

Dataset Information:

Title	Burning - Savanna
Abstract	Greenhouse Gas (GHG) emissions from burning of savanna consist of methane and nitrous oxide gases from biomass combustion. 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, and projections for 2030 and 2050.
Supplemental	This sub-domain contains data on GHG emissions, associated emission factors, underlying activity data (amount of area and biomass burned statistics). Estimations are produced within spatially distributed grids and then aggregated at 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; projections for 2030 and 2050
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 savanna consist of methane (CH₄) and nitrous oxide (N₂O) gases produced from the burning of vegetation biomass in the following five land cover types: Savanna, Woody Savanna, Open Shrublands, Closed Shrublands, and Grasslands. The FAOSTAT data are estimated at Tier 1 following IPCC, 2006, Vol. 4, Ch. 2, Eq. 2.27.</p> <p>CH₄ and N₂O emissions are estimated on a spatial grid at 0.25 degree resolution (approximately 25 km at the equator), using the formula:</p> $Emission = A * EF$ <p>where:</p> <p><i>Emission</i> = GHG emissions in g CH₄ and g N₂O;</p> <p><i>A</i> = Activity data, representing the total mass of fuel burned in each pixel, kg of dry matter (1);</p> <p><i>EF</i> = Tier 1 IPCC emission factor, expressed in g CH₄ or g N₂O per kg of burned dry matter (2).</p> <p>(1) Total mass of fuel burned is computed by multiplying burned area (<i>i</i>) by fuel biomass consumption values (<i>ii</i>).</p> <p>(i) Yearly composite burned area values are produced from monthly statistics of the Global Fire Emission Database v.4, based on MODIS remote-sensing data (GFED4; Giglio et al. 2013). The dataset provides burned area by land cover classes as identified by the MODIS Land Cover product (MCD12Q1, Hansen et al., 2000).</p> <p>(ii) Fuel biomass consumption values are taken from IPCC, 2006: Vol.4, Ch. 2, Tab. 2.4. The different values were geographically allocated using the JRC Climate Zones map</p>
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(<http://eusoils.jrc.ec.europa.eu/projects/RenewableEnergy/>).

The data period available on FAOSTAT is 1990 to present with annual updates, and projections to 2030 and 2050. Since GFED4 data are not available before 1996 and obviously for future periods, yearly values for the period 1990-1995, as well as 2030 and 2050, are set as a constant, and estimated as the average of the period 1996-2012.

(2) Default EF values are taken from IPCC, 2006: Vol. 4, Ch. 2, Tab. 2.5.

GHG estimates made 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-Savanna 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.

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

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.

IPCC. 1997. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. OECD, Paris, France.

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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.

Data Collection Method	Computed
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Completeness	100%
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Links	www.fao.org/climatechange/micca/ghg/ www.ipcc-nggip.iges.or.jp/public/
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