United Nations Framework Convention on Climate Change

Agenda item 4.1 (a)
Paragraph 18 of the annotated agenda

Information note: Development of default values for fraction of non-renewable biomass

CDM EB 125

Bonn, Germany – 11 to 13 June 2025

UNFCCC Secretariat
Mitigation Division

Procedural background

- **EB 116** requested the MP to:
  a) **Develop subnational/regional values of fNRB, building on scientific studies and engaging external experts**.
  b) **Prepare a concept note** based on the work undertaken, for consideration by the Board at a future meeting.
  c) **Propose a revision to TOOL30 and/or related methodologies/tools** if there is a need to further clarify and/or revise elements of TOOL30 or related methodologies/tools.

Procedural background

- MP 92 provided updates to the Board on the progress (e.g. initial results of fNRB values for 43 countries in sub-Saharan Africa and regional level results for other regions) via the **information note** .

- MP 92 also launched a call for public inputs from 13 Oct to 10 Nov 2023. **46 inputs were received**.

- **EB 120** considered the information note and provided further guidance regarding further work that mainly includes:
  a) Having wider stakeholder consultation including webinar for DNAs,
  b) Refining the Model fuel saving scenario (MoFuSS) model and accordingly update information note taking care of stakeholder inputs,
  c) Developing regionally disaggregated fNRB values for all countries,
  d) Providing information on the uncertainty range of the estimates of fNRB values.

Procedural background

- Extended public call (until 31 Jan 2024): **4 inputs were received.**
- DNA webinar held on 1 Feb 2024: **around 15 DNAs attended**
- Call for public input on the updated revised report from the experts - 21 June to 9 August 2024- **28 inputs were received**

Procedural background

- At MP 94, the MP prepared an information note- “Stakeholder inputs on the review of clean cooking methodologies including estimation of fNRB values”.

- At EB 122, The Board took note of the above information note and requested the MP to continue to consider the issue and make a recommendation at its next meeting for its consideration.

- At MP 95, the MP prepared an updated information note.

- At EB 123, the Board took note of the above information note and requested the MP to continue to consider the issues and make a recommendation for its consideration at its next meeting.
- At MP 96, the MP prepared an updated information note.

Procedural background

- At EB 124, the Board took note of the information note prepared at MP 96 and requested the MP to further work on the following:

- (a) Explore further the data on the calculation of urban fraction of non-renewable biomass (fNRB) and the localisation of wood harvesting for charcoal production supplying the urban areas; and
- (b) Assess the optimal geographical disaggregation for the estimation of fNRB values taking into account e.g. the uncertainty level of estimates at different geographical levels and fuelwood and charcoal flows between different sub-national jurisdictions or across national borders.
- The Board requested the MP to revise the information note for consideration by the Board at its next meeting.

Purpose

- To address the mandate provided by the EB to
  - Develop subnational/regional values of fNRB
  - Propose a revision to TOOL30 and/or related methodologies/tools if there is a need to further clarify and/or revise elements of TOOL30 or related methodologies/tools, and
  - Propose incorporating the default values of fNRB in TOOL33.

Key issues and proposed solutions

- With references to the EB 124 clarifications, the additional clarifications are as below:
  a) fNRB for urban areas and charcoal production: MoFuSS estimates the impacts of demand at the point of woodfuel harvesting, not limited to the area where consumption occurs.
  b) Optimal geographical disaggregation: The **MoFuSS model** improves upon previous tools like TOOL30 and WISDOM by more realistically defining **woodfuel supply areas** based on factors like **commercial vs. domestic demand**, **transport infrastructure**, and **maximum sourcing distances**, rather than relying on rigid administrative boundaries or fixed "woodfuel sheds.

Key issues and proposed solutions

- MoFuSS efficiently uses existing national-level data to estimate fuelwood and charcoal supply zones for demand centers.

- These supply zones help calculate fNRB (fraction of non-renewable biomass) at national and sub-national levels.

- However, the model currently does not fully account for trade flows of fuelwood and charcoal across national or sub-regional boundaries.

