

**INFORMATION NOTE****DEFAULT VALUES OF FRACTION OF NON-RENEWABLE BIOMASS FOR LEAST DEVELOPED COUNTRIES AND SMALL ISLAND DEVELOPING STATES****(Version 01.0)****I. Background**

1. Paragraph 46 of decision 3/CMP.6 requests the Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) to develop standardized baselines, as appropriate, in consultation with relevant designated national authorities, prioritizing methodologies that are applicable to least developed countries (LDCs), small island developing States (SIDS), Parties with 10 or fewer registered clean development mechanism project activities as of 31 December 2010 and underrepresented project activity types or regions, inter alia, for energy generation in isolate systems.

2. To respond to the mandate from CMP.6, through the work programmes of the Small-Scale Working Group (SSC WG) and CDM management action plan (MAP) 2012, the Board tasked the SSC WG and the secretariat to work on the methodologies AMS-I.E “Switch from Non-Renewable Biomass for Thermal Applications by the User” and AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass”. Taking into account the public inputs received in response to the call for inputs opened at the sixty-third meeting of the Board, the SSC WG at its 35<sup>th</sup> meeting provided feedback to the secretariat on the options for developing country-specific default values for the fraction of non-renewable biomass (fNRB).

3. This document describes the materials and methods used to develop the default values referred to above for inclusion in AMS-I.E and AMS-II.G. Project proponents have an option to use these conservative country-specific default values or determine project-specific values by undertaking a study in the project region as prescribed in the methodology. Therefore, the application of these default values is not mandatory.

**II. Methodology for the calculation of fNRB**

4. The requirements from AMS-I.E and AMS-II.G to calculate fNRB are reproduced in appendix 1 which is essentially captured in the equation below.

$$fNRB = \frac{NRB}{NRB + DRB} \quad (1)$$

Where:

|             |   |
|-------------|---|
| <i>fNRB</i> | Fraction of non-renewable biomass (fraction or %) |
| <i>NRB</i>  | Non-renewable biomass (t/yr)                      |
| <i>DRB</i>  | Demonstrably renewable biomass (t/yr)             |

5. On a project-specific basis, project participants determine the shares of renewable (DRB) and non-renewable woody biomass (NRB) in the total biomass consumption (i.e.  $B_y$  - the quantity of woody biomass used in the absence of the project activity). A national-level default value for fNRB can be derived by calculating Total Annual Biomass Removals (R) from each country as a proxy for  $B_y$  and estimating the proportion of R that is demonstrably renewable (DRB) and non-renewable (NRB).

$$NRB = R - DRB \quad (2)$$

Where:

$R$  Total annual biomass removals (t/yr)

6. Total Annual Biomass Removals (R) for each country is inferred by calculating the sum of the Mean Annual Increment in biomass growth (MAI) and the Annual Change in Living Forest Biomass stocks ( $\Delta F$ ). Given biomass growth (MAI) and change in stock ( $\Delta F$ ) are both known, the balancing removals (R) can be calculated as the sum of the two:

$$R = MAI + \Delta F \quad (3)$$

Where:

$R$  Total annual biomass removals (t/yr)

$MAI$  Mean Annual Increment of biomass growth (t/yr)

$\Delta F$  Annual change in living forest biomass<sup>1</sup> (t/yr)

7. Mean Annual Increment of biomass growth (MAI) is calculated in equation 4 as the product of the Extent of Forest (F) in hectares and the country-specific Growth Rate (GR) of the Mean Annual Increment:

$$MAI = F \times GR \quad (4)$$

Where:

$MAI$  Mean Annual Increment of biomass growth (t/yr)

$F$  Extent of forest (ha)

$GR$  Annual Growth rate of biomass (t/ha-yr)

8. Demonstrably renewable biomass (DRB) is calculated in equation 5 as the product of Protected Area Extent of Forest (PA) in hectares and the country-specific Growth Rate (GR) of the Mean Annual Increment:

$$DRB = PA \times GR \quad (5)$$

Where:

$PA$  Protected Area Extent of Forest (ha)

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<sup>1</sup> When net annual change in living forest biomass i.e.  $\Delta F$  is negative add it to MAI, else subtract from MAI.



