

Info Note

Agriculture's contribution to national emissions

Analysis of national reports to the UN Framework Convention on Climate Change

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Key Messages

- Agriculture contributes a range of 0-98% of countries' greenhouse gas emissions, with an average of 30%.
- Emissions from agriculture make up more than 50% of national emissions in 42 countries and more than 20% in 91 countries.
- 39% of emissions from agriculture come from only 4 countries: China, India, Brazil, and the USA.
- Total emissions from agriculture per country are similar between Annex 1 and non-Annex 1 countries, but agriculture contributes a smaller portion of total emissions in Annex 1 countries (12%, compared to 35% in non-Annex 1 countries).

Agriculture is an important source of greenhouse gas emissions globally, but how do emissions differ among countries? The relative contribution of agriculture to

countries' emissions budgets can inform priority setting for global programs and policy. It also indicates which countries are likely to have the most interest in reducing their agriculture-related emissions

This info note offers an overview of the distribution of agricultural emissions among countries and the relative contribution of agriculture to national emissions. It is based on three data sources: the FAOSTAT database of greenhouse gas emissions from agriculture, United States Environmental Protection Agency (EPA) global emission estimates for 2010 and national reports to the United Nations Framework Convention on Climate Change (UNFCCC).¹

Agricultural emissions include methane (CH₄) and nitrous oxide (N₂O) emissions from livestock, manure management, flooded rice cultivation, agricultural soils and fertilizers, and burning of crop residues and savannas, as well as carbon dioxide (CO₂) from liming

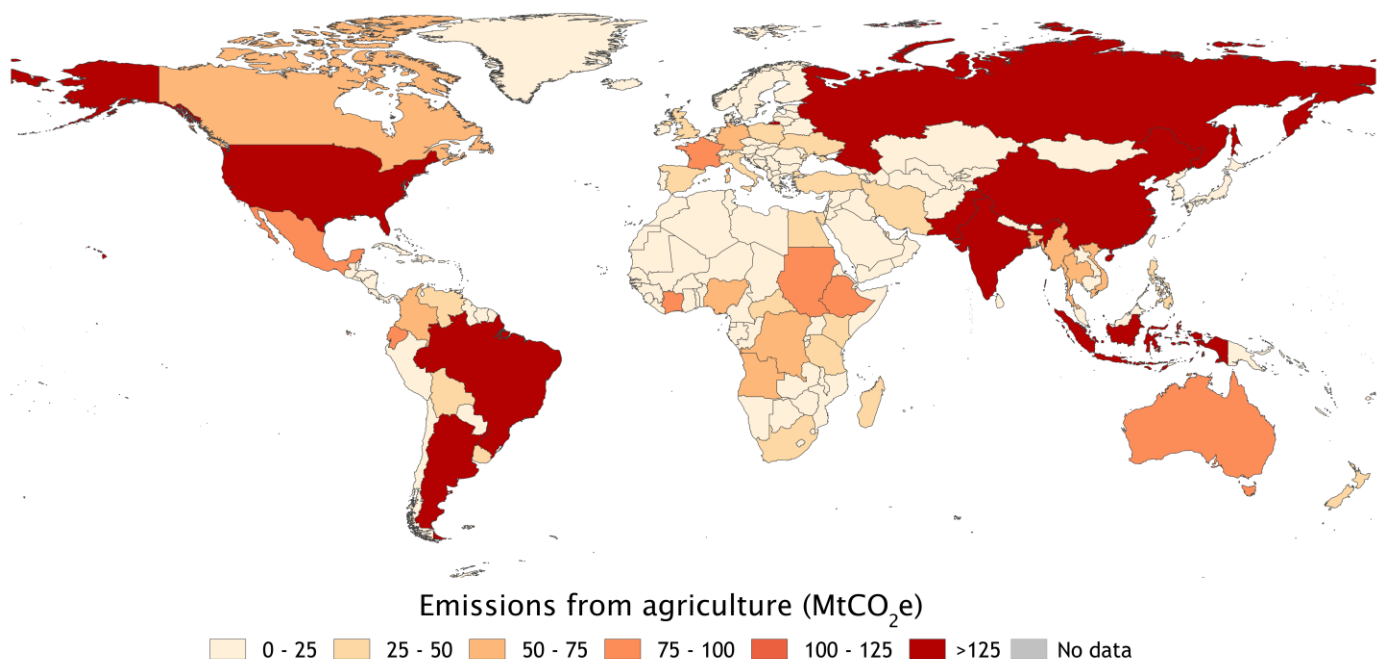


Figure 1. Total emissions from agriculture by country¹

and urea application. CO₂ emissions and uptakes associated with agricultural soils, biomass, and land use change are accounted for in the land use, land use change and forestry (LULUCF) sector and not included in this analysis.

Distribution of emissions among countries

Most agricultural emissions come from just a few countries: 39% of global non-CO₂ agricultural emissions come from: China, India, Brazil, and the US (Appendix 1). Russia and South Africa contribute an additional 2 and 1%, respectively. The vast majority of countries have low emissions (less than 25 MtCO₂e per year) (Fig. 1, Fig. 2).