Key issues and proposed solutions

- The project participants, in principle, shall use national values for fNRB. Where national values are not listed, the regional (continental) default value may be used.
- The information note proposes, the default fNRB values at the
  a) National level
  b) Regional level

Impacts

The national and regional (continental) default values of fNRB will ensure the reliability of calculating emission reductions, reduce transaction cost and facilitate the implementation of CDM project activities and PoAs in the household cookstove or water purification sector.

Recommendations to the Board

The MP recommends that the Board

a) **Approve** the default national and regional (continental) values of fNRB for the countries respectively shown in Table 2 and Table 1 of the information note and agree to include these values in the updated version of TOOL 33- Default values for common parameters.
b) **Allow** use of relevant regional (continental) value where national values are not listed in the aforementioned tables.
c) **To discontinue** TOOL 30 with effect from 1 Jan 2026;
d) **To approve** the updated relevant methodologies (AMS-I.E; AMS-II.G.; AMS-III.AV; AMS-III.BG.) where reference to TOOL30 is made.

Recommendations to the Board

- **The MP also recommends:**
  - That alternatively to using approved default values, stakeholders may submit new methodological approaches for the calculation of fNRB values that result in further advancements in terms of accuracy and conservativeness, for consideration by the Board. Further, stakeholders may also choose to propose different default values through a request for revision to TOOL33 as per existing procedures.
  - That fNRB for project activities in urban areas and in countries where more than 20% of the woodfuel consumed in the country is imported, the weighted average of the fNRB of the host country and the fNRB of countries from where woodfuel is imported shall be used to calculate a relevant value for the project activity.

Summary of stakeholder inputs

- Call for inputs was launched from 8-22 May 2025 for TOOL33; 4 associated methodologies.
  - 16 inputs were received on TOOL33
    (includes 9 inputs from Stakeholders in India; Project Developer Forum amongst others)
  - 1 input for "AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user"
  - 1 input for "AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass”
  - Types of inputs
    - Parameters used in MoFuSS

Stakeholder inputs

- Option to use sub-national value.
- 9 inputs related to:
  - The model's treatment of all forest biomass as a uniform supply source and this approach fails to distinguish between naturally occurring forests and purpose-grown plantations/agroforestry species.
  - Modify the MoFuSS model to explicitly exclude purpose-grown plantations and agroforestry systems from its sustainable biomass supply calculations, ensuring f_{NRB} reflects only extraction from natural forests.
  - Develop country-specific f_{NRB} adjustments based on empirical data (such as India's FSI's degraded forest records) where the MoFuSS model cannot be sufficiently refined.
  - Use of regional default values.
- The default WCCF of 4.0 (wet basis) does not clarify the assumed moisture content range of the input wood, which can vary substantially across geographies and seasons.

Stakeholder inputs

- Provide region-specific default WCCF values or allow country-specific values to override the default when supported by peer-reviewed or Host Country-endorsed data. Change the updated Tool 33 default to 7:1.
- Change the updated Tool 33 default to 7:1, as per the evidence above, or at least 6:1 (former IPCC based value) while more primary data is made available.
- Allow project developers to propose MoFuSS-derived fNRB values, provided they are transparently documented and validated.
- Allow country governments and PDs to use MoFuSS-derived fNRB values at either a national or sub-national value. This will allow governments or PDs to strengthen fNRB values via projects or country specific data.

- Consider revising methodologies to align fully with MoFuSS if it is to be used, or refrain from mixing incompatible conceptual frameworks (household vs. landscape).

Summary of stakeholder inputs

- Allow fNRB to be set to 1 (or close to 1) in regions with demonstrable firewood overuse and lack of plantation-sourced biomass.
- Reinstate model standard deviation for expressing fNRB uncertainty instead of spatial mean.
- Clealy define the process, responsibilities, and criteria for proposing new methodological fNRB approaches.
- Justify the choice to provide only national-level fNRB values when sub-national resolution is possible.

