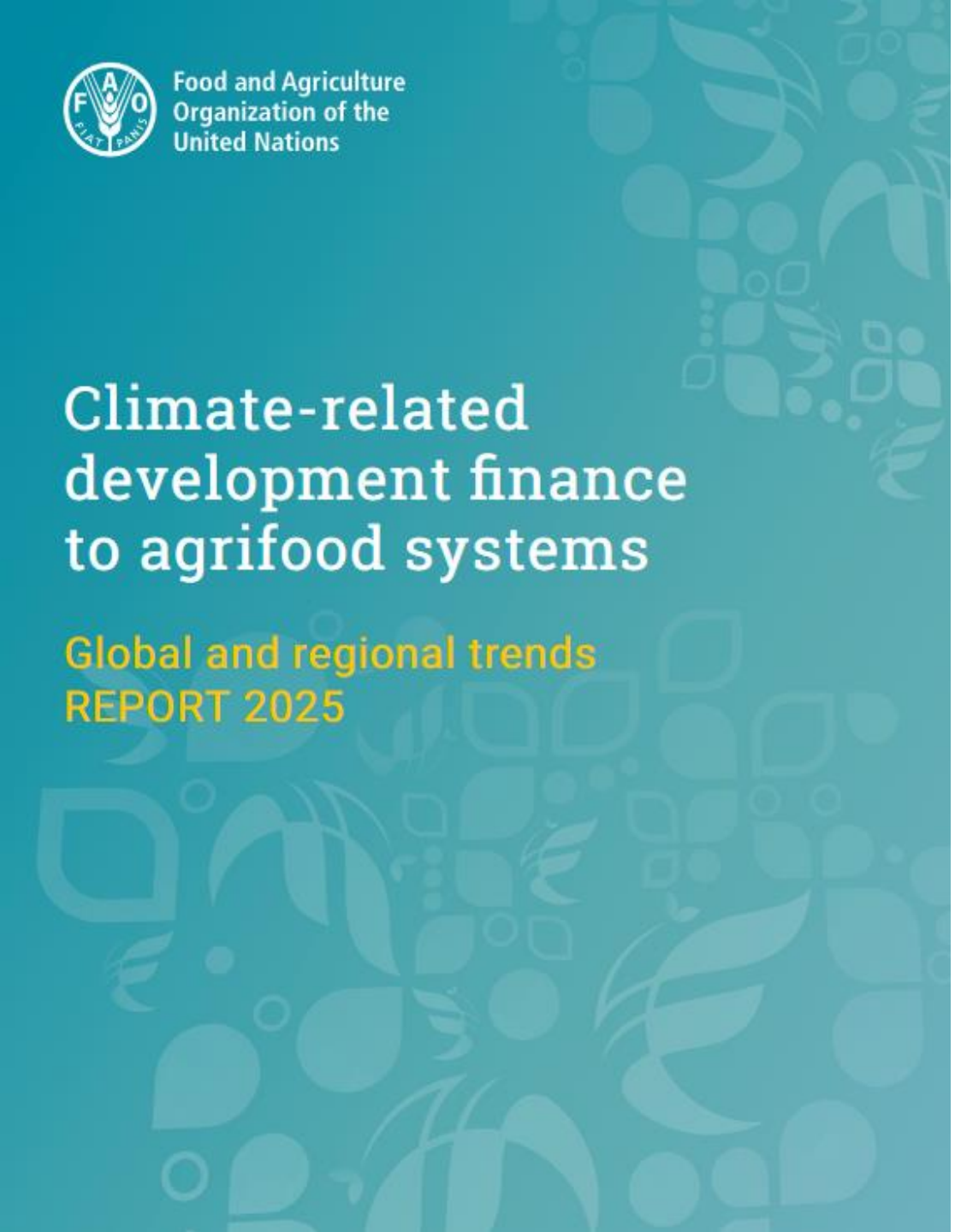
Overview of progress, challenges and opportunities related to identifying needs and accessing means of implementation for climate action in agriculture and food security

Additional Information Following the Discussion During the Workshop

Second in-session workshop on

Progress, challenges and opportunities related to identifying needs and accessing means of implementation for climate action in agriculture and food security, including sharing of best practices

