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## Dataset Information:

Title	Agriculture Total
<b>Abstract</b>	Agriculture Total provides a complete picture of the GHG emissions from agriculture estimated by FAO. These emissions consist of non-CO <sub>2</sub> gases, namely methane (CH <sub>4</sub> ) and nitrous oxide (N <sub>2</sub> O), associated with crop and livestock production and associated management activities (Tubiello, 2019). Data are computed at Tier 1 following the IPCC Guidelines for National GHG Inventories (IPCC, 1996; 1997; 2000; 2002; 2006) and are available by country with global coverage, with annual updates. Emission estimates are available for the period 1961–2017, and include projection years 2030 and 2050. Data for “Cultivation of organic soils” and “Burning–savanna” begin in 1990.
<b>Supplemental</b>	<p>The FAOSTAT domain “Agriculture Total” disseminates CH<sub>4</sub> and N<sub>2</sub>O emissions from the FAOSTAT agricultural sub-domains, expressed in Gg (10<sup>9</sup> g). GHG estimates are available for each greenhouse gas (CH<sub>4</sub> and N<sub>2</sub>O) as well as in Co<sub>2</sub>eq, the latter computed by using the IPCC Second Assessment report global warming potentials, GWP_SAR. Data are available for all countries and territories listed in FAOSTAT and for standard FAOSTAT regional aggregations, plus Annex I and non-Annex I groups.</p> <p>FAOSTAT emissions are estimated by FAO and may not coincide with GHG data reported by member countries to UNFCCC. The database is intended as a tool to help member countries assess and report their emissions, as well as a useful international reference.</p>
<b>Creation Date</b>	2012
<b>Last Update</b>	2019
<b>Data Type</b>	Climate Change - Greenhouse Gases
<b>Category</b>	Environment
<b>Time Period</b>	1961–2017; projections for 2030 and 2050
<b>Periodicity</b>	Annual
<b>Geographical Coverage</b>	World
<b>Spatial Unit</b>	Country
<b>Language</b>	Multilingual (EN, FR, ES)

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## Methodology and Quality Information:

<b>Methods and processing</b>	<p><b>Overview</b></p> <p>The FAOSTAT domain “Agriculture Total” includes estimates of GHG emissions computed at Tier 1 following the IPCC Guidelines for National GHG Inventories, for each single greenhouse gas (CH<sub>4</sub>, N<sub>2</sub>O) as well as aggregated using CO<sub>2</sub> equivalents.</p> <p>Estimates are available for the period 1961–2017, as well as for the years 2030 and 2050:</p> <ul style="list-style-type: none"><li>• Enteric fermentation (CH<sub>4</sub>)</li><li>• Manure management (CH<sub>4</sub>, N<sub>2</sub>O)</li><li>• Rice cultivation (CH<sub>4</sub>)</li><li>• Synthetic fertilizers (N<sub>2</sub>O)</li><li>• Manure applied to soils (N<sub>2</sub>O)</li><li>• Manure applied to pastures (N<sub>2</sub>O)</li><li>• Crop residues (N<sub>2</sub>O)</li><li>• Burning–crop residues (CH<sub>4</sub>, N<sub>2</sub>O)</li><li>• Cultivation of organic soils (N<sub>2</sub>O)</li><li>• Burning–savanna (CH<sub>4</sub>, N<sub>2</sub>O)</li></ul> <p>The last two sub-domains are only available for the period 1990–2017—as well as for the years 2030 and 2050—because the relevant activity data is derived from remote sensing.</p>
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Projections to 2030 and 2050 are based on a baseline defined as the 2005–2007 average of the corresponding FAOSTAT activity data and on their projections as computed by FAO (Alexandratos and Bruinsma, 2012). Projections for “Cultivation of organic soils” and “Burning–savanna” are computed applying domain-specific methods.

Methodological notes are available under the “Related documents” section of each FAOSTAT sub-domain.

#### Global Warming Potential (GWP)

The GWP values of the IPCC Second Assessment report (IPCC, 1996: Technical Summary, Tab. 4 pg. 22), corresponding to a 100-year horizon, were applied to convert CH<sub>4</sub> and N<sub>2</sub>O amounts to equivalent CO<sub>2</sub>eq, as follows:

GWP-CH<sub>4</sub> = 21;

GWP-N<sub>2</sub>O = 310.

#### **References**

IPCC **1996**. Climate Change 1995 - The Science of Climate Change: Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge. Available at: <https://www.ipcc.ch/ipccreports/sar/wg I/ipcc sar wg I full report.pdf>

IPCC **1997**. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, OECD, Paris. Available at: <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>

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/gpgaum\\_en.html](http://www.ipcc-nggip.iges.or.jp/public/gp/english/gpgaum_en.html)

IPCC **2002**. Background Papers, IPCC Expert Meetings on Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. IPCC-NGGIP, p.399-417. Available at: <http://www.ipcc-nggip.iges.or.jp/public/gp/gpg-bgp.html>

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>

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>

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

**Data Collection Method** Computed

**Method**

**Completeness** 100%

**Useful links** <http://www.fao.org/economic/ess/environment/en/>  
<http://www.ipcc-nggip.iges.or.jp/public/>

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<b>Citation</b>	FAO, 2019. FAOSTAT Emissions Database, Agriculture, Agriculture Total, <a href="http://faostat3.fao.org/download/G1/GT/E">http://faostat3.fao.org/download/G1/GT/E</a>
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