



3.2 Agricultural inputs

	Arable land		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural machinery			
	hectares per capita		% of cropland		thousand hectares		hundreds of grams per hectare of arable land		Tractors per 1,000 agricultural workers		Tractors per 100 hectares of arable land	
	1979-81	1995-97	1979-81	1995-97	1979-81	1996-98	1979-81	1995-97	1979-81	1995-97	1979-81	1995-97
Albania	0.22	0.18	53.0	48.4	367	225	1,556	133	15	11	173	147
Algeria	0.37	0.26	3.4	6.9	2,968	2,785	277	80	27	41	68	122
Angola	0.41	0.26	2.2	2.1	705	837	49	16	4	3	35	34
Argentina	0.89	0.71	5.8	6.3	11,099	10,455	46	295	132	190	73	112
Armenia	..	0.13	..	51.5	..	190	..	155	..	68	..	291
Australia	2.97	2.79	3.5	5.1	15,986	16,356	269	406	751	700	75	64
Austria	0.20	0.17	0.2	0.3	1,062	838	2,615	1,688	945	1,567	2,084	2,507
Azerbaijan	..	0.21	..	74.9	..	618	..	178	..	33	..	181
Bangladesh	0.10	0.06	17.1	43.4	10,823	10,983	459	1,453	0	0	5	6
Belarus	..	0.60	..	1.8	..	2,412	..	1,101	..	124	..	175
Belgium ^a	..	..	1.7	3.8	426	323	5,323	4,150	917	1,156	1,416	1,491
Benin	0.39	0.25	0.3	0.8	525	754	12	240	0	0	1	1
Bolivia	0.35	0.23	6.6	4.1	559	750	23	54	4	4	21	28
Bosnia and Herzegovina	..	0.14	..	0.3	..	194	..	140	..	257	..	580
Botswana	0.44	0.23	0.5	0.3	153	167	32	91	9	20	54	173
Brazil	0.32	0.33	3.3	4.8	20,612	18,116	915	927	31	57	139	137
Bulgaria	0.43	0.51	28.3	18.0	2,110	1,869	2,334	441	66	63	161	62
Burkina Faso	0.39	0.33	0.4	0.7	2,026	3,014	26	90	0	0	0	6
Burundi	0.22	0.12	0.7	1.3	203	209	11	45	0	0	1	2
Cambodia	0.29	0.33	5.8	7.1	1,241	1,959	68	23	0	0	6	3
Cameroon	0.68	0.43	0.2	0.3	1,021	1,036	56	55	0	0	1	1
Canada	1.86	1.53	1.3	1.6	19,561	19,360	416	587	824	1,642	144	163
Central African Republic	0.81	0.57	..	..	194	148	5	2	0	0	1	1
Chad	0.70	0.46	0.2	0.6	907	1,758	9	33	0	0	1	1
Chile	0.34	0.14	31.1	54.3	820	633	338	2,082	43	49	86	124
China	0.10	0.10	45.1	37.7	94,647	92,911	1,494	2,882	2	1	76	55
Hong Kong, China	0.00	0.00	37.5	30.2	0	0	..	..	0	0	10	7
Colombia	0.13	0.05	7.7	23.7	1,361	1,208	812	2,783	8	6	77	114
Congo, Dem. Rep.	0.25	0.15	0.1	0.1	1,115	2,088	12	10	0	0	3	4
Congo, Rep.	0.08	0.05	0.6	0.5	19	5	28	238	2	1	55	52
Costa Rica	0.12	0.07	12.1	24.7	136	71	2,650	7,021	22	22	210	246
Côte d'Ivoire	0.24	0.21	1.0	1.0	1,008	1,605	261	280	1	1	16	13
Croatia	..	0.29	..	0.2	..	644	..	1,656	..	14	..	28
Cuba	0.27	0.34	22.9	20.3	224	254	2,024	593	78	95	259	207
Czech Republic	..	0.30	..	0.7	..	1,636	..	1,082	..	164	..	276
Denmark	0.52	0.44	14.5	20.5	1,818	1,525	2,453	1,890	973	1,116	708	626
Dominican Republic	0.19	0.13	11.7	17.2	149	142	572	922	3	4	20	17
Ecuador	0.20	0.13	19.4	8.1	419	1,059	471	814	6	7	40	57
Egypt, Arab Rep.	0.06	0.05	100.0	99.8	2,007	2,581	2,864	3,899	4	11	158	319
El Salvador	0.12	0.10	13.7	14.5	422	426	1,376	1,450	5	5	59	54
Eritrea	..	0.10	..	7.0	..	313	..	109	..	0	..	19
Estonia	..	0.77	..	0.3	..	323	..	244	..	495	..	443
Ethiopia	..	0.17	..	1.8	..	7,181	..	150	..	0	..	3
Finland	0.50	0.42	..	3.0	1,190	1,106	2,022	1,483	721	1,147	824	923
France	0.32	0.31	4.6	8.5	9,804	9,095	3,260	2,742	737	1,236	836	717
Gabon	0.42	0.29	0.9	1.4	6	18	20	8	5	7	43	46
Gambia, The	0.26	0.16	0.6	1.0	54	103	136	51	0	0	3	3
Georgia	..	0.14	..	43.3	..	384	..	458	..	29	..	214
Germany	0.15	0.14	3.7	3.9	7,692	6,921	4,249	2,394	624	991	1,340	1,027
Ghana	0.18	0.16	0.2	0.2	902	1,292	104	57	1	1	18	15
Greece	0.30	0.27	24.2	34.5	1,600	1,307	1,927	1,777	120	277	485	808
Guatemala	0.19	0.13	5.0	6.6	716	613	726	1,394	3	2	32	32
Guinea	0.16	0.13	7.9	6.4	708	719	16	45	0	0	3	8
Guinea-Bissau	0.32	0.27	6.0	4.9	142	128	24	10	0	0	1	1
Haiti	0.10	0.08	7.9	9.9	416	455	62	143	0	0	3	4
Honduras	0.44	0.29	4.1	3.6	421	507	163	598	5	7	21	29