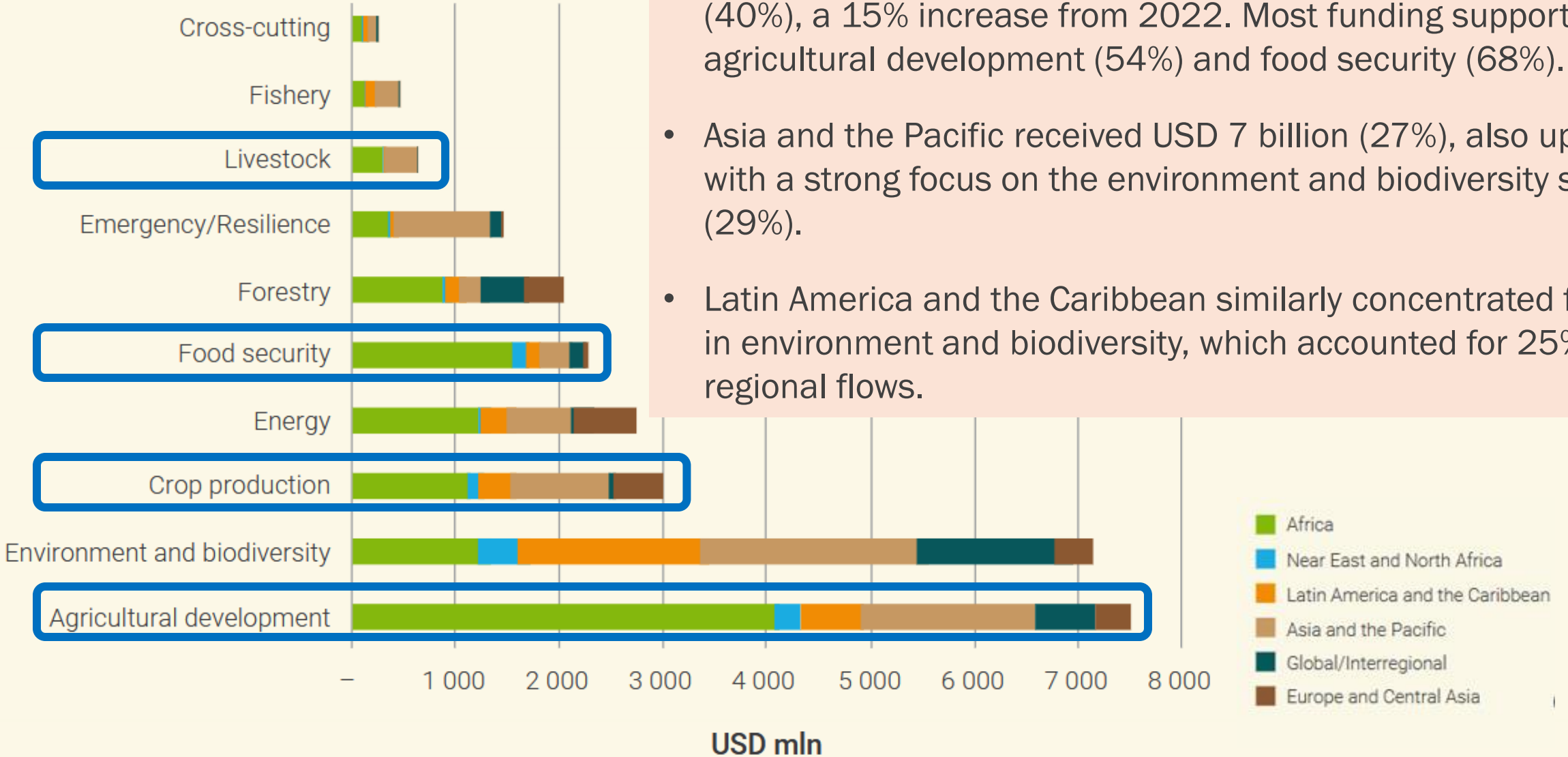
Sharm el-Sheikh joint work on implementation of climate action on agriculture and food security (SJWA)



Additional information for Slides 10 and 11

https://doi.org/10.4060/cd7500en

FIGURE 10 Climate-related development finance to agrifood systems most financed subsectors in 2023



- Africa remained the largest recipient, receiving USD 11 billion (40%), a 15% increase from 2022. Most funding supported agricultural development (54%) and food security (68%).
- Asia and the Pacific received USD 7 billion (27%), also up 15%, with a strong focus on the environment and biodiversity sector (29%).
- Latin America and the Caribbean similarly concentrated funding in environment and biodiversity, which accounted for 25% of regional flows.

