Agricultural Sustainability Key Issue Discussion: Additionality

ONE OF FOUR KEY ISSUE DISCUSSION PAPERS

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Additionality Discussion Paper

Introduction

This discussion paper is intended to clarify why traditional assumptions of additionality may not necessarily apply to agricultural insetting programs and provides analysis of alternative additionality approaches. Additionality is one of the foremost issues debated regarding greenhouse gas emission offsets internationally. Establishing the additionality of a practice involves justifying intent. In other words, to qualify as an activity in a protocol, one needs to demonstrate that the activity will result in greenhouse gas (GHG) reductions/removals that are **additional** or **incremental** to what would have happened in the absence of the project (i.e., baseline condition). Different tools have been developed globally to improve assessments of additionality.

For discussion's sake, we view agriculture as being unique or different from other sectors in this space. First, agriculture is different from the industrial or point-source or facility-based activity types for which additionality principles were developed and traditionally applied. Unlike these project types and sectors, agriculture activity is biological, highly dispersed and heterogeneous, and systems-based. Agriculture is exceptionally multi- faceted, meaning that agricultural solutions inherently involve multiple issues/multiple actions/multiple risks/multiple benefits. Thus, the nature of agriculture activity complicates the application of established additionality principles.

Established approaches to additionality focus on the connection of offset activity to motivations attributed to opportunities afforded by carbon markets (Gillenwater 2011a, 2011b, 2011c). But, the need to achieve "adaptable additionality", by adapting additionality tests to an appropriate process, is stressed (Trexler et al. 2006). This paper draws from concepts put forward by Janzen et al 2012, presented to the C-AGG process for considering additionality in the context of agricultural activities.

To adapt additionality to Agriculture, the 4 strategies considered by Janzen et al (2012) are modified here and include:

1. Involve experts in agricultural science and practice for determinations of additionality;
2. Include 'support of practice change' as a criterion for determination of additionality;
3. Identify infrastructural platforms such as an Insetting Programs as the agents of change for catalyzing widespread activities; and
4. Initiate standardized methods for determination of additionality.

Additionality Based on Expert Assessment – as per Janzen et al. (2012)

An approach common to GHG programs is to decide internally how to address additionality. In most cases, these programs request information from subject-matter experts regarding state of science, common practice, and quantification of GHGs associated with practice change. However, the types of information requested and received, the weight given to different elements of information, and the policy framework within which the weighted information is considered vary by program. Also, program personnel are typically experts in GHG accounting and policy, and so are essential members of the team of experts needed to assess additionality. But, these program experts are not necessarily experts in the biogeochemical processes which govern GHG emissions from agricultural systems, or in the management practices which can be used to mitigate these emissions. Further, the program experts may have little exposure to the barriers to practice change on modern farms. For these reasons, it is important for agricultural experts, technicians, and practitioners to play a more substantive role in the development of additionality tests and determinations for agricultural protocols and projects.

Additionality Based on Support of Practice Change

Traditionally, an offset protocol or project assures environmental integrity of the capped sector by ensuring the activity undertaken in the non-capped sector results in actual reductions. Compared to non-agricultural or point-source GHG reduction protocols and projects, it is difficult in agricultural protocols and projects to effect management changes in a "one-size-fits-all" approach in a manner that ensures the success of mitigation in the non-capped sector at a meaningful scale. Expert-based technical support (such as extension-based experts) would greatly enhance the transfer and potential adoption of these protocols and projects. Indeed, a key element of additionality is the testing of barriers to the practice change prescribed by the project or protocol. In terms of standard principles of additionality, when asking whether an agricultural protocol or project is additional, a key test or criteria may be to identify the level of supportive infrastructure or technical support needed to overcome barriers identified through additionality tests. That is, approaches to additionality for agriculture could be based on whether an insetting program, as delivered by program developers with the infrastructure they build or integrate, serve as a catalyst to overcome barriers to adoption of GHG mitigating practices.

Additionality Based on Project/Program Developers as the 'Agents of Change'

Almost universally, the definition of additionality includes a requirement for practice change to be adopted in response to the opportunity to sell offsets. That is, there is a requirement for the 'agent of change' to be motivated by the intervention of the perceived carbon value. An issue from the perspective of ensuring additionality of agriculture protocols and projects is identifying who is the agent of change.

