



3.2

Agricultural inputs

	Agricultural land ^a		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural employment		Agricultural machinery	
	% of land area		% of cropland		thousand hectares		hundred grams per hectare of arable land		% of total employment		Tractors per 100 sq. km of arable land	
	1990-92	2003-05	1990-92	2001-03	1990-92	2003-05	1990-92	2000-02	1990-92	2001-03	1990-92	2001-03
Afghanistan	58.3	58.3	33.9	33.8	2,283	2,788	59	19	..	..	1	1
Albania	41.1	40.9	55.6	49.5	243	148	903	420	..	62.7	177	141
Algeria	16.3	16.8	6.4	6.9	3,105	2,751	144	130	..	21.1	128	129
Angola	46.1	46.2	2.3	2.3	893	1,306	29	5	..	..	35	33
Argentina	46.6	47.0	5.6	5.4	8,510	9,391	73	295	0.4	1.1	103	108
Armenia	43.1	49.3	49.9	51.2	163	198	493	157	..	45.7	277	289
Australia	60.5	57.5	4.2	5.2	12,814	19,905	275	479	5.5	4.4	67	65
Austria	42.5	40.0	0.3	0.3	903	810	1,995	1,540	7.5	5.6	2,367	2,380
Azerbaijan	51.5	57.5	68.0	70.5	628	788	432	61	32.5	40.1	184	164
Bangladesh	73.5	69.3	33.8	54.3	10,985	11,511	1,136	1,738	66.4	51.7	6	7
Belarus	43.6	42.7	2.1	2.3	2,581	2,148	2,251	1,325	21.7	..	195	111
Belgium	43.6	46.0	..	4.6	326	314	4,937	3,427	2.8	1.7	1,498	1,254
Benin	20.6	31.3	0.6	0.4	660	963	78	154	..	..	1	1
Bolivia	32.9	34.2	5.5	4.1	633	792	42	37	1.7	..	25	20
Bosnia and Herzegovina	15.0	42.1	0.2	0.3	333	326	..	356	..	..	235	289
Botswana	45.9	45.8	0.2	0.3	140	67	22	122	..	16.8	143	159
Brazil	28.9	31.2	4.6	4.4	19,633	19,806	656	1,201	25.6	20.6	142	137
Bulgaria	55.7	48.5	29.6	16.5	2,174	1,721	1,194	500	19.7	18.0	128	95
Burkina Faso	34.9	39.8	0.6	0.5	2,725	3,249	60	30	..	..	3	4
Burundi	82.9	91.3	1.2	1.6	219	210	34	33	..	..	2	2
Cambodia	30.2	30.3	6.6	7.0	1,801	2,332	19	..	..	70.2	3	7
Cameroon	19.7	19.7	0.3	0.4	816	1,077	34	75	60.6	..	1	1
Canada	7.5	7.4	1.4	1.5	20,864	17,272	476	549	4.2	2.8	162	160
Central African Republic	8.0	8.3	0.0	0.1	104	187	5	3	..	..	0	0
Chad	38.4	38.6	0.5	0.8	1,242	2,096	25	49	..	..	1	0
Chile	21.0	20.4	57.1	82.4	742	687	1,215	2,386	18.8	13.6	144	272
China	57.0	59.5	43.6	47.5	93,430	79,896	2,777	3,519	53.5	44.7	77	89
Hong Kong, China	..	..	..	..	..	..	..	..	0.8	0.2	..	..
Colombia	40.5	38.2	14.3	23.3	1,598	1,265	1,822	2,670	1.4	21.2	98	91
Congo, Dem. Rep.	10.1	10.1	0.1	0.1	1,868	1,974	8	7	..	..	4	4
Congo, Rep.	30.8	30.9	0.3	0.4	9	13	35	67	..	..	15	14
Costa Rica	55.7	56.1	15.2	20.6	83	58	4,522	6,455	25.2	15.5	259	311
Côte d'Ivoire	59.8	62.6	1.1	1.1	1,434	953	151	256	..	..	15	12
Croatia	15.0	50.8	0.2	0.4	647	646	1,514	1,303	..	15.8	35	25
Cuba	61.5	60.6	22.6	22.5	235	309	1,288	476	25.1	21.7	250	249
Czech Republic	55.4	55.2	..	0.7	..	1,563	..	1,186	10.1	4.7	..	305
Denmark	65.4	62.0	16.9	19.6	1,581	1,495	2,249	1,393	5.4	3.2	625	540
Dominican Republic	74.7	76.4	14.9	17.2	134	150	860	848	19.5	15.4	22	17
Ecuador	28.6	26.9	27.9	33.0	861	892	508	1,679	7.0	8.5	67	106
Egypt, Arab Rep.	2.7	3.5	100.0	100.0	2,410	2,851	3,977	4,464	36.2	28.6	251	309
El Salvador	71.1	82.2	4.9	4.9	453	330	1,336	1,054	17.9	19.9	60	52
Eritrea	..	74.6	..	3.7	..	370	..	119	..	..	..	8
Estonia	31.2	19.1	0.5	0.6	454	268	993	432	19.5	6.7	395	889
Ethiopia	51.0	31.8	1.4	2.6	4,586	9,039	..	145	..	..	..	3
Finland	7.9	7.4	2.8	2.9	1,050	1,200	1,647	1,353	8.8	5.3	1,040	882
France	55.3	53.9	11.0	13.3	9,212	9,160	2,918	2,221	..	4.3	784	685
Gabon	20.0	20.0	1.1	1.4	14	20	25	9	..	..	50	46
Gambia, The	63.2	77.9	0.9	0.6	90	186	44	26	..	..	2	1
Georgia	44.8	43.3	39.9	44.1	249	339	889	412	..	53.8	279	254
Germany	49.8	48.8	4.0	4.0	6,673	6,875	2,616	2,245	4.0	2.5	1,253	801
Ghana	55.7	64.8	0.7	0.5	1,078	1,376	38	60	62.2	..	15	9
Greece	71.3	65.2	31.1	37.4	1,455	1,272	2,289	1,580	22.7	15.6	774	939
Guatemala	39.5	42.9	6.8	6.4	768	666	1,072	1,427	..	38.7	33	30
Guinea	48.9	50.7	7.0	5.6	627	778	16	32	..	..	5	5
Guinea-Bissau	53.2	58.0	4.1	4.6	112	138	15	80	..	..	1	1
Haiti	57.9	57.7	8.0	8.4	406	458	35	181	..	..	2	2

