Information note

"Top-down development of standardized approaches for determining methane emissions in rice field under AMS-III.AU"

I. Background

1. The Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) agreed to launch a call for public input on developing standardized approaches in small-scale methodologies as indicated in the work programme of the Board 2012 (EB 67, annex 1).

2. Stakeholders were invited to provide their input on the "Information note on top-down development of standardized approaches for determining methane emissions in rice field under AMS-III.AU. The call for input from public stakeholders was open from 14 May (12:00 GMT) to 28 May 2012 (12:00 GMT).

3. In total one public submission were received from stakeholders. The SSC WG at its thirty-seventh meeting thanked the authors of the submission. In addition the following responses were prepared by the secretariat and the SSC WG on some of the issues raised in particular those related to paragraph 20 of the information note.

II. Summary of public comments and responses by the SSC WG

4. **Question (a):** Are the proposed approaches for estimating the regional/country specific default values for methane emissions in rice field practical and appropriate? Which option should be selected? Only for the baseline scenario, or for both baseline and project scenarios? Are the values reasonable and conservative?

[Comment from World Bank]: The approach for adopting regional/country specific default values for methane emissions in rice fields is reasonable and practical and is a cost effective alternative to the monitoring and measurement of these emissions in rice fields. Option 2 (default values for both baseline emissions and project emission) is reasonable as it permits the use of default emission reduction factor based on the monitoring of rice production activities/practices. By not requiring the measurement of methane emissions, the Option 2 lowers the transaction costs of monitoring and measurement in methane emission reduction projects in rice that are most likely comprise large proportion of marginal and small farmers. Option 1 (default values for baseline emissions) may have limited use unless procedures for assessing project emissions or adoption of research/published values relevant to a project are allowed along with this option. This option could be an alternative to the Option 2, if the project participants use he ata from onitoring of project emissions or from research/publications relevant to a project context. In this context, guidelines on use of research and published data on methane emissions in an agro-ecological zone may need to be outlined to facilitate the use of such data to a program or project context. The use of IPCC default values is appropriate for promoting robust and simplified GHG accounting framework for methane emissions in rice production. The default values could be revised and updated with the availability of updated data.

[Response from SSC WG and secretariat]: Option 2 has been chosen and included in the revised methodology.

5. **Question (b):** In case Option 2 (i.e. default emission reduction factor) is selected, what kind of additional conditions or monitoring requirements if any should be included in the methodology to ensure that emission reductions are actually realized through the implementation of the project activity?

[Comment from World Bank]: It is suggested that the simplified monitoring procedures or reporting requirements to ascertain the rice production technologies/practices be included in the monitoring methodology so as to facilitate the use of default values are included in the methodology. Considering that specific factors (e.g. soil type, cultivars) can influence the magnitude of methane emissions, it will be useful to outline procedures for adopting them as per the characteristics of production system. The scaling factors (e.g. water management, organic amendments, cultivar, and technologies) and revised data based on future updates to IPCC 2006 guidelines or official reports published by country could be adopted.

[Response from SSC WG and secretariat]: With the use of default values in Option 2, project proponents do not need to measure CH_4 emissions from reference fields for both baseline emissions and project emissions. Only simple requirements to monitor A_y (Area of project fields in year *y*) and L_y (Cultivation period of rice in year *y*) have been added.

6. **Question (c):** Shall the cultivation period (days) be necessarily monitored, e.g. in logbooks? Is it possible to determine valid and conservative default values for the rice cultivation periods applicable for countries/regions or for certain and given conditions of cultivation practices?

