Inputs on modalities and procedures for alternative approaches to addressing the risk of non-permanence under the Clean Development Mechanism (CDM) per the decision of the SBSTA 39 on the agenda item 12(b), paragraph 3

Views submitted by the World Bank

1. Introduction

In response to the decision of the thirty-ninth session of the Subsidiary Body on Scientific and Technological Advice (SBSTA) on the agenda item 12(b)[1], paragraph 3 (FCCC/SBSTA/2013/L.26), the World Bank welcomes the opportunity to present inputs on the modalities and procedures for alternative approaches to addressing the risk of non-permanence under the CDM.

The inputs in this submission are based on the analytical work conducted by the World Bank in collaboration with Nicholas Institute for Environmental Policy Solutions, Duke University, USA[2]. It is hoped that this submission provides useful inputs in the development of modalities and procedures to addressing the risk of non-permanence under the CDM.

In this submission, alternative approaches to addressing the risk of non-permanence are elaborated along with suggestions on the revisions to the decision 5/CMP.1 (modalities and procedures of A/R project activities under the CDM) (FCCC/KP/CMP/2005/8/Add.1) to include modalities and procedures applicable to alternative approaches.

The suggestions made in this submission on alternative approaches are in addition to the existing approach to addressing the non-permanence in the decision 5/CMP.1. The alternative approaches suggested are expected to provide choice and flexibility to project participants of A/R projects in implementing alternative approaches suiting to their circumstances as well as overcome the constraints associated with temporary credits under the existing modalities and procedures.

2. Background

Land Use, Land-Use Change and Forestry (LULUCF) activities generate greenhouse gas (GHG) emission reduction credits by removing carbon dioxide (CO_2) from the atmosphere and sequestering it in aboveground and belowground biomass, litter and soils pools or avoiding their conversion. A biophysical feature of LULUCF activities is the risk of *non-permanence*, leading to the release of sequestered carbon back into the atmosphere as CO_2.

[1] As per the decision.2/CMP.7, paragraph 7 (FCCC/KP/CMP/2011/10/Add.1), the SBSTA has been requested to consider and as appropriate develop and recommend modalities and procedures to address the risk of non-permanence under the CDM.

[2] Murray BC, Galik CS, Mitchell S, Cottle P (2012) Alternative Approaches to Addressing the Risk of Non-Permanence in Afforestation and Reforestation Projects under the Clean Development Mechanism. Nicholas Institute for the Environment, Duke University, prepared for the BioCarbon Fund at the World Bank's Carbon Finance Unit, Washington DC.

The land use mitigation activities involving management of cropland, grassland, and forests, including afforestation and reforestation activities are subject to natural risks (e.g. fire, wind, pests and diseases etc.); anthropogenic factors (e.g. encroachment, theft, harvesting, land conversion); political risks (e.g. non-enforcement, expropriation, policy changes); economic risks (e.g. changes in opportunity costs of land); financial, market and institutional risks (Watson et al.2000)[3].The risk associated with natural factors such as fire, wind, droughts, floods, pests, and disease can be categorized as *unintentional risks*; while anthropogenic actions such as harvests outside of the management plan or changes to land use prior to the project crediting period are considered *intentional risks*.

3. Significance of the non-permanence risk for land use mitigation activities

The carbon sequestered in land use activities in terrestrial ecosystems is subject to the risk of non-permanence due to disturbances that cause the stored carbon to be emitted back into the atmosphere. Such reversal of carbon sequestered in terrestrial pools can nullify emissions reduction benefit and undermine the *permanence* of mitigation actions. With a systematic assessment of risks and exclusion of intentional risks through legal and regulatory provision, and adoption of suitable approaches to address unintentional risks, it is possible to address non-permanence risk in land use activities. In this context, definition of permanence period over which risks are to be addressed also assumes priority.

This submission refers to non-permanence risk in the context of A/R project activities under the CDM as modalities and procedures of A/R project activities have been in implementation. However, the inputs of this submission are also relevant to additional LULUCF activities such as mitigation activities in cropland, grassland, wetland or other land use categories that may be considered for inclusion under the CDM.