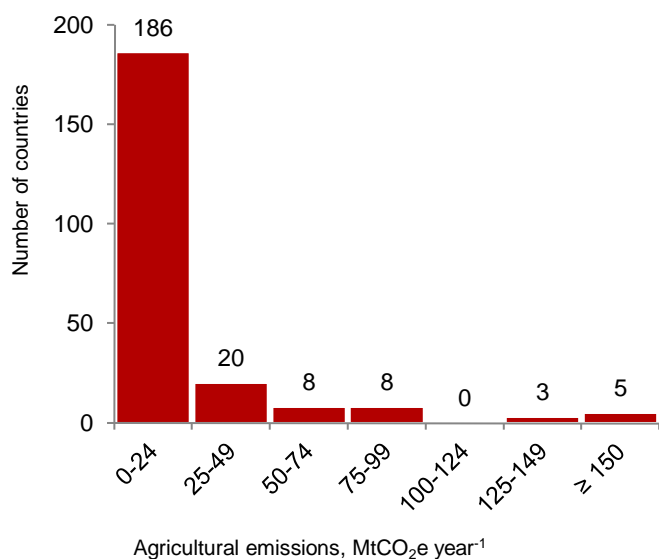


Figure 2. Histogram of countries' agricultural emissions¹

Average total agricultural emissions per country are slightly higher in UNFCCC Annex 1 countries compared to Non-Annex 1 countries (Fig 3). Annex 1 also countries

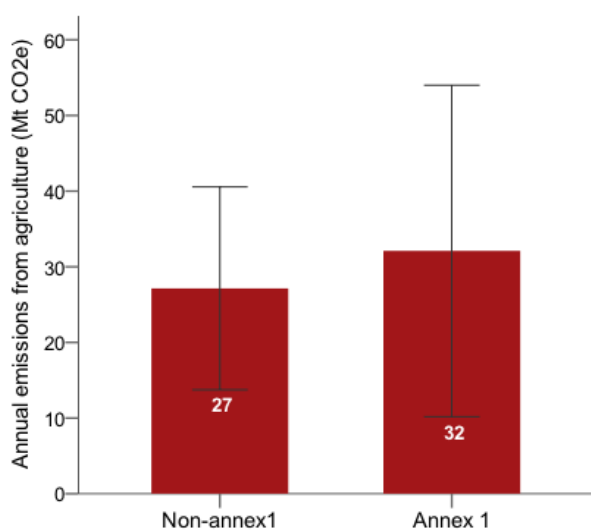


Figure 3. Country averages of emissions from agriculture. Bars represent 95% confidence intervals around the mean for each group of countries. show a wider range.

Regionally, South America, Eastern Asia (including China) and South Asia make the largest contributions to agricultural emissions: 17, 15, and 13%, respectively. North America contributes 9% (Appendix 3).

Per-capita emissions from agriculture show a distribution similar to total agricultural emissions: most countries produce less than 1 tCO₂e per person annually (Fig. 4). Countries with higher per-capita emissions tend to be those with large livestock populations relative to their human populations, such as Mongolia, New Zealand, Australia and some South American countries (Fig. 5). It should be noted that these calculations account only for agricultural production, not consumption. Countries that export agricultural commodities, especially beef, would therefore have higher per-capita emissions.

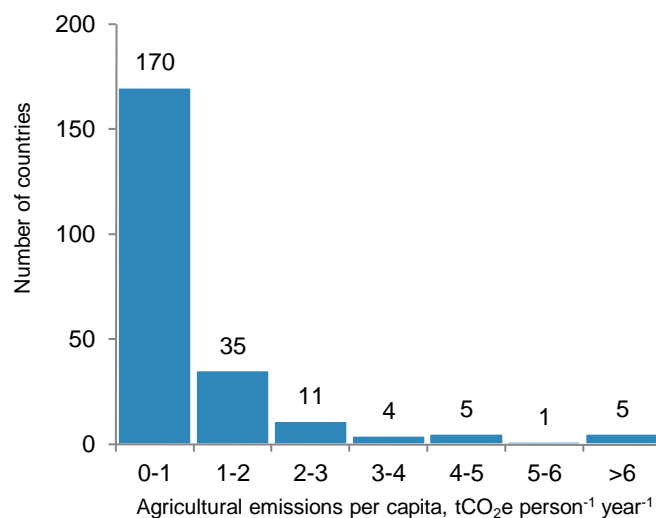


Figure 4. Histogram of agricultural emissions per capita^{1,3}

Contribution of agriculture to national emissions

Agriculture contributes an average of 30% (± 27%) of countries' total² greenhouse gas emissions. This is higher than the IPCC global estimate of agriculture's contribution to emissions (10-12%) because of the large number of countries where agricultural emissions are low but relatively important in national greenhouse gas budgets.

In 42 countries, agriculture contributes more than half of greenhouse gas emissions; all of these are Non-Annex 1 countries (Fig. 6). In 91 countries—only 5 of which are Annex 1 Parties to the UNFCCC—agriculture contributes ≥20% of greenhouse gas emissions (Appendix 3).

The importance of agricultural emissions within countries shows a different geographical picture from the distribution of emissions among countries (Fig. 6). Whereas African nations have low emissions, agriculture generally contributes a large percentage of a country's total emissions.