Agricultural inputs

3.2

ENVIRONMENT

	Agricultural land ^a		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural employment		Agricultural machinery	
	% of land area		% of cropland		thousand hectares		hundred grams per hectare of arable land		% of total employment		Tractors per 100 sq. km of arable land	
	1990-92	2003-05	1990-92	2001-03	1990-92	2003-05	1990-92	2000-02	1990-92	2001-03	1990-92	2001-03
Honduras	29.8	26.2	3.8	5.6	502	391	203	1,193	42.1	35.1	31	49
Hungary	70.7	65.4	4.1	4.8	2,803	2,940	796	993	11.3	6.0	158	247
India	60.9	60.6	28.3	32.7	100,760	97,872	758	1,044	68.1	..	65	141
Indonesia	23.5	26.3	14.5	12.7	13,861	15,140	1,330	1,259	54.9	44.8	18	41
Iran, Islamic Rep.	37.7	37.9	39.7	42.7	9,612	8,983	750	890	25.6	..	136	161
Iraq	21.9	22.9	63.0	58.6	3,506	3,221	347	968	..	..	72	80
Ireland	70.2	62.4	..	..	298	294	6,591	5,172	14.1	6.8	1,667	1,324
Israel	26.7	24.4	44.4	45.4	108	92	2,836	2,575	3.7	2.0	763	714
Italy	55.4	50.7	22.9	24.9	4,347	4,142	2,195	1,819	8.4	5.0	1,619	2,031
Jamaica	44.0	47.4	11.0	5.9	3	1	1,737	1,258	27.3	20.4	242	177
Japan	15.5	12.9	54.3	54.7	2,439	2,008	3,779	3,066	6.8	4.7	4,297	4,588
Jordan	12.0	11.5	25.0	27.3	112	53	969	1,322	..	3.9	352	308
Kazakhstan	79.1	76.9	9.8	15.7	22,174	13,697	133	23	..	35.4	59	22
Kenya	45.7	..	1.3	1.8	1,766	2,017	255	320	19.0	..	24	28
Korea, Dem. Rep.	21.0	24.9	58.2	50.9	1,569	1,272	3,522	1,018	..	..	297	241
Korea, Rep.	21.9	19.2	47.1	47.1	1,368	1,093	4,932	4,317	16.7	9.4	275	1,239
Kuwait	7.9	8.6	60.0	77.0	0	1	2,000	711	..	..	215	69
Kyrgyz Republic	50.7	56.2	72.6	76.0	579	596	238	209	35.5	52.8	179	167
Lao PDR	7.2	8.5	16.2	17.2	630	758	31	94	..	..	11	12
Latvia	39.3	26.5	1.1	2.1	699	451	977	572	..	14.8	343	580
Lebanon	31.1	32.2	28.1	33.2	41	61	1,639	2,838	..	..	188	488
Lesotho	76.7	76.9	0.6	0.9	178	177	167	309	..	..	57	61
Liberia	27.1	27.0	0.5	0.5	135	120	8	..	..	..	8	9
Libya	8.8	8.8	21.8	21.9	355	341	458	349	..	..	187	219
Lithuania	52.1	42.5	0.5	0.4	1,135	899	531	903	18.8	17.7	242	641
Macedonia, FYR	17.9	48.8	12.1	9.0	257	195	..	502	..	23.0	730	954
Madagascar	47.0	47.4	30.7	30.6	1,321	1,457	34	31	..	78.0	11	12
Malawi	40.2	47.2	1.2	2.3	1,443	1,544	351	400	..	..	8	6
Malaysia	22.7	24.0	4.8	4.8	699	701	5,264	6,548	23.9	14.8	161	241
Mali	26.3	32.4	3.7	5.0	2,393	3,292	91	88	..	..	11	6
Mauritania	38.7	38.8	11.8	6.5	133	176	132	59	..	..	8	8
Mauritius	55.7	55.7	16.0	20.1	1	0	2,732	3,035	14.3	10.5	36	37
Mexico	54.5	56.2	22.4	23.2	10,075	10,126	696	727	24.2	17.2	129	131
Moldova	75.1	76.7	14.2	13.9	676	927	762	86	..	47.9	293	221
Mongolia	79.9	83.3	5.8	7.0	620	180	111	31	..	45.0	73	42
Morocco	68.2	68.1	13.2	15.5	5,374	5,565	353	440	..	44.8	46	58
Mozambique	60.9	62.0	2.8	2.7	1,509	2,071	12	53	..	..	16	14
Myanmar	15.8	17.2	10.1	17.9	5,283	7,215	79	146	69.4	..	12	10
Namibia	47.0	47.2	0.7	1.0	215	244	..	4	48.2	..	47	39
Nepal	29.0	29.5	43.0	47.2	2,957	3,346	340	333	82.3	..	23	24
Netherlands	58.9	56.8	61.0	60.0	185	217	6,298	4,286	4.3	2.8	2,056	1,645
New Zealand	65.0	64.3	7.6	8.5	153	121	1,892	5,704	10.7	8.7	322	507
Nicaragua	52.1	57.5	4.0	2.8	299	502	270	177	38.7	26.8	20	15
Niger	27.0	30.4	0.5	0.5	7,011	8,111	1	3	..	..	0	0
Nigeria	79.4	79.7	0.7	0.8	16,417	17,799	142	66	..	..	8	10
Norway	3.3	3.4	..	..	361	326	2,362	2,086	5.9	3.8	1,723	1,486
Oman	3.5	3.5	71.6	88.4	2	2	2,441	2,491	..	..	42	50
Pakistan	33.7	35.2	78.5	81.1	11,777	12,587	962	1,378	48.9	45.3	133	149
Panama	28.7	30.0	4.8	6.2	182	195	666	545	25.8	17.7	103	148
Papua New Guinea	2.0	2.3	..	..	2	3	622	556	..	..	59	53
Paraguay	59.6	62.5	2.9	2.1	455	782	92	319	1.7	32.2	72	55
Peru	17.1	16.6	29.9	27.9	683	1,116	246	759	1.0	3.5	36	36
Philippines	37.4	40.9	15.7	14.5	6,957	6,613	935	1,313	45.3	37.3	20	20
Poland	61.6	52.8	0.7	0.7	8,523	8,290	895	1,151	25.2	18.9	821	1,034
Portugal	42.8	41.7	20.5	27.2	780	435	1,123	1,258	15.6	12.5	569	1,044
Puerto Rico	47.5	25.1	36.8	37.1	0	0	..	..	3.5	2.0	..	..