4. Progress made in addressing non-permanence risk in LULUCF activities under different standards

Adequately accounting for the risk of non-permanence in LULUCF activities has been a point of discussions of the parties to the United Nations Framework Convention on Climate Change (UNFCCC). Deliberations on the topic were held during the development of modalities and procedures of A/R project activities. The options paper on addressing the non-permanence risk prepared for the eighteenth session of the SBSTA[4] discussed relevant issues and highlighted the approaches of buffer, insurance, credit reserves, and temporary CERs (tCERs) for addressing the risk of non-permanence. Subsequently, in the modalities and procedures of A/R project activities implemented under the CDM (Decision 5/CMP.1), temporary crediting approach has been adopted to address the risk of non-permanence.

During the past few years, alternative approaches to address non-permanence in LULUCF project activities have been adopted under voluntary standards; and project activities supporting carbon capture and storage under the CDM.

In the context of land use project activities, voluntary standards have adopted buffer as a major approach to address the risk of non-permanence, while insurance has also been permitted in lieu of buffer in some voluntary standards (e.g. American Carbon Registry).

[3] Watson et al (2000): Land Use, Land Use change and Forestry: A Special Report of the Intergovernmental Panel on Climate Change, Intergovernmental Panel on Climate Change, Geneva.

[4] Options paper on modalities for addressing non-permanence, eighteenth session of SBSTA (FCCC/SBSTA/2003/5).

In the context of carbon capture and storage, as per the Decision 10/CMP.7, modalities and procedures approved for carbon capture and storage (CCS) in geological formations as CDM project activities[5], permit a combination of approaches involving buffer and host country guarantee and in lieu of which it, Annex I country guarantee or third party guarantee to address the risk of non-permanence.

5. Experience with the existing approach to address the non-permanence risk under the CDM

Temporary crediting approach in the form of tCER/lCER has been adopted to address the risk of non-permanence for A/R project activities under the CDM. Temporary credits tCERs and lCERs, expire at the end of commitment period and crediting period, respectively and need to be replaced. Credits under the temporary approach expire at the end of the project and need to be replaced with permanent credits at the end of a project.

Experience with the temporary crediting approach implemented in A/R project activities under the CDM during the first commitment period indicates that this approach although addresses the risk of non-permanence as credits issued to a project expire at the end of project, it does not contribute to economic viability of projects due to low prices of expiring temporary credits (tCERs/lCERs) relative to the permanent CERs issued to projects in other sectors under the CDM, and limited demand for temporary credits due to the buyers' liability to replace credits. Temporary credits also create compliance and liability issues for the mechanism over the long term with regard to replacement of temporary credits at the end of a project's period, in situations where entities that hold tCERs/lCERS do not replace or cease to.

Taking into account the experience with temporary crediting approach for A/R project activities under the CDM and progress made in addressing the risk of non-permanence for LULUCF activities under the voluntary standards, parties through the decision.2/CMP.7, paragraph 7, requested the SBSTA to consider and as appropriate develop and recommend modalities and procedures to address the risk of non-permanence under the CDM[6]. The inputs of this submission are expected contribute to this objective.

6. Suggested revisions to the Decision 5/CMP.1 (modalities and procedures of A/R project activities under the CDM) (FCCC/KP/CMP/2005/8/Add.1) to address the risk of non-permanence

Considering the significance of non-permanence risk to A/R activities, there is a need for adopting suitable modalities and procedures for addressing the risk of non-permanence. In this context, suggestions on revisions to the decision 5/ CMP.1 on modalities and procedures of A/R project activities under the CDM **(**FCCC/KP/CMP/2005/8/Add.1) (and additional LULUCF activities that may be included under the CDM in the near future) to address the risk at different stages of project cycle such as at validation and registration; monitoring; verification and certification; issuance of CERs; and inclusion of relevant information in the project design document and monitoring plan formats.

6.1 Definition of terms related to the risk of non-permanence

The terms relevant to non-permanence risk need to be included in the definitions of Section A of the Annex to modalities and procedures of A/R project activities under the CDM (decision 5/ CMP.1). In this

[5] FCCC/KP/CMP/2011/10/Add.2 (Decision 10/CMP.7)
[6] (FCCC/KP/CMP/2011/10/Add.1),

context, some terms related to the risk of non-permanence noted below are adapted based on the documentation of the Voluntary Carbon Standard pertaining to the non-permanence risk[7].