- Issues related to MoFuSS
  - “Black box”
  - risks defunding clean cooking transitions across Africa.
  - commission independent research rather than leaving methodological correction to stakeholders.
  - emphasizes that poorly grounded fNRB values will reduce climate finance and disincentivize meaningful mitigation in vulnerable regions.

Summary of stakeholder inputs

- 1 input for "AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user"
  - Proposal to use sub-National values based on MoFuSS
- 1 input for "AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass”
  - Against the concept of fNRB

Response to stakeholder inputs

- MoFuSS is fully documented with peer-reviewed publications, public codebases, and datasets. Allegations of intentional outcome manipulation are unfounded and defamatory.
- Outdated datasets used in simulations (e.g., biomass data >10 years old): Input parameters must be circa 2010 to allow for simulations to run forward.
- Exclusion of biomass from land clearing for agriculture: Cookstoves won't stop land clearing for agriculture, so including this will produce lower fNRB values. Assuming that cookstove will prevent all other drivers of tree loss is simply wrong.

Response to stakeholder inputs

- Poor resolution (1km) leads to inaccuracies: MoFuSS was designed to run at 100m at landscape level, but run at 1km for the UNFCCC assessment in order to model 70+ countries in a reasonable amount of time. Running the model at higher resolutions, for example shifting from 1km to 100m, usually results in lower fNRB, which we've written about extensively.
- *Overestimated regrowth in arid zones due to inappropriate use of GEDI-based rmax values:* MoFuSS does not use any GEDI-based products. Ongoing work includes recoding the supply module using CTrees data for an upcoming peer-reviewed publication. The upcoming peer-reviewed analysis focuses on estimating emissions reductions from hypothetical cookstove interventions and does not reference or calculate fNRB.

Response to stakeholder inputs

- Demand assumptions are conservative and grounded in global datasets. MoFuSS can incorporate higher-resolution local demand inputs when available.
- MoFuSS is not incompatible to cookstove methodologies; it improves spatial realism, bridging the gap between household-level interventions and landscape-scale sustainability metrics.
- With regard to comment on that India's fNRB of 7% is implausibly low; it ignores forest degradation, relies on agroforestry data, and misrepresents fuelwood realities across ecologically diverse states.
    - The 7% value is a national average, and notably, it aligns closely with observed changes in AGB for the 2010–2022 period when accounting for all drivers of biomass loss, not just woodfuel extraction.

Response to stakeholder inputs

- MoFuSS supports subnational disaggregation and explicitly excludes plantations at 1km. Users are encouraged to conduct more granular analyses with MoFuSS, which is designed to accommodate regional variation and diverse landscape dynamics.

Thank you

Extra slides

let's consider an alternative analysis that requires no modeling or future projections: divide all observed aboveground biomass (AGB) losses between 2010 and 2022 by woodfuel demand in the same period. This yields an fNRB value grounded in observed change. Of course, these losses stem from many drivers unrelated to cooking, such as commercial agriculture, logging (legal and illegal), mining, roadbuilding, hydropower, urban expansion, fires (intentional and natural), and multiple forms of plantation expansion. If cookstove adoption could somehow halt all of these, India's fNRB between 2010 and 2022 would be just 5%. You can access a draft tool here: https://www.mofuss.unam.mx/tools/apps/fNRB_obs/

Aboveground Biomass Losses vs Woodfuel Demand

Start Year is 2010. Select End Year:

2020

Calculate | Clear Selection

This tool is a prototype, it is slow and could be buggy. For an extended description on what the tool does and how to interpret its results, follow this link.

Send questions and suggestions to mofussfreeware@gmail.com. A proper tool with similar functionalities is being built as part of MoFuSS-US.

Instructions

1.- Select end year of analysis.

2.- Select up to 16 countries, by clicking or tapping on the map, and waiting 1-2 seconds in each case for the selected country to be highlighted.

3.- Press **Calculate** and wait for the results table to appear. Depending on the number of countries and their area, it can take up to 5-7 minutes. Do not close your browser.

4.- Press **Clear Selection** to start from scratch.