Table 1: Description of the parameters and relevant data sources

| Parameter | Units   | Description                             | Source   | Considerations   |
|-----------|---------|---|--|--|
| $f_{NRB}$ | %       | Fraction of non-renewable biomass       | Equation 1   |  |
| $NRB$     | t/yr    | Non-renewable biomass                   | Equation 2   | Proportion of Total Annual Biomass Removals (R) that is not demonstrably renewable   |
| $DRB$     | t/yr    | Demonstrably renewable biomass          | Equation 5   | Calculated as equivalent to the total annual biomass growth in protected areas   |
| $R$       | t/yr    | Total annual biomass removals           | Equation 3   | Used as a national-level proxy for $B_y$ . Accounts for all removals (not only woodfuels), which is equivalent to the sum of Mean Annual Increment of biomass growth and the Annual change in living forest biomass    |
| $MAI$     | t/yr    | Mean Annual Increment in biomass growth | Equation 4   | Country-specific MAI calculated from extent of forest and its growth rate  |
| $GR$      | t/ha-yr | Growth Rate of biomass                  | Distribution of total forest area by ecological zone (FAO Global Forest Resources Assessment 2000, Table 14; <a href="http://www.fao.org/DOCR/EP/004/Y1997E/y1997e21.htm#bm73">http://www.fao.org/DOCR/EP/004/Y1997E/y1997e21.htm#bm73</a> )><br><br>Above-ground biomass growth rates (t/ha-yr) for different ecological zones (2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 4, Table 4.9) | Country-specific growth rate calculated as a weighted average based on FAO reporting on distribution of total forest area by ecological zone and IPCC above-ground biomass growth rates for different ecological zones |
| $F$       | ha      | Extent of forest                        | FAO Forest Resource Assessment (FRA) 2010 Global Tables, Table 2   |  |



| Parameter | Units | Description                            | Source   | Considerations   |
|-----------|-------|--|--|--|
| <i>PA</i> | ha    | Protected area extent of forest        | FAO Forest Resource Assessment (FRA) 2010 Global Tables, Table 6   | 15% of extent of forest used as default in countries with no figures on protected areas reported (Burkina Faso, Chad, Dominican Republic, Ethiopia, Guinea-Bissau, Guyana, Mauritania, Samoa, Togo, Trinidad and Tobago). Average protected areas for all other LDCs with available data was 16% of extent of forest |
| <i>ΔF</i> | t/yr  | Annual change in living forest biomass | Annual change in carbon stock in living forest biomass 2005-2010 (FAO Forest Resource Assessment 2010 Global Tables, Table 11)<br><br>Carbon stock/Biomass Conversion rate (2003 IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry): 0.5 is used as a default for the carbon fraction of dry matter | Calculated by converting:<br><br>Annual Change in Carbon Stock in Living Forest Biomass 2005-2010 (t-carbon/yr)<br><br>to<br><br>Annual Change in Living Forest Biomass 2005-2010(t/yr)  |

### III. Default values of fNRB

9. The default values of fNRB are summarized in Table 2 below and the detailed calculation for the proposed default values is shown in appendix 2.

**Table 2: Country-specific default values for the fraction of non-renewable biomass**

| Country            | Default values of fNRB |
|--------------------|------------------------|
| Angola             | 97%                    |
| Bangladesh         | 83%                    |
| Benin              | 81%                    |
| Bhutan             | 40%                    |
| Burkina Faso       | 90%                    |
| Burundi            | 77%                    |
| Cambodia           | 76%                    |
| Cape Verde         | 89%                    |
| Chad               | 92%                    |
| Cuba               | 40%                    |
| Dominican Republic | 85%                    |
| DR Congo           | 90%                    |
| Equatorial Guinea  | 68%                    |
| Eritrea            | 97%                    |
| Ethiopia           | 88%                    |