Agricultural inputs 3.2

	Arable land		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural machinery			
	hectares per capita		% of cropland		thousand hectares		hundreds of grams per hectare of arable land		Tractors per 1,000 agricultural workers		Tractors per 100 hectares of arable land	
	1979-81	1995-97	1979-81	1995-97	1979-81	1996-98	1979-81	1995-97	1979-81	1995-97	1979-81	1995-97
Hungary	0.47	0.47	3.6	4.2	2,878	2,874	2,906	871	59	156	111	64
India	0.24	0.17	22.8	32.4	104,349	100,697	345	912	2	6	24	85
Indonesia	0.12	0.09	16.2	15.5	11,825	15,085	645	1,480	0	1	5	34
Iran, Islamic Rep.	0.36	0.29	35.5	37.7	8,062	8,662	430	614	17	40	57	134
Iraq	0.40	0.24	32.1	63.6	2,159	3,023	172	631	23	74	44	67
Ireland	0.33	0.37	..	..	425	296	5,373	5,228	606	978	1,289	1,259
Israel	0.08	0.06	49.3	45.5	129	84	2,384	3,260	294	322	809	731
Italy	0.17	0.14	19.3	24.9	5,082	4,165	2,295	2,264	370	913	1,117	1,814
Jamaica	0.06	0.07	13.4	12.0	4	3	1,208	1,383	9	11	156	173
Japan	0.04	0.03	62.6	62.8	2,724	2,155	4,687	3,989	209	637	3,091	5,463
Jordan	0.14	0.06	11.0	19.5	158	98	404	802	48	34	153	188
Kazakhstan	..	1.93	..	7.2	..	14,734	..	41	..	91	..	49
Kenya	0.23	0.14	0.9	1.5	1,692	1,860	160	310	1	1	17	35
Korea, Dem. Rep.	0.09	0.07	58.9	73.0	1,625	1,408	4,688	699	13	19	275	441
Korea, Rep.	0.05	0.04	59.6	60.6	1,689	1,159	3,920	5,274	1	41	14	605
Kuwait	0.00	0.00	..	75.4	0	1	4,500	1,778	3	14	220	200
Kyrgyz Republic	..	0.29	..	77.3	..	632	..	227	..	39	..	260
Lao PDR	0.21	0.17	15.4	18.6	751	631	40	56	0	0	8	11
Latvia	..	0.70	..	1.1	..	466	..	302	..	312	..	311
Lebanon	0.07	0.04	28.3	36.0	34	38	1,663	2,971	28	100	141	217
Lesotho	0.22	0.16	..	..	203	192	150	182	6	6	47	63
Libya	0.58	0.35	10.7	22.2	538	225	357	388	101	288	134	187
Lithuania	..	0.79	..	0.3	..	1,134	..	383	..	263	..	242
Macedonia, FYR	..	0.31	..	8.7	..	225	..	722	..	381	..	889