3.2

Agricultural inputs

	Agricultural land ^a		Irrigated land		Land under cereal production		Fertilizer consumption		Agricultural employment		Agricultural machinery	
	% of land area		% of cropland		thousand hectares		hundred grams per hectare of arable land		% of total employment		Tractors per 100 sq. km of arable land	
	1990-92	2003-05	1990-92	2001-03	1990-92	2003-05	1990-92	2000-02	1990-92	2001-03	1990-92	2001-03
Romania	64.4	63.8	31.0	31.2	5,842	5,675	788	355	30.6	38.1	146	179
Russian Federation	13.0	13.2	4.2	3.7	59,600	39,471	410	121	14.5	11.4	92	52
Rwanda	75.6	78.4	0.3	0.7	258	332	20	48	..	..	1	1
Saudi Arabia	..	..	44.2	42.7	1,062	669	1,446	1,067	..	5.4	20	28
Senegal	41.9	42.4	3.3	4.6	1,154	1,202	65	140	..	..	2	3
Serbia and Montenegro	21.1	54.8	1.9	0.8	2,618	1,987	265	732	..	..	1,067	1,023
Sierra Leone	38.3	39.7	5.2	5.0	452	253	23	5	..	..	3	2
Singapore	2.2	1.2	..	..	..	..	54,333	25,920	0.3	0.3	637	794
Slovak Republic	50.9	42.3	..	12.6	1	802	..	..	..	6.0	..	..
Slovenia	9.8	25.0	0.8	1.5	130	99	3,168	4,239	..	9.3	..	..
Somalia	70.2	70.3	19.2	18.7	531	682	26	5	..	..	21	16
South Africa	80.2	82.0	8.3	9.5	5,736	4,429	549	558	..	10.7	101	46
Spain	60.8	58.3	16.9	20.7	7,588	6,573	1,186	1,653	10.7	6.1	494	712
Sri Lanka	36.2	36.5	28.0	34.4	834	882	2,016	2,862	44.3	34.7	71	113
Sudan	52.0	56.6	13.9	11.0	6,267	10,005	51	40	..	..	8	7
Swaziland	75.8	80.9	24.1	26.0	69	61	688	371	..	..	251	222
Sweden	8.2	7.8	4.1	4.3	1,184	1,098	1,112	1,010	3.3	2.2	604	615
Switzerland	46.9	38.1	6.0	5.8	207	164	4,032	2,272	4.2	4.2	2,870	2,649
Syrian Arab Republic	73.7	75.6	14.3	24.0	3,812	3,195	621	718	..	30.3	137	224
Tajikistan	30.9	30.4	72.9	68.2	266	393	1,461	175	..	..	392	233
Tanzania	53.7	54.4	3.2	3.5	3,003	3,340	136	31	84.2	82.1	19	19
Thailand	41.9	36.2	21.0	26.6	10,594	11,134	598	1,039	61.5	45.7	39	144
Togo	58.7	66.7	0.3	0.3	610	767	56	74	..	..	0	0
Trinidad and Tobago	25.7	25.9	3.3	3.3	6	2	1,111	631	11.8	7.4	354	360
Tunisia	58.4	63.0	7.3	8.0	1,525	1,450	330	372	..	..	88	126
Turkey	51.8	53.3	14.8	19.5	13,760	13,817	757	768	46.5	35.5	287	410
