

Dataset Information:

Title	Burning - Biomass
Abstract	Greenhouse Gas (GHG) emissions from burning of biomass consist of methane and nitrous oxide gases from biomass combustion of forest land cover classes 'Humid and Tropical Forest' and 'Other Forests', and of methane, nitrous oxide, and carbon dioxide gases from combustion of organic soils. Emissions are computed at Tier 1 following the 2006 IPCC Guidelines for National GHG Inventories (IPCC, 2006); they are available by country, with global coverage and relative to the period 1990-present, with annual updates.
Supplemental	This sub-domain contains data on GHG emissions, associated emission factors, underlying activity data (area and biomass burned statistics). Estimations are first produced within spatially distributed grids and then aggregated to national level. The FAOSTAT Emissions data are estimates by FAO and do not coincide with GHG data reported by member countries to UNFCCC. The database is intended primarily as a service to help member countries assess and report their emissions, 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>Greenhouse Gas (GHG) emissions from burning of biomass consist of gases produced from the burning of biomass for the following items: 'Humid Tropical Forest,' 'Other Forests' and 'Organic Soils'. They consist of methane (CH₄), nitrous oxide (N₂O), and, only in the case of Organic Soils, also Carbon Dioxide (CO₂).</p> <p>Humid Tropical Forest is defined by aggregation of the following FAO-FRA Global Ecological Zones (FAO 2012): "Tropical rainforest" and "Tropical moist deciduous forest".</p> <p>Other Forest area contains the rest of the FAO-FRA Global Ecological Zones for Forest.</p> <p>Organic Soils are defined as the Histosols class in the Harmonized World Soil Database (FAO et al., 2012), consistently with the FAOSTAT Emissions database "Cultivation Organic Soils" definitions.</p> <p>Emissions are estimated following IPCC, 2006, Vol. 4, Ch. 2, Eq. 2.27, by aggregation to the national level of spatially distributed information, produced on a spatial grid at 0.25 degree resolution (approximately 25 km at the equator).</p> <p>For each item, and at each pixel, the following formula is used:</p> $Emission = A * EF$ <p>where:</p> <p>$Emission$ = GHG emissions in g CH₄, g N₂O and g CO₂.</p> <p>A = Activity data, representing the total mass of fuel burned, in kg of dry matter (1);</p> <p>EF = Tier 1 IPCC emission factor, expressed in g CH₄, g N₂O or g CO₂, per kg of burned dry</p>
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matter (2).

(1) Total mass of fuel burned is computed by multiplying burned area (i) by fuel biomass consumption values (ii).

(i) Yearly composite values of burned area are obtained as the sum of monthly burned area data from the Global Fire Emission Database v.4 (GFED4; Giglio et al. 2013). For forest, the GFED4 burned forest area is an aggregate of burned area in the following MODIS land cover classes (MCD12Q1, Hansen et al., 2000): Evergreen Needle-leaf, Evergreen Broadleaf, Deciduous Needle-leaf, Deciduous Broadleaf, and Mixed Forest.

For “Humid Tropical Forest,” burned area is obtained by overlapping GFED4 Burned Forest area data with the relevant FAO-FRA Global Ecological Zones.

For “Other Forest,” burned area is obtained as GFED4 burned Forest area minus Humid Tropical Forest burned area.

For “Organic Soils,” burned areas is obtained by overlapping GFED4 Burned area data with the Histosols class information of the Harmonized World Soil Database (FAO et al., 2012), assuming even distribution of organic soils within the grid cell.

(ii) Fuel biomass consumption values are taken from IPCC, 2006: Vol.4, Ch. 2, Tab. 2.4. The different values are climate dependent, and were geographically allocated using the JRC Climate Zones map (EC-JRC, 2010).

(2) EF values are taken from IPCC, 2006: Vol. 4, Ch. 2, Tab. 2.5. The different values are climate dependent, and were geographically allocated using the JRC Climate Zones map (EC-JRC, 2010).

For each item, Emissions at pixel level were subsequently aggregated at country level, using the FAO Global Administrative Unit Layers (GAUL) dataset.

Dimensionless conversion factors used are:

10^{-9} , to convert the emissions from g CH₄ to Gg CH₄ and g N₂O to Gg N₂O;

GWP- CH₄ = 21 (100-year time horizon global warming potential), to convert Gg CH₄ to Gg CO₂eq.

GWP-N₂O = 310 (100-year time horizon global warming potential), to convert Gg N₂O to Gg CO₂eq (IPCC, 1996: Technical Summary, Tab. 4 pg. 22).

The Burning-Biomass sub-domain contains the following data categories available for download for each land cover class: country-level GHG emissions, provided as totals, in Gg CH₄, Gg N₂O and Gg CO₂eq; implied emission factor; burned area; and total mass of fuel available. Data is available for all countries and territories with an area large enough to be monitored at the resolution of GFED4 data, as well as for standard FAOSTAT regional aggregations, plus Annex I and non-Annex I groups. The data period available on FAOSTAT is 1990-present, with annual updates. Since GFED4 data are not available before 1996 and for future periods, a single yearly value for the period 1990-1995 was estimated for each country as the average of the period 1996-2012.

Uncertainties in estimates of GHG emissions are due to uncertainties in emission factors and activity data. They may be related to, inter alia, natural variability, partitioning fractions, lack of spatial or temporal coverage, spatial aggregation, errors in satellite data. In the case of Biomass burning more detailed information is available in the IPCC guidelines (IPCC, 2006: Vol.4, Ch. 5, Section 5.2.4.4).

References

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Giglio, L., J. T. Randerson, , and G. R.van der Werf. 2013. Analysis of daily, monthly, and annual burned area using the fourth generation Global Fire Emissions Database (GFED4). *Journal of Geophysical Research: Biogeosciences* 118: 1-12. Hansen, M. C., R. S. DeFries, J. R. G. Townshend, and R. Sohlberg. 2000. Global land cover classification at 1km spatial resolution using a classification tree approach. *International Journal of Remote Sensing* 21: 1331–1364.

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Data Collection Computed

Method

Completeness 100%

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Citation FAOSTAT. 2013. FAOSTAT Emissions Database.
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Acknowledgements The FAOSTAT Emissions database was produced by the Monitoring and Assessment of Greenhouse Gas Emissions and Mitigation Potential in Agriculture project (MAGHG), with generous funding from the Governments of Norway and Germany, trust funds GCP/GLO/286/GER and GCP/GLO/325/NOR.