



Food and Agriculture Organization
of the United Nations

>> FAO Statistics Division

Updates from FAO: Emissions from Land Use, Land Use Change and Forestry (LULUCF)

Francesco N. Tubiello

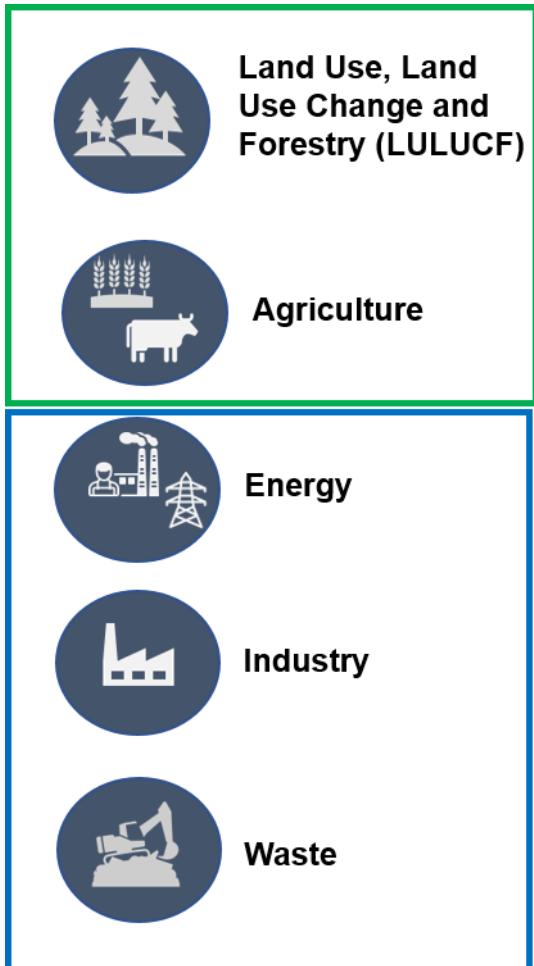
FAO Statistics Division

Tenth Meeting of the Expert Group on Environment Statistics

New York, Oct 3-10 2023 (Virtual)