If developers (or aggregators) of agricultural inset programs are considered the agent of change, however, change clearly can be motivated by the prospect of the value of the carbon. And, aggregators, and the technical experts and professional farm advisors they engage, can be key providers of supportive infrastructure to farms participating in agriculture insetting programs. Further, because of the small number of insets expected per farm, it is unlikely agricultural projects could be accomplished without the aggregation services of program developers. When applied to the motivations and contributions of developers, agriculture insetting programs meet the accepted principles of additionality.

Additionality Based on a Standardized Approach

The use of standardized approaches for determination of additionality resonates with the effort to adapt to agriculture the interpretation of established principles of additionality. This Discussion paper, based on Janzen et al. (2012) proposes that project-specific determinations of additionality for agricultural projects are likely to remain as resource-intensive approaches that are difficult to "prove". This Discussion Paper further proposes that adaptation of additionality for agriculture is best operationalized through the use of standardized approaches (see Appendix for discussion of standardized vs project level approaches).

The term 'standardized approaches' is used with a broad range of meaning in the carbon sector. So, it is necessary to address what it means to use standardized approaches to test additionality in agriculture projects and protocols. In general, using standardized approaches involves testing additionality for agriculture as much as possible before or during the insetting framework development. Options include:

- Approved tests — government regulators or GHG programs can prescribe tests which developers must use to justify the additionality of practice change prescribed in protocols/insetting frameworks. These tests can include:
  - Surplus to regulation or to government subsidy;
  - Subsequent to agreed date of initiation;
  - Subject to barriers (such as financial, technological, informational, cultural, etc.);
  - Innovative in relation to common practice.
- Performance benchmarks — government regulators or GHG programs can derive criteria which they have determined to meet approved tests of additionality, and which can be embedded in protocols/insettign frameworks;
- Positive lists — government regulators or GHG programs can create lists of project types which they have determined to meet their approved tests of additionality.

By stipulating the standardized approaches required, or even applying them as positive lists or approved protocols, government regulators and GHG programs can ensure the right experts are involved, and that the appropriate barriers to practice change are identified and tested.

Appendix A – Supplemental Information

Baselines and Additionality

When quantifying emission reductions, the baseline condition represents the conditions that would likely have occurred in the absence of the proposed program. In other words, the baseline represents the business-as-usual (BAU) practice and the insetting program represents a change from this practice.

Baselines can be standardized or specific to the project. Standardized baseline assessments involve using a generalized approach that defines the baseline or BAU scenario. Project-specific baseline assessments involve a case-by-case examination of inset projects to deem whether a project is additional. Under a project specific approach, a distinct project baseline scenario is identified and any emission reductions beyond the baseline are considered additional.

Common Additionality Approaches

At the highest level, most existing and proposed carbon reduction systems have some programmatic level additionality criteria. For example, most specify that project activities must start after a certain date and be surplus to regulatory requirements. In other words, a carbon reduction cannot be generated from an action that is already required by law[1].

At a more granular level, additionality is generally assessed at either the project or system level. At this level, a distinct project baseline scenario is identified and any emission reductions beyond the baseline are considered additional. The two most common types of project or system level additionality assessments are Common Practice Tests and Barriers Tests (also known as the positive list method).

Common Practice Tests

Common Practice Tests can take several forms. The Alberta offset system employs a common practice performance benchmark, applied to most protocols (excluding energy efficiency and fuel switching protocols for example), where a project does not qualify for offset credits once there is 40% market penetration of the project activity or technology within the sector. For example, when an activity (e.g. no till practices) is taken up by more than 40% of the sector (e.g. cropping sector) it is no longer considered additional. Similarly, the Climate Action Reserve and Verified Carbon Standard (the former a North American voluntary program and the latter a globally applicable voluntary program) employ a 5% limit on sector uptake before other additionality metrics are reviewed to ascertain if project

[1] Federal, provincial and/or municipal laws, regulations, directives and by-laws all apply.

activity implementation is deemed common practice. The level of market penetration representing common practice can differ between sectors and geographic areas but is widely used in offset systems.

The analysis of current uptake in a sector is typically conducted by the GHG program administrator, but can be subject to assumptions and interpretations, depending on the type of project.