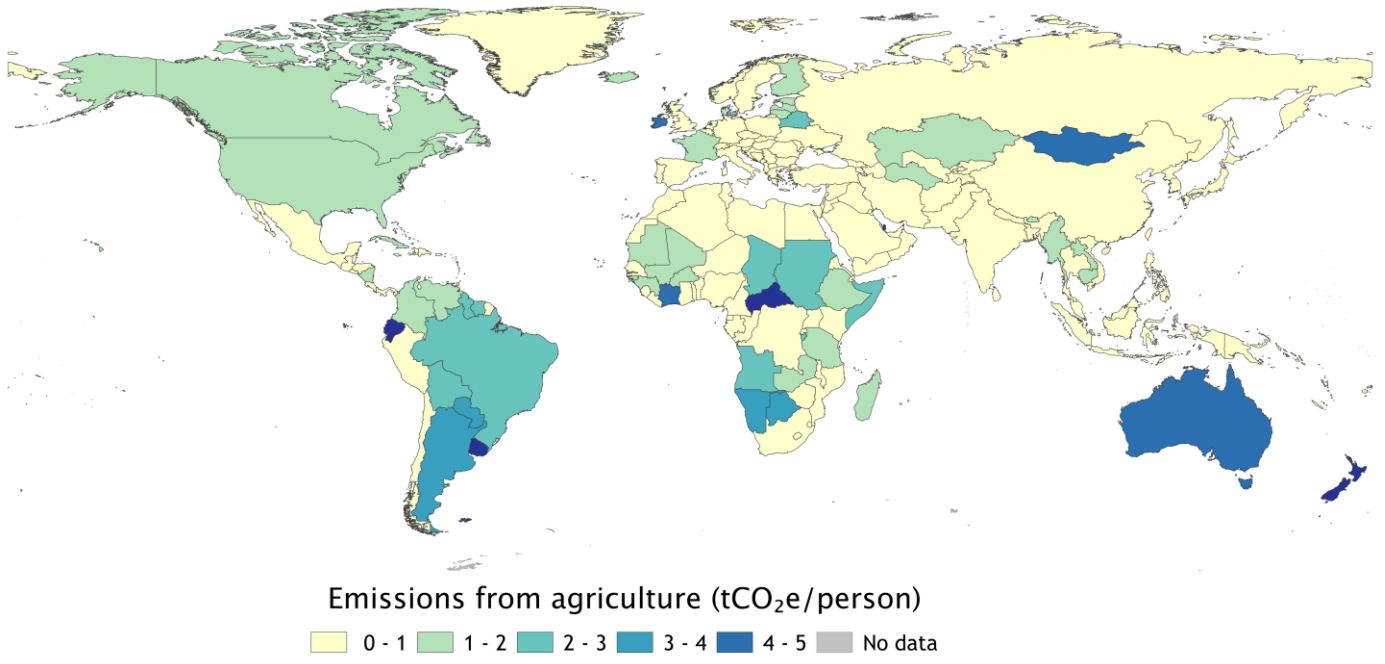


Figure 5. Per-capita emissions from agriculture by country³

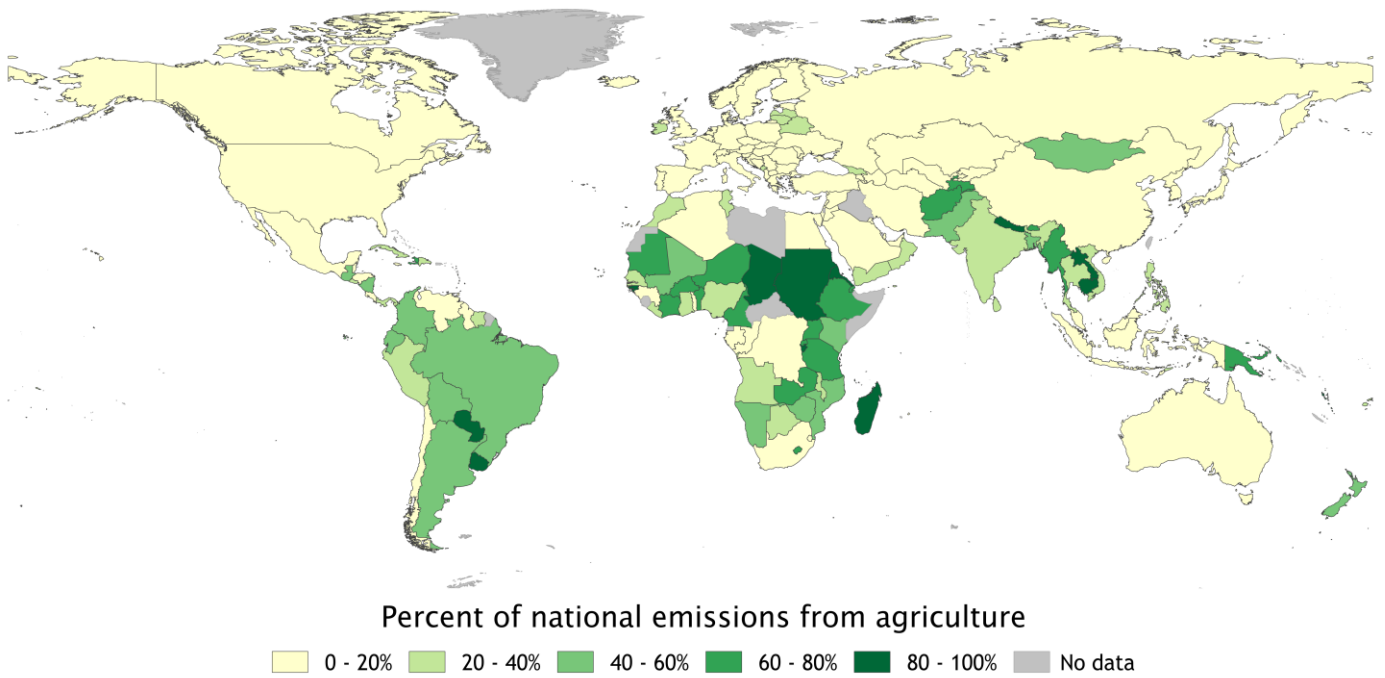


Figure 6. Agriculture's contribution to total national emissions.²

The two regions with the highest average contribution of agricultural emissions are West and East Africa. However, agricultural emissions are also of high importance in Southern Asia and South America—regions that contribute substantially to global agricultural emissions.

Agriculture’s contribution to national emissions per country for the BRICS (Brazil, Russia, India, China and South Africa) countries (19% ± 16%) is smaller than the global average (30% ± 27%). In contrast, agriculture contributes a larger share of national greenhouse gas emissions in Non-Annex 1 countries (35% ± 29%) than in Annex 1 countries (12% ± 8%) (Fig. 7).

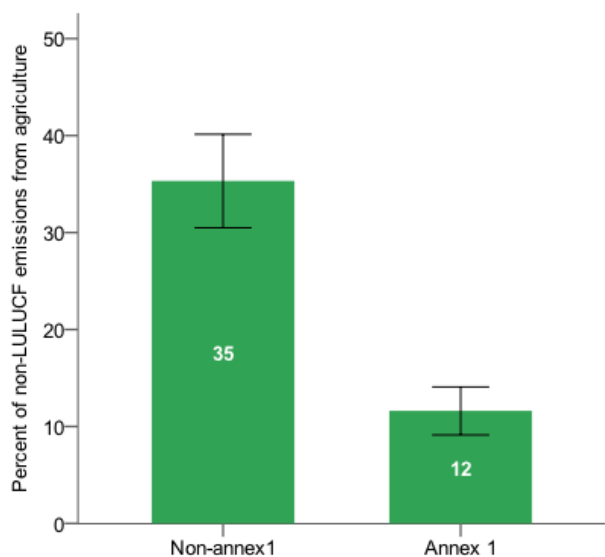


Figure 7. Agriculture’s contribution to national emissions: comparison of Non-Annex 1 and Annex 1 countries. Bars represent 95% confidence intervals around the means.

Future data needs

Estimates of agricultural emissions are highly uncertain; the data sources used in this analysis often differed by a factor of two or more (Appendix 1). This is due to the inherent difficulty of estimating emissions from agriculture, which requires detailed data not available in all countries, such as accurate livestock populations and crop-specific fertilizer use.

Better estimates—such as those based on Tier 2 and 3 methods—and up-to-date estimates would allow for more precise tracking of the distribution of emissions among countries and the relative importance of agriculture to national emissions. Importantly, they would also allow countries to monitor changes in emissions and demonstrate emission reductions resulting from shifts to more efficient and lower-emissions agricultural production. This would also allow for improved tracking of agriculture’s contributions to and mitigation of climate change on a global level.

Notes on methodology