Permanence period*: F*rom mitigation policy perspective, the length of time that carbon must remain out of the atmosphere for emission reduction to be considered permanent. The non-permanence risk is relevant for the duration of permanence period[8].

Risk of non-permanence: It is the risk of release of stored carbon from a project activity back into the atmosphere as CO_2 during the permanence period. The risk may be in the form of *unintentional* caused by natural factors such as fire, wind, other extreme weather events, and pests and disease; and/or *intentional* caused by purposeful actions such as harvests that are not part of the management plan or conversion or changes to land use prior to the end of a project's crediting period.

Risk Report**:** It is a report prepared by project participants using the CDM approved Risk Report Template and Risk Assessment Tool.

Risk Assessment Tool: The risk assessment tool covers various categories of risks such as natural disturbances (fire, wind, storms, floods, droughts, other extreme weather events, and pests and diseases), risks involving financial, economic, management, and social (land tenure, community engagement, political stability) aspects that lead to non-permanence.

Reversal: refers to a loss of significant carbon stock in pools included in the project boundary due to natural disturbances or anthropogenic causes.

Reversal Report: It is a report prepared subsequent to a reversal event describing the details of reversal using the CDM approved Reversal Report Template.

Risk profile: Based on the review of non-permanence risk, a DOE is expected to assign risk profile to a project at validation and subsequent verifications in the range of 10 to 60%. A project with a risk profile greater than 60% is considered ineligible for registration under the CDM until such time the relevant risks are addressed.

Liability**:** Liability refers to assignment of responsibility for replacement of the carbon lost when non-permanence risk materializes[9]. Liability for replacement of carbon lost can vary by approaches adopted. For example, in case of buffer approach, liability for loss beyond buffer contribution primarily rests with project participants unless contract specifies transfer of the liability to buyer. In case of insurance, liability can be with project participants for the amount of deductible of insurance policy; and liability for losses beyond deductible rests with insurance agencies. In case of combination of approaches such as buffer and country (host or Annex I) guarantee, liability beyond buffer contribution may rest with the agency providing guarantee.

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[7] Voluntary Carbon Standard (2013) VCS Program Definitions; AFOLU Non-permanence Risk Analysis and Buffer Determination; AFOLU Non-permanence Risk Tool, version 3.2; VCS Risk Report Calculation Tool, version 3.0; Non-permanence Risk Report, version 3.0.

[8] Several voluntary standards (Verified Carbon Standard, Climate Action Reserve etc.) and Australia's Carbon Farming Initiative defined permanence period as 100 years, whereas American Carbon Registry has defined a contract period of 40 years, beyond which credits issued to projects are not expected to be replaced.

[9] The procedures to be followed for establishing liability, its time frame, and enforcement need to be clarified in the modalities and procedures.

6.2. Modalities and procedures for addressing non-permanence at validation and registration

A pre-requisite for adopting alternative approaches for addressing the risk of non-permanence is to conduct an assessment of risks contributing to the risk of non-permanence is to determine the risk profile of a project[10]. Proposals for risk assessment studies and risk management were also highlighted in the options paper on modalities for addressing non-permanence prepared for the eighteenth session of the SBSTA in 2003 (FCCC/SBSTA/2003/5). In this reference, the modalities and procedures for risk assessment need to be approved to establish the risk profile of a project. The risk assessment is expected to facilitate projects to manage risks in a proactive manner and to also strengthen project due diligence.

6.2.1 Assessment of non-permanence risk

For A/R project activities seeking to implement alternative approaches to address non-permanence risk, the modalities and procedures should require assessment of non-permanence risk for A/R activities and preparation of a risk report following the Risk Report Template and Risk Assessment Tool approved by the CDM as an annex to the project design document and monitoring plan. The assessment should cover different categories of risks relevant to A/R projects such as risks due to natural disturbances, risks within a project, and risks external to a project[11].

As part of the validation, DOE shall review the risk report and risk assessment tool prepared by project participants taking into account relevant data, assumptions, and supporting documentation. The project participants shall respond to the DOE's validation findings on the non-permanence risk assessment and should amend the risk report and project documentation as necessary and update the risk profile of a project. DOE should include its opinion on a project's risk profile in the validation report and subsequent verification reports.