| Country                          | Default values of fNRB |
|----------------------------------|------------------------|
| Fiji                             | 90%                    |
| Gambia                           | 91%                    |
| Grenada                          | 88%                    |
| Guinea                           | 96%                    |
| Guinea-Bissau                    | 85%                    |
| Guyana                           | 85%                    |
| Haiti                            | 96%                    |
| Jamaica                          | 65%                    |
| Liberia                          | 97%                    |
| Madagascar                       | 72%                    |
| Malawi                           | 81%                    |
| Mali                             | 73%                    |
| Mauritania                       | 85%                    |
| Mauritius                        | 100%                   |
| Mozambique                       | 91%                    |
| Myanmar                          | 95%                    |
| Nepal                            | 86%                    |
| Niger                            | 82%                    |
| Papua New Guinea                 | 99%                    |
| Rwanda                           | 98%                    |
| Samoa                            | 85%                    |
| Senegal                          | 85%                    |
| Sierra Leone                     | 95%                    |
| Sudan                            | 81%                    |
| Togo                             | 97%                    |
| Trinidad and Tobago              | 85%                    |
| Uganda                           | 82%                    |
| UR Tanzania                      | 96%                    |
| Zambia                           | 81%                    |
| Antigua and Barbuda              | 85%                    |
| Bahamas                          | 85%                    |
| Bahrain                          | 100%                   |
| Barbados                         | 96%                    |
| Belize                           | 88%                    |
| Comoros                          | 100%                   |
| Djibouti                         | 100%                   |
| Lao People's Democratic Republic | 87%                    |
| Lesotho                          | 98%                    |
| Maldives                         | 85%                    |
| Saint Lucia                      | 96%                    |
| Singapore                        | 85%                    |
| Suriname                         | 87%                    |
| Yemen                            | 94%                    |



## Appendix 1

### DIFFERENTIATION BETWEEN NON-RENEWABLE AND RENEWABLE WOODY BIOMASS

1. Project participants shall determine the shares of renewable and non-renewable woody biomass in  $B_y$  (the quantity of woody biomass used in the absence of the project activity), the total biomass consumption using nationally approved methods (e.g. surveys or government data if available) and then determine  $f_{NRB,y}$  as described below. The following principles shall be taken into account:

#### **Demonstrably renewable woody biomass<sup>2</sup> (DRB)**

Woody<sup>3</sup> biomass is “renewable” if one of the following two conditions is satisfied:

2. The woody biomass originates from land areas that are forests<sup>4</sup> where:
  - (a) The land area remains a forest;
  - (b) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting);
  - (c) Any national or regional forestry and nature conservation regulations are complied with.
3. The biomass is woody biomass and originates from non-forest areas (e.g. croplands, grasslands) where:
  - (a) The land area remains cropland and/or grasslands or is reverted to forest;
  - (b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting);
  - (c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

#### **Non-renewable biomass**

4. Non-renewable woody biomass (*NRB*) is the quantity of woody biomass used in the absence of the project activity ( $B_y$ ) minus the *DRB* component, as long as at least two of the following supporting indicators are shown to exist:

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<sup>2</sup> This definition uses elements of annex 18, EB 23.

<sup>3</sup> In cases of charcoal produced from woody biomass, the demonstration of renewability shall be done for the areas where the woody biomass is sourced.

<sup>4</sup> The forest definitions as established by the country in accordance with the decisions 11/CP.7 and 19/CP.9 should apply.



- (a) A trend showing an increase in time spent or distance travelled for gathering fuel-wood, by users (or fuel-wood suppliers) or alternatively, a trend showing an increase in the distance the fuel-wood is transported to the project area;
- (b) Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;
- (c) Increasing trends in fuel-wood prices indicating a scarcity of fuel-wood;
- (d) Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass.

5. Thus, the fraction of woody biomass saved by the project activity in year  $y$  that can be established as non-renewable, is:

$$f_{NRB,y} = \frac{NRB}{NRB + DRB} \quad (6)$$

6. Project participants shall also provide evidence that the trends identified are not occurring due to the enforcement of local/national regulations.