¹ The data presented in Figures 1 through 5 are averages of non-CO₂ emissions from agriculture from EPA (2012) for 2010, FAO (2015) for 2010, and National Communications to the UNFCCC. Where data from one of these sources were not available for a given country, we used the sources available to calculate the average. Emissions inventories from National Communications are not all from the same year; where a country had not conducted an inventory since 2000, we did not include the National Communication in the average.

² The data presented in Figures 6 and 7 are from National Communications to the UNFCCC. Communications from all years were included. In calculating total emissions, we excluded emissions from land use, land use change and forestry (LULUCF), as emissions in this sector are often negative (indicating net CO₂ absorption), which would skew the calculation of agriculture’s contribution to the total. These results may be very different if LULUCF emissions were included.

³ Population data for 2010 from FAOSTAT.

Further reading

- Campbell B, Wamukoya G, Kinyangi J, Verchot L, Wollenberg L, Vermeulen SJ, Minang PA, Neufeldt H, Vidal A, Loboguerrero Rodriguez AM, Hedger M. 2014. The Role of Agriculture in the UN Climate Talks. CCAFS Info Note. Copenhagen, Denmark. <http://hdl.handle.net/10568/51665>
- [US-EPA] United States Environmental Protection Agency. 2012. *Global anthropogenic non-CO₂ greenhouse gas emissions: 1990 – 2030*. EPA 430-R-12-006. Washington, DC: US-EPA. www.epa.gov/climatechange/EPAactivities/economic/nonco2projections.html
- [FAO] Food and Agriculture Organization of the United Nations. 2015. FAOSTAT. FAO, Rome, Italy. <http://faostat3.fao.org/>
- Smith P, Bustamante M, Ahammad H, Clark H, Dong H, Elsiddig EA, Haberl H, Harper R, House J, Jafari M, Masera O, Mbow C, Ravindrath NH, Rice CW, Robledo Abad C, Romanovskaya A, Sperling F, Tubiello FN. 2014. Agriculture, Forestry and Other Land Use (AFOLU). In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. <http://www.ipcc.ch/report/ar5/wg3/>
- Vermeulen SJ. 2014. Climate change, food security and small-scale producers. CCAFS Info Note. Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Appendix 1 Agricultural emissions by country