PURPOSE CODE	PURPOSE CODE DESCRIPTION	AGRIFOOD SYSTEMS SECTOR
31164	Agrarian reform	Agriculture
31165	Agricultural alternative development	Agriculture
31194	Agricultural cooperatives	Agriculture
31120	Agricultural development	Agriculture
31181	Agricultural education/training	Agriculture
31166	Agricultural extension	Agriculture
31193	Agricultural financial services	Agriculture
31110	Agricultural policy and administrative management	Agriculture
31182	Agricultural research	Agriculture
31191	Agricultural services	Agriculture
32161	Agro-industries	Agriculture
43050	Non-agricultural alternative development	Agriculture
43040	Rural development	Agriculture
31130	Agricultural land resources	Crop production
31140	Agricultural water resources	Crop production
31150	Agricultural inputs	Crop production
32165	Fertilizer plants	Crop production
31161	Food crop production	Crop production
31162	Industrial crops/export crops	Crop production
31192	Plant and post-harvest protection and pest control	Crop production
31163	Livestock	Livestock
31195	Livestock/veterinary services	Livestock

List of purpose codes considered in FAO's Climate-related development finance to agrifood systems – Global and regional trends

Source: https://doi.org/10.4060/cd7500en

List of purpose codes considered in FAO's Climate-related development finance to agrifood systems – Global and regional trends

PURPOSE CODE	PURPOSE CODE DESCRIPTION	AGRIFOOD SYSTEMS SECTOR
14031	Basic drinking water supply	Food security
14030	Basic drinking water supply and basic sanitation	Food security
52010	Food assistance	Food security
43073	Food safety and quality	Food security
43071	Food security policy and administrative management	Food security
11250	School feeding	Food security
12240	Basic nutrition	Food security
12310	Non-communicable diseases (NCDs) control, general	Food security
12350	Other prevention and treatment of NCDs	Food security
12382	Research for prevention and control of NCDs	Food security
43072	Household food security programmes	Food security

Source: https://doi.org/10.4060/cd7500en

List of purpose codes considered in FAO's Climate-related development finance to agrifood systems – Global and regional trends

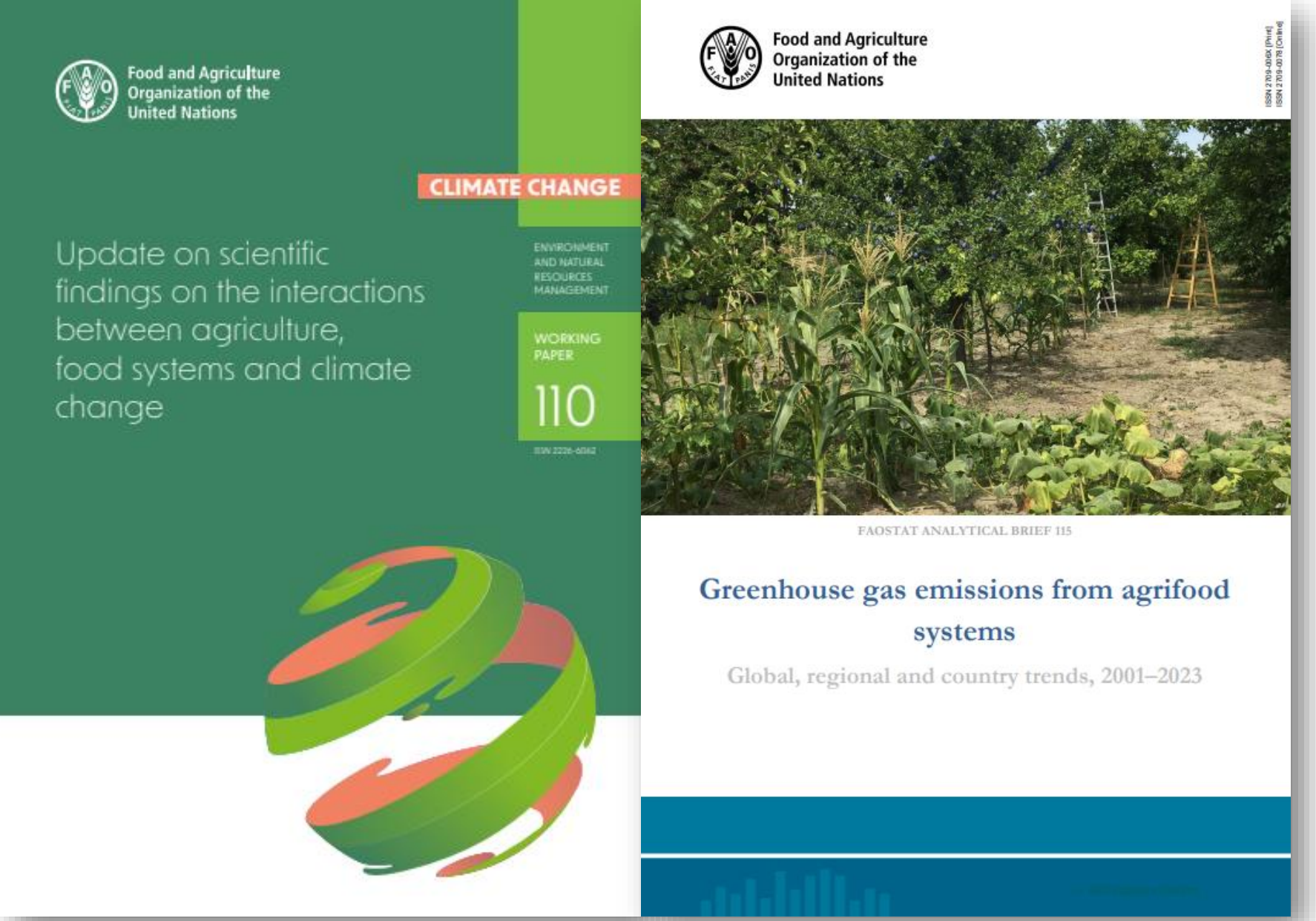
PURPOSE CODE	PURPOSE CODE DESCRIPTION	AGRIFOOD SYSTEMS SECTOR
41030	Biodiversity	Environment and Biodiversity
41020	Biosphere protection	Environment and Biodiversity
41081	Environmental education/training	Environment and Biodiversity
41010	Environmental policy and administrative management	Environment and Biodiversity
41082	Environmental research	Environment and Biodiversity
41040	Site preservation	Environment and Biodiversity
31320	Fishery development	Fishery
31381	Fishery education/training	Fishery
31382	Fishery research	Fishery
31391	Fishery services	Fishery
31310	Fishing policy and administrative management	Fishery
32162	Forest industries	Forestry
31220	Forestry development	Forestry
31281	Forestry education/training	Forestry
31210	Forestry policy and administrative management	Forestry
31282	Forestry research	Forestry
31291	Forestry services	Forestry