## Appendix 2

## CALCULATION FOR THE DEFAULT VALUES OF fNRB FOR LDCs and SIDs

| Country            | F           | GR<br>Growth<br>Rate of<br>biomass<br>(t/ha-<br>yr) | MAI<br>Mean Annual<br>Increment (t/yr) | ΔF<br>Annual Change in<br>Living Forest<br>Biomass (t/yr) | R<br>Total Annual<br>Biomass Removals<br>(t/yr) | PA<br>Protected Areas<br>Extent of Forest<br>(ha) | DRB<br>Biomass<br>Growth in<br>Protected<br>Areas (t/yr) | NRB<br>Total Annual<br>Removals -<br>Protected Area<br>Growth (t/yr) | fNRB<br>fNRB =<br>NRB/(NRB+DRB) |
|--------------------|-------------|---|--|---|---|---|--|--|---------------------------------|
| Angola             | 58,480,000  | 3.17  | 185,308,500                            | (18,000,000)  | 203,308,500                                     | 1,862,000   | 5,900,213  | 197,408,288  | 97%                             |
| Bangladesh         | 1,442,000   | 4.93  | 7,113,386                              | 0   | 7,113,386                                       | 247,000   | 1,218,451  | 5,894,935  | 83%                             |
| Benin              | 4,561,000   | 3.02  | 13,753,696                             | (6,000,000)   | 19,753,696                                      | 1,263,000   | 3,808,577  | 15,945,119   | 81%                             |
| Bhutan             | 3,249,000   | 2.26  | 7,331,369                              | 4,000,000   | 3,331,369                                       | 883,000   | 1,992,490  | 1,338,879  | 40%                             |
| Burkina Faso       | 5,649,000   | 2.18  | 12,316,232                             | (6,000,000)   | 18,316,232                                      | 847,350   | 1,847,435  | 16,468,797   | 90%                             |
| Burundi            | 172,000     | 2.38  | 408,500                                | 0   | 408,500   | 40,000  | 95,000   | 313,500  | 77%                             |
| Cambodia           | 10,094,000  | 4.09  | 41,279,413                             | (12,000,000)  | 53,279,413                                      | 3,092,000   | 12,644,734   | 40,634,679   | 76%                             |
| Cape Verde         | 85,000      | 0.68  | 57,375                                 | 0   | 57,375  | 9,000   | 6,075  | 51,300   | 89%                             |
| Chad               | 11,525,000  | 0.80  | 9,266,100                              | (8,000,000)   | 17,266,100                                      | 1,728,750   | 1,389,915  | 15,876,185   | 92%                             |
| Cuba               | 2,870,000   | 3.30  | 9,471,000                              | 6,000,000   | 3,471,000                                       | 634,000   | 2,092,200  | 1,378,800  | 40%                             |
| Dominican Republic | 1,972,000   | 8.93  | 17,600,100                             | 0   | 17,600,100                                      | 295,800   | 2,640,015  | 14,960,085   | 85%                             |
| DR Congo           | 154,135,000 | 7.29  | 1,123,721,218                          | (80,000,000)  | 1,203,721,218                                   | 16,297,000  | 118,813,279  | 1,084,907,939  | 90%                             |
| Equatorial Guinea  | 1,626,000   | 9.70  | 15,772,200                             | (2,000,000)   | 17,772,200                                      | 586,000   | 5,684,200  | 12,088,000   | 68%                             |
| Eritrea            | 1,532,000   | 0.98  | 1,495,615                              | (504,800)*  | 2,000,415                                       | 55,000  | 53,694   | 1,946,721  | 97%                             |
| Ethiopia           | 12,296,000  | 1.77  | 21,803,882                             | (6,000,000)   | 27,803,882                                      | 1,844,400   | 3,270,582  | 24,533,300   | 88%                             |