A project whose risk profile is within the permitted risk threshold should adopt an approach or a combination of approaches to be eligible for registration as an A/R project under the CDM.

6.2.2 Exclusion of projects with high risk

[10] Several voluntary carbon standards such as Verified Carbon Standard, American Carbon Registry, and Climate Action Reserve have implemented procedures for assessing the risks of non-permanence. These standards use information from risk assessment to establish the proportion of credits to be set aside in a buffer account for the purpose of replacing reversed credits. Thus the risk screening and assessment forms the basis for the risk management system to address non-permanence risk under various voluntary standards. A similar approach could be followed for A/R projects under the CDM, regardless of the approach put in place to address reversal. For example, Verified Carbon Standard (VCS) requires project proponents to develop an assessment of project risks covering various categories such as - project management (e.g., management experience, asset protection capability);financial viability (e.g., payback period, sustained financing); opportunity costs (relative value of competing land use); project longevity (e.g., legal requirement to continue the practice) using the VCS Non-permanence Risk Tool.

[11] (i) *Risks due to natural disturbances:* include risk due to wild fires, wind, floods, droughts, other extreme weather events, pests and diseases; (ii*) Risks within a project*: refer to risks associated with project management, financing, and operations that may impact a project; and (iii) *Risks external to project*: include aspects related to legal, policy, institutional aspects that influence a project.

A project whose risk profile is validated by DOE as greater than the risk threshold defined for non-permanence risk shall be considered ineligible for registration as CDM project until such time the relevant risks are addressed.

6.2.3 Implementation of alternative approaches to address the risk of non-permanence

Subsequent to risk assessment, a project whose risk profile is below the risk threshold is expected to implement alternative approaches to address the risk of non-permanence. In this context, the paragraph 12 (f) of Section G, modalities and procedures of A/R project activities under the CDM (decision 5/CMP.1) should be revised to include alternative approaches to addressing the risk of non-permanence, which can be grouped into two categories; (i) approaches for credits issued after meeting permanence requirements; (ii) approaches for credits issued prior to meeting permanence requirements.

The alternative approaches relevant to both the above categories are noted below and further details on them are presented in **Annex I** to this submission.

6.2.4 Approaches for credits issued after meeting permanence requirements

For contexts where credits issued upon compliance with permanence requirements are not required to be replaced subsequent to reversal as credits issued have fulfilled permanence. Tonne-year approach represents this category.

Tonne-year approach, wherein a fraction of credits earned in each year is issued at verification upon meeting permanence requirements. A notion of tonne-year is that a tonne of CO_2 stored at time period *t* and emitted in the future period has fulfilled permanence for this fraction of permanence period defined.

Under tonne-year approach, the proportion of credits issued have relationship to the permanent period defined assuming a linear relationship in the absorption and emission of a CO_2 pulse. For example, a project with 100-year permanence period can receive 1% of permanent CERs at verification for each year of project completed; and a project with 40-year permanence period, receives 2.5% of permanent CERs at verification for each year of project completed.

However, scientific studies show that the time profile of atmospheric absorption and residency follows non-linear pattern instead of linear tonne-year increments noted above. Studies estimate that about 50 percent of the net anthropogenic CO_2 pulse would be absorbed in 50 years, and about 70 percent of the net anthropogenic CO_2 pulse in 100 years, and the remaining amount is removed from the atmosphere slowly over thousands of years. In this reference, suggestions have been made that for sequestration projects that have a crediting period of up to 40 years, credits issued could be 31.2 % of the full credits, and for projects that have duration of 70 years, the amount of credits that could be issued is 59.4% of the full credits (Watson et al. 2000)[12].

In the above context, to balance scientific and economic rationale of incentivizing long term mitigation activities, for example, an A/R project implemented with renewable crediting option in its first 20-year crediting period could be issued with X% of GHG removals by sinks as permanent CERs; Y% of GHG removals by sinks as permanent CERs during the second crediting period until 40 years; and Z% of GHG removals by sinks as permanent CERs during the third crediting period (i.e. until 60 years).

[12] Watson et al (2000): Land Use, Land Use change and Forestry: A Special Report of the Intergovernmental Panel on Climate Change, Intergovernmental Panel on Climate Change, Geneva.