Source: https://doi.org/10.4060/cd7500en

List of purpose codes considered in FAO's Climate-related development finance to agrifood systems – Global and regional trends

PURPOSE CODE	PURPOSE CODE DESCRIPTION	AGRIFOOD SYSTEMS SECTOR
16062	Statistical capacity-building	Cross-cutting
32163	Textiles, leather and substitutes	Cross-cutting
15170	Women's rights organizations and movements, and government institutions	Cross-cutting
43060	Disaster risk reduction	Emergency/Resilience
72040	Emergency food assistance	Emergency/Resilience
41050	Flood prevention/control	Emergency/Resilience
23231	Solar energy for isolated grids and standalone systems	Energy
23181	Energy education/training	Energy
23270	Biofuel-fired power plants	Energy
31261	Fuelwood/charcoal	Energy
32173	Modern biofuels manufacturing	Energy
32174	Clean cooking appliances manufacturing	Energy

Source: https://doi.org/10.4060/cd7500en



Additional information for Slide 12 on Greenhouse Gas Emissions from Agrifood Systems and Agriculture

https://doi.org/10.4060/cd6901en

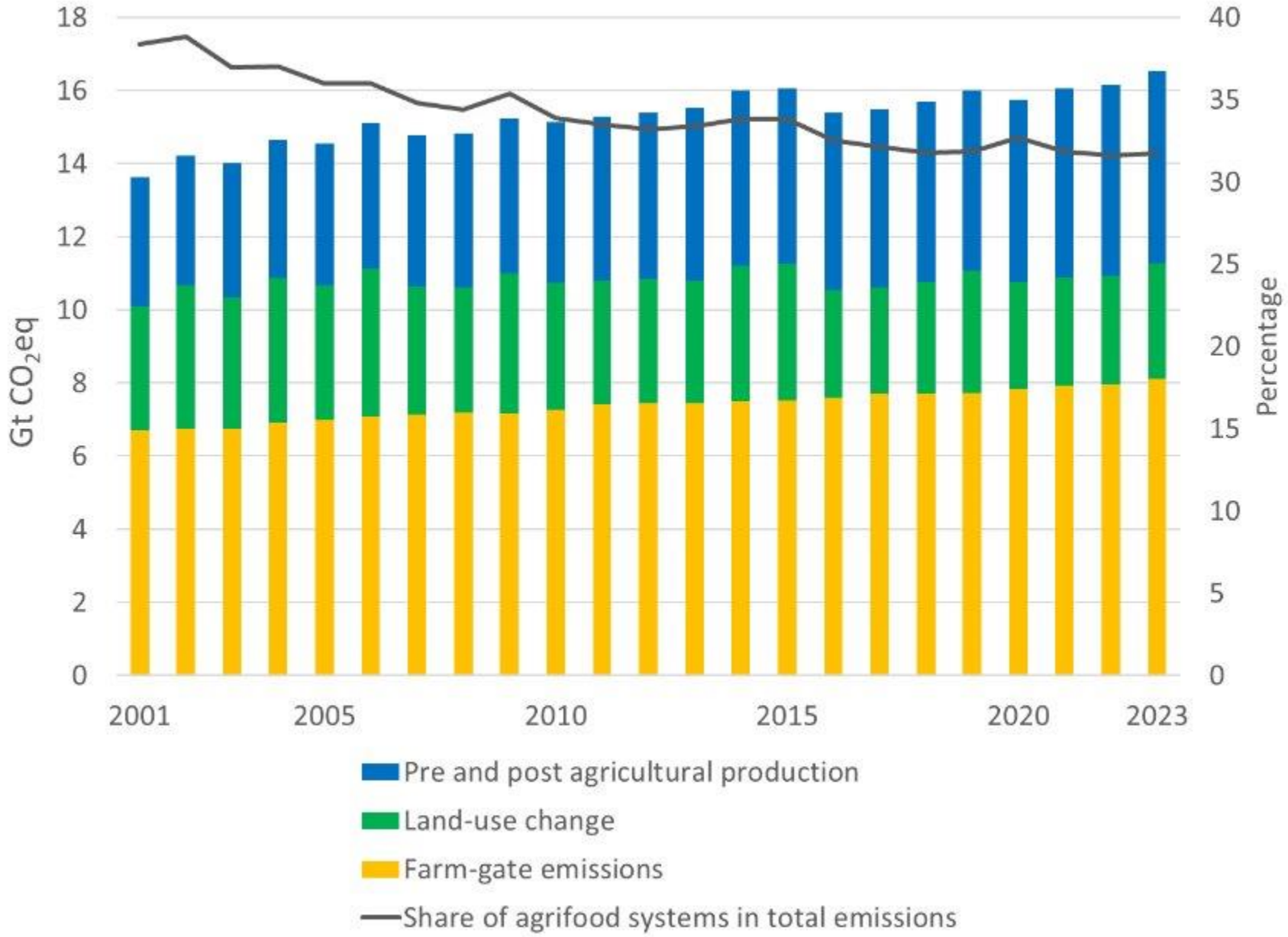
https://doi.org/10.4060/cd7300en

Agrifood systems' emissions are generated within the **farm gate,** from crop and livestock production activities; by **land use change**, caused by deforestation, biomass fires and peatland degradation processes often linked to land clearance for agriculture; and in **pre and post agricultural production processes**, comprising the supply chain including food manufacturing, retail, household consumption and food disposal.

Source: FAO. 2025. *Greenhouse gas emissions fromagrifood systems – Global, regional and country trends, 2001–2023*. FAOSTATAnalytical Brief Series, No. 115. Rome. https://doi.org/10.4060/cd7300en

Pre- and post-agricultural production (hereafter referred to as pre- and post-production) activities cover activities after the farm gate (food processing, food packaging, food transport, food retail, food household consumption, agrifood systems waste disposal), and before the fam gate (fertilizers manufacturing, pesticides manufacturing, generation of electricity used on farm, generation of heat used on farm).

Source: *Greenhouse gas emissions from pre- and post-agricultural production processes. Global, regional and country trends, 1990–2020.* FAOSTAT Analytical Brief 65.
https://openknowledge.fao.org/server/api/core/bitstreams/448061c0-7a43-4633-87d2-bb0290ce36df/content

