

Genetically modified crops

Biotechnology encompasses a wide range of technologies and they can be applied for a range of different purposes, such as the genetic improvement of plant varieties and animal populations to increase their yields or efficiency; genetic characterization and conservation of genetic resources; plant or animal disease diagnosis; vaccine development; and improvement of feeds. Some of the technologies may be applied to all the food and agriculture sectors, such as the use of molecular DNA markers or genetic modification, while others are more sector-specific, such as tissue culture (in crops and forest trees), embryo transfer (livestock) or triploidization and sex-reversal (fish).

Higher productivity holds the key in the fight against rural poverty. Biotechnology promises to boost productivity and thus raise rural incomes, much in the same way that the green revolution did in large parts of Asia during the 1960s to 1980s. Productivity gains encompass essentially all factors of agricultural production. This may mean higher crop and livestock yields, lower pesticide and fertilizer applications, less demanding production techniques, higher product quality, better storage and easier processing, or enhanced methods to monitor the health of plants and animals.

One type of technology, however, has given rise to a host of concerns and questions, namely **Genetically Modified Organisms (GMOs)**. GMOs are those organisms that have been modified by the application of recombinant DNA technology or genetic engineering, a technique used for altering a living organism's genetic material. With the rapid advances in biotechnology, a number of genetically modified (GM) crops or transgenic crops carrying novel traits have been developed and released for commercial agriculture production. These include, *inter alia*, pest resistant cotton, maize, canola (mainly Bt or *Bacillus thuringiensis*), herbicide glyphosate resistant soybean, cotton and viral disease resistant potatoes, papaya and squash. In addition, various transgenic crops are under development and not yet commercially released with traits for biofortification, phytoremediation and production of pharmaceuticals, such as rice with high level of carotenoid for production of Vitamin A (e.g. golden rice) and bananas with vaccines.

Commercial cultivation of transgenic crops started in the early 1990s. Herbicide tolerance and insect resistance are the main GM traits that are currently under commercial cultivation, and the main crops are: soybean, maize, canola and cotton. GM crops are now commercially planted on about 100 million hectares in some 22 developed and developing countries. Argentina, Brazil, China and India are the largest developing-country producers of transgenic crops. The choice of GM crops varies among the developing countries, with insect resistant cotton being the most important commercially produced transgenic crop in Asian and African countries, while herbicide-resistant soybean followed by insect-resistant corn is predominant in the Latin American continent.

Map 67:



Source: Clive James, ISAAA

Metalink: P4.ENV.ISAAA.BIO.GM.HA, p. 349 

- Almost 150 million hectares of world crop acreage planted with GM crops
- The Americas constitute the largest growing region, but GM cotton area is substantial in Asia