Country	Emissions from agriculture, MtCO ₂ e ¹	Per capita emissions from agriculture, tCO ₂ e per person ¹				
China, mainland	702.4 – 820.0	0.52 – 0.60	Japan	23.9 – 26.9	0.19 – 0.21	
Brazil	441.8 – 596.1	2.26 – 3.05	Zambia	10.4 – 43.1	0.78 – 3.26	
India	350.6 – 647.0	0.29 – 0.54	Peru	21.7 – 26.1	0.74 – 0.89	
United States	356.8 – 526.3	1.14 – 1.69	Paraguay	20.4 – 29.4	3.16 – 4.55	
Indonesia	84.2 – 246.8	0.35 – 1.03	Chad	19.5 – 30.4	1.66 – 2.60	
Russia	93.0 – 158.2	0.65 – 1.10	Kazakhstan	21.5 – 27.5	1.35 – 1.73	
Pakistan	71.6 – 133.7	0.41 – 0.77	Nepal	20.7 – 30.3	0.77 – 1.13	
Argentina	105.9 – 144.8	2.62 – 3.59	Burundi	1.8 – 36.3	0.19 – 3.93	
Australia	87.4 – 104.0	3.90 – 4.64	Belarus	19.9 – 23.4	2.10 – 2.46	
Sudan (former)	57.6 – 123.0	1.26 – 2.70	Morocco	12.1 – 31.1	0.38 – 0.98	
Ethiopia	38.5 – 96.4	0.44 – 1.11	Uganda	19.5 – 22.8	0.57 – 0.67	
France	70.5 – 103.9	1.12 – 1.64	Mali	11.4 – 26.0	0.81 – 1.86	
Mexico	61.7 – 92.2	0.52 – 0.78	Romania	15.6 – 27.1	0.71 – 1.24	
Ecuador	13.9 – 210.1	0.93 – 14.01	Somalia	19.9 – 20.9	2.06 – 2.17	
Côte d'Ivoire	4.8 – 194.5	0.25 – 10.25	Uzbekistan	16.4 – 23.0	0.59 – 0.83	
Viet Nam	60.6 – 88.4	0.68 – 0.99	Cambodia	11.8 – 19.4	0.82 – 1.35	
Myanmar	26.6 – 132.2	0.51 – 2.55	Ireland	17.7 – 19.3	3.96 – 4.33	
Nigeria	54.4 – 99.8	0.34 – 0.62	Burkina Faso	4.7 – 18.9	0.30 – 1.22	
Colombia	59.2 – 76.1	1.27 – 1.64	Mozambique	5.5 – 18.0	0.23 – 0.75	
Germany	59.2 – 69.5	0.71 – 0.84	Netherlands	15.9 – 18.2	0.96 – 1.09	
Thailand	51.9 – 70.7	0.78 – 1.07	Republic of Korea	13.0 – 22.0	0.27 – 0.45	
DRC Congo	8.5 – 151.8	0.14 – 2.44	Malaysia	5.9 – 24.8	0.21 – 0.88	
Canada	56.0 – 65.5	1.64 – 1.92	Niger	11.6 – 20.5	0.73 – 1.29	
Bangladesh	40.5 – 74.8	0.27 – 0.49	Cuba	9.9 – 19.7	0.88 – 1.75	
Angola	22.6 – 104.5	1.15 – 5.35	Cameroon	10.2 – 18.3	0.49 – 0.89	
United Kingdom	44.1 – 52.1	0.71 – 0.84	Guatemala	8.1 – 19.5	0.56 – 1.36	
Tanzania	33.9 – 50.7	0.75 – 1.13	Chile	12.1 – 14.7	0.70 – 0.86	
Iran	41.7 – 56.4	0.56 – 0.76	Guinea	3.0 – 16.3	0.28 – 1.50	
Philippines	37.0 – 50.7	0.40 – 0.54	Afghanistan	10.5 – 15.1	0.37 – 0.53	
Central African Republic	18.7 – 60.2	4.29 – 13.85	Zimbabwe	6.5 – 22.3	0.49 – 1.70	
South Africa	30.6 – 51.8	0.59 – 1.01	Mongolia	6.5 – 14.6	2.38 – 5.37	
Spain	36.4 – 41.7	0.79 – 0.90	Laos	7.3 – 18.6	1.15 – 2.91	
Turkey	32.3 – 41.6	0.45 – 0.58	Saudi Arabia	5.2 – 13.5	0.19 – 0.50	
New Zealand	34.6 – 37.7	7.93 – 8.63	Syria	6.4 – 13.9	0.30 – 0.65	
Venezuela	30.9 – 39.6	1.06 – 1.36	Senegal	7.0 – 11.4	0.54 – 0.88	
Italy	30.6 – 39.4	0.51 – 0.65	Belgium	9.1 – 9.8	0.83 – 0.90	
Poland	31.2 – 36.7	0.82 – 0.96	Nicaragua	4.9 – 11.2	0.85 – 1.92	
Kenya	14.4 – 37.4	0.35 – 0.92	Greece	8.1 – 10.1	0.73 – 0.91	
Egypt	28.4 – 35.4	0.36 – 0.45	Denmark	7.4 – 9.6	1.33 – 1.73	
Ukraine	28.6 – 36.0	0.62 – 0.78	Malawi	3.3 – 12.9	0.22 – 0.86	
Madagascar	22.6 – 44.8	1.07 – 2.12	Turkmenistan	6.8 – 10.7	1.35 – 2.12	
Qatar	0.1 – 84.9	0.07 – 48.49	Ghana	6.6 – 11.0	0.27 – 0.46	
Bolivia	15.2 – 42.0	1.50 – 4.13	Namibia	4.9 – 11.7	2.26 – 5.39	
Uruguay	24.1 – 32.1	7.14 – 9.53	Hungary	6.7 – 8.7	0.66 – 0.87	
			Portugal	6.2 – 9.8	0.59 – 0.92	
			Algeria	6.5 – 9.8	0.18 – 0.26	
			Dominican Republic	6.2 – 8.3	0.61 – 0.83	