Barriers Tests/ Positive List

The barriers test or positive list method of assessing additionality requires the project developer to demonstrate if the project would have occurred in the absence of the incentive of emission reduction credits. Essentially barriers tests/positive lists aim to demonstrate that the generation of credits will help overcome barriers to implement of the project. Barriers or questions may refer to:

- Investment/financial benefits of the project;
- Implementation barriers such as technology risk or lack of information/new technology; and/or
- Social opposition and institutional barriers.

A good example of the positive list method for assessing additionality is offered in the American Carbon Registry offset system. To prove additionality, a project must prove that there is no regulatory or legal requirement, it is not employed as common practice in the field or industry/sector in the geographic area, and that there is at least one barrier to implementation. Barriers can include: financial constraints (capital, economic viability without offset credits), technological constraints (reason for implementation is GHG reduction/sequestration), or institutional constraints (organization, cultural or social barriers).

Table 1 below provides a more thorough description of possible barriers that can be considered in barrier/positive list tests.

Table 1: Potential Barriers Examined in Barriers Tests/ Positive Lists

Barrier Type	Description
Financial	Financial additionality assessments disqualify commercially attractive projects that produce profit independent from the sale of offsets as they would have likely occurred without the existence of the offset system. If a project level financial additionality test is required by the rules of an offset system, a standardized set of assumptions (e.g. discount rate, payback period) should be established by the offset program to ensure consistency of the test between projects. In practice, there may be projects whose financial statements may seem to disqualify them, yet other, non-

Barrier Type	Description
	monetary barriers, such as technological or social barriers, are sufficient justification for the project to be considered additional.
Technological	Technologies that are readily available and economic to install are generally not considered additional. However, if a technology is not available or requires significant financial investment to install, it is considered to have a barrier impeding it's use and is therefore additional. Other technological barriers may include research and development deployment risk, lack of trained personnel and supporting infrastructure for technology implementation and lack of knowledge on the practice/activity (American Carbon Registry, 2015).
Institutional	"Institutional barriers can include institutional opposition to technology implementation, limited capacity for technology implementation, lack of management consensus, aversion to upfront costs and lack of awareness of benefits" (American Carbon Registry, 2015).
Social	Social barriers assess public perception and understanding of the new technology/practice. Often a lack of understanding can impede adoption of a new practice, which generates a barrier. A protocol can help create understanding of a practice and advance its implementation.

It's generally recognized that financial additionality criteria do not fit industrialized nation's activities well. The concept of financial additionality under the Clean Development Mechanism (CDM) was to prevent relatively wealthy companies from instituting sustainable development projects that would result in a windfall of revenues, based on carbon credits, at the expense of the host nations who may or may not receive the touted benefits of the projects implemented. As a result, various international organizations such as the CDM and Verified Carbon Standard (VCS) have not settled on explicit assessment pathways on which activities are deemed 'truly' additional, and the definitions are in a continual state of flux.

No matter how quantitative and objective, all additionality tests will create some false positives (i.e. projects that appear additional even though they are not) and false negatives (i.e. projects that appear non-additional even though they are). The design of the test determines if it will err on the side of false positives or false negatives. Deciding which is more acceptable must be determined through a political process. It is important to understand that while false positives and false negatives both impair economic efficiency, only false positives undermine the environmental integrity of offsets. In other words, it is the false positives – offsets from non-additional projects – that lead to increases in emissions and therefore hinder climate protection goals.

Performance Standard Baselines and Proportional Additionality

A Performance Standard Baseline establishes a generic baseline scenario against which all projects (of a given type) are assessed. This baseline can take the form of a quantitative performance standard − or "benchmark" carbon intensity per unit of output − specific to a given sector. For example, an electricity carbon intensity in $kgCO_2/kWh$ defined for the power sector.

Any project with emissions below this pre-defined benchmark is automatically deemed additional.

The advantage of benchmark approaches is they are simpler and more transparent to apply. They shift the workload from individual project hosts to a centralized entity that collects the necessary sector-specific data and decides the level at which to set the benchmark. However, establishing a benchmark requires comprehensive data collection and verification, as well as regular updates. Furthermore, the political process to approve a benchmark may take a long time and it may only be feasible for certain industries. Another problem with performance benchmarks is that they can be viewed as too simple since all activities whose emissions fall below the benchmark emissions are awarded credits, regardless of whether they would have taken place anyway.