6.2.4 Credits issued prior to meeting permanence requirements

The alternative and their combinations under this category are noted below and further details on them are presented in **Annex I** to this submission.

(a) Buffer approach, wherein certain proportion of credits are set aside in a buffer account taking into account the risk profile of a project.

(b) Insurance approach, in which a third party is contracted to cover the non-permanence risk for insurance premium paid by project participants to insurance agencies during project period.

(c) Combination of approaches*, wherein a* project can choose a combination of approaches from the list of approaches approved by the CDM for addressing the risk of non-permanence. Combination of approaches can include - buffer and insurance; and buffer (and insurance) in combination with host country (or third party guarantee approved by host country) or Annex I country guarantee, as well as other approaches approved under the CDM.

Combination of approaches for A/R project activities involving buffer and host country guarantee builds on the modalities and procedures for carbon capture and storage (CCS) in geological formations as CDM project activities allowing a combination of approaches involving buffer and government guarantee either by a host country or by an Annex I country.

6.3. Modalities and procedures for addressing the non-permanence risk as part of monitoring

Paragraph 25, section H of the modalities and procedures of A/R projects need to be revised to include the monitoring requirements for the approaches addressing non-permanence in the project design document and monitoring plan.

As part of monitoring, projects should perform risk assessment at the end of each monitoring period and prepare a risk report following the approved Risk Report Template and Risk Assessment Tool.

When a non-permanence risk materializes during a monitoring period leading to reversal for which CERs have been previously issued, a project is expected to submit a reversal report providing data and information on the area and carbon stock affected in the event. The reversal report prepared using the reversal report template shall be submitted to the CDM EB within one year of occurrence of a reversal event.

Buffer approach

Based on the reversal report, the CDM EB will put the project's buffer credits in an amount equal to those reported in the reversal report on hold in the CDM buffer pool account.

Insurance approach

The project participants are expected to share reversal report submitted to the CDM EB with the insurance agency

The monitoring report prepared at the end of a monitoring period should include information reported in reversal report(s), which will be verified by a DOE as part of verification.

6.4. Modalities and procedures for addressing non-permanence at verification and certification

The paragraph 34 of the modalities and procedures of A/R project activities may be revised suitably revised as below.

The DOE contracted by project participants to perform verification shall review the non-permanence risk report and approaches implemented to address the risk of non-permanence.

To verify the events of reversal during a monitoring period, the DOE performing verification is expected to review reversal report(s), verify reversals and certify the amount of reversal in the verification report.

Buffer approach

For projects using buffer approach or combination of approaches in which buffer is a part, the number of credits withheld prior to issuance of credits to be placed in a CDM buffer pool account shall confirm to the certification of buffer in the verification and certification report.

In cases of reversal, if projects fail to submit a verification report within five years from the previous verification event, a percentage of buffer credits are put on hold. Where projects fail to submit a verification report within 10 years from the previous verification event, a project's credits in the buffer are cancelled.

Insurance

For projects adopting insurance approach, DOE is expected to check the validity of insurance policy, payment of premium.

Combination of approaches

For projects adopting combinations of approaches (e.g. buffer and country guarantee), DOE is expected to conduct verification and certification of buffer, and the adequacy and credibility of country guarantee proposed.

6.5. Modalities and procedures on issuance of certified emission reductions

Paragraph 36 of the modalities and procedures of A/R project activities needs to be revised to include a sub-paragraph (c) on the issuance of (permanent) CERs for a project that has implemented one or more alternative approaches listed in the paragraph 12(f) of the modalities and procedures.

Buffer approach

In cases where the net anthropogenic GHG removals by sinks for a monitoring period assessed in a verification and certification report are positive, a reversal has not occurred and any buffer credits that

were put on hold based on an earlier reversal report shall be released from the hold status in the CDM buffer account.

Where the net anthropogenic GHG removals by sinks assessed in verification and certification report are negative, a reversal has occurred and buffer credits equivalent to the reversal amount shall be cancelled from the CDM buffer account. In cases where the reversal assessed by DOE in verification report is greater than the reversal report submitted by a project, the buffer credits equivalent to those certified as reversal in the verification report shall be transferred to the cancellation account.

Where the reversal is a non-catastrophic reversal (e.g. due to poor management or over-harvesting), no CERs can be issued to an A/R project until the deficit resulting from reversal is recovered.