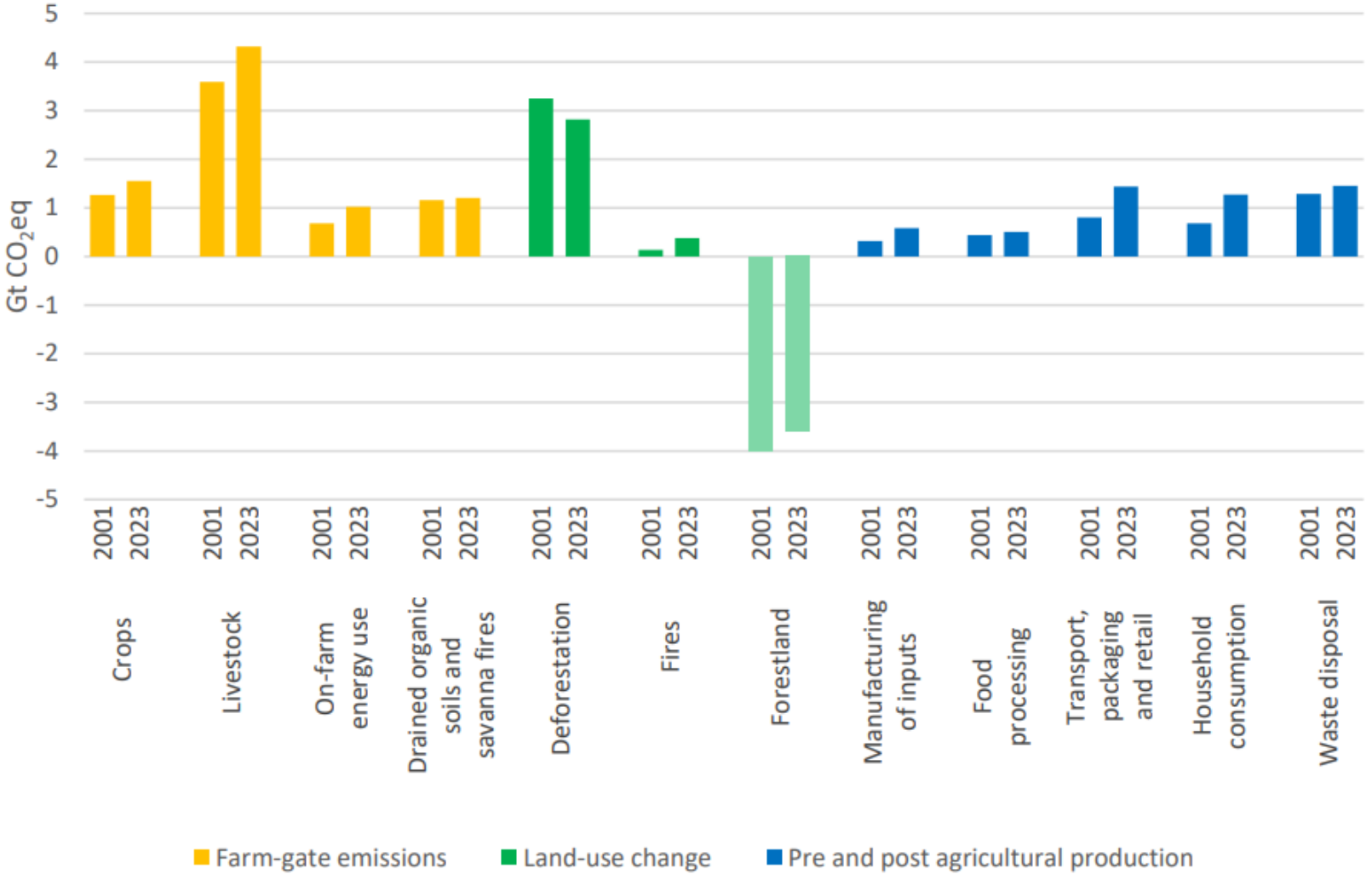


The share of **agrifood systems** emissions in global anthropogenic emissions has **decreased from 38% in 2001 to 32% in 2023.**

Farm-gate emissions remained the largest component of agrifood systems in 2023 of 49%, whereas the contribution of land-use change emissions dropped to 19%, pre and post agricultural production increased their contribution to total agrifood systems emissions to 32%.

Source: https://doi.org/10.4060/cd7300en

Figure 2: Agrifood systems emissions by component



Note: Emissions/removals on forestland are not accounted for within agrifood systems in this analysis and are shown here for comparison. They are disseminated in FAOSTAT as part of land-use, land-use change and forestry (LULUCF) emissions.