Madagascar	0.28	0.18	21.5	35.0	1,309	1,367	31	50	1	1	11	14
Malawi	0.20	0.16	1.3	1.6	1,155	1,403	246	333	0	0	10	9
Malaysia	0.07	0.09	6.7	4.5	729	700	4,273	6,125	4	23	77	238
Mali	0.31	0.45	2.9	2.1	1,346	2,237	61	81	0	1	5	6
Mauritania	0.14	0.20	22.8	9.7	125	227	85	87	1	1	13	7
Mauritius	0.10	0.09	15.0	17.0	0	0	2,547	3,593	4	6	33	37
Mexico	0.34	0.27	20.3	22.8	9,356	11,072	570	597	16	20	54	68
Moldova	..	0.41	..	14.1	..	919	..	659	..	85	..	279
Mongolia	0.71	0.52	..	6.4	559	317	83	15	32	21	82	54
Morocco	0.38	0.32	15.2	13.1	4,414	5,600	273	315	7	10	35	48
Mozambique	0.24	0.18	2.1	3.4	1,077	1,851	109	25	1	1	20	19
Myanmar	0.28	0.22	10.4	15.4	5,133	6,095	111	183	1	0	9	8
Namibia	0.64	0.51	0.6	0.9	195	322	..	..	10	11	39	39
Nepal	0.16	0.13	22.5	38.2	2,251	3,258	98	350	0	0	10	15
Netherlands	0.06	0.06	58.5	61.0	225	199	8,620	5,854	561	631	2,238	2,061
New Zealand	0.80	0.42	5.2	8.7	193	166	1,965	4,392	619	437	367	485
Nicaragua	0.39	0.53	6.0	3.2	266	396	392	160	6	7	19	11
Niger	0.62	0.52	0.7	1.3	3,872	6,505	10	19	0	0	0	0
Nigeria	0.39	0.25	0.7	0.7	6,048	18,166	59	56	1	2	3	4
Norway	0.20	0.22	..	..	311	333	3,146	2,172	824	1,276	1,603	1,486
Oman	0.01	0.01	92.7	98.4	2	3	840	4,792	1	1	76	94
Pakistan	0.24	0.17	72.7	80.8	10,693	12,420	525	1,201	5	13	50	145
Panama	0.22	0.19	5.0	4.9	166	118	692	704	27	20	122	100
Papua New Guinea	0.01	0.01	..	..	2	2	3,827	2,167	1	1	699	190
Paraguay	0.52	0.44	3.4	2.9	304	629	44	136	14	25	45	75
Peru	0.19	0.15	32.8	42.0	732	945	381	452	5	3	37	20
Philippines	0.09	0.07	14.0	16.3	6,790	6,220	765	1,354	1	1	24	22
Poland	0.41	0.36	0.7	0.7	7,875	8,821	2,393	1,107	112	281	425	927
Portugal	0.25	0.22	20.1	21.8	1,099	629	1,113	1,158	72	208	351	697
Puerto Rico	0.02	0.01	39.0	51.3	1	0	..	..	..	..	..	..
Romania	0.44	0.41	21.9	31.3	6,340	5,985	1,448	402	39	84	150	176
Russian Federation	..	0.85	..	4.0	..	51,313	..	140	..	106	..	88



