that the methods therein will aid USDA “in assessing GHG and carbon sequestration increases and decreases resulting from current and future conservation programs and practices;” and “in evaluating and improving national and regional GHG inventory efforts,” and states that it allows for net GHG flux to be estimated at the entity scale, in an integrated fashion. These statements raise several questions, including the following:
    - The report implies that use of the methodology (and/or the tool) by landowners at the entity-level will be required as part of future participation in conservation programs; is that the case, or is the methodology intended solely for voluntary purposes?
    - C-AGG applauds USDA for undertaking an entity-wide approach to estimating GHG emissions and emissions reductions, which is critical to building a more comprehensive knowledge-base of GHG impacts of the agricultural sector. However, market-based opportunities currently focus on specific, targeted practices and/or impacts, rather than whole-farm impacts. We understand the ‘modular’ methodology approach undertaken by USDA in the Report allows for such selective utilization, but question whether selective applications are intended, as well?
  - The report also notes that it “does not address policy issues related to crediting reductions such as permanence, additionality, or leakage. The intended purpose

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is simply to provide a quantitative estimate of what is occurring under a given set of practices and activities, or what could be expected to occur given a change in management.” While C-AGG understand the limitations of USDA in addressing these particular policy issues in the absence of a national policy, it would still be useful for USDA to help develop a method to estimate baselines for agricultural producers, particularly since it is stated that the tool might allow landowners to participate in current or future GHG reporting programs, which could greatly benefit from standardized baseline approaches and methodologies.

- Also, it is noted that “The Report will provide additional co-benefits. For example, the Report may provide improved methods for GHG registries, help to facilitate regional GHG markets, or inform existing and/or future GHG reporting programs (e.g., sequestration/emissions from land use and agriculture under Executive Order (EO) 13514).” While C-AGG acknowledges and understands the footnotes related to this, the Executive Order does not, to the best of our knowledge, account for or allow for any land use or agricultural GHG offsets or emissions reductions on private lands to be utilized to help federal agencies meet their sustainability and GHG emissions obligations commitments. Is this then, a reference to use of (or potential future use of) the methodology on public lands to help federal agencies meet their obligations and commitments? Or are other potential applications related to EO 13514 intended, such as use on and credit for activities on private lands? Clarification of this point would be most helpful.

- **Chapter 1: Introduction**

- C-AGG understands that the report does not include estimations from mobile or stationary source combustion, but as noted, these are associated with many activity changes, and while we understand that other federal agencies address how to account for such changes, we suggest that in order to provide an entity-scale or whole-farm tool, these accounting tools should be added to any future tool USDA constructs for agricultural producer utilization; otherwise, the producer must investigate how to account for these changes, and how to add them to any estimates provided by the USDA tool. Additionally, since COMET-FARM does incorporate on-farm energy use, it would seem consistent for a tool that arises from this effort do so, as well.
- USDA acknowledges a few sector-specific LCA and sustainability initiatives, but does not indicate whether development of this report included interactions with or any stakeholder involvement from these or other groups that have undertaken to or have developed tools to report GHG emissions or changes in emission from the agricultural sector. There are many such tools in existence and use, and it would be beneficial to understand to what extent USDA integrated these stakeholders and their tools into the development of the report, given that the response and buy-in of these stakeholders to the report will influence their use of the report or resulting tool, to a great extent.

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- **Chapter 2: Considerations when Estimating Agricultural and Forestry GHG Emissions and Removal**
  - C-AGG suggests that in this chapter or the prior chapter, a more succinct identification of the uncertainty estimates associated with utilization of the method or tool be discussed. At present, the uncertainty descriptions for each method are dispersed across chapters and activities and systems, which is very useful for each of these, but particularly to stakeholders such as agricultural producers and landowners, a more succinct and understandable description of caveats and limitations should be included, to provide the proper qualifications to unfamiliar users.
- **Chapter 3: Quantifying Greenhouse Gas Sources and Sinks in Cropland and Grazing Land Systems**
  - C-AGG hopes that USDA will consider developing a Tier 2 estimation factor for indirect nitrous oxide emissions from soils that is specific for regions of the US.
  - Although the guidelines outline quantification of emissions from agricultural soils, a holistic sustainability approach to managing cropland should be noted so that reducing GHG emissions doesn't result in a negative effect elsewhere. This includes managing for water quality, soil health and sustainability, air quality and biodiversity. It is therefore recommended that frameworks from other key areas be incorporated into this report. For instance, the 4R Nutrient Management Framework integrates these elements along with managing nitrous oxide emissions from fertilizer (<http://www.nutrientstewardship.com>).
  - To achieve emission reductions and production goals, mitigation practices must be considered within and specific to each cropping system. Therefore quantification methodologies must be able to account for this flexibility that exists with farmer adoption of a variety of mitigation practices. To meet both emission reduction and production goals, for instance, fertilizer best management practices will need to address all 4Rs (right nutrient source, at the right rate, the right time and in the right place).
  - Further research should be conducted in order to build in an uncertainty component estimate. In particular, guidance could be provided on how users of the tool could improve the accuracy of estimates. For example, explaining which input variables have the biggest influence on uncertainty intervals and how/if accuracy may change depending on the scale of application. This type of detail will likely be most helpful for third parties (e.g., registries) to tailor tools appropriately to specific applications.
  - Co-benefits from these management changes could also be added to the model as there may be value to tallying co-benefits, e.g. GHG mitigation practices that also provide nitrate or phosphorus pollution abatement. In the event two practices have the same GHG mitigation potential, if one has a known co-benefit that should be noted and promoted, as appropriate.
  - The tool should be further developed so that it can be aggregated up to larger areas (as opposed to top-down system development). The farm scale is where the work to reduce GHGs and increase soil organic carbon (SOC) will take place

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so systems will need to capture this data at the farm scale; however state and regional systems should be built around this ability, or should build in the capacity to utilize data that is captured and summarized from the farm scale.