5.- You can add countries to the list or change the end year and recalculate, but you can't deselect countries from the list (bug), just press **Clear Selection** and start again.

Country	Start.Year	End.Year	Demand.Mg.period	AGB.losses.Mg.period	fNRB....
IND	2010	2020	3,249,683,267	133,800,346	4

mofuss.unam.mx/tools/apps/fNRB_obs/

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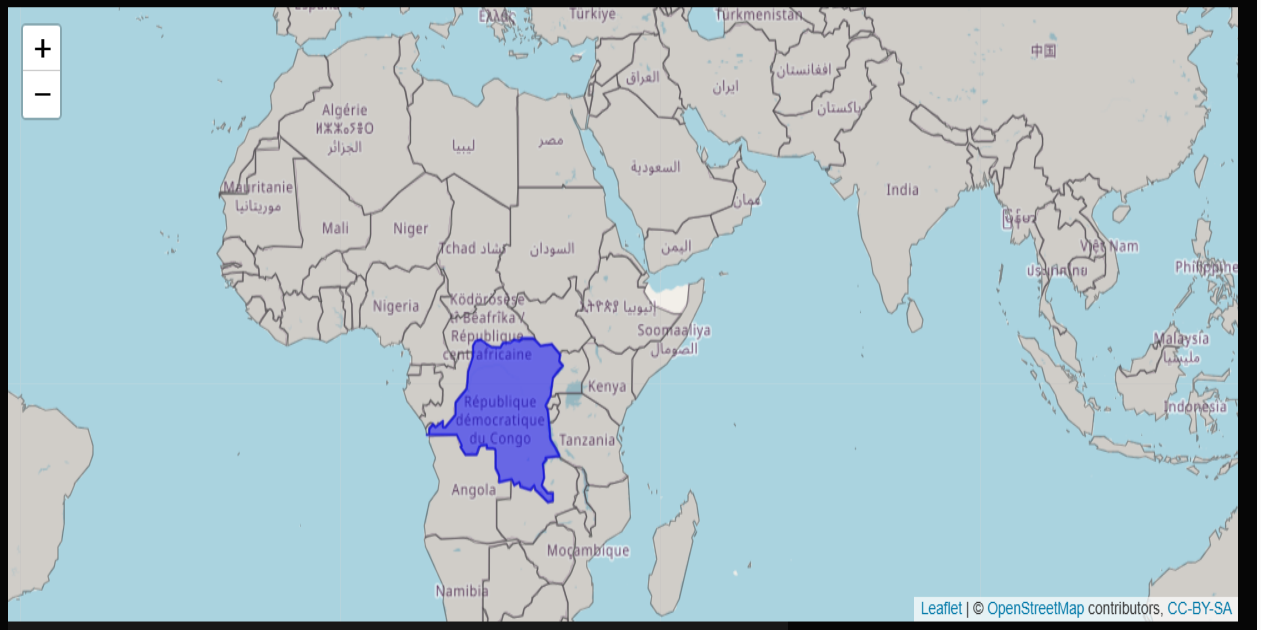

Country	Start.Year	End.Year	Demand.Mg.period	AGB.losses.Mg.period	fNRB....
COD	2010	2020	721,845,972	155,235,171	22

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Stakeholder inputs

- Pakistan DNA- wants the option to use sub-national value.
- Stakeholders from India (9 inputs)-
  - the model's treatment of all forest biomass as a uniform supply source and this approach fails to distinguish between naturally occurring forests and purpose-grown plantations/agroforestry species.
  - Modify the MoFuSS model to explicitly exclude purpose-grown plantations and agroforestry systems from its sustainable biomass supply calculations, ensuring f_{NRB} reflects only extraction from natural forests.
  - Develop country-specific f_{NRB} adjustments based on empirical data (such as India's FSI's degraded forest records) where the MoFuSS model cannot be sufficiently refined.
- PD Forum
  - The default WCCF of 4.0 (wet basis) does not clarify the assumed moisture content range of the input wood, which can vary substantially across geographies and seasons

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