Proportional additionality awards emission reduction credits based on the total emission reduction achieved in a sector for a particular practice, to date. The quantity of emission reduction credits awarded to each project is the proportion of this total based on a predetermined metric, such as production. An example of this approach can be found in Alberta's Conservation Cropping Protocol (see appendix for an explanation of the approach used in the Conservation Cropping protocol). Proportional additionality is mentioned in the WCI Offset Policy Criteria (2010) and has been positioned in important pieces of policy in North America (Canada's Turning the Corner Climate Change Policy 2008; the US Senate Waxman-Markey Bill 2007).

Appendix B – Proportional Additionality Approach

Conservation Cropping Protocol in Alberta – Addressing Additionality
(within Combined Tillage System Management and Summerfallow Reduction Protocol)

Issue:
The new combined Conservation Cropping Protocol (Tillage System Management and Summerfallow Reduction in the Dry Prairie Region) may come under fire due to the adoption levels of No-Till in Alberta. This brief is designed to clarify why traditional assumptions of additionality may not necessarily apply to this type of activity, both from a wider North American perspective and a Canadian and Alberta perspective.

Background:
Additionality is one of the foremost issues surrounding offsets internationally. Additionality involves trying to justify intent. In other words, to qualify as an activity in a protocol, one needs to demonstrate that the activity will result in greenhouse gas (GHG) reductions/removals that are **additional** or **incremental** to what would have happened in the absence of the project (i.e., baseline condition). Different tools have been developed globally to improve assessments of additionality.

It's generally recognized that financial additionality criteria do not fit industrialized nation's activities well. The concept of financial additionality under the Clean Development Mechanism (CDM) was to prevent relatively wealthy companies from instituting sustainable development projects that would result in a windfall of revenues, based on carbon credits, at the expense of the host nations who may or may not receive the touted benefits of the projects implemented. As a result, various international organizations such as the CDM and Verified Carbon Standard (VCS) have not settled on explicit assessment pathways on which activities are deemed 'truly' additional, and the definitions are in a continual state of flux. Financial additionality, including the 'least cost pathway' is being relegated to a secondary consideration within a host of other assessments.

1. __Additionality Definitions in the North Amercian/Global Context:__
The Tillage System Management component of the Conservation Cropping Protocol uses a performance standard baseline, that is proportionally adjusted to the level of practice uptake of various tillage systems in different soil regions of Alberta. This proportional method of additionality, coupled with the recognized importance of soil sequestration to climate change mitigation, results in unique approaches to this protocol that differ from most others in addressing additionality. This is recognized in Alberta, the government of Canada's policy statements on Offsets, proposed US policy statements, the WCI proposed Offsets Criteria, and the Australian Carbon Farming Initiative:

Environment Canada Policy Statements (June 2009):

- Section 2.3.4 - The project must achieve incremental greenhouse gas reductions, that is:
    - The project must have started to achieve reductions in greenhouse gases on or after January 1, 2006, except for projects that are susceptible to easy reversal (such as reduced and no-till projects in agriculture), for which the Minister may specify a normalized baseline[2] in the Offset System Quantification Protocol that all projects can utilize regardless of start date.

American Clean Energy and Security Act HR 2454: (Waxman Markey Bill)

- Activities that are readily reversible, may have a start date no earlier than January 1, 2001, where an alternative date may produce an environmental benefit by removing an incentive to cease and then re-initiate activities that began prior to January 1, 2009.
    - Also in Section 734a (2) and Sec 504a (2) b, for activity baselines, it reads:
        - a standardized methodology for establishing activity baselines for offset projects. The Administrator shall establish activity baselines to reflect a conservative estimate of business-as-usual performance or practices for the relevant type of activity such that the baseline provides an adequate margin of safety to ensure the environmental integrity of offsets calculated in reference to such baseline.