In case of catastrophic reversal, credits exceeding the buffer credits contributed by a project need to be deposited in the CDM buffer account. Buffer credits deposited to replenish buffer pool after a reversal shall not be eligible for release to the project.

The balance of credits in the buffer account is cancelled at the end of crediting period unless the crediting period of a project is renewed.

Insurance approach

Where the net anthropogenic GHG removals by sinks assessed in a verification and certification report are negative, a reversal has occurred and the insurance agency is liable to replace the amount of GHG removals by sinks affected in the reversal.

Combinations of approaches

For projects adopting combinations of approaches (e.g. buffer, and host or Annex I country guarantee), with net anthropogenic GHG removals by sinks assessed in a verification and certification report are negative, a reversal has occurred and buffer credits equivalent to those certified as reversal in the verification report shall be transferred to the cancellation account. In cases where buffer credits are inadequate to cover the reversal, country guarantee is called for to cover the gap between the reversal and the buffer.

6.6. Modalities and procedures on addressing non-permanence of A/R project activities

The paragraph 38, Section K on the modalities and procedures for addressing the non-permanence of A/R activities under the CDM needs to be revised to include the issuance for (permanent) CERs.

The section K should be revised to include a separate sub-section on the provisions governing the (permanent) CERs.

The sub-sections 3 (transaction log) and sub-section 4 (reporting and review) need to revised to include the reference to CERs issued to A/R project activities.

6.7. Revisions to the Appendix B of Decision 5/CP.1

The appendix B (Project design document for afforestation and reforestation project activities under the clean development mechanism) needs to be revised to include reference to the alternative approaches adopted a project to address the risk of non-permanence.

We hope the inputs are useful. We will be glad to provide further information and clarifications as necessary.

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Annex 1

Alternative Approaches to Addressing the Risk of Non-permanence

Alternative approaches to address the risk of non-permanence can be grouped into two categories; (1) approaches for projects in which credits are issues after meeting permanence requirements; (2) approaches for projects in which credits are issued prior to meeting permanence requirements. An overview of the two categories of approaches is presented below.

A1.1 Approaches for projects in which credits are issued after meeting permanence requirements

For credits issued after meeting permanence requirements, no specific risk management measures are expected to be implemented subsequent to the risk assessment. The following alternative approaches are relevant for addressing the risk of non-permanence in situations where credits are issued after meeting permanence requirements.

Tonne-year approach, wherein a fraction of credits earned in each year after meeting the permanence requirements are issued at the end of each verification period. The equivalence time of one ton of CO_2 is leveled out by sequestration of the permanence period, independently from the future release of the carbon sequestered.

Project length and permanent period have strong influence on the number of credits earned under tonne year approach. The length of permanence period defines the fraction of the credits earned in each year, and a long permanence period equates to a small portion of credits earned in each year. The tonne-year approach considers the average timeframe for calculating annual fractions of carbon removed and divides a project into a series of tonne-years. For example, a 100-year permanence period yields a one percent credits each year, and a 40-year permanence period yields a 2.5 percent credits each year. In tonne year approach, credits upon issuance need not be replaced as reversals do not introduce integrity risks to the system as credits are only issued upon meeting permanence requirements.

A modified version of tonne-year approach is based on average rate of atmospheric CO_2 absorption and residence, wherein the proportion of CO_2 removed from the atmosphere during the permanence period is considered as the emission reduction. The time profile of atmospheric absorption and residency for a unit of CO_2 emitted into the atmosphere is a consideration in this context. A pulse of CO2 released into the atmosphere decays over time following a non-linear process, which is rapid at the beginning and slows down asymptotically over time with some portion of CO_2remaining in the atmosphere for over thousands of years. Studies estimate that about 50 percent of the net anthropogenic CO_2 pulse would be absorbed in 50 years, and about 70 percent in 100 years, and the remaining amount is removed from the atmosphere slowly over thousands of years.

In this reference, suggestions have been made that for sequestration projects that have a crediting period of up to 40 years, credits issued could be 31.2 % of the full credits, and for projects that have duration of 70 years, credits that could be issued is 59.4% of the full credits (Watson et al. 2000). If such a suggestion is accepted, X% of GHG removals by sinks can be issued as permanent CERs for A/R projects during first crediting period of a project adopting renewable crediting period; Y% of GHG removals by

sinks as permanent CERs for implemented renewed for the second crediting period (i.e., until 40 years); and Y% of GHG removals by sinks as permanent CERs for projects renewed for the third crediting period (i.e. until 60 years).