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| Country       | F          | GR<br>Growth<br>Rate of<br>biomass<br>(t/ha-<br>yr) | MAI<br>Mean Annual<br>Increment (t/yr) | ΔF<br>Annual Change in<br>Living Forest<br>Biomass (t/yr) | R<br>Total Annual<br>Biomass Removals<br>(t/yr) | PA<br>Protected Areas<br>Extent of Forest<br>(ha) | DRB<br>Biomass<br>Growth in<br>Protected<br>Areas (t/yr) | NRB<br>Total Annual<br>Removals -<br>Protected Area<br>Growth (t/yr) | fNRB =<br>NRB/(NRB+DRB) |
|---------------|------------|---|--|---|---|---|--|--|-------------------------|
| Fiji          | 1,014,000  | 8.20  | 8,314,800                              | 840,000*  | 7,474,800                                       | 92,000  | 754,400  | 6,720,400  | 90%                     |
| Gambia        | 480,000    | 2.35  | 1,128,960                              | 0   | 1,128,960                                       | 43,000  | 101,136  | 1,027,824  | 91%                     |
| Grenada       | 17,000     | 7.93  | 134,887                                | 0   | 134,887   | 2,000   | 15,869   | 119,018  | 88%                     |
| Guinea        | 4,940,000  | 4.09  | 20,225,595                             | (6,000,000)   | 26,225,595                                      | 242,000   | 990,809  | 25,234,787   | 96%                     |
| Guinea-Bissau | 2,022,000  | 3.93  | 7,950,504                              | 0   | 7,950,504                                       | 303,300   | 1,192,576  | 6,757,928  | 85%                     |
| Guyana        | 15,205,000 | 6.34  | 96,369,290                             | 0   | 96,369,290                                      | 2,280,750   | 14,455,394   | 81,913,897   | 85%                     |
| Haiti         | 101,000    | 7.88  | 796,234                                | 0   | 796,234   | 4,000   | 31,534   | 764,700  | 96%                     |
| Jamaica       | 337,000    | 8.66  | 2,917,746                              | 0   | 2,917,746                                       | 118,000   | 1,021,644  | 1,896,102  | 65%                     |
| Liberia       | 4,329,000  | 6.52  | 28,207,764                             | (8,000,000)   | 36,207,764                                      | 194,000   | 1,264,104  | 34,943,660   | 97%                     |
| Madagascar    | 12,553,000 | 3.26  | 40,922,780                             | (14,000,000)  | 54,922,780                                      | 4,752,000   | 15,491,520   | 39,431,260   | 72%                     |
| Malawi        | 3,237,000  | 2.65  | 8,562,674                              | (2,000,000)   | 10,562,674                                      | 757,000   | 2,002,454  | 8,560,220  | 81%                     |
| Mali          | 12,490,000 | 2.24  | 27,924,518                             | (4,000,000)   | 31,924,518                                      | 3,900,000   | 8,719,425  | 23,205,093   | 73%                     |
| Mauritania    | 242,000    | 0.68  | 163,350                                | 0   | 163,350   | 36,300  | 24,503   | 138,848  | 85%                     |
| Mauritius     | 35,000     | 3.15  | 110,250                                | 0   | 110,250   | 0   | 0  | 110,250  | 100%                    |
| Mozambique    | 39,022,000 | 2.33  | 91,057,837                             | (16,000,000)  | 107,057,837                                     | 4,143,000   | 9,667,691  | 97,390,147   | 91%                     |
| Myanmar       | 31,773,000 | 4.26  | 135,472,129                            | (32,000,000)  | 167,472,129                                     | 2,081,000   | 8,872,864  | 158,599,265  | 95%                     |
| Nepal         | 3,636,000  | 3.15  | 11,467,944                             | 0   | 11,467,944                                      | 526,000   | 1,659,004  | 9,808,940  | 86%                     |
| Niger         | 1,204,000  | 2.09  | 2,511,243                              | 0   | 2,511,243                                       | 220,000   | 458,865  | 2,052,378  | 82%                     |