3.2 Agricultural inputs

	Arable land		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural machinery			
	hectares per capita		% of cropland		thousand hectares		hundreds of grams per hectare of arable land		Tractors per 1,000 agricultural workers		Tractors per 100 hectares of arable land	
	1979-81	1995-97	1979-81	1995-97	1979-81	1996-98	1979-81	1995-97	1979-81	1995-97	1979-81	1995-97
Rwanda	0.15	0.12	0.4	0.3	239	165	3	4	0	0	1	1
Saudi Arabia	0.20	0.19	28.9	42.3	388	585	228	835	2	12	10	26
Senegal	0.42	0.26	2.6	3.1	1,216	1,176	104	91	0	0	2	2
Sierra Leone	0.14	0.10	4.1	5.3	434	376	58	62	0	0	6	11
Singapore	0.00	0.00	..	..	..	..	22,333	32,473	3	18	220	650
Slovak Republic	..	0.28	..	12.5	..	865	..	777	..	92	..	188
Slovenia	..	0.12	..	0.7	..	98	..	3,116	..	3,082	..	3,840
South Africa	0.45	0.38	8.4	7.9	6,760	5,448	874	520	94	68	140	87
Spain	0.42	0.38	14.8	18.1	7,391	6,754	1,012	1,354	200	546	335	535
Sri Lanka	0.06	0.05	28.3	30.7	864	762	1,800	2,393	4	2	276	355
Sudan	0.66	0.61	14.4	11.7	4,447	9,010	51	45	2	2	8	8
Sweden	0.36	0.32	..	..	1,505	1,254	1,654	1,084	715	958	623	592
Switzerland	0.06	0.06	6.2	5.8	172	189	4,623	2,785	494	627	2,428	2,832
Syrian Arab Republic	0.60	0.32	9.6	20.5	2,642	3,294	250	746	29	66	54	186
Tajikistan	..	0.13	..	79.7	..	308	..	805	..	38	..	366
Tanzania	0.12	0.10	3.8	3.8	2,835	3,183	143	120	1	1	45	24
Thailand	0.35	0.28	16.4	23.9	10,625	11,157	177	889	1	7	11	87
Togo	0.76	0.48	0.3	0.3	416	776	13	77	0	0	1	2
Trinidad and Tobago	0.06	0.06	17.8	18.0	4	5	1,064	1,216	50	52	337	353
Tunisia	0.51	0.32	4.9	7.6	1,416	1,452	212	316	30	39	79	123
Turkey	0.57	0.43	9.6	14.7	13,499	14,001	529	684	38	58	169	322
Turkmenistan	..	0.35	..	..	..	662	..	854	..	82	..	347
Uganda	0.32	0.25	0.1	0.1	752	1,339	2	2	0	1	6	9
Ukraine	..	0.65	..	7.4	..	12,521	..	268	..	89	..	119
United Arab Emirates	0.01	0.02	..	87.6	0	1	2,250	7,808	6	4	106	80
United Kingdom	0.12	0.11	2.0	1.7	3,930	3,431	3,185	3,600	726	883	742	832
United States	0.83	0.66	10.8	12.0	72,630	63,366	1,092	1,141	1,230	1,484	253	273
Uruguay	0.48	0.39	5.4	10.7	614	639	564	923	171	173	236	262
Uzbekistan	..	0.19	..	88.3	..	1,662	..	1,158	..	59	..	376
Venezuela, RB	0.19	0.12	3.6	5.7	814	744	711	1,116	50	59	133	183
Vietnam	0.11	0.07	24.1	31.0	5,963	7,799	302	2,566	1	4	38	178
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	0.16	0.09	19.9	31.3	865	732	93	77	3	2	33	41
Yugoslavia, FR (Serb./Mont.)	..	0.35	..	1.6	..	2,337	..	477	..	353	..	..
Zambia	0.89	0.56	0.4	0.9	595	729	145	103	3	2	9	11
Zimbabwe	0.36	0.27	3.1	4.7	1,633	1,964	609	536	7	7	66	81
World	0.24 w	0.24 w	17.8 w	19.2 w	583,798 s	703,133 s	866 w	971 w	18 w	20 w	172 w	187 w
Low income	0.18	0.15	25.6	29.7	294,763	336,301	550	1,175	2	3	20	59
Excl. China & India	0.23	0.18	16.2	20.0	94,142	141,284	206	430	1	3	..	..
Middle income	0.24	0.35	15.5	14.1	134,447	227,139	796	558	23	49	100	124
Lower middle income	0.18	0.38	22.3	14.9	63,168	153,297	679	396	17	32	69	90
Upper middle income	0.34	0.30	10.3	12.4	71,278	73,842	886	874	37	75	144	208
Low & middle income	0.20	0.21	21.9	21.9	429,210	563,440	640	869	4	8	62	100
East Asia & Pacific	0.11	0.11	37.0	36.3	141,594	145,454	1,162	2,329	2	2	55	61
Europe & Central Asia	0.16	0.59	11.6	10.4	33,069	127,954	1,467	344	..	101	223	172
Latin America & Carib.	0.32	0.27	11.6	13.5	49,788	49,463	587	741	25	35	95	110
Middle East & N. Africa	0.29	0.21	25.8	35.5	25,653	29,076	422	661	12	25	61	119
South Asia	0.23	0.16	28.7	39.7	132,128	130,930	360	926	2	5	26	85
Sub-Saharan Africa	0.32	0.25	4.0	4.2	46,978	80,562	160	132	3	2	23	18
High income	0.46	0.41	9.8	11.2	154,588	139,693	1,307	1,264	520	906	383	437
Europe EMU	0.23	0.21	12.6	15.8	33,970	30,003	2,705	2,247	451	841	888	955

