



Food and Agriculture Organization
of the United Nations

>> FAO Statistics Division

FAOSTAT Emissions data: Agriculture and Forest Land, 1990–2019

Francesco N Tubiello

Giulia Conchedda, Griffiths OblyLayrea

WGIA 18, Jul 13 2021



FAO Statistics Work on GHG

- Enhance capacity of countries to collect, analyse and report data on food and agriculture and food systems, consistently with UNFCCC and SDG processes
- Provide global knowledge products that enable analysis of food and agriculture trends at regional and world level (e.g., IPCC AR6)
- Disseminate data and tools in support of country QAQC and validation processes for their NGHGs (e.g., IPCC GLs, UNFCCC Lead reviewers meeting 2021)

Data to monitor sustainable food and agriculture



Questionnaire on Agricultural Resources
Land use and Irrigation

Reference Year: 2001-2010

National Reporting Office and Contact name

Organization name: _____
Address: _____
City: _____
Country: _____
Telephone: _____
Fax: _____
E-mail: _____

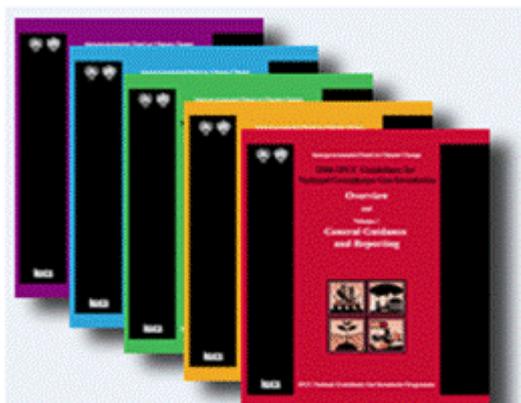
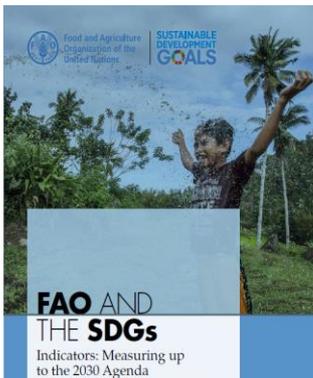
FAO leads an international reporting process on food and agriculture



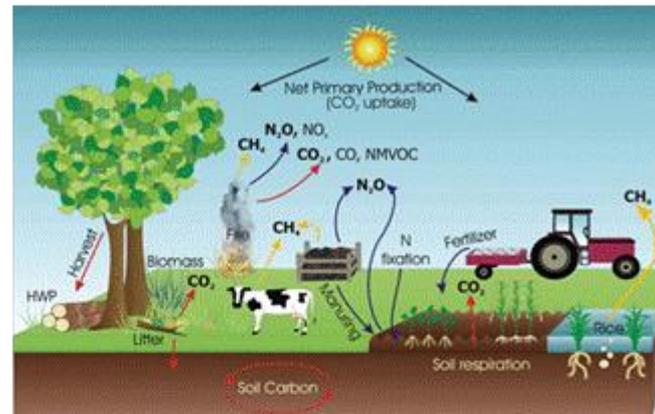
FAO leads an international reporting process on food and agriculture

SDG Indicators

IPCC 2006 Guidelines



Sustainable and productive agriculture SDG 2.4.1, AFOLU, Agriculture, LULUCF



FAO generates data as global public goods that can be used for supporting member countries on data