FAOSTAT GHG Data structure

UNFCCC National GHG Inventories



FAO Agrifood Systems



Farm gate



Land use change

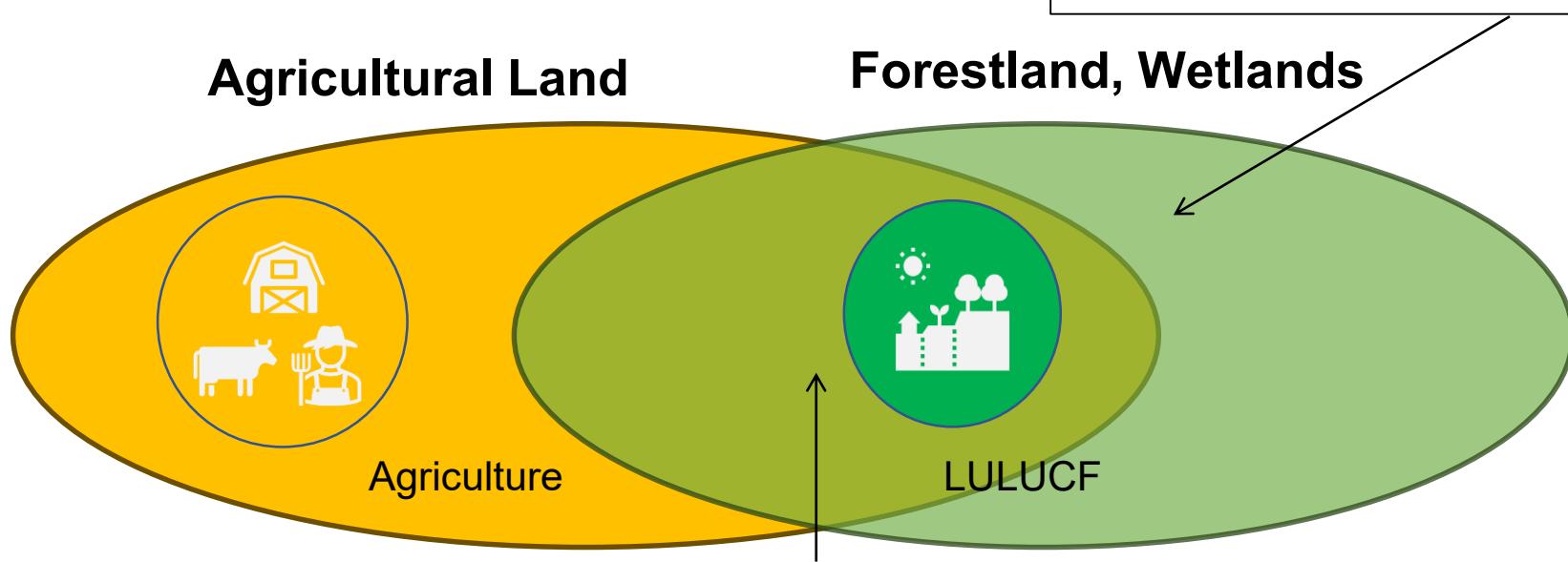


**Pre and post
agricultural production**

A large blue double-headed arrow is positioned above a table, indicating a relationship or comparison between the two systems.

	Emissions
Greenhouse gas	CO ₂ ; N ₂ O; CH ₄ ; F-gases – Quantities and indicators (per capita, per commodity, per total economy)
Spatial Coverage	194 Countries and 36 Territories
Temporal Coverage	1990-2021; 1961–2021
Thematic Coverage	All IPCC sectors, all food system processes
Main input data sources	FAOSTAT, UNSD, PRIMAP