Source: https://doi.org/10.4060/cd7300en

In 2023, **livestock** was the largest source of agrifood systems emissions (**4.3 Gt CO_2eq**), followed by **deforestation** (**2.8 Gt CO_2eq**) and **packaging, transport, and retail** (**1.4 Gt CO_2eq**).

Since 2001, livestock emissions increased by **22%**, while deforestation emissions declined by **13%**, reflecting a shift towards more intensive production systems.

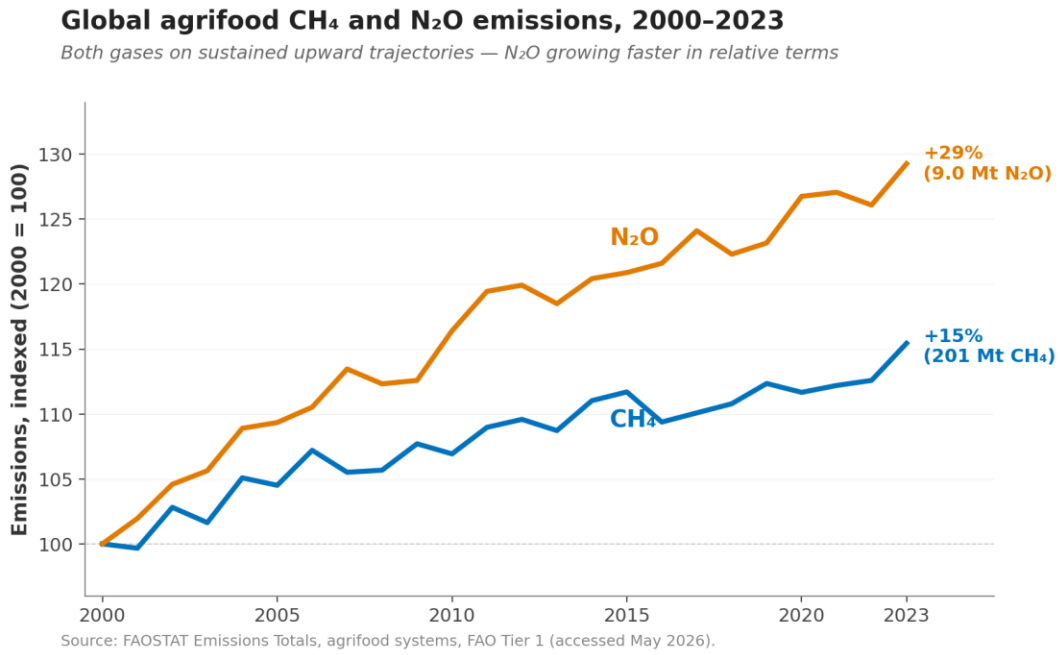
The fastest growth occurred in **pre and post agricultural production**, with emissions from inputs, transport, packaging, retail, and household consumption rising by around **80% since 2001**.