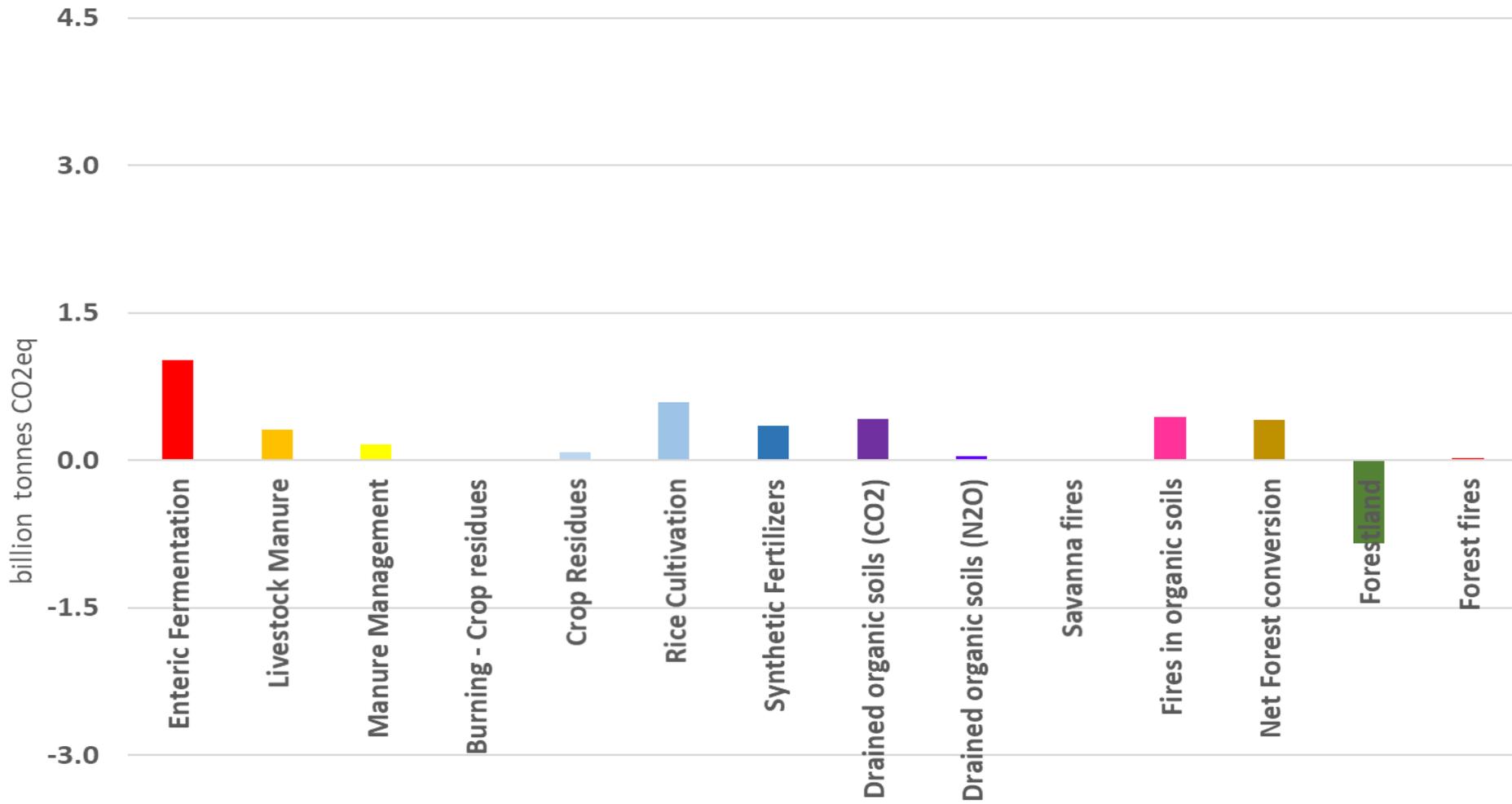
FAOSTAT 2021 Features

- New updated series, FAO estimates 1961-2019;
- UNFCCC country data from NCs/BURs
- Mapping IPCC categories to food systems

	FAOSTAT	NGHGI - UNFCCC	
	Agriculture and Forest Land	Agriculture	LULUCF
Gases	CO ₂ ; N ₂ O; CH ₄	N ₂ O; CH ₄	CO ₂ ; N ₂ O; CH ₄
Spatial Coverage	194 countries 36 territories	184 countries (Incomplete spatial coverage)	
Temporal Coverage	1961-2019 (1990-2020)	1990-2018 (Incomplete temporal coverage)	
Thematic Coverage	Complete (13 categories)	Incomplete	

