COMMENTS RE AMS I.E and II.G

NRB fraction

Assessment of By and Efficiency

Replacing total biomass with wood

Default values

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Assessing NRB fraction

- To clarify the NRB fractional concept it helps to start by defining it as

Fraction of biomass non-renewing =

1 – BRF

Where BRF = Biomass renewability fraction

= Annual Growth of biomass / Annual Harvest and loss of biomass

- Assessment is difficult in practice. Three proposals for simplification are presented below.

- Proposal 1 is recommended as an improvement to the meths. Proposal 2 removes the fractional approach wrt wood as it is difficult to implement, while Proposal 1 retains the benefit of the fraction wrt wood, as it builds awareness of wood sustainability in each locality and promotes an effort to achieve a “higher BRF grade”. It also helps define renewable biomass fuel resources . Proposal 3 is a variation on both.

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Assessing NRB fraction: Proposal 1

- ***Proposal 1***: F(nrb) = 1-(dRWB areas/All areas)

- Where dRWB is demonstrably renewing biomass

- Note that the wording of the NRB sections of the meth's do not need to be changed, only clarified; this proposal is an interpretation of existing wording

- ***Explanation Step i:*** The first step in this assessment, is that in each country, an assessment is made of what area of woody biomass is demonstrably renewing, and what area is uncertain or "don't know". (Strictly, non-wood area is also added to dRWB area – see later).

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Proposal 1 continued

- Proposal 1: F(nrb) = 1-(dRWB areas/All areas)
- ***Explanation Step ii:*** Within the uncertain areas, an investigation is made of signs of deforestation and unreasonable livelihood threats. If found, these areas are designated as 100% NRB. The fraction thus becomes inverse of 100% NRB areas divided by all areas.
- Signs of deforestation and unreasonable livelihood threats are for example: price lifts, people collecting from further away, humanly unreasonable collection patterns (kids not going to school because of hours spent collecting, danger to women collecting wood, poverty linked with high cooking fuel collection burden or price)
- 100% NRB designation for such areas is justified because these conditions imply that harvesting far exceeds growth of wood in a “reachable” area and that therefore the ratio growth/harvest is near zero and approaching zero.

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Assessing NRB fraction: Proposal 2

- ***Proposal 2a***: Fraction NRB = (Wood-fuel / Total Biomass fuel) in regions experiencing deforestation
- ***Explanation:*** In the region of interest, is there deforestation overall? If so, then all wood-fuel is seen as emitting CO2 as a green-house gas. AMS I.E and II.G could therefore prescribe 100% NRB to all wood-fuel in that region.
- By is total biomass, wood-fuel and non-wood. If all wood-fuel is 100% NRB, the meth's define F(nrb) as fraction of wood in total biomass, which contains wood and non-wood.
- If the region is not deforesting but manages its wood resources sustainably, then Fnrb = 0. Annual monitoring will establish when the turning point to Fnrb = 0 occurs.
- In conditions of Fnrb = 0 cook-stove projects would focus on GHG reductions from non-CO2 gases (eligibility session)

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Proposal 2 continued

- Note that this aggregate conclusion would not imply non-renewability for specific wood resources which are sustainably managed; but the potential for confusion here limits usefulness of this proposal, as does the fact that it does not offer a regional renewability grading and thus an incentive to improve the grade, as does Proposal 1.
- ***Proposal 2b***: Fraction NRB = (Wood-fuel / Total Biomass fuel) in all countries, while global aggregate deforestation is experienced
- ***Proposal 2c***: Fraction NRB = (Wood-fuel / Total Biomass fuel) in countries experiencing deforestation
- ***Proposal 2d***: Fraction NRB = (Wood-fuel / Total Biomass fuel) in project biomass fuel collection areas experiencing deforestation.
- Note: In practice collection areas are difficult to define, while regions can be identified more easily. Yet Proposal 1d is technically correct to account for import of biomass fuel into the region. Projects designed to mitigate GHG emissions in deforesting regions will be hampered by approach 1c as the country as a whole may not be deforesting.
- Proposal 1a should therefore be adopted qualified by 1d.
- Proposal1b has hazards: countries needing carbon-financed stove projects would not get them if wealthy countries afforested sufficiently to achieve world biomass sustainability

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Proposal 3: Further simplification to NRB assessment (also simplifies By assessment)

- In any application of the meths, it is reasonable to accept that non-wood biomass is renewing biomass and that a clarification would be to substitute nrb(total biomass) with nrb(wood)

  Explanation of this is presented on a later slide, with respect to assessing By.

  If it is done, Proposal 2 becomes even simpler: If a region/collection area is deforesting, Fnrb = 1, otherwise it is 0.