Western Climate Initiative (WCI) Offset Criteria:

- WCI aims for the most conservative baselines possible to guarantee that projects go beyond business as usual. To accomplish this, WCI will identify the most stringent regulatory and legal requirements found in any of its jurisdictions - and measure baselines against those requirements.
- Performance Standard baselines are the preferred option, but, where jurisdictions have varying levels of regulatory, incentive or adoption levels - WCI Partners can suggest alternative protocols.
- In this regard, WCI retains the option to use what it terms "proportional additionality" to determine performance standards for agriculture and forestry sequestration. WCI proposes to assess sector activity across a region (a jurisdiction or WCI as a whole) and measure change in a project's carbon stocks against this sector level baseline[3]

Australian Carbon Farming Initiative:

- The Australian Carbon Farming Initiative uses a 'positive list' of activities or project types which they deem additional. That is, the Australians have made policy decisions to deem conservation tillage as additional activities. The Government of Alberta can also make a policy decision to proceed with this protocol — they can decide to include conservation

[2] A normalized baseline is essentially an adjusted baseline or the use of proportional additionality.

[3] See http://www.westernclimateinitiative.org/component/remository/Offsets-Committee-Documents/Offsets-System-Essential-Elements-Final-Recommendations

cropping, for the reasons described therein, as a legitimate approach to real reductions of GHGs.

2. Alberta Context:

In Alberta, the Tillage System Management component of the Conservation Cropping Protocol allows early adopters and projects implemented after Jan 1, 2002 (Alberta's start/crediting date) to be eligible to create credits at a discounted rate (essentially adjusting the carbon gain to zero), starting Jan 1, 2012, for only new, incremental carbon to be credited. Thus, no one receives credit for the carbon stored to date; everyone applies the discounted coefficient. This is the policy solution to forming a more equitable arrangement between late and early adopters – while maintaining the practice, and the sink stored to date, by those who adopted earlier. For the Tillage System Management protocol, 2001 Census data represent the baseline carbon gains that were set to zero. Adoption of No Till in the 2006 Census increased by about 20% relative to 2001 levels.

The maintenance of stored carbon up until the start date of the system is an important policy objective for Alberta, in the proposed Canadian rules, in US draft legislation, WCI objectives and Australian policy. By incenting this continued activity by early adopters it ensures that the carbon stored to date (up to 6 Mt of carbon (not CO_2e) from 1990-2001 in Canada)[4] is maintained. The introduction of an Offset System policy, with all of it's new regulatory criteria (real, permanent, measureable) should recognize the need to keep soil sequestration to date 'permanent' – thus avoiding perverse policy outcomes.

The original designers of the Tillage System Management protocol (Agriculture and Agri-Food Canada and Environment Canada policy makers) thought that the proportional additionality approach to the baseline achieved a more equitable outcome for all stakeholders in Canada. Other offset systems and registries are considering this approach as well (see Appendix for how the baseline coefficients were generated).

EXAMPLE: Approach for Generating Baseline Coefficients (historical document and the basis for the Alberta Conservation Cropping protocol).

The Census of Agriculture tillage system adoption rates for 1996 and 2001 are shown in Table 2.5.9. These values reflect the proportion of land area reported in two questions, the first being the seeding question #107 provided in Table 2.5.7. The second question (#109) is the area of fallow land using chemical only, chemical and tillage, and tillage only for weed control. These three categories correspond to NT, RT, and FT tillage systems, respectively. The detailed

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calculation of the Census data is shown in Annex I. The straight line interpolated values for 1999 are used for the baseline assessment in this protocol.

Table 2.5.9 Interpolation of 1999 land area in NT, RT, and FT from 1996 and 2001 Census data (in percent of total seeded plus summerfallowed land area).

	NT			RT			FT		
	1996	2001	**1999** [1]	1996	2001	**1999**	1996	2001	**1999**
East	3.99	4.80	4.48	16.40	19.10	18.02	79.61	76.10	77.50
East-Central	14.96	20.72	18.42	20.92	20.81	20.85	64.12	58.46	60.72
Parkland	11.04	23.66	18.61	32.90	33.90	33.50	56.06	42.44	47.89
Dry Prairie	19.76	36.25	29.65	32.91	29.66	30.96	47.33	34.09	39.39
West	11.49	15.06	13.63	20.62	17.39	18.68	67.89	67.56	67.69

Note: [1] Interpolated 1999 value = 1996 value + [(2001 value – 1996 value) * 3/5]

Generating Baseline Deductions from Tillage Adoption Data

The concept of a baseline deduction has been discussed in section 2.2 (a) and a simple example was provided. In reality, the deduction calculation is made more complex because of the presence of three tillage systems, instead of two. Reduced till can be considered a partial change from full till, with no-till involving a more complete change. Since reduced till also contributes toward GHG emission reductions and removals it must also be considered in the baseline deduction.