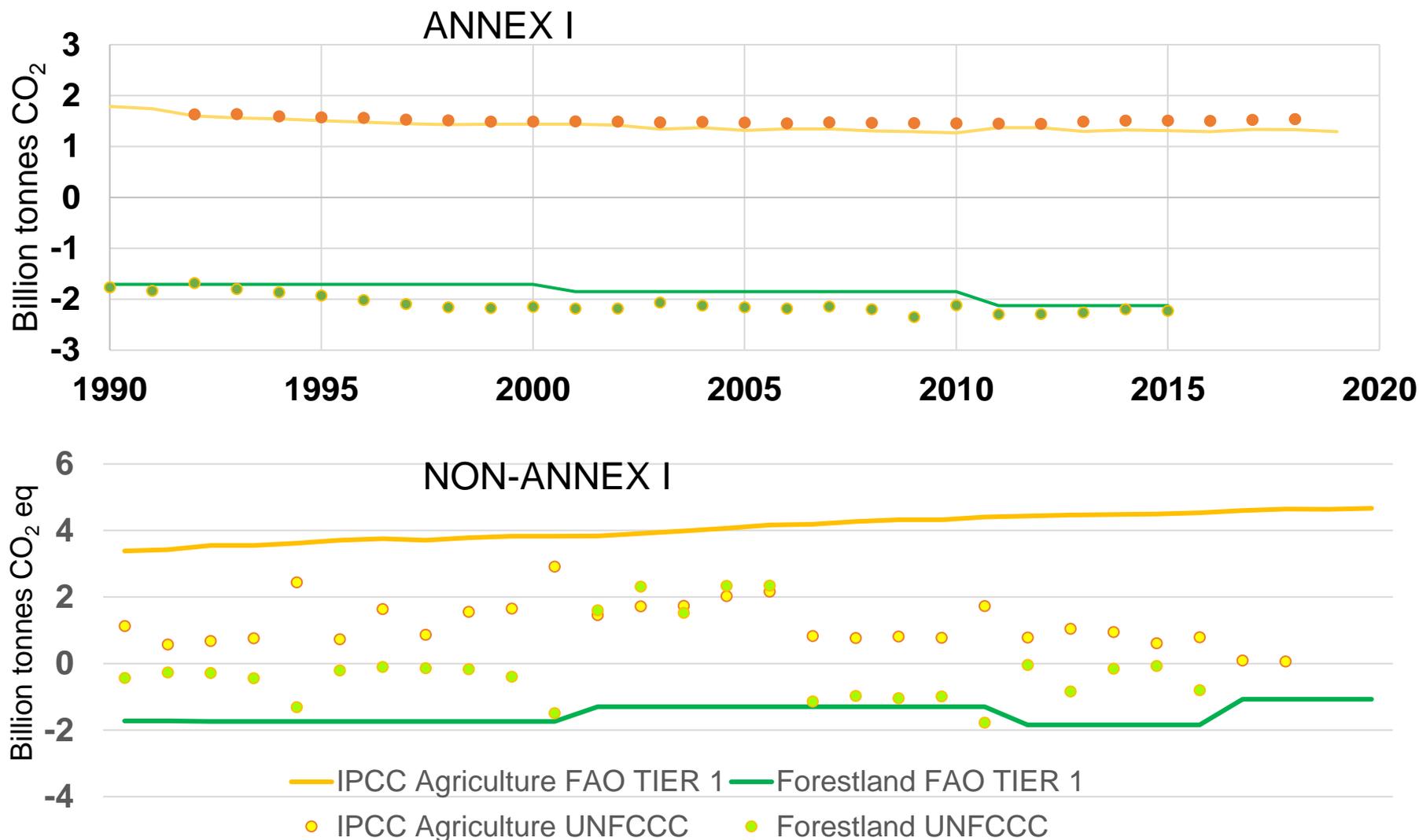
Emissions from agriculture and forest land, 1990-2019