Turkmenistan	66.1	70.2	..	89.1	332	983	1,273	543	..	..	439	256
Uganda	61.0	..	0.1	0.1	1,098	1,550	1	14	91.5	69.1	9	9
Ukraine	69.8	71.4	7.6	6.8	12,555	13,082	792	154	..	19.5	145	124
United Arab Emirates	3.7	6.7	..	29.2	1	0	4,810	5,149	..	..	50	55
United Kingdom	75.0	70.2	2.5	3.0	3,549	3,040	3,323	3,141	2.2	1.4	762	878
United States	46.6	45.3	11.3	12.5	64,547	57,163	1,015	1,096	2.9	2.2	245	270
Uruguay	84.7	85.4	10.2	14.3	509	528	610	849	4.5	4.3	259	241
Uzbekistan	62.8	64.1	87.3	87.4	1,227	1,692	1,602	1,614	..	..	380	373
Venezuela, RB	24.7	24.5	13.9	16.9	799	1,042	1,388	1,132	12.6	10.0	176	189
Vietnam	21.0	30.8	44.6	33.9	6,726	8,392	1,299	3,172	73.8	61.9	60	247
West Bank and Gaza	..	..	..	..	..	..	..	..	..	14.1	..	..
Yemen, Rep.	33.4	33.6	24.3	31.4	738	635	127	95	..	..	40	43
Zambia	47.4	47.5	0.7	2.8	813	717	131	84	..	..	11	11
Zimbabwe	52.3	53.1	3.6	5.2	1,431	1,617	508	443	..	..	61	75
World	37.7 w	38.3 w	17.7 w	18.4 w	704,675 s	677,585 s	925 w	1,020 w	41.8 w	.. w	186 w	200 w
Low income	44.3	45.2	21.8	24.4	211,290	230,781	541	686	..	..	52	84
Middle income	34.6	35.5	20.1	18.5	350,107	310,863	970	1,110	44.2	35.8	127	137
Lower middle income	41.2	42.6	24.4	24.4	228,729	208,372	1,278	1,573	48.9	40.1	99	112
Upper middle income	25.7	25.9	11.8	9.5	121,378	102,492	553	471	20.8	15.5	164	173
Low & middle income	37.4	38.2	20.7	20.7	561,397	541,644	817	951	50.6	..	100	117
East Asia & Pacific	48.4	50.7	..	..	142,270	133,753	..	..	54.2	44.9	63	89
Europe & Central Asia	28.4	27.6	10.3	11.2	140,517	114,042	581	347	22.4	20.9	172	185
Latin America & Carib.	34.7	35.8	11.3	11.4	47,720	49,696	587	896	18.1	16.7	123	123
Middle East & N. Africa	22.6	23.2	29.6	32.7	30,593	29,108	643	833	..	..	115	142
South Asia	54.7	54.5	33.9	38.9	129,690	129,043	767	1,067	66.1	..	67	129
Sub-Saharan Africa	43.4	44.1	3.4	3.6	70,608	86,002	136	125	..	..	19	13
High income	38.5	38.6	10.7	11.8	143,278	135,941	1,213	1,212	5.7	3.8	417	431
Europe EMU	49.7	47.5	14.9	17.0	32,976	31,419	2,332	2,059	7.3	4.9	992	1,002