- In proposal 1, this amendment simplifies the process for estimating By. Instead of surveying for both mass of wood-fuel and non-wood fuel, the survey needs to be only for wood-fuel

- Having made this simplification, it may be useful to retain as a separate data item, the fraction wood-fuel/non-wood fuel, if this is also considered a useful index.

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Assessment of By and Efficiency

- Use **literature and lab tests** as first option to assess By (and in case of monitoring efficiency, to assess efficiency) (e.g. Bangladesh Stoves)

- **Sampling and Surveying to 90/10 precision** as second option (e.g. Non-domestic fuel consumption may not appear in literature)

- If not feasible in practice to achieve large enough sample size (due to high level of variation intrinsically found in cook-stove context) then permissible to use **the lower bound of 90% Confidence Interval approach**

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Replacing total biomass with wood

The general case is that cooks mix renewable fuels such as crop residues, dung, leaves and tree litter with wood, in both baseline and project scenarios. The total baseline biomass is therefore a mix of non-wood and wood fuels.

The following argument is that values of $F_{NRBwood}$ and B_{ywood} can be used in place of $\mathbf{F_{nrb,y}}$ and B_y respectively. These are the non-renewable fraction of the wood alone (not that of total biomass) and the baseline woody biomass (as opposed to total biomass. the use of these parameters resolves to exactly the same equation for calculation of ERy as prescribed by the methodology, while at the same time providing clarity of presentation, clarity of calculation and also practical feasibility with regard to field measurements.

The equivalence of these parameters is demonstrated as follows:

Let crop residues, dung, leaves and tree litter be labelled “non-wood” and their savings have symbol $B_{savingsnonwood}$. Let savings of wood have symbol $B_{savingswood}$.

Given that the NRBfraction for total biomass ($\mathbf{f_{NRB,y}}$) can be expressed as:

$\mathbf{f_{NRB,y}} = (fNRB_{wood} \cdot B_{savingswood} + fNRB_{non\text{-}wood} \cdot B_{savingsnonwood}) / B_{y,savings}$

And given that $fNRB_{non\text{-}wood} = 0\%$

Therefore

$\mathbf{f_{NRB,y}} = fNRB_{wood} \cdot B_{savingswood} / B_{y,savings}$

Therefore $B_{y,savings} \cdot \mathbf{f_{NRB,y}} = fNRB_{wood} \cdot B_{savingswood}$

In the governing equation for emission reductions,

$ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected_fossilfuel}$

the parameter $f_{NRB,y}$ can therefore be replaced accordingly, so giving:

$Ry = B_{savingswood} \cdot f_{NRBwood} \cdot NCV_{biomass} \cdot EF_{projected_fossilfuel}$

The efficiency improvement of the project stove is based on measurements of wood consumed by a traditional stove compared to that consumed by the improved stove, while care is taken that the users are using non-wood in a typical manner during the tests. Thus:

$B_{y,savingswood} = B_{ywood} \cdot (1 - \eta_{old} / \eta_{new})$

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Governing equation

- Given the above recommendations, the AMS II.G governing equation can be simplified, and made more easily implemented while still conservative, as follows:

- ERy = By,savings (wood) . Fnrb(wood) . NCV(wood) . Efprojfossil

- Where Fnrb(wood) is 1-(dRWB areas/ all areas) (proposal 1)
- or Fnrb = 1 where deforestation is occurring (proposal 2)

- Ideally the methodology is amended to allow for reduction of non-CO2 gases (principally methane) and therefore EFfossil is changes to EFwood:

- ERy = By,savings (wood) . Fnrb(wood) . NCV(wood) . EFco2(wood)
  + By,savings (wood). NCV(non-wood) . EFnon-co2(non-wood)
  + By,savings (non-wood) . NCV(non-wood) . EFnon-co2(non-wood)

- And Fnrb(wood) is as defined above

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Default values for By,savings (inclusive of By and efficency) and /or Fnrb

- In practice By has been found through exhaustive field tests in a variety of projects to fall between 1 tonne/year per stove and 3 tonnes/year per stove)
- Consequently a radical simplification could be to devise a set of criteria (eg lab tests showing efficiency of stove is at least 40% better) which would allow a project to be eligible for a minimum value of By,savings of 1.
- Monitoring would include continuing application of such criteria. Project seeking higher vales would need to justify them for validation and during monitoring.

- ERy = Default: 1 tonne wood/ year/stove. Number of stoves in use . (dRWB areas / all areas) . 15.6 . EFprojfossil
- or
- ERy = Default: 1 tonne wood/ year/stove. Number of stoves in use . (NRB=1). 15.6 . EFprojfossil

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Thank you

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