[Comment from World Bank]: The monitoring requirements for adoption of default values need to be simple and cost effective. Therefore, it is not necessary to monitor the cultivation period or rice production practices specific to each farmer as it is costly, cumbersome and difficult to implement. The data on rice cultivation/production period from official reports on rice roduction at regional/national level could be permitted under the methodology. In this context, it will be useful to stratify the data requirements of the methodology (1) at program or project (data collected from official rice production reports at sub-regional/regional/national level); and (2) at farm(er) level using surveys.
(1) Program/project level - data requirements could include: (i) average length of one crop period/two or more crops (in days); (ii) water management practices and frequency; (iii) use of organic amendment by type (t/ha) etc.
(2) Farm(er) level – data and monitoring requirements need to be minimal and cover data specific to the farm level such as (i) area of farm under rice production (one crop/two or more crops) in ha; (ii) soil type; (ii) rice cultivar grown (iii) conformation of practices implemented to reduce methane emissions. This information could be either collected from revenue records or from farmers.

[Response from SSC WG and secretariat]: We believe that the cultivation period (especially the flooding days) should be determined using cultivation logbooks since this is the key determininant for emission reductions. Also, while we agree that the requirements and procedures should be as simple as possible for the approach using default values, we believe that project proponents and participant farmers shall make the minimum required efforts to keep control over their daily activity, and allow for monitoring and verification of some key parameters such as organic amendments and dates where the water regime is changed from one status to another, so that the default values built on applicability conditions based on IPCC guidelines can be taken at face value.

7. **Question (d):** Possible default values for the amount of organic amendments other than rice straw (i.e. t/ha application of compost, farm yard manure or green manure)

[Comment from World Bank]: The default values for organic amendments (compost, farm yard manure or green manure) in t/ha could be adopted from the data on organic amendments reported in official sources/surveys. If the data on organic amendments spans a range of values, weighted value based on the proportion of area covered under each category of amendment in a sub-region/region/country could be adopted to program/project context.

[Response from SSC WG and secretariat]: The default values above consider the rice straw on field as the only organic amendment inputs. For simplification, the following condition has been added in the revised methodology: "*Other organic amendments such as compost, farm yard manure and green manure, which have been used in the pre-project scenario, may continue to be applied at the same or a lower rate during the crediting period, but do not affect the emission reductions estimated using the default values."*

8. **Question (e):** Are there other approaches for determining methane emission factor that should be assessed? If any, please provide further justification on the proposed approach(es).
[Comment from World Bank]: In situations where data on parameters of methane emissions in rice cultivation are available for regions/country contexts from published sources using DNDC (DeNitrification-DeComposition) biochemical process models or other relevant models and data could be permitted as alternatives to the default values of the methodology or as complements for use as parameters in the equations of the methodology, provided project participants are able to demonstrate that the data are applicable to a program/project/region by confirming to the applicability conditions/criteria of the methodology. Although this note focuses on the default value for methane emissions, it is useful to also adopt similar default approach for estimation of nitrous oxide emissions (N2O) emissions for activities targeting efficient use of organic amendments (guidelines on organic amendments covered under methane emissions could also be useful for guidelines on default values for nitrous oxide emissions) and inorganic fertilizer use. The methodological approach for default values for GHG emissions in rice production could be organized in parts: (a) methane emissions and (b) nitrous oxide emissions so that project participants could target the GHG mitigation activities that address water management to reduce CH_4 the emissions; and efficient fertilizer use to reduce N_2O emissions, respectively, or CH_4 and N_2O in an integrated manner to lower the GHG emissions from both the sources under a common methodology.

[Response from SSC WG and secretariat]: Noted. We will explore the possibility of using model-based approach. Regarding N_2O emissions, the current methodology is limited to the situation where "*due to the optimized N fertilization practice (cf. applicability criteria, N fertilizer control), N_2O emissions do not significantly deviate from the baseline emissions and hence are not considered.*". We agree that an integrated approach should consider both the sources (CH_4 and N_2O). The SSC WG will look for the possiblity for introducing such an integrated approach, while assessing the proposed new methodology NM082 "Reduction of N_2O emissions from use of Nitrogen Use Efficient (NUE) seeds that require less fertilizer application". It is however to be observed that the technology/measure consisting of reduced flooding alone will not necessarily result in reduced N_2O emissions, rather on the contrary: reduced anaerobic conditions being switched to anoxic may lead to favorable conditions for the denitrificating bacteria, eventually resulting in increased nitrous oxide formation.