The intent of the protocol is to establish net coefficients for NT, RT, and FT. All three of these are impacted by the current level of NT, RT, and FT adoption in the baseline. The equations used to calculate these net coefficients are as follows. This methodology preserves the integrity and principles set out in the ISO 14064:2 standard.

Net NT coefficient = [Raw Coeff(FT to NT)*(%Area in FT)/100% + Raw Coeff(RT to NT)*(%Area in RT)/100%]

Net RT coefficient = [Raw Coeff(FT to RT)*(%Area in FT)/100% + Raw Coeff(NT to RT)*(%Area in NT)/100%]

Net FT coefficient = [Raw Coeff(RT to FT)*(100%Area in RT)/100% + Raw Coeff(NT to FT)*(%Area in NT)/100%

Table 2.5.10 provides the sum of all raw coefficients quantified earlier and presented previously in tables 2.5.2, 2.5.3, and 2.5.6. Using the baseline adoption rates provided in Table 2.5.9 and the above equations, net coefficients are provided in Table 2.5.11.

Table 2.5.10 Summary of Raw Coefficients associated with Tillage Changes

Region	Tillage Change	10 year SOC	N_2O	Energy	Total
East	FT to NT	0.25		0.1649	0.415
	FT to RT	0.20		0.1186	0.319
	RT to NT	0.08		0.0463	0.126
	NT to FT	-0.25		-0.1649	-0.415
	RT to FT	-0.20		-0.1186	-0.319
	NT to RT	-0.08		-0.0463	-0.126
East Central	FT to NT	0.41		0.1649	0.575
	FT to RT	0.16		0.1186	0.279
	RT to NT	0.26		0.0463	0.306
	NT to FT	-0.41		-0.1649	-0.575
	RT to FT	-0.16		-0.1186	-0.279
	NT to RT	-0.26		-0.0463	-0.306
Parkland	FT to NT	0.59	0.045	0.1091	0.744
	FT to RT	0.22	0.045	0.0239	0.289
	RT to NT	0.31	0.000	0.0852	0.395
	NT to FT	-0.59	-0.045	-0.1091	-0.744
	RT to FT	-0.22	-0.045	-0.0239	-0.289
	NT to RT	-0.31	0.000	-0.0852	-0.395
Dry Prairie	FT to NT	0.41	0.014	0.0589	0.482
	FT to RT	0.15	0.014	0.0250	0.189
	RT to NT	0.19	0.000	0.0339	0.224
	NT to FT	-0.41	-0.014	-0.0589	-0.482
	RT to FT	-0.15	-0.014	-0.0250	-0.189
	NT to RT	-0.19	0.000	-0.0339	-0.224
West	FT to NT	0.20		0.1091	0.309
	FT to RT	0.03		0.0239	0.054
	RT to NT	0.16		0.0852	0.245
	NT to FT	-0.20		-0.1091	-0.309
	RT to FT	-0.03		-0.0239	-0.054
	NT to RT	-0.16		-0.0852	-0.245

Table 2.5.11 Net Coefficients for use in this Protocol (Mg CO_{2e} ha^{-1} yr^{-1})

Tillage System	East	East Central	Parkland	Dry Prairie	West
No-till	0.3443	0.4129	0.4886	0.2594	0.2550
Reduced till	0.2413	0.1127	0.0646	0.0079	0.0031
Full till	-0.0760	-0.1640	-0.2351	-0.2014	-0.0522

It is important to note that net coefficients for full till are negative and not zero. In the absence of a baseline they would be zero. In other words, a negative FT coefficient reflects that there is already RT and NT in the baseline. Therefore, the practice of FT at the project level reflects a reversal in practice from the baseline scenario, and therefore must be negative. For regions where the adoption of NT and RT is high, the size of the negative FT value is also larger.

This negative FT coefficient attributable to baseline condition is not the same as a reversal that occurs as a result of previously removed or sequestered soil organic carbon being lost due to a change to FT. This latter type of reversal is discussed in the next section.