Emissions from agriculture and forest land, ASIA, 2019

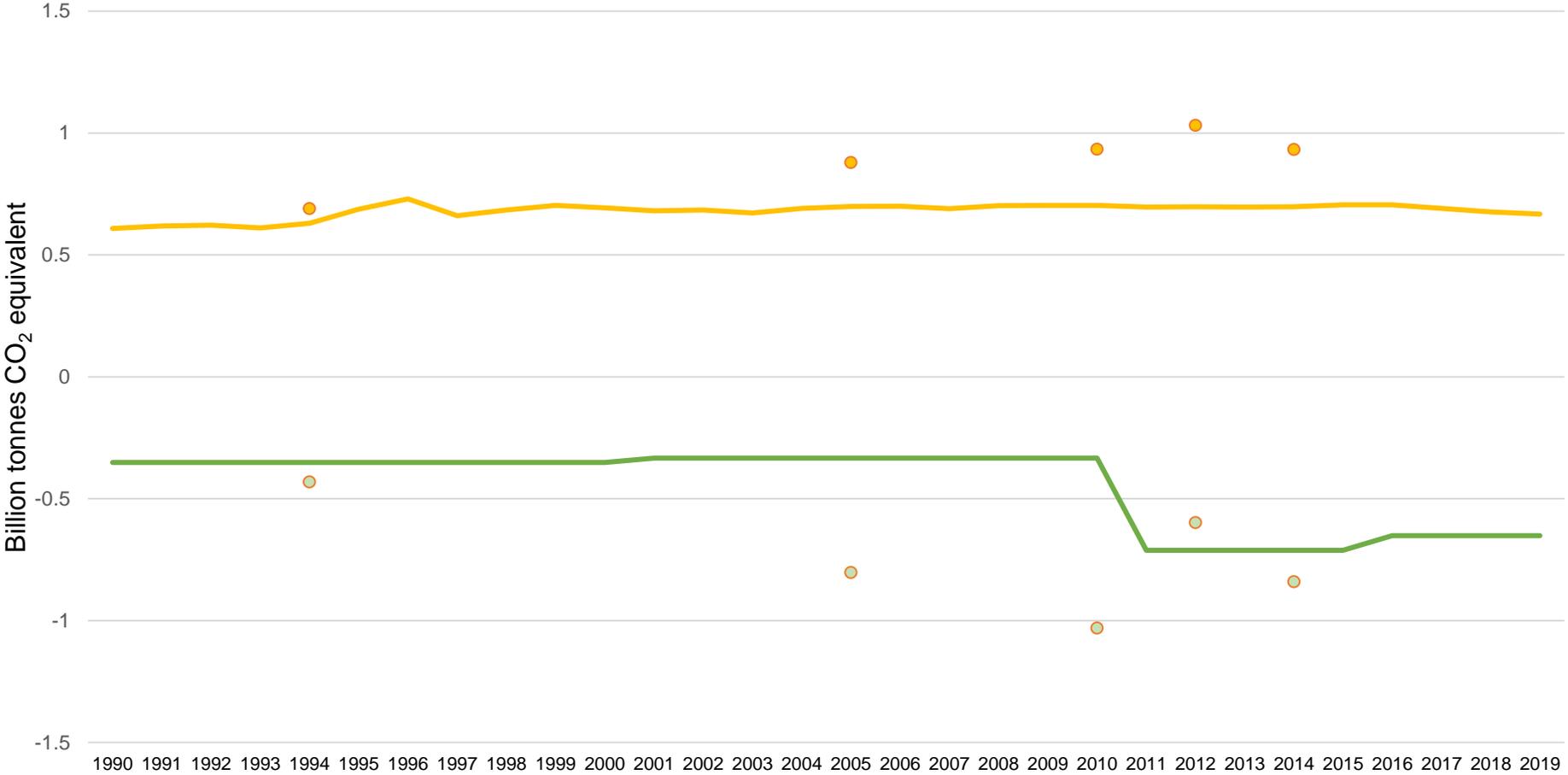


Source: FAOSTAT 2021

