FAOSTAT Domain Burning - Crop residues. Methodological note, release October 2022

Dataset Information:

Title	**Burning - Crop residues**
Abstract	The FAOSTAT domain Burning crop residues consist of methane (CH_4) and nitrous oxide (N_2O) emissions from crop residues burnt in the fields. FAO estimates are computed using the Tier 1 method of the 2006 IPCC Guidelines for National greenhouse gas Inventories (IPCC, 2006). Data are available by country and with global coverage, in complete time series for the period 1961–2020 and projections for 2030 and 2050. The database is updated annually.
Supplemental	The FAOSTAT domain *Burning crop residues* disseminates information by country on: activity data (in kg of biomass burned by select crop –maize, sugar cane, wheat and rice); and greenhouse gas (GHG) emissions (in kilotonnes of CH_4 and N_2O). Data are available for all countries and territories, for standard FAOSTAT regional aggregations, and for Annex I and non-Annex I country groups. This FAOSTAT domain also disseminates the activity data and emissions data reported by countries to the United Nations Framework Convention on Climate Change (UNFCCC), under category 'Field burning of agricultural residues.' Activity data are sourced from the most recently available GHG National Inventories (NGHGI) or from National Communications. Emission data are sourced directly from the UNFCCC data portal or from Biennial Update Reports (BURs). UNFCCC data are disseminated in FAOSTAT with permission, formalized via a FAO-UNFCCC Memorandum of Understanding. The IPCC recommends the use of the FAOSTAT database to countries as a tool for NGHGI QA/QC processes and validation of both activity data and emissions estimates (IPCC, 2019).
Creation Date	2012
Last Update	2022
Data Type	Climate Change - Greenhouse Gases
Category	Agriculture; Environment
Time Period	1961–2020; projections for 2030 and 2050
Periodicity	Annual
Geographical Coverage	World
Spatial Unit	In 2020, 177 countries and 6 territories (FAO Tier I)
Language	Multilingual (EN, FR, ES)

Methodology and Quality Information:

Methods and processing	***Overview*** Greenhouse Gas (GHG) emissions from *Burning crop residues* consist of methane (CH_4) and nitrous oxide (N_2O) gases produced during combustion of crop residues burnt in the field. The biomass of fuel available for burning is estimated taking into account the fractions removed before burning due to animal consumption, decay in the field, and use in other sectors (e.g., biofuel, domestic livestock feed, building materials, etc.). The FAOSTAT data are estimated at Tier 1 following IPCC, 2006, Vol. 4, Ch. 2 and 5. The CH_4 and N_2O emissions are estimated at country level, using the formula:

*Emission = A * EF*

where:
Emission = GHG emissions in units of kt CH_4 and kt N_2O;
A = Activity data, representing the total amount of biomass burned, kg of dry matter (1);
EF = Tier 1, default IPCC emission factors, expressed in g CH_4/kg of dry matter and g N_2O/kg of dry matter (2).

(1) Activity data are calculated from harvested area statistics and cover the following crops: wheat, maize, rice, and sugarcane. For the period 1961–2020, the harvested area is taken from FAOSTAT domain "Production/Crops and livestock products" (http://www.fao.org/faostat/en/#data/QCL). Projections of harvested area for 2030 and 2050 are computed with respect to a baseline, defined as the 2005–2007 average of the corresponding FAOSTAT activity data, and by applying percentage growth rates from FAO perspective studies (Alexandratos and Bruinsma 2012). The FAO projections cover some 140 countries. Projections of activity data for countries not included assume the same growth rate of neighboring countries.

The harvested area by crop is used to estimate the amount of biomass that is burned using default fuel biomass consumption values as reported in the IPCC, 2006 guidelines (Vol.4, Ch. 2, Tab. 2.4). Based on the IPCC 2000 Good Practice Guidance document, the biomass burned is reduced by the fraction of crop residues that is burnt on-site—assumed to be 10 percent of the area harvested (IPCC, 2000, Ch.4, Section 4A.2.1.1).

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

Dimensionless conversion factors:
10^{-9}, to convert the emissions from g to kt.

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. In the case of burning crop residues more detailed information is available in the IPCC guidelines (IPCC, 2006: Vol.4, Ch. 5, Section 5.2.4.4).

References

IPCC **2000**. Good practice guidance and uncertainty management in national greenhouse gas inventories. In: J. Penman et al. (Eds.), IPCC National Greenhouse Gas Inventories Programme, Technical Support Unit, Hayama, Japan. Available at: http://www.ipcc-nggip.iges.or.jp/public/gp/english/

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	Alexandratos N. and Bruinsma J. **2012**. World agriculture towards 2030/2050: the 2012 revision. ESA Working paper No. 12-03. Rome, FAO. Available at: http://www.fao.org/docrep/016/ap106e/ap106e.pdf IPCC **2019**. 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Available at: https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/. Tubiello, F.N. **2019**. Greenhouse Gas Emissions Due to Agriculture. In: Ferranti, P., Berry, E.M., Anderson, J.R. (Eds.), Encyclopedia of Food Security and Sustainability, vol. 1, pp. 196–205. Elsevier. ISBN: 9780128126875 United Nations Framework Convention on Climate Change (UNFCCC). **2020.** Greenhouse gas inventory data – Detailed data by party. Available at https://di.unfccc.int/detailed_data_by_party. United Nations Framework Convention on Climate Change (UNFCCC). **2020.** National inventory submissions, 2019. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2019.
Data Collection Method	Computed
Completeness	100%
Useful links	http://www.fao.org/food-agriculture-statistics/statistical-domains/environment/en/ http://www.ipcc-nggip.iges.or.jp/public/ https://unfccc.int

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Statistical Database Terms of Use

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