Sweden	6.6	-	8.1	0.70	-	0.87	Gambia	1.3	-	1.6	0.79	-	0.93
Czech Republic	5.6	-	8.4	0.53	-	0.80	Armenia	1.2	-	1.5	0.40	-	0.50
Austria	6.7	-	7.6	0.80	-	0.90	Swaziland	0.9	-	1.6	0.77	-	1.34
Sri Lanka	4.7	-	10.9	0.23	-	0.53	Macedonia	0.9	-	1.4	0.40	-	0.68
Azerbaijan	7.0	-	7.2	0.77	-	0.80	Liberia	0.4	-	2.6	0.10	-	0.65
Botswana	1.8	-	13.9	0.91	-	7.08	Oman	1.1	-	7.3	0.39	-	2.59
Iraq	5.7	-	7.6	0.19	-	0.25	Suriname	0.8	-	1.4	1.48	-	2.63
Benin	4.5	-	10.8	0.47	-	1.13	Brunei Darus-salam	0.1	-	1.8	0.33	-	4.47
Serbia	5.8	-	9.5	0.60	-	0.98	Jordan	0.6	-	1.3	0.09	-	0.20
Yemen	5.9	-	7.2	0.26	-	0.32	Lebanon	0.6	-	1.1	0.14	-	0.25
Mauritania	4.6	-	7.5	1.28	-	2.07	Fiji	0.8	-	1.0	0.88	-	1.13
Finland	5.7	-	6.1	1.06	-	1.14	Timor-Leste	0.5	-	1.1	0.45	-	1.01
Tajikistan	4.8	-	6.7	0.63	-	0.88	Bhutan	0.5	-	1.0	0.71	-	1.40
Bulgaria	4.8	-	6.2	0.65	-	0.84	Puerto Rico	0.8	-	0.8	0.21	-	0.21
Tunisia	4.3	-	7.6	0.40	-	0.72	Djibouti	0.5	-	0.8	0.61	-	0.97
Switzerland	5.2	-	5.7	0.66	-	0.73	Luxembourg	0.6	-	0.7	1.10	-	1.40
Honduras	4.8	-	5.8	0.63	-	0.77	Gabon	0.4	-	1.0	0.23	-	0.67
DPR Korea	3.3	-	6.8	0.13	-	0.28	Cyprus	0.4	-	0.8	0.34	-	0.74
Lithuania	4.5	-	5.1	1.46	-	1.65	Iceland	0.4	-	0.7	1.36	-	2.13
Norway	4.4	-	4.6	0.90	-	0.94	Kuwait	0.1	-	0.5	0.02	-	0.15
Papua New Guinea	3.2	-	5.6	0.46	-	0.82	Vanuatu	0.3	-	0.4	1.19	-	1.69
Haiti	3.9	-	4.8	0.40	-	0.48	Montenegro	0.3	-	0.8	0.52	-	1.37
Taiwan	3.7	-	3.7	0.16	-	0.16	Trinidad and Tobago	0.3	-	0.3	0.21	-	0.25
Eritrea	3.4	-	4.0	0.59	-	0.70	Comoros	0.1	-	0.5	0.20	-	0.69
Panama	3.4	-	3.5	0.92	-	0.96	Occupied Palestinian Territory	0.3	-	0.3	0.07	-	0.07
Togo	2.2	-	5.0	0.35	-	0.80	Cabo Verde	0.1	-	0.3	0.28	-	0.67
Costa Rica	0.9	-	5.7	0.19	-	1.23	New Caledonia	0.2	-	0.2	0.87	-	0.87
El Salvador	3.0	-	3.7	0.48	-	0.60	Mauritius	0.1	-	0.2	0.10	-	0.19
Croatia	2.5	-	3.6	0.59	-	0.82	Western Sahara	0.2	-	0.2	0.35	-	0.35
Congo	0.3	-	7.3	0.08	-	1.77	Belize	0.0	-	0.3	0.01	-	0.88
Rwanda	1.4	-	4.2	0.13	-	0.39	Réunion	0.2	-	0.2	0.18	-	0.18
Kyrgyzstan	2.2	-	4.0	0.41	-	0.75	Falkland Islands (Malvinas)	0.1	-	0.1	1	-	47.51
Georgia	2.2	-	3.6	0.50	-	0.81	Guadeloupe	0.1	-	0.1	0.30	-	0.30
Bosnia and Herzegovina	2.2	-	2.8	0.56	-	0.74	Samoa	0.1	-	0.1	0.45	-	0.80
Slovakia	2.3	-	3.1	0.42	-	0.57	Malta	0.1	-	0.1	0.19	-	0.22
United Arab Emirates	1.5	-	4.0	0.18	-	0.47	Singapore	0.0	-	0.2	0.00	-	0.04
Latvia	2.3	-	2.8	1.08	-	1.33	Tonga	0.1	-	0.1	0.84	-	1.01
Libya	1.9	-	2.5	0.31	-	0.42	Antigua and Barbuda	0.0	-	0.1	0.29	-	0.84
Sierra Leone	2.0	-	421.0	0.35	-	73.19	French Guiana	0.1	-	0.1	0.27	-	0.27
Jamaica	0.6	-	2.7	0.22	-	0.99	Solomon Islands	0.1	-	0.1	0.40	-	0.92
Albania	1.4	-	2.5	0.43	-	0.79	Grenada	0.0	-	1.8	0.10	-	0.85
Lesotho	1.5	-	2.2	0.73	-	1.10	Saint Vincent and the Grenadines	0	-	0	0.12	-	0.12
Moldova	1.5	-	2.1	0.41	-	0.60	Barbados	0	-	0	0.14	-	0.14
Slovenia	1.4	-	2.1	0.67	-	1.01	Kiribati	0	-	0	0.00	-	0.04
Israel	1.3	-	2.5	0.17	-	0.34	Dominica	0	-	0	0.23	-	0.70
Guinea-Bissau	1.5	-	1.9	0.95	-	1.19	Palau	0	-	0	0.13	-	0.25
Guyana	1.3	-	2.1	1.62	-	2.61	French Polynesia	0	-	0	0.05	-	1.05
Estonia	1.2	-	2.4	0.93	-	1.83							