However, within agrifood systems, CH_4 and N_2O are the dominant emissions still on a rising trajectory under current policy

Both gases are agriculturally concentrated. The contrast in atmospheric lifetime is what matters for policy design:

- CH_4 reductions deliver temperature response within years;
- N_2O reductions affect long-term climate commitment and ozone-layer recovery.

	CH_4	N_2O
Share of anthropogenic emissions from agriculture	**~42%** of total CH_4	**~75%** of total N_2O
Main agricultural sources	Livestock 76% Rice 21% Ag waste burning 3%	Fertiliser & manure on soils ~90% Manure management ~10%
Atmospheric lifetime	~9–12 years	>100 years
GWP-100 (IPCC AR6)	28×	273×
Climate role	Near-term temperature response	Long-term climate forcing & ozone depletion potential
Trajectory under current policies (to 2050)	Agricultural CH_4 **+17%**	Anthropogenic N_2O **+30%**

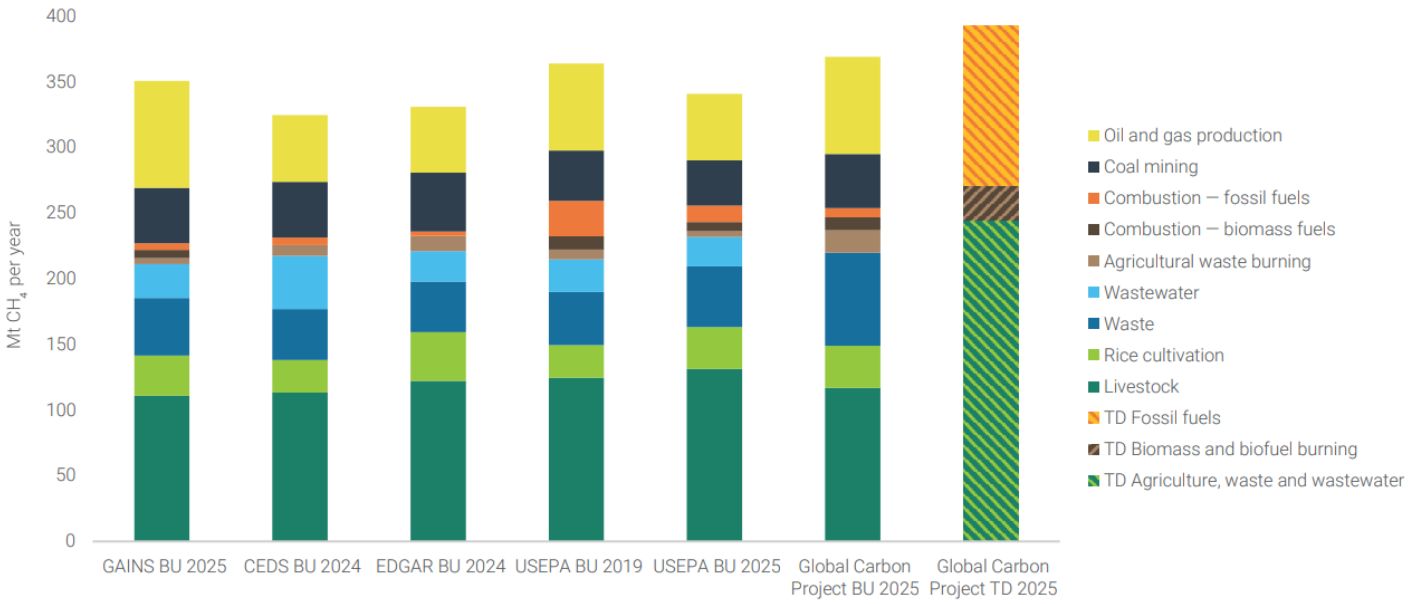


*Graph represents **relative emission change over time**, not absolute emissions*

Sources. *Global Methane Status Report 2025 (UNEP/CCAC); Global Nitrous Oxide Assessment 2024 (UNEP); IPCC AR6 Working Group I (Forster et al. 2021); FAOSTAT 2025.*

Agricultural methane is the largest single source of anthropogenic CH_4

Methane's short atmospheric lifetime makes near-term reductions consequential for peak temperatures — a different policy profile from N_2O.