Comparison to country data, aggregates



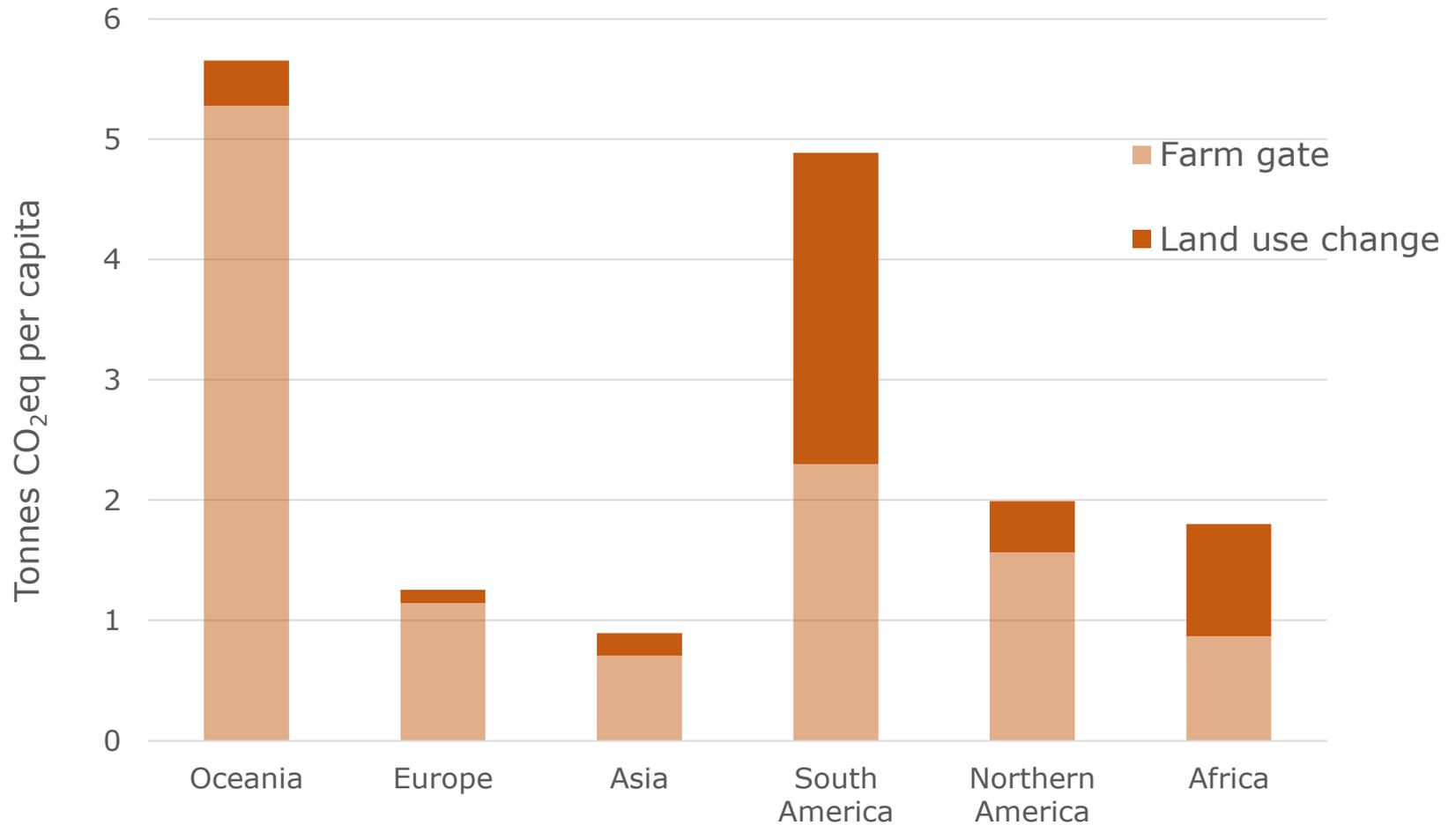
Comparison to country