- **Chapter 7: Quantifying Greenhouse Gas Sources and Sinks from Land-Use Change**
  - While it is clear that the intent of the Report and the tool are to only consider land-use change within the farm-gate, C-AGG notes that the loss of farmland due to development and urban encroachment, for instance, impacts US GHG inventories and the net effect of agriculture and agricultural mitigation opportunities. Consideration to how to capture loss of agricultural lands, and the implications of this loss is suggested.
- **Chapter 8: Uncertainty Assessment for Quantifying Greenhouse Gas Sources and Sinks**
  - USDA chose the Monte Carlo approach as the method for determining uncertainty around the outputs of the methodologies in this report, which USDA acknowledges is complicated, and requires the use of a statistical tool to produce a Probability Density Function (PDF) around the GHG emissions estimate. To develop the PDF, information is required about the uncertainty associated with parameters, sampling methods, large data sets, and models; and the proper statistical tools are required to run the Monte Carlo analyses. While this chapter is dealing with what is obviously a complex but important aspect of estimating GHG from agricultural sources and sinks, it is unclear who will identify the sources of uncertainty associated with each of the identified factors, since each is obviously quite complicated and requires a certain expertise.
  - Additionally, however, this chapter does not address by whom or how the uncertainty assessments will be completed, when it is possible to complete them, and since Monte Carlo analyses require large computing capacity and time and resources, it is unclear how this approach will work for landowners or even USDA.
  - Section 8.2 on Research Gaps only briefly mentions that the data for much of what is required is largely unavailable, and requires more research. Perhaps greater detail on the highest priority aspects of this research, and who should complete it, would provide better information that can lead to the necessary investments.
  - C-AGG also suggests that the intended use of the tool – whether for assessment of the impacts of conservation programs, or for use in carbon or ecosystem service markets – will likely change the prioritization of research gaps, since research needs for each will be different. Additional guidance, either from USDA (as developers, and potential users in the former instance), or from constituents (as potential users in the latter instance) can help to inform such decisions on what and how to prioritize.

### ***Responses to Specific Questions Posed by USDA in the Federal Register Notice:***

**1. Are sources of GHG emissions or sinks missing? Are the methods provided complete? Are there potential inconsistencies in and across the methods?**

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- C-AGG is not aware of any missing sources or sinks.
- The proposed methods are comprehensive and would seem to be complete. However, because they are also quite variable, and given that they include IPCC Tier 1, Tier 2, Tier 3 and direct measurements as well as methods that involve multiple of these approaches, including newly-developed methods, C-AGG notes that this variability does introduce inconsistency across methods, but we find it difficult to ascertain to what extent there are inconsistencies in and across methods.

### **2. Are the proposed methods suitable for estimating GHG emissions at the farm-, forest- or entity-scale while meeting the selection criteria of transparency, consistency, comparability, completeness, accuracy, cost effectiveness, and ease of use?**

- While the Report is comprehensive in identifying which methods are selected for standardized reporting of GHG emissions and changes in emissions, it is difficult to state with certainty that the criteria identified above are consistently met across the report. For instance:
  - more information on the development of and the certainty of the new nitrous oxide method would lend greater transparency to that particular effort/method, and allow potential users to determine whether and when to incorporate it into other methodologies or protocols;
  - comparability of methods may be assured from one farm to the next if all farms utilize the methods as identified and described, but comparability within methods is not provided, or assured (particularly given the complexities associated with uncertainty determinations);
  - accuracy is quite difficult to assess, based on this report, given the mix of methods utilized, though it may well be that the methods selected are those that offer the greatest accuracy, at this point in time;
  - Cost-effectiveness and ease of use based on the Report are difficult to agree with on behalf of agricultural producers or landowners, as has been noted elsewhere, though it may well be that a comprehensive tool based on this report meets one or both of these criteria.

### **3. Are new (or additional) data sources available for calculating emission factors?**

- None that C-AGG is aware of.

### **4. Are there additional management practices for which the science and data are clear, and which should be addressed in the methods report? If yes, please provide details.**

- None that C-AGG is aware of.

### **5. Are the methods appropriate across a variety of farm and forest entities as well as applicable to operations of any size?**

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- The methods appear to provide applications across a variety of farm and forest entities, including entities of different size, but it is difficult to assess without access to the tool whether the methods will provide utility to all operations equally.

### **6. Are the research gaps clearly identified? Are there additional gaps to note, or new data sources that significantly address any of the listed gaps?**

- C-AGG would note that there are research gaps clearly identified, but they are not exhaustive (as noted in the Report).
- It may be beneficial to prioritize research gaps according to those that will make the most critical advancements in this arena, from an overall programmatic approach. But, as previously noted, this would likely require finer definition of intended uses and users of the report/tool, since programmatic investments aimed at assessing GHG impacts of conservation programs will require different programmatic investments than those intended to support stakeholder engagement and participation in carbon and ecosystem service markets.
- C-AGG also suggests that future consideration be given to incorporating economics into the tool, since this will be relevant to landowners, farmers, ranchers, and other stakeholders' decision-making when considering activity changes; and, economics and trade are major factors that influence producers' actions at the farm scale.