Martinique	0 - 0	0.10 - 0.10
Bahrain	0 - 0	0.00 - 3.14
Saint Lucia	0 - 0	0.12 - 0.23
Bahamas	0 - 0	0.06 - 0.06
Equatorial Guinea	0 - 0	0.02 - 0.03
Faroe Islands	0 - 0	0.38 - 0.38
Liechtenstein	0 - 0	0.49 - 0.64
Micronesia	0 - 0	0.15 - 0.24
Montserrat	0 - 0	4.10 - 4.10
Saint Kitts and Nevis	0 - 0	0.15 - 2.39
Sao Tome and Principe	0 - 0	0.07 - 0.10
United States Virgin Islands	0 - 0	0.15 - 0.15
British Virgin Islands	0 - 0	0.29 - 0.29
Cook Islands	0 - 0	0.06 - 16.67
Netherlands Antilles	0 - 0	0.04 - 0.04
Seychelles	0 - 0	0.05 - 0.18
Wallis and Futuna Islands	0 - 0	0.85 - 0.85
American Samoa	0 - 0	0.08 - 0.08
Andorra	0 - 0	0.00 - 0.06
Anguilla	0 - 0	0.00 - 0.00
Aruba	0 - 0	0.00 - 0.00
Bermuda	0 - 0	0.07 - 0.07
Cayman Islands	0 - 0	0.01 - 0.01
Channel Islands	0 - 0	0.00 - 0.00
Gibraltar	0 - 0	0.00 - 0.00
Greenland	0 - 0	0.08 - 0.08
Guam	0 - 0	0.02 - 0.02
Holy See	0 - 0	0.00 - 0.25
Isle of Man	0 - 0	0.02 - 0.02
Maldives	0 - 0	0.00 - 0.00
Marshall Islands	0 - 0	0.00 - 0.00
Mayotte	0 - 0	0.00 - 0.00
Monaco	0 - 0	0.00 - 0.00
Nauru	0 - 0	0.12 - 0.60
Niue	0 - 0	1.00 - 1.42
Norfolk Island	0 - 0	0.00 - 0.00
Northern Mariana Islands	0 - 0	0.00 - 0.00
Pitcairn Islands	0 - 0	0.00 - 0.00
Saint Helena, Ascension and Tristan da Cunha	0 - 0	0.18 - 0.18
Saint Pierre and Miquelon	0 - 0	0.07 - 0.07
San Marino	0 - 0	0.00 - 0.11
Svalbard and Jan Mayen Islands	0 - 0	0.00 - 0.00
Tokelau	0 - 0	0.42 - 0.42
Turks and Caicos Islands	0 - 0	0.00 - 0.00

Tuvalu 0 - 0 0.00 - 0.56

¹Range reflects minimum and maximum of emissions data from FAOSTAT, EPA and UNFCCC National Communications.