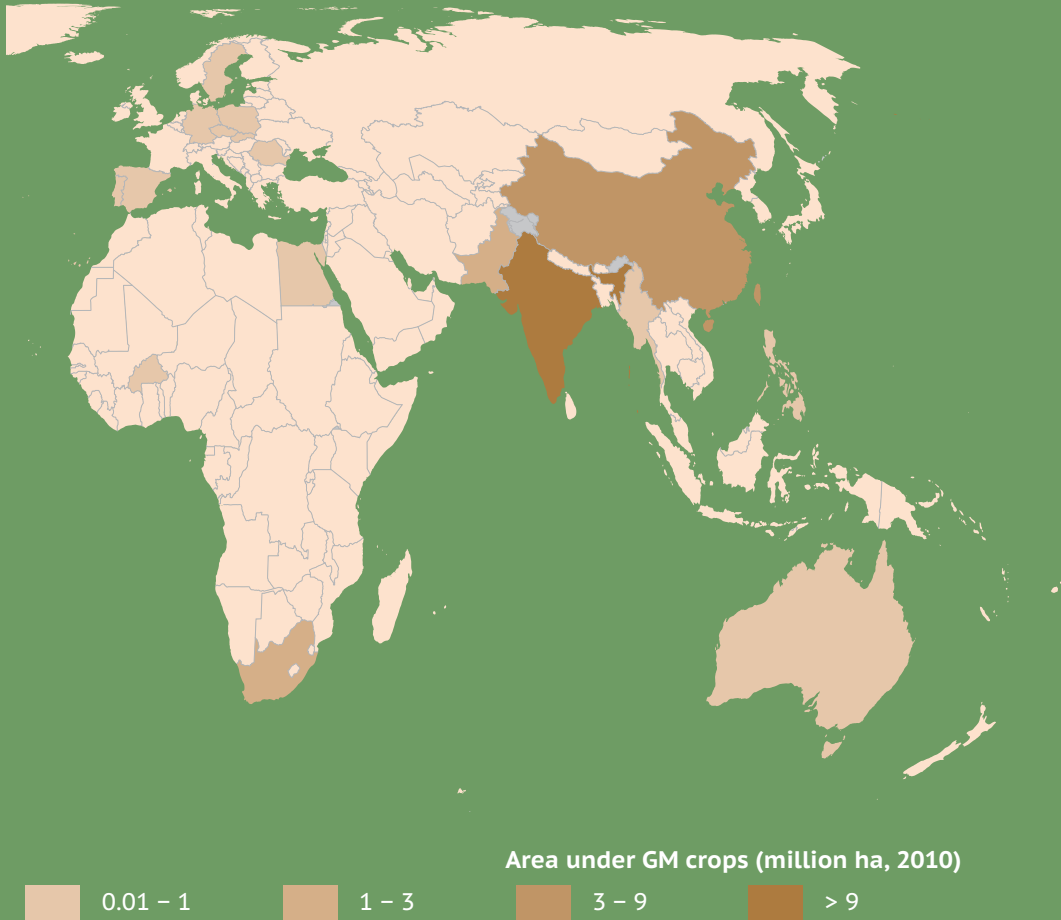
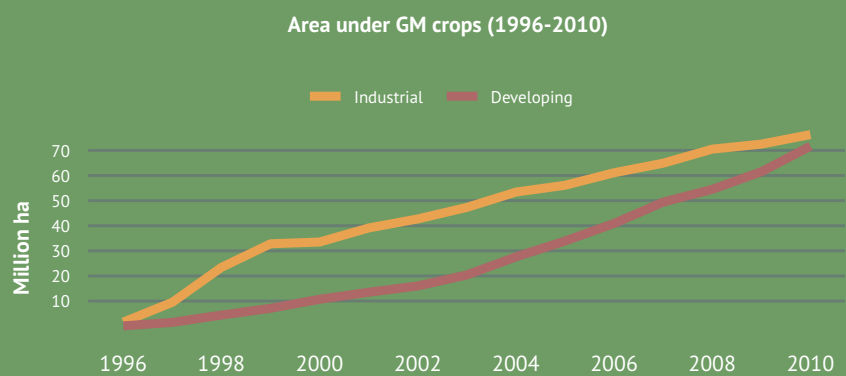


Chart 118: Genetically modified crops also becoming important in developing countries



Source: Clive James, ISAAA

Metalink: P4.ENV.ISAAA.BIO.GM.RHA, p. 350

In most cases these GM technologies are proprietary, developed by the private sector and released for commercial production through licensing agreements. Cultivation and commercial production of GM crops are capital intensive owing to high costs of seed and technology. Nevertheless, their cultivation has generally increased, mainly because of the benefits accrued from lower labour and production costs, reduction in use of chemical inputs and improved economic gain. The United States of America, Argentina and Canada are the major producers and exporters of GM crops and products. The four main global GM crops are among the major commodities traded on world markets.