***Issues for consideration**: Credits issued under tonne-year approach are a fraction of credits sequestered under the A/R projects depend on the length of permanence period defined and average proportion of credits issued for each year of project implementation. Considering a proportion of sequestered credits that comply with permanence requirement are issued, the decision on permanence period assumes significance under the tonne-year approach.*

In the modified version of tonne-year approach, average proportion of credits issued for each crediting period assumes significance. If the proportion of credits issued for each crediting period is insufficient to meet the costs of transaction costs of a project activity, the tonne-year approach is unlikely to contribute to the viability of projects implemented under the CDM.

A1.2 Credits issued prior to meeting permanence requirements

For situations in which credits are issued prior to meeting permanence requirements, risk assessment forms the basis for adopting specific approaches. Permanent credits can be issued so long as their replacement following a reversal is guaranteed through legal requirements. By anticipating reversal risks and pooling such risks across projects, it is feasible to create a mechanism that protects against net carbon loss without sacrificing the viability of mitigation activities involving A/R projects. In this reference, the following alternative approaches for addressing the risk of non-permanence are relevant.

(a) Buffer approach, wherein based on assessment of risk profile of a project an d preparation of risk report, a project is expected to specify a proportion of CERs as buffer in its project design document and monitoring plan to cover any future reversals[13] DOE is expected to validate the risk report and amount of buffer specified as part of validation.

For a buffer to provide effective coverage against reversals, it must hold ERs in proportion to the magnitude of the risk profile assessed from the risk assessment report. The proportion of emission reductions to be set aside in buffer account depend on the risks anticipated for a project and the length of time over which the risk is evaluated relative to the thresholds specified for different categories of risks is the risk assessment tool, i.e. higher the risk profile, higher is the buffer to be withheld for a project. Buffer is expected to be effective if the number of pooled credits is adequate to compensate for the reversals that actually occur. Setting the appropriate buffer withholding rate in relation to the risk profile of a project is therefore important[14].

[13] Voluntary standards, such as Verified Carbon Standard, American Carbon Registry, Climate Action Reserve and others use the risk assessment information to establish the proportion of credits to be set aside in a buffer for replacing reversals in the future. Thus the risk screening and assessment forms the basis for risk management system to address non-permanence risk under various standards. A similar approach could be followed for A/R projects under the CDM, regardless of the approach put in place to address reversal. The risk assessment could also help projects to manage risks in a proactive manner so as to improve project due diligence.

[14] In case of voluntary standards, the share of credits withheld is based on project specific risk evaluation (determined prior to registration and recalculated at verification). For example, In case of Verified Carbon Standard, depending on a project's risk profile, 10 to 40 percent of credits could be withheld in a buffer for afforestation and reforestation projects. The registry retains ownership of buffer credits and retires buffer credits in case of actual reversal. If the project proponent fails to monitor and report carbon within a fixed period after a reversal event, the buffer credits can be cancelled.

(b) Insurance approach, permits third party contracts to cover the non-permanence risk in lieu of payment of insurance premium[15] transfer of liability for non-permanence risk to a third-party. A project is expected to pay a premium to an insurance agency[16] registered with the CDM EB. In the event of reversal, insurance agency contracted by project would be required to replace the CERs associated with equivalent quantity of CERs to the CDM Executive Board. In order for insurance to be effective, the insuring entity must be appropriately capitalized to withstand the catastrophic loss.

A project adopting insurance approach to address the risk of non-permanence is expected to include the details of insurance in the project design document and monitoring plan, along with documentation of the insurance contract, proof of payment of premium and deductible, and confirmation of compliance with the terms of insurance policy. The DOE is expected to validate the insurance information as part of validation.