data, example



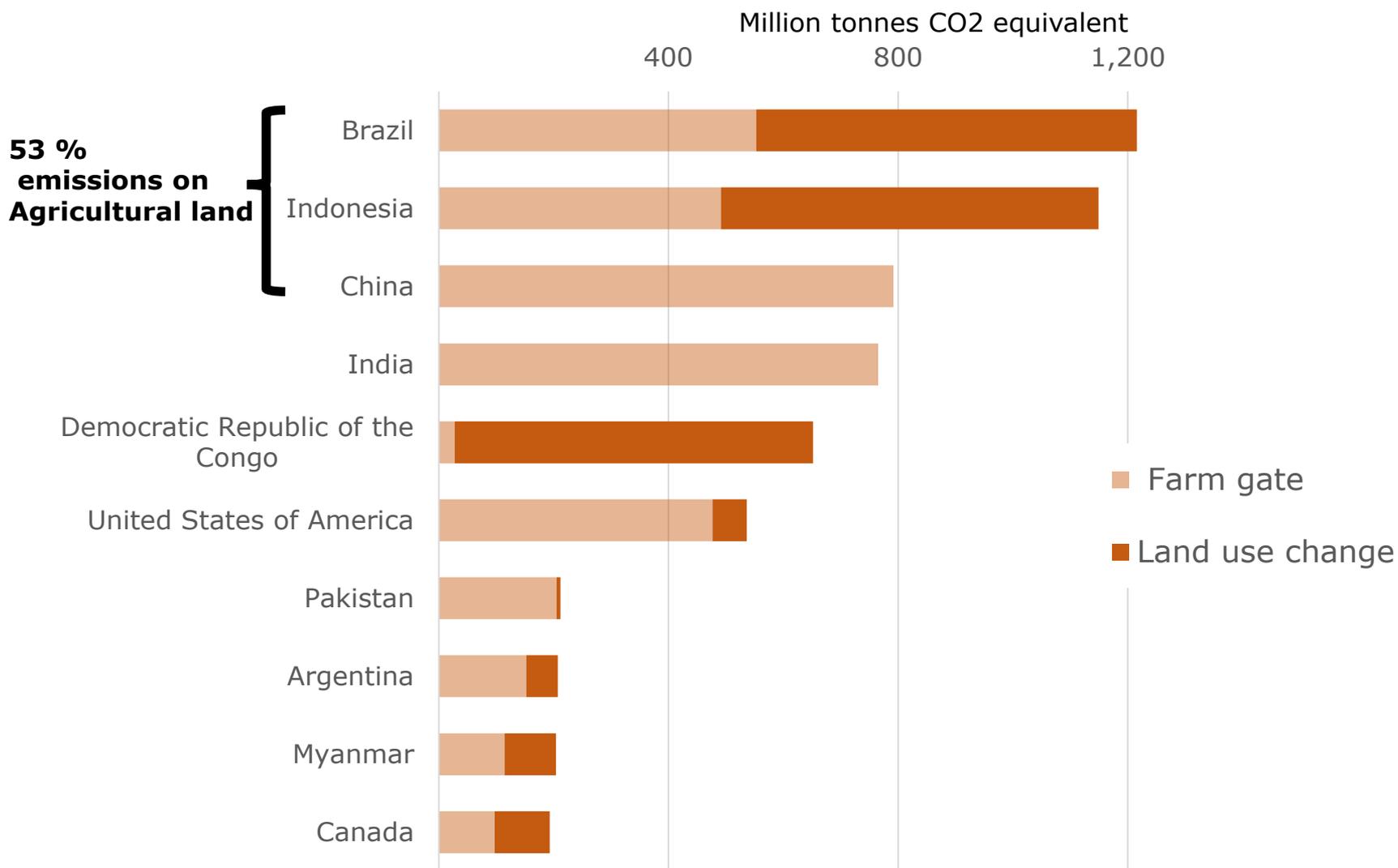
— Forestland FAO TIER 1
— IPCC Agriculture FAO TIER 1