a. Agricultural land includes permanent pastures, arable land, and land under permanent crops.

About the data

Agriculture is still a major sector in many economies, and 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 soil 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, fertilizer, labor, 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.

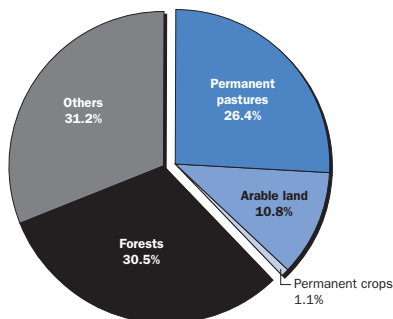
The data shown here and in table 3.3 are collected by the Food and Agriculture Organization (FAO) through annual questionnaires. The FAO tries to impose standard definitions and reporting methods, but exact consistency across countries and over time is not possible. For example, despite standard definitions, data on agricultural land in different climates may not be comparable. For example, permanent pastures are quite different in nature and intensity in African countries and dry Middle Eastern countries. 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. Consumption is calculated as production plus imports minus exports. 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.

Nearly 40 percent of land globally is used for agriculture 3.2a

Total land: 130 million square kilometers



Note: Agricultural land includes permanent pastures, arable land, and land under permanent crops.

Source: Tables 3.1 and 3.2.

Definitions

- **Agricultural land** refers to the share of land area that is arable, under permanent crops, or under permanent pastures. 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. Land under permanent crops is land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee, and rubber. This category includes land under flowering shrubs, fruit trees, nut trees, and vines, but excludes land under trees grown for wood or timber. Permanent pasture is land used for five or more years for forage, including natural and cultivated crops.
- **Irrigated land** refers to areas purposely provided with water, including land irrigated by controlled flooding.
- **Cropland** refers to arable land and permanent cropland (see table 3.1).
- **Land under cereal production** refers to harvested areas, although some countries report only sown or cultivated area.
- **Fertilizer consumption** is the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). Traditional nutrients—animal and plant manures—are not included. The time reference for fertilizer consumption is the crop year (July through June).
- **Agricultural employment** refers to employment in agriculture, forestry, hunting, and fishing (see table 2.3 for more detail).
- **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

Data on agricultural inputs are from electronic files that the FAO makes available to the World Bank.