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| Country             | F<br>Extent of<br>Forest (ha) | GR<br>Growth<br>Rate of<br>biomass<br>(t/ha-<br>yr) | MAI<br>Mean Annual<br>Increment (t/yr) | ΔF<br>Annual Change in<br>Living Forest<br>Biomass (t/yr) | R<br>Total Annual<br>Biomass Removals<br>(t/yr) | PA<br>Protected Areas<br>Extent of Forest<br>(ha) | DRB<br>Biomass<br>Growth in<br>Protected<br>Areas (t/yr) | NRB<br>Total Annual<br>Removals -<br>Protected Area<br>Growth (t/yr) | fNRB =<br>NRB/(NRB+DRB) |
|---------------------|-------------------------------|---|--|---|---|---|--|--|-------------------------|
| Papua New Guinea    | 28,726,000                    | 7.59  | 217,958,525                            | (24,000,000)  | 241,958,525                                     | 313,000   | 2,374,888  | 239,583,638  | 99%                     |
| Rwanda              | 435,000                       | 2.38  | 10,370,000                             | 2,000,000   | 8,370,000                                       | 62,000  | 147,250  | 8,222,750  | 98%                     |
| Samoa               | 171,000                       | 8.20  | 1,402,200                              | 0*  | 1,402,200                                       | 25,650  | 210,330  | 1,191,870  | 85%                     |
| Senegal             | 8,473,000                     | 2.17  | 18,365,228                             | (4,000,000)   | 22,365,227.50                                   | 1,532,000   | 3,320,610  | 19,044,618   | 85%                     |
| Sierra Leone        | 2,726,000                     | 4.51  | 12,294,260                             | (4,000,000)   | 16,294,260                                      | 187,000   | 843,370  | 15,450,890   | 95%                     |
| Sudan               | 69,949,000                    | 2.88  | 201,767,891                            | (2,000,000)   | 203,767,891                                     | 13,346,000  | 38,496,537   | 165,271,354  | 81%                     |
| Togo                | 287,000                       | 3.70  | 1,063,048                              | (3,718,000)*  | 4,781,048                                       | 43,050  | 159,457  | 4,621,591  | 97%                     |
| Trinidad and Tobago | 226,000                       | 7.05  | 1,593,300                              | 0   | 1,593,300                                       | 33,900  | 238,995  | 1,354,305  | 85%                     |
| Uganda              | 2,968,000                     | 5.65  | 16,778,846                             | (6,000,000)   | 22,778,846                                      | 731,000   | 4,132,526  | 18,646,320   | 82%                     |
| UR Tanzania         | 33,428,000                    | 2.16  | 72,087,482                             | (48,000,000)  | 120,087,482                                     | 2,000,000   | 4,313,000  | 115,774,482  | 96%                     |
| Zambia              | 49,468,000                    | 2.61  | 129,334,086                            | (16,000,000)  | 145,334,086                                     | 10,680,000  | 27,922,860   | 117,411,226  | 81%                     |
| Antigua and Barbuda | 10,000                        | 4.86  | 48,640                                 | 0*  | 48,640  | 1,500   | 7,296  | 41,344   | 85%                     |
| Bahamas             | 515,000                       | 5.54  | 2,851,040                              | 0*  | 2,851,040                                       | 77,250  | 427,656  | 2,423,384  | 85%                     |
| Bahrain             | 1,000                         | 0.00  | 0                                      | 0*  | 0   | 150   | 0  | 0  | 100% **                 |
| Barbados            | 8,000                         | 2.50  | 20,000                                 | 0*  | 20,000  | 320   | 800  | 19,200   | 96%                     |
| Belize              | 1,393,000                     | 6.58  | 9,164,547                              | (2,000,000)   | 11,164,547                                      | 208,950   | 1,374,682  | 9,789,865  | 88%                     |
| Comoros             | 3,000                         | 3.15  | 9,450                                  | 0   | 9,450   | 0   | 0  | 9,450  | 100%                    |
| Djibouti            | 6,000                         | 0.00  | 0                                      | 0   | 0   | 0   | 0  | 0  | 100% **                 |