○ Forestland UNFCCC
● IPCC Agriculture UNFCCC

Regional per cap agriculture emissions, 2019

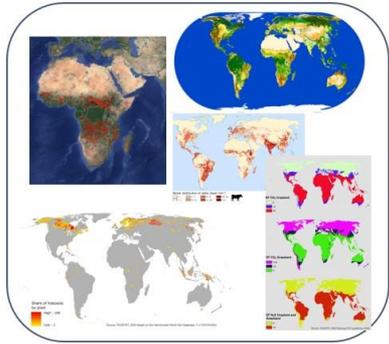


Country highlights, top ten emitters, 2019



From Geospatial to Environmental statistics

Geospatial implementation of IPCC methods

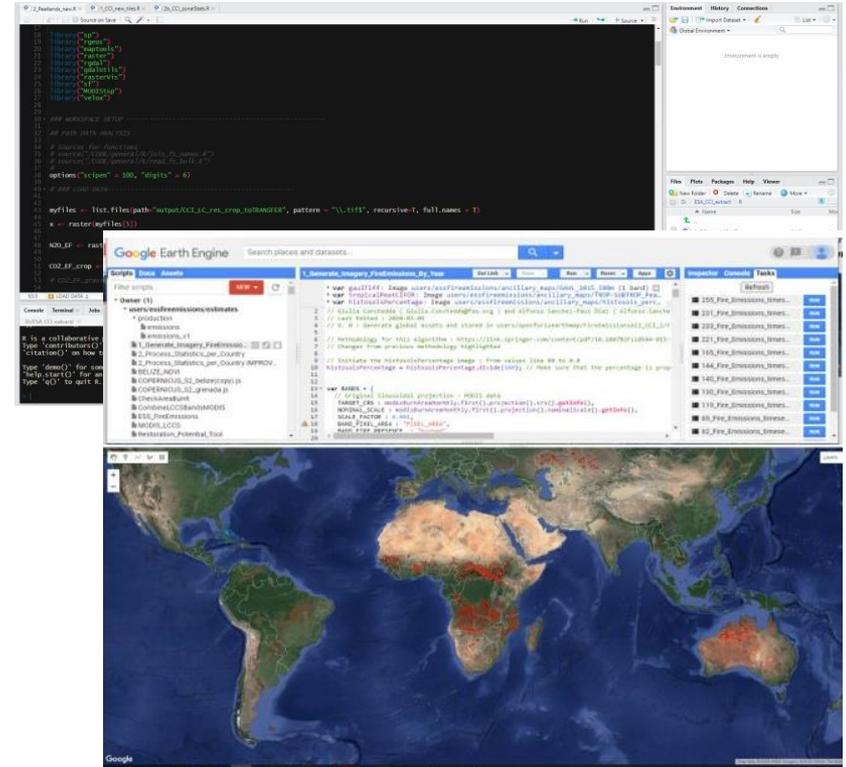


Global and free data

- FAO map of *histosols* (organic soils);
- Annual land cover maps for cropland and grassland organic soils: European Space Agency – Copernicus;
- NASA MODIS fires and land cover data;
- Gridded Livestock of the World;
- Climatic Zones: IPCC – FAO;
- Maps of emissions factors

Open source software

R – code editor of the Google Earth Engine



Country aggregates, zonal statistics

FAOSTAT statistics and reference publications

- **Drained organic soils:** in 2019, data for 105 countries and territories
- **Biomass and peat fires:** in 2019, 229 countries and territories

The screenshot shows the FAOSTAT web interface. The top section displays 'Greenhouse gas emissions from burning of biomass' with a world map and a legend for emissions by country (CO₂) from 1990 to 2019. Below this, the 'Cultivation of Organic Soils' section is visible, featuring filters for country, region, and special group, along with a legend for soil types like 'Organic soils' and 'Non-organic soils'. A sidebar on the right offers 'Bulk Downloads' for various data sets.

The screenshot shows the 'FAO Hand in Hand Geospatial Platform'. It features a map of Southeast Asia with a data overlay. A 'Feature Information' window is open, displaying details for 'FAOSTAT GHG Emissions from Drained Organic Soils (Global - yearly - Gg)'. The window includes fields for 'Year: 2018', 'Land Use: Cropland', and 'Emissions: Gas, Carbon'. A legend on the left side of the map shows color-coded categories for GHG emissions.

FAO Hand in Hand Geospatial Platform

Google Earth Engine Data Catalog

The screenshot shows the Google Earth Engine Data Catalog search results for 'FAO Drained Organic Soils'. The top section includes the 'Earth Engine Data Catalog' header and search filters. Below, the search results for 'FAO Drained Organic Soils' are displayed, including a title, author information (Paolo Probst, Mario Blaise, Francesco N. Tubello, Giulia Conchedda, Simone Rossi, Luigi Benvenuti, Mirella Salvatore & Martial Bernoux), and a brief abstract. The abstract discusses the Paris Agreement and the need for transparent monitoring and reporting of GHG emissions and on the NDCs implementation efforts. Biomass fires significantly affect the GHG atmospheric balance, with fire emissions representing more than 5% of total emissions from agriculture, forestry, and other land use (AFOLU), according to recent estimates produced by the Food and Agriculture Organization (FAO). We update previously published Tier 1 estimates of GHG emissions in FAOSTAT—which has been used in the IPCC AR5 analysis—by using new burned area activity data from the Moderate Resolution Imaging Spectroradiometer (MODIS) known as MCD64A1, Collection 6. The previous FAOSTAT

FAO Earth Map

The screenshot shows the 'FAO Earth Map' interface. It features a world map with data overlays for 'Emissions: Drained Organic Soils'. A legend on the right side of the map shows color-coded categories for emissions. The map is interactive, with various layers and filters available on the left side.

>> FAO Statistics Division

Conclusions

- FAOSTAT data offer a robust assessment of regional and global trends on food and agriculture
- Developed at country level, over long time series, they support QAQC and validation of NGHGs, including availability of geospatial data
- Significant capacity development activities ongoing, with linkages to key UNFCCC and SDG processes

Thank you!

francesco.tubiello@fao.org

FAO Analytical Brief: <http://www.fao.org/food-agriculture-statistics/data-release/data-release-detail/en/c/1413420/>

FAOSTAT Emissions data: <http://www.fao.org/faostat/en/#data/GT>