LULUCF Components in FAOSTAT



Forest land

- Forest biomass stock change
- Forest fires

Agricultural Land



Agriculture

Forestland, Wetlands



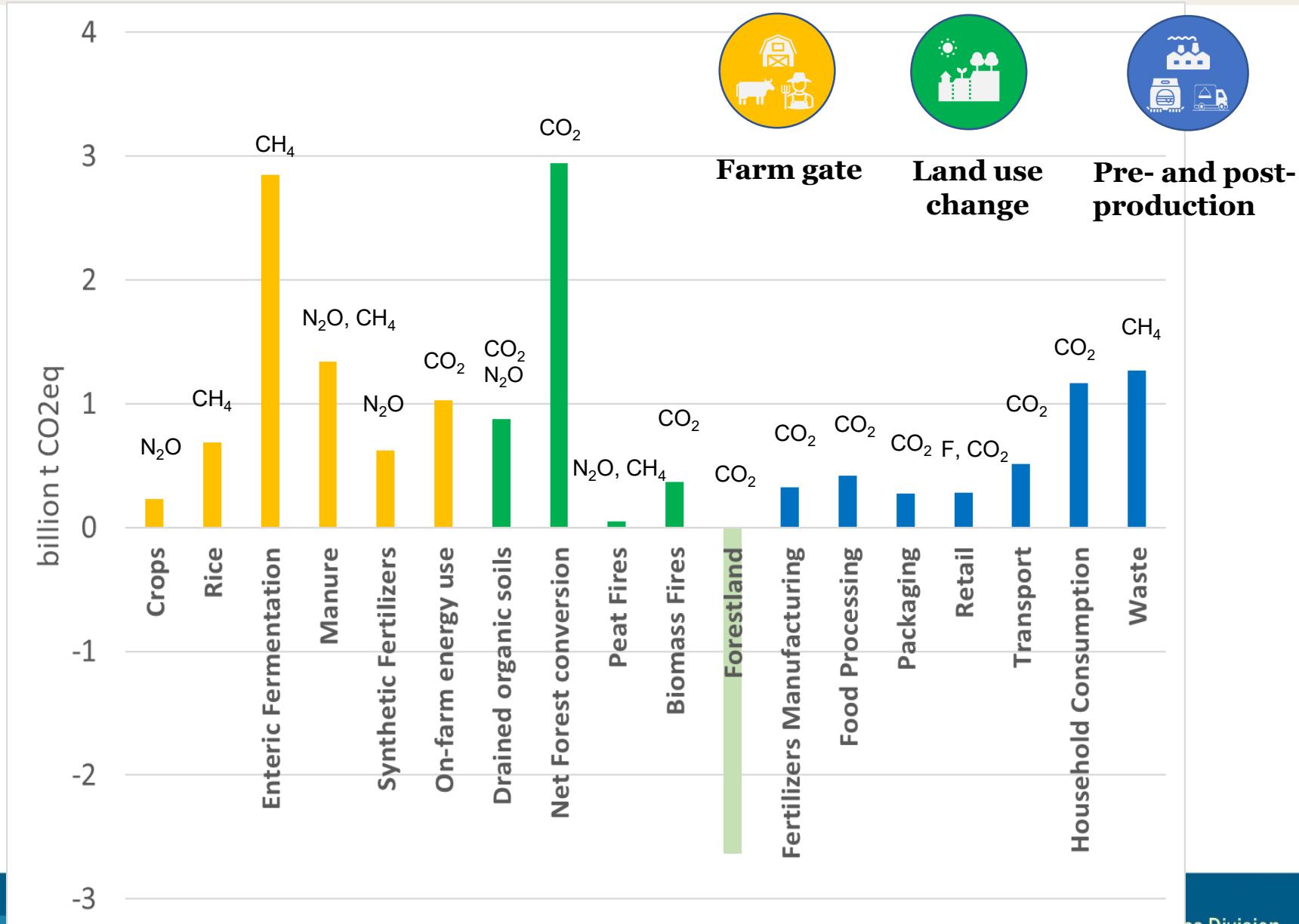
LULUCF

New agricultural Land through conversion:

- Deforestation
- Peatland Drainage
- Peatland Fires



World emissions by agri-food system component, 2021



World and regional LULUCF emissions, 2021

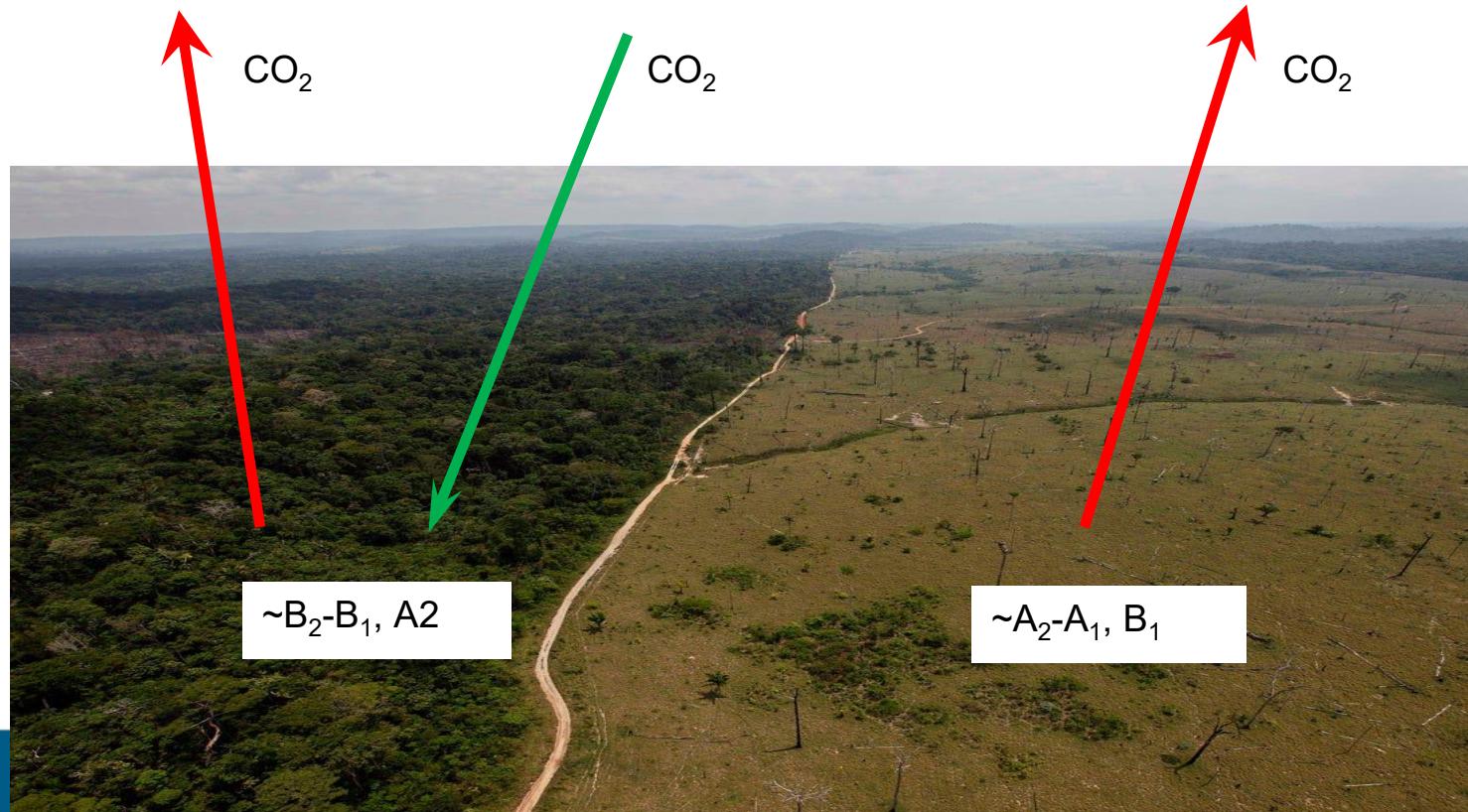


From national forest statistics to FAOSTAT GHG

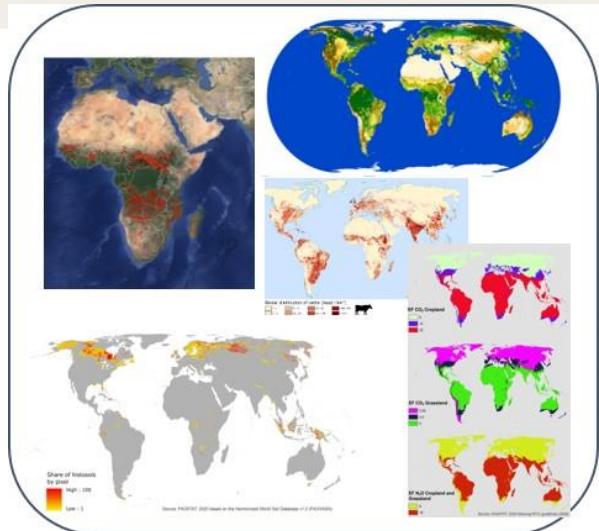
- $A_i (A_{nr}, A_{pl}) = \text{Forest land area}$ (Nat. Regen., Planted)
- $B_i = \text{Carbon stock in living biomass}$
- $i = 1990, \dots, 2020$

FRA 2020 INPUT DATA

FAOSTAT Emissions estimates:



From geospatial maps of fire, peat, to FAOSTAT



Geospatial implementation of IPCC methods

Global and openly available data

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

Code editor of the Google Earth Engine; R
Country statistics



The background image shows a collection of meal prep containers arranged on a light-colored wooden surface. Each container is a clear plastic tray with a black lid, filled with various prepared meals like salads and grains. A white rectangular label is attached to the front of each lid, featuring a red and white logo with a fork and knife, the text 'Meals for All', and a QR code.

Thank you

more info: francesco.tubiello@fao.org