Global anthropogenic methane emissions in 2020 across various recent bottom-up (BU) and top-down (TD) inventories, million tonnes.

Source. *Global Methane Status Report 2025 (UNEP 2025)*

- Agriculture accounts for around **40%** of global anthropogenic CH_4
  - approximately **144 Mt/yr** in the 2010s
  - livestock (enteric fermentation and manure management) ~**76%**
  - rice cultivation ~**21%**
  - agricultural waste burning ~**3%**

2000–2020 growth was concentrated in livestock and manure (+17 Mt/yr) and rice (+3 Mt/yr)

- largest regional increases in Africa, Brazil, Central America, South Asia and Southeast Asia

Agricultural N_2O sources, 2000–2020 (Mt N_2O/yr)

Source	2000	2010–2019 mean	2020	Increase 2000–2020	Increase (%)
Direct soil emissions	2.4	3.1	3.3	0.9	**+38%**
Manure left on pasture	1.7	2.0	2.2	0.5	**+29%**
Manure management	0.4	0.4	0.5	0.1	**+25%**
Aquaculture	0.1	0.2	0.2	0.1	**+100%**
Indirect emissions	*1.5*	*1.7*	*1.8*	*0.3*	***+20%***
Total agricultural N_2O	**6.1**	**7.4**	**8.0**	**1.9**	**+31%**

Synthetic fertiliser use (direct soil emissions **2.4 → 3.3 Mt/yr**)

Livestock production (manure on pasture **1.7 → 2.2 Mt/yr**)

From Table 2.5 of FAO (2025), drawing on Tian et al. (2024) global N_2O budget.

Sources. *FAO (2025) Update on scientific findings on agriculture, food systems and climate change.* https://doi.org/10.4060/cd6901en

Definitions

The **agri-food system** covers the journey of food from farm to table – including when it is grown, fished, harvested, processed, packaged, transported, distributed, traded, bought, prepared, eaten and disposed of. It also encompasses non-food products that also constitute livelihoods and all of the people as well as the activities, investments and choices that play a part in getting us these food and agricultural products.

Source: *Report of the Council of FAO – Hundred and Sixty-sixth Session: 26 April – 1 May 2021*. Rome, CL 166/REP. https://www.fao.org/3/nf693en/nf693en.pdf

Through the agri-food systems approach, FAO focuses on profiling agriculture beyond production and macro-economic purposes to ensure food security and resilient livelihoods, promote innovations, and better catalyse investment and partnerships.

Source: *FAO Strategic Framework 2022-2031*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/29404c26-c71d-4982-a899-77bdb2937eef/content

The term **agriculture** and its derivatives include fisheries, marine products, forestry and primary forestry products.

Source: *Basic texts of the Food and Agriculture Organization of the United Nations. 2017 edition* . Rome. https://openknowledge.fao.org/handle/20.500.14283/k8024e

Definitions

Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four food security dimensions can be identified:

- ***food availability*** addresses whether or not food is actually or potentially physically present, including aspects of production, food reserves, markets and transportation, and wild foods.
- ***economic and physical access to food*** addresses if food is actually or potentially physically present, the next question is whether or not households and individuals have sufficient physical and economic access to that food.
- ***food utilization*** addresses if food is available and households have adequate access to it. The next question is whether or not households are maximizing the consumption of adequate nutrition and energy. Sufficient energy and nutrient intake by individuals is the result of good caring and feeding practices, food preparation, dietary diversity and intra-household distribution of food, and access to clean water, sanitation and health care. Combined with good biological utilization of food consumed, this determines the nutritional status of individuals.
- ***stability over time*** is the condition in which the whole system is stable, thus ensuring that households are food secure at all times. Stability issues can refer to short-term instability (which can lead to acute food insecurity) or medium- to long-term instability (which can lead to chronic food insecurity). Climatic, economic, social and political factors can all be a source of instability.

Source: FAO, IFAD, UNICEF, WFP and WHO. 2025. *The State of Food Security and Nutrition in the World 2025 – Addressing high food price inflation for food security and nutrition*. Rome. https://doi.org/10.4060/cd6008en