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|                                  | <b>F</b>              | <b>GR</b>                        | <b>MAI</b>                   | <b>ΔF</b>                                     | <b>R</b>                             | <b>PA</b>                             | <b>DRB</b>                               | <b>NRB</b>   | <b>fNRB</b>          |
|----------------------------------|-----------------------|----------------------------------|------------------------------|---|--------------------------------------|---------------------------------------|--|--|----------------------|
| Country                          | Extent of Forest (ha) | Growth Rate of biomass (t/ha-yr) | Mean Annual Increment (t/yr) | Annual Change in Living Forest Biomass (t/yr) | Total Annual Biomass Removals (t/yr) | Protected Areas Extent of Forest (ha) | Biomass Growth in Protected Areas (t/yr) | Total Annual Removals - Protected Area Growth (t/yr) | fNRB = NRB/(NRB+DRB) |
| Lao People's Democratic Republic | 15,751,000            | 4.10                             | 64,579,100                   | (12,000,000)                                  | 76,579,100                           | 2,362,650                             | 9,686,865                                | 66,892,235   | 87%                  |
| Lesotho                          | 44,000                | 2.38                             | 104,500                      | 0   | 104,500                              | 1,000                                 | 2,375                                    | 102,125  | 98%                  |
| Maldives                         | 1,000                 | 8.20                             | 8,200                        | 0*  | 8,200                                | 150                                   | 1,230                                    | 6,970  | 85%                  |
| Saint Lucia                      | 47,000                | 7.48                             | 351,537                      | 0*  | 351,537                              | 2,000                                 | 14,959                                   | 336,578  | 96%                  |
| Singapore                        | 2,000                 | 4.60                             | 9,200                        | 0*  | 9,200                                | 300                                   | 1,380                                    | 7,820  | 85%                  |
| Suriname                         | 14,758,000            | 5.98                             | 88,238,082                   | (2,000,000)                                   | 90,238,082                           | 2,015,000                             | 12,047,685                               | 78,190,397   | 87%                  |
| Yemen                            | 549,000               | 1.18                             | 648,506                      | 0   | 648,506                              | 31,000                                | 36,619                                   | 611,888  | 94%                  |

\* Annual Change in Living Forest Biomass was not reported for Eritrea, Fiji, Samoa, Togo, Antigua and Barbuda, Bahamas, Bhain, Barbados, Maldives, Saint Lucia and Singapore. Value assumed to be zero in Samoa given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value in Eritrea calculated as Annual Change Rate 2005-2010 of Forest Extent (-4,000ha/yr from FRA 2010 Table 3) multiplied by Average Biomass Density in Eastern and Southern Africa (126.2 t/ha, calculated from FAO FRA 2010, Table 11, divided by 2003 IPCC carbon stock:biomass conversion factor). Value in Fiji calculated as Annual Change Rate 2005-2010 of Forest Extent (3,000ha/yr from FRA 2010 Table 3) multiplied by Average Biomass Density in Oceania (280.0 t/ha, calculated from FAO FRA 2010, Table 11, divided by 2003 IPCC carbon stock:biomass conversion factor). Value in Togo calculated as Annual Change Rate 2005-2010 of Forest Extent (-20,000ha/yr from FRA 2010 Table 3) multiplied by Average Biomass Density in Western and Central Africa (185.9 t/ha, calculated from FRA 2010, Table 11, divided by 2003 IPCC carbon stock:biomass conversion factor). Value assumed to be zero in Antigua and Barbuda given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Bahamas given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Bahrain given n.s. (not significant) Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Barbados given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Maldives given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Saint Lucia given 0% Change in



Extent of Forest 2005-2010 (FAO FRA 2010, Table 3). Value assumed to be zero in Singapore given 0% Change in Extent of Forest 2005-2010 (FAO FRA 2010, Table 3).

\*\* For Bahrain and Djibouti, the ecological zone of the forest is tropical/sub-tropical desert where the growth rate is zero, resulting in no Mean Annual Increment. The fraction of NRB is considered to be 100%.

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## History of the document

| Version  | Date        | Nature of revision   |
|--|-------------|--|
| 01.0   | 11 May 2012 | EB 67, Annex 22<br><br>Initial adoption. This information note comprises content previously published as annex 20 to the 35 <sup>th</sup> SSC WG meeting report relating to fNRB factors for Least Developed Countries (LDCs) and Small Island Developing States (SIDS) as mandated by the CMP. Factors for further countries (14) have been added to the original list (Table 2). Footnote one is added to clarify the calculations pertaining to net annual change in living forest biomass. |
| <b>Decision Class:</b> Regulatory<br><b>Document Type:</b> Information note<br><b>Business Function:</b> Methodology |             |  |