Issues for consideration*: Insurance is likely to be a limited option in most developing countries. In countries where insurance is feasible, policies are likely to be written for a short duration with new premiums and deductibles estimated upon renewal. Use of insurance approach on its own is likely to be limited relative to buffer approach as premiums and deductibles of insurance are likely to increase at each renewal and also upon reversals; and value of reversals are also likely to be large as carbon price and project length increases leading to higher late year premiums and deductibles. Therefore, insurance is not likely to viable approach on its own in developing country contexts. However, insurance may have a role in combination with buffer and country guarantee as discussed under combination of approaches below*.

(c) Combination of approaches, allows a project to flexibly choose combinations of approaches from the list of approaches approved by the CDM EB[17]. Combination of approaches can include - buffer and insurance; and buffer (and insurance) in combination with host guarantee.

(i) Buffer and insurance

In the case of individual projects, insurance can be used to supplement a buffer, especially in the early years of a project. In this role, insurance can act as a backstop against early-year reversals that would otherwise overwhelm a small buffer. Insurance can also be used to augment buffer in more mature

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[15] It is relevant to note that experience with insurance for forestry projects mainly for against natural events (e.g. fire, wind etc.) exists in developed countries such as countries in Western Europe, New Zealand, Australia, Japan and US. Insurance is not expected to cover intentional risks. There is no experience with insurance for forestry and land use projects developing country contexts. For many developing countries, the setting up of a legislative and institutional framework for insurance is likely to be beyond their capacities in the near term. The absence of strong financial markets and supporting institutions in developing countries may be a more serious impediment to securing insurance than simply insufficient capital to purchase insurance.

[16] The insurance and re-insurance agencies should be accredited and registered with the CDM Executive Board in order for the projects to be able to sign contracts with the agencies.

[17] From the perspective of project participants, a flexible system with a choice among approaches to dealing with reversals is likely to be advantageous. The menu of approaches can provide incentives to project participants to combine different approaches such as a buffer or insurance, or both with host country guarantee.

projects, thus permitting insurance to be factored into risk assessment thereby lower risk profile translating in lower buffer contributions from a project.

Insurance can also be used to provide additional protection to the CDM pooled buffer account in situations of extreme loss. In this context, deduction of certain proportion of credits from a project prior to each issuance for the purpose of insuring the CDM system buffer can limit the impact of catastrophic events on the CDM buffer pool.

(ii) Buffer and country guarantee

Combination of buffer and country guarantee is relevant for most developing country contexts as a host country or its designated third party can guarantee against non-permanence risk not covered by buffer or insurance

Combination of approaches for A/R project activities involving buffer and host country guarantee builds on the modalities and procedures for carbon capture and storage (CCS) in geological formations as CDM project activities[18] allowing a combination of approaches involving buffer and government guarantee either by a host country or by an Annex I country[19].

In this combination of buffer and country guarantee, for losses beyond buffer, a country (or its designated third party such as insurance agency or multilateral agency) can choose to assume liability for losses over and above the buffer provision made for covering losses (such as a buffer) in a project. The use of host country guarantee to cover the residual risks beyond a project's buffer minimizes risks to projects while maximizing the sovereign carbon mitigation potential with guarantee. However, abuse of guarantee could lead to unrealized carbon benefits. For example, one country may have an incentive to guarantee an excessive amount of high-risk projects. To prevent such abuse, terms and conditions on the use of host country guarantee need to be included in the modalities and procedures.

[18] FCCC/KP/CMP/2011/10/Add.2 (Decision 10/CMP.7)

[19] As per the rules established by the CDM for Carbon Capture and Storage (CCS) projects, a buffer can be established to cover the non-permanence risk of stored CO_2 in CCS projects, in which 5 percent of credits issued to a CCS project would be placed in a buffer reserve for at least 20 years after the project stops receiving credits. After this 20-year monitoring period, if no leakage of CO_2 is detected, the buffer credits may be released to the project with no further monitoring is required. If a reversal occurs prior to 20-year period, buffer credits would be cancelled to compensate for reversal. If total reversals exceed the amount credits in the buffer, the project would have to compensate for additional reversals (e.g., through retirement of CERs or other Kyoto Protocol compliance units). If the project is unable to compensate for the additional reversals, then either (a) the host country of the project may cover excess emissions through the retirement of Kyoto Protocol compliance units; or (b) credits issued to the project will be invalidated (making Annex I countries liable for the reversal). Under this approach, projects would essentially be "self-insuring" (i.e., the 5% buffer reserve would be specific to each project).