

## Dataset Information:

Title	Forest Land
Abstract	Annual net CO <sub>2</sub> emission/removal from Forest Land consist of net carbon stock gain/loss in the living biomass pool (aboveground and belowground biomass) associated with <i>Forest</i> and <i>Net Forest Conversion</i> . Computed at Tier 1 and Approach 1, with the stock difference method, following the 2006 IPCC Guidelines for National GHG Inventories (IPCC, 2006) and using area and carbon stocks data compiled by countries in the FAO Global Forest Resource Assessment of 2010 (FRA, 2010); available by country, with global coverage and relative to the period 1990-present, with periodic updates in line with FRA.
Supplemental	This sub-domain contains data on net CO <sub>2</sub> emissions/removals, associated implied emission factors and underlying activity data. The FAOSTAT Emissions data are estimated by FAO and do not coincide with GHG data reported by Parties to UNFCCC. The database is intended primarily as a service to help member countries to assess and report their emissions and removals, as well as a useful international benchmark. The FAOSTAT Emissions data are disseminated publicly to facilitate continuous feedback from member countries.
Creation Date	2013
Last Update	2013
Data Type	Climate Change - Greenhouse Gases
Category	Environment
Time Period	1990-present
Periodicity	Annual
Geographical Coverage	World
Spatial Unit	Country
Language	Multilingual (EN, FR, ES)

## Methodology and Quality Information:

Methods and processing	<p>Net CO<sub>2</sub> emissions/removals from Forest Land consist of net carbon stock change in the living biomass pool (aboveground and belowground) associated with: i) <i>Forest</i>, referring to changes occurred on Forest Land in the reported year; and ii) <i>Net Forest conversion</i> from Forest Land to other land uses. The FAOSTAT data are computed at Tier 1, with the stock difference method, following IPCC 2006 Vol. 4, Ch. 2 and 4.</p> <p>The net CO<sub>2</sub> emission/removal, E/R, are estimated at country level, using the formula:</p> $E/R = A * CSCF * -44/12 / 1,000$ <p>where:</p> <p>E/R= Net CO<sub>2</sub> emission/removal, in Gg CO<sub>2</sub> yr<sup>-1</sup> (3);</p> <p>A = Activity data, representing the forest area under forest management or the forest area net change, in ha (1);</p> <p>CSCF = per hectare carbon stock change in the living biomass pool (aboveground + belowground) of forest land, expressed in units of t C/ha (2);</p> <p>(1) Area of forest, A, is calculated from annual areas of forest land taken directly from the Global Forest Resource Assessment (GFRA) of FAO (<a href="http://www.fao.org/forestry/fra/fra2010/en/">http://www.fao.org/forestry/fra/fra2010/en/</a>). Data for the year 1990, 2000, 2005 and 2010, as provided by GFRA-FAO, for categories <i>Primary forest</i>, <i>Other naturally regenerated forest</i> and <i>Planted forest</i> were linearly interpolated to compile, for each country, complete timeseries of areas for each category, for the period 1990-2010. GFRA categories <i>Primary forest</i> and <i>Other naturally regenerated forest</i> were aggregated, while <i>Planted forest</i> were considered separately, to compute the following forest area</p>
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components at year t:

- a. Area of forest that was still forest in the previous year (area type SFA), computed as  $\text{Min}[A(t), A(t-1)]$ ;
- b. For *Forest*, new net area converted to forest in the same year (area type NAD), computed as:  $\text{Max}[A(t)-A(t-1), 0]$ , thus including only positive net forest area change; or
- c. For *Net Forest Conversion*: net area loss converted from forest to other land uses (area type NAD), computed as:  $\text{Min}[A(t)-A(t-1), 0]$ , thus including only positive net forest area change.

(2) CSCF is computed from the per hectare carbon stock in the living biomass (aboveground + belowground) pool in the country in year t,  $b(t)$ . The latter is obtained from data on per hectare carbon stocks taken directly from the GFRA database for the years 1990, 2000, 2005 and 2010. These were linearly interpolated to compile, for each country, a complete timeseries of per hectare average carbon stock in the living biomass pool,  $b(t)$ , for the period 1990-2010. For countries for which GFRA carbon stock data were not available, the relevant GFRA regional carbon stock (table T2.21 of GFRA 2010) was applied.

For each year t, and each forest area type above, the CSCF is calculated as follows:

For *Forest*:

- i.  $\text{CSCF}(t, \text{SFA}) = \Delta b(t) = b(t) - b(t-1)$ , for forest are of type SFA;
- ii.  $\text{CSCF}^*(t, \text{NAD}) = b(t)$ , for forest areas of type NAD.

The overall net carbon stock change factor at year t,  $\text{CSCF}(t)$ , is computed as:  
$$\text{CSCF}(t) = [\text{CSCF}(t, \text{SFA}) * \text{SFA} + \text{CSCF}(t, \text{NAD}) * \text{NAD}] / A$$

For *Net Forest Conversion*:

- i.  $\text{CSCF}^*(t, \text{NAD}) = b(t-1)$ , for forest areas of type NAD.

The overall net carbon stock change factor at year t,  $\text{CSCF}(t)$ , is computed as:  
$$\text{CSCF}(t) = \text{CSCF}(t, \text{NAD}) * \text{NAD} / A$$

Dimensionless conversion factors used were:

-44/12, to convert from carbon mass to CO<sub>2</sub> emissions; and  
10<sup>-3</sup>, to convert tons in Gg.

The Forest Land sub-domain contains the following data available for download: country-level Net CO<sub>2</sub> emission/removal in Gg CO<sub>2</sub>, and Carbon stock change in Gg C; implied emission factors (i.e., the CSCFs); and underlying activity data. Data are available for all individual countries and territories, as well as for standard FAOSTAT regional aggregations, plus Annex I and non-Annex I groups. The data period is 1990-present, with periodic updates in line with FRA releases.

For estimating uncertainty, it should be noted that information on growing stock and basic wood densities is typically used to compute living biomass carbon stocks. FAO GFRA 2005 estimates uncertainties in growing stock at  $\pm 8\%$  for industrialized countries and  $\pm 30\%$  for non-industrialized countries, and uncertainties for the basic wood density around 10 to 40%. FAOSTAT estimates area uncertainties at  $\pm 10\%$ .

### References

FAO, 2010. Global Forest Resources Assessment 2010, FAO Forestry Paper 163, Rome. Available at <http://www.fao.org/forestry/fra/fra2010/en/>.

IPCC, 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (Eds), IGES, Hayama, Japan. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>

FAO, 2005. Global Forest Resources Assessment 2005, FAO Forestry Paper 147, Rome. Available at <http://www.fao.org/forestry/fra/fra2005/en/>

**Data Collection Method** Computed

**Completeness** 100%

**Links** [www.fao.org/climatechange/micca/ghg/](http://www.fao.org/climatechange/micca/ghg/)  
[www.ipcc-nggip.iges.or.jp/public/](http://www.ipcc-nggip.iges.or.jp/public/)

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