a. Includes Luxembourg.



About the data

Agricultural activities provide developing countries with food and revenue, but they also can degrade natural resources. Poor farming practices can cause soil erosion and loss of fertility. Efforts to increase productivity through the use of chemical fertilizers, pesticides, and intensive irrigation have environmental costs and health impacts. Excessive use of chemical fertilizers can alter the chemistry of soil. Pesticide poisoning is common in developing countries. And salinization of irrigated land diminishes soil fertility. Thus inappropriate use of inputs for agricultural production has far-reaching effects.

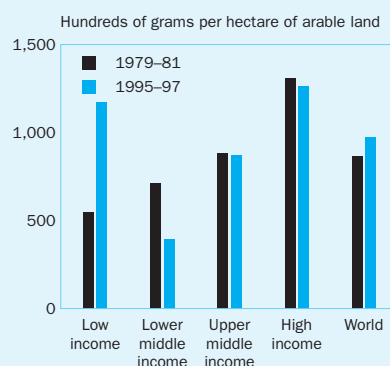
This table provides indicators of major inputs to agricultural production: land, fertilizers, and agricultural machinery. There is no single correct mix of inputs: appropriate levels and application rates vary by country and over time, depending on the type of crops, the climate and soils, and the production process used. The data shown here and in table 3.3 are collected by the Food and Agriculture Organization (FAO) through annual questionnaires. The FAO tries to impose standard definitions and reporting methods, but exact consistency across countries and over time is not possible. Data on agricultural employment in particular should be used with caution. In many countries much agricultural employment is informal and unrecorded, including substantial work performed by women and children.

Fertilizer consumption measures the quantity of plant nutrients in the form of nitrogen, potassium, and phosphorous compounds available for direct application. Consumption is calculated as production plus imports minus exports. Traditional nutrients—animal and plant manures—are not included. Because some chemical compounds used for fertilizers have other industrial applications, the consumption data may overstate the quantity available for crops.

To smooth annual fluctuations in agricultural activity, the indicators in the table have been averaged over three years.

Figure 3.2a

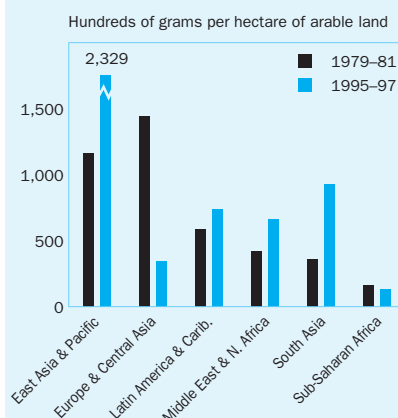
Fertilizer consumption has more than doubled in low-income countries . . .



Source: Table 3.2.

Figure 3.2b

. . . and in East Asia and the Pacific



Source: Table 3.2.

Definitions

- **Arable land** includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.
- **Irrigated land** refers to areas purposely provided with water, including land irrigated by controlled flooding. Cropland refers to arable land and land used for permanent crops (see table 3.1).
- **Land under cereal production** refers to harvested areas, although some countries report only sown or cultivated area.
- **Fertilizer consumption** measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). The time reference for fertilizer consumption is the crop year (July through June).
- **Agricultural machinery** refers to wheel and crawler tractors (excluding garden tractors) in use in agriculture at the end of the calendar year specified or during the first quarter of the following year.

Data sources

The data in the table are from electronic files that the FAO makes available to the World Bank. Data on arable land, irrigated land, and land under cereal production are published in the FAO's *Production Yearbook*.