The increasing cultivation of GM crops has raised a wide range of concerns with respect to food safety, environmental effects and socio-economic issues. From the food and health perspective, the main concerns are related to possible toxicity and allergenicity of GM foods and products. Concerns about environmental risks include the impact of introgression of the transgenes into the natural landscape, impact of gene flow, effect on non-target organisms, evolution of pest resistance and loss of biodiversity. Adoption of GM technologies has also evoked a range of social and ethical concerns about restricting access to genetic resources and new technologies, loss of traditions (such as saving seeds), private sector monopoly and loss of income of resource-poor farmers. The scientific evidence concerning the environmental and health impacts of GMOs is still emerging, but so far there is no conclusive information on the definitive negative impacts of GMOs on health or the environment. Nevertheless, public perceptions about GMOs in food and agriculture are divided with a tendency toward avoiding GM food and products in many developed and developing countries.

Regarding international agreements, the Cartagena Protocol on Biosafety came into force in 2003, and by October 2011 has been ratified by 161 countries. The objective of the Protocol, as stated "is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements". In a host of countries, it is also mandatory to label products that use GM ingredients. As a consequence, GM and non-GM crops must be kept separate, but as the area cultivated with GM varieties increases, this task is becoming more difficult and costly.

Further reading

- [FAO Biotechnology \(www.fao.org/biotech/en/\)](http://www.fao.org/biotech/en/)
- [FAO Biotechnologies for agricultural development \(www.fao.org/docrep/014/i2300e/i2300e00.htm\)](http://www.fao.org/docrep/014/i2300e/i2300e00.htm)
- [Cartagena Protocol on Biosafety \(bch.cbd.int/protocol\)](http://bch.cbd.int/protocol)

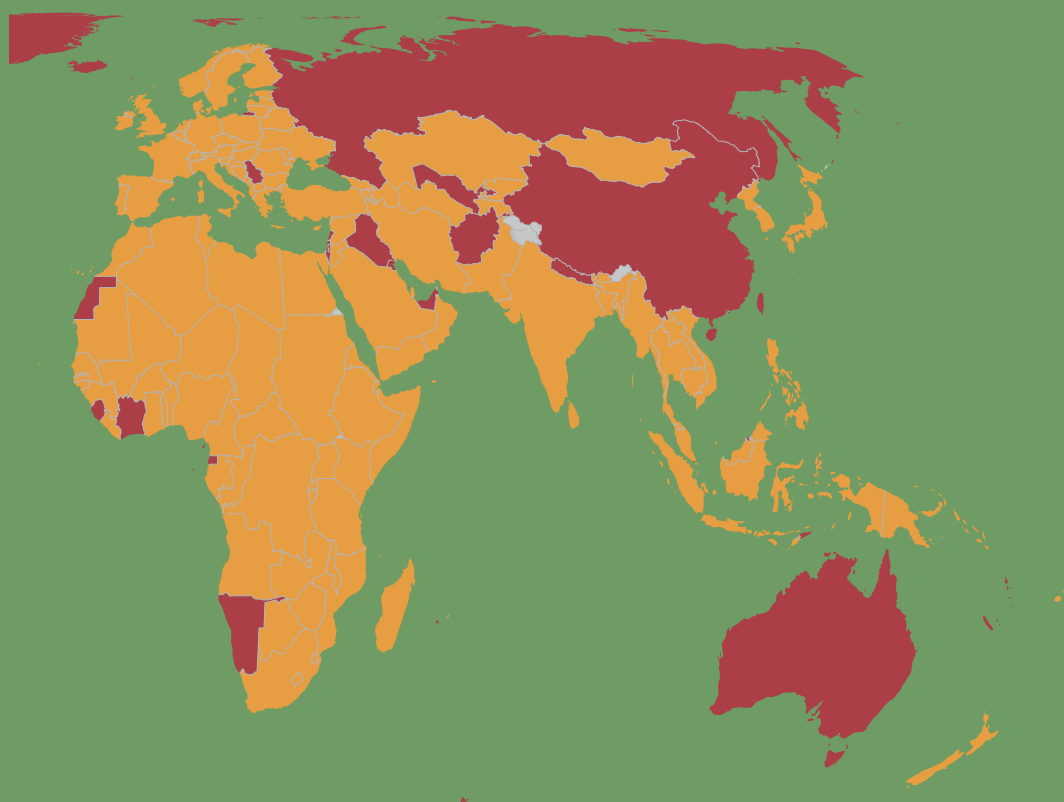
Map 68:



Source: Convention on Biological Diversity

Metalink: [P4.ENV.CBD.GMO.CBP, p. 344](#) 

- 163 countries are now party to the "Biosafety Protocol"
- Notable exceptions include several of the major grain exporters, such as the United States



Countries that have ratified the Cartagena Protocol on Biosafety (number, 2011)

No Data
 No
 Yes

Chart 119: Many crops, among them food, have been subject to genetic modification

Species		
Alfalfa	Melon	Rose
Argentine Canola	Papaya	Soybean
Carnation	Petunia	Squash
Chicory	Plum	Sugar Beet
Cotton	Polish canola	Sweet pepper
Creeping Bentgrass	Poplar	Tobacco
Flax, Linseed	Potato	Tomato
Maize	Rice	Wheat

Source: ISAAA

Metalink: P4.ENV.ISAAA.BIO.GM.CROPS, p. 349

Agriculture and the bio-based economy

Agriculture is playing an increasingly important role in the bio-based economy, providing feedstocks for the production of liquid fuels, chemicals and advanced materials such as natural fibre composites for industry. The emergence of green industries provides expanded opportunities for the rural sector beyond traditional forestry and the supply of wood. Biological science has the ability to make both incremental efficiency improvements and to bring about radical change in a wide range of sectors. This includes enzymes, fermentation and organisms for processes and products in the energy, chemical, pharmaceutical, food, textile, and pulp and paper industries.

Above all, biological and material science working with agriculture has the greatest potential in the energy, natural fibre composite and starch sectors. Much of this potential is already being realized, especially when considering the rapid growth of the biofuel sector. Currently, ethanol is being produced from easily fermentable agricultural feedstocks such as sugar cane, sugar beet, cereal grains and cassava. Biodiesel is produced from vegetable oil (typically rapeseed, soybean and palm oil) using a process of chemical modification. The expansion of liquid biofuels has been rapid – doubling 68.3 million tonnes in 2006 to 130 million tonnes in 2011, currently drawing upon feedstocks from over 45 million ha of land.

The emerging bio-based economy is based on energy efficiency, renewable feed stocks in polymer products, industrial processes that reduce carbon emissions and recyclable materials. Natural fibres exemplify these attributes. For example, growing one tonne of jute fibre requires less than 10 percent of the energy used for the production of competing polypropylene. Sisal processing produces residues that can be used in biocomposites for building houses or to generate electricity. At the end of their life cycle, natural fibres are 100 percent biodegradable.

Natural fibres have intrinsic properties – mechanical strength, low weight and low cost – that have made them particularly attractive to the automobile industry. Car manufacturers are using abaca, flax and hemp in press-moulded thermoplastic panels for interior components. The low density of plant fibres also reduces vehicle weight, which cuts fuel consumption. Worldwide, the construction industry is moving to natural fibres for a range of products, including light structural walls, insulation materials, floor and wall coverings, and roofing. Among recent innovations are cement blocks reinforced with sisal fibre now being manufactured in Tanzania and Brazil.

Map 69:



Source: IEA

Metalink: [P4.ENV.IEA.BIO.BF.QP](#), p. 349

- Global expansion of biofuel production from crops has been rapid - doubling from 68.3 million tonnes in 2006 to 130 million tonnes in 2011
- The bioenergy sector currently draws upon feedstocks from over 45 million hectares of land
- The United States and Brazil are the largest producers of biofuels

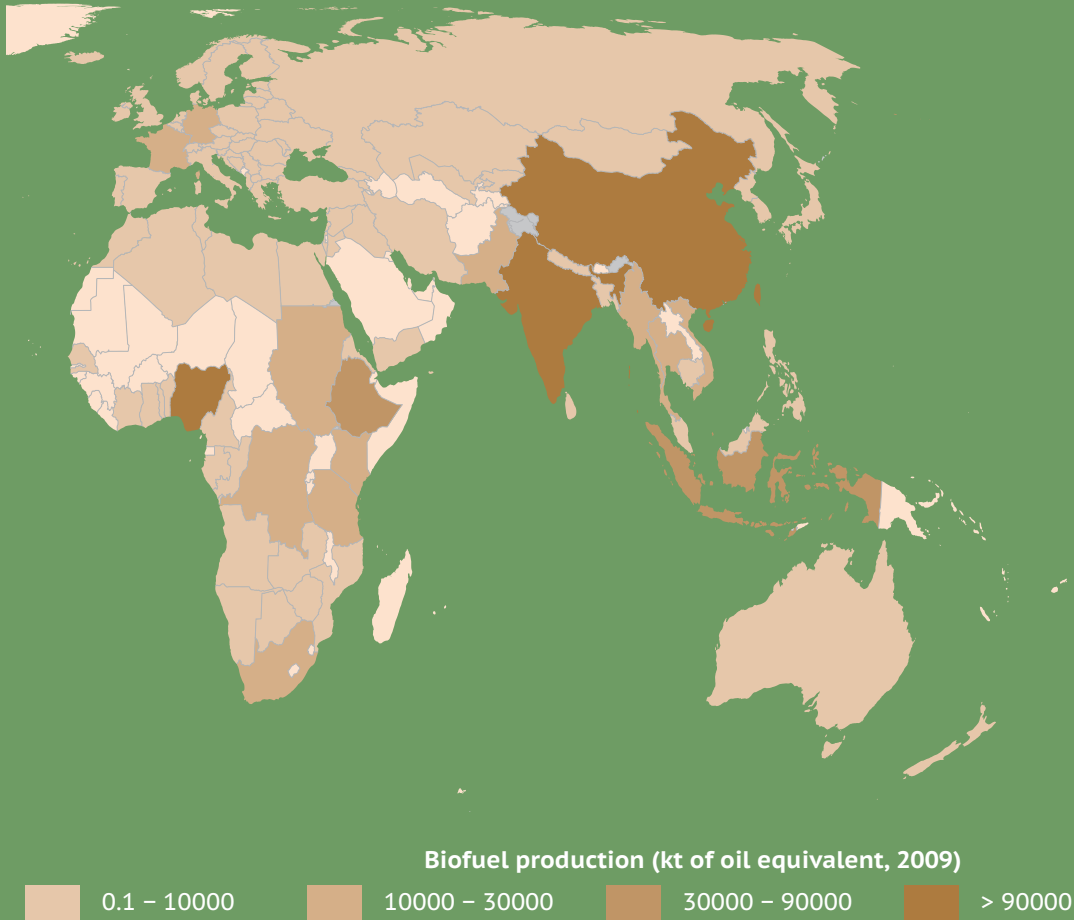
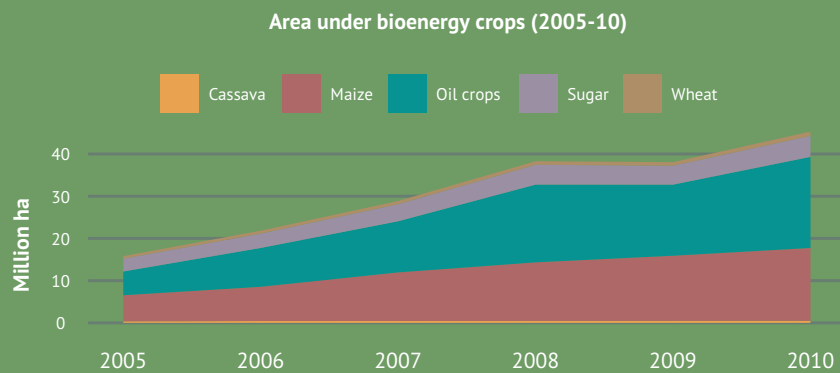


Chart 120: In the space of five years, the global crop area used to produce biofuels rose almost threefold



Source: FAO, Statistics Division
 Metalink: P4.ENV.FAO.BIO.BF.HA, p. 344

In India, a growing shortage of timber for the construction industry has spurred development of composite board made from jute veneer and coir ply, whose high lignin content has been shown to make it both stronger and more resistant to rotting than teak. In Europe, hemp fibres are being used in cement and to make particle boards half the weight of wood-based boards. Geotextiles are another promising outlet for natural fibre producers. Made from hard natural fibres, they strengthen earthworks and encourage the growth of plants and trees, which provide further reinforcement.

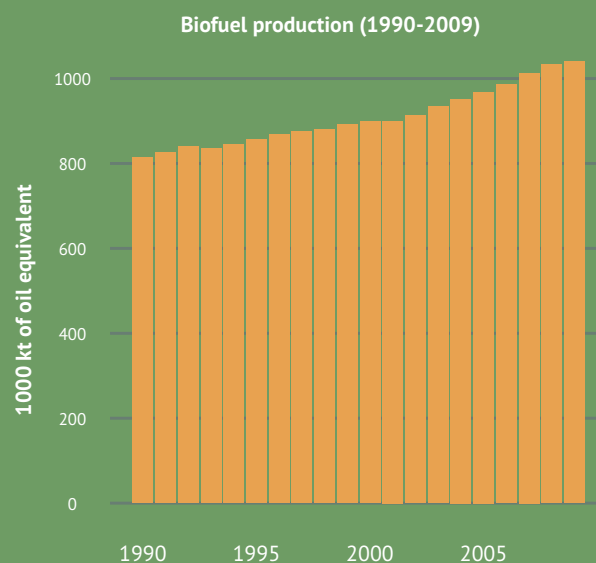
The starch industry extracts starch from cereals and roots and tubers and processes it into products that are used as ingredients and functional supplements in food, feed and non-food applications. There are more than 600 different starches and starch derivatives, ranging from native starches to physically or chemically modified starches, liquid and solid sugars. The starch industry uses enzymatic technologies for hydrolysis that are playing a pivotal role in the development of green chemistry as an alternative to fossil-fuel-based products. For instance, in the chemical sector, starch is used for the production of surfactants, polyurethane, resins, biodegradable plastics and pharmaceuticals. When fermented, starches are used in the production of citric acid, lactic acid, amino acids, organic acids, enzymes, yeast and ethanol. Other bio-based applications involving starch products include binders, solvents, biopesticides and lubricants.

The sustainability of a rapidly growing agricultural bio-based economy, especially one reliant on liquid fuels, has generated the “food versus fuel” debate. The links between bio-industries and food security are complex and multi-faceted. Ensuring the sustainable development of bio sectors becomes challenging when one tries to capture its potential benefits for rural development, climate and non-food security. For instance, the rapid growth and sheer scale of the biofuel sector has potentially negative implications for all four dimensions of food security (availability, access, stability and utilization) as it may result in increased competition for land and water resources, leading to higher and less stable food prices. At the same time, however, it may create new employment, income-generating opportunities and investment in production technologies, especially in countries with abundant marginal land and climates conducive to feedstock production, where such land would be too costly to bring into food cultivation. Such opportunities exist, for example, in countries of Latin America, South-East Asia and sub-Saharan Africa.

Further reading

- [FAO Bioenergy \(www.fao.org/bioenergy\)](http://www.fao.org/bioenergy)
- [UN International Year of Natural Fibres \(www.naturalfibres2009.org/en/index.html\)](http://www.naturalfibres2009.org/en/index.html)
- [Europabio Industrial Biotechnology \(www.europabio.org/Industrial_biotech/\)](http://www.europabio.org/Industrial_biotech/)