Appendix 2 Percent of national emissions from agriculture

Country	Agriculture's contribution to total emissions ¹		
Chad	98%	New Zealand	46%
Cambodia	92%	Argentina	45%
Burundi	91%	Colombia	45%
Madagascar	90%	Zimbabwe	43%
Nepal	88%	Pakistan	42%
Guinea-Bissau	88%	Bangladesh	41%
Grenada	87%	Namibia	41%
Laos	86%	Senegal	39%
Comoros	85%	Malawi	38%
Sudan (former)	84%	Angola	37%
Uruguay	82%	Fiji	37%
Paraguay	81%	Timor-Leste	37%
Eritrea	81%	Ghana	36%
Vanuatu	81%	Morocco	35%
Rwanda	80%	Cuba	35%
Burkina Faso	79%	Panama	34%
Niger	79%	Oman	34%
Uganda	78%	Samoa	34%
Afghanistan	78%	Viet Nam	33%
Papua New Guinea	77%	Peru	32%
Cameroon	75%	Liberia	32%
Côte d'Ivoire	72%	Ireland	30%
Zambia	72%	Cabo Verde	30%
Tanzania	71%	Nigeria	29%
Haiti	71%	Philippines	29%
Myanmar	70%	Georgia	29%
Tajikistan	70%	El Salvador	28%
Benin	68%	Dominica	28%
Djibouti	66%	Suriname	27%
Mauritania	65%	Belarus	26%
Bhutan	64%	Montenegro	26%
Lesotho	63%	Sri Lanka	25%
Tonga	63%	Saint Kitts and Nevis	25%
Saint Vincent and the Grenadines	63%	Botswana	24%
Kiribati	62%	India	23%
Ethiopia	61%	Dominican Republic	23%
Guatemala	60%	Yemen	23%
Kenya	59%	Lithuania	23%
Mozambique	59%	Thailand	22%
Nicaragua	59%	Tunisia	22%
Bolivia	54%	Latvia	22%
Ecuador	51%	Indonesia	20%
Mali	48%	Venezuela	20%
Mongolia	48%	Guinea	20%
Brazil	46%	Albania	20%
		Armenia	20%
		Jamaica	19%
		France	18%
		Syria	18%

Kyrgyzstan	18%	Italy	7%
Denmark	17%	Honduras	7%
Gambia	17%	Slovakia	7%
Australia	16%	Estonia	7%
Egypt	16%	Macedonia	7%
Chile	16%	Jordan	7%
Moldova	16%	Saint Lucia	7%
Sao Tome and Principe	16%	Russia	6%
Romania	15%	Algeria	6%
Azerbaijan	15%	Czech Republic	6%
Congo	15%	Lebanon	6%
Iceland	15%	Luxembourg	6%
Hungary	14%	Gabon	6%
Mexico	13%	Seychelles	5%
Sweden	13%	DRC Congo	4%
Serbia	13%	Saudi Arabia	4%
Croatia	13%	DPR Korea	4%
Antigua & Barbuda	12%	Mauritius	4%
Nauru	12%	Republic of Korea	3%
China, mainland	11%	Malaysia	3%
Spain	11%	Togo	3%
Turkmenistan	11%	Israel	3%
Portugal	11%	Malta	3%
Switzerland	11%	Japan	2%
Cook Islands	11%	United Arab Emirates	2%
South Africa	10%	Guyana	2%
Bulgaria	10%	Barbados	2%
Slovenia	10%	Tuvalu	2%
Liechtenstein	10%	Andorra	1%
United Kingdom	9%	San Marino	1%
Iran	9%	Qatar	0%
Poland	9%	Kuwait	0%
Austria	9%	Trinidad and Tobago	0%
Finland	9%	Belize	0%
Norway	9%	Singapore	0%
Costa Rica	9%	Bahrain	0%
Bosnia & Herzegovina	9%	Monaco	0%
Swaziland	9%	Niue	0%
Cyprus	9%		
Palau	9%		
United States	8%		
Canada	8%		
Ukraine	8%		
Kazakhstan	8%		
Uzbekistan	8%		
Netherlands	8%		
Belgium	8%		
Greece	8%		
Germany	7%		
Turkey	7%		

¹Because these figures are based on national reports to the UNFCCC, data are not all from the same year. Total country emissions do not include LULUCF.

Appendix 3 Agricultural emissions by region

Region	Emissions from agriculture, MtCO ₂ e	Per capita emissions from agriculture, tCO ₂ e per person
South America	764.8 – 1010.0	1.94 – 2.56
Eastern Asia	766.5 – 878.4	0.48 – 0.55
South Asia	561.9 – 938.8	0.33 – 0.56
Northern America	413.0 – 582.3	1.19 – 1.68
South-Eastern Asia	314.3 – 627.1	0.53 – 1.05
Eastern Africa	213.5 – 381.0	0.64 – 1.15
Eastern Europe	209.2 – 298.4	0.71 – 1.01
Western Africa	174.4 – 322.6	0.57 – 1.06
Western Europe	169.4 – 206.7	0.89 – 1.08
Northern Africa	124.1 – 203.1	0.59 – 0.97
Oceania	122.4 – 141.7	4.57 – 5.29
Central America and Mexico	111.2 – 118.5	0.69 – 0.74
Northern Europe	100.1 – 106.7	1.01 – 1.08
Southern Europe	97.3 – 120.3	0.63 – 0.78
Western Asia	82.4 – 179.9	0.36 – 0.78
Middle Africa	71.1 – 373.7	0.57 – 2.99
Southern Africa	53.8 – 62.3	0.92 – 1.06
Central Asia	53.2 – 65.6	0.86 – 1.06
Caribbean	23.9 – 35.2	0.57 – 0.85
Melanesia	4.3 – 7.1	0.50 – 0.82
Polynesia	0.2 – 0.3	0.30 – 0.47
Micronesia	0.0 – 0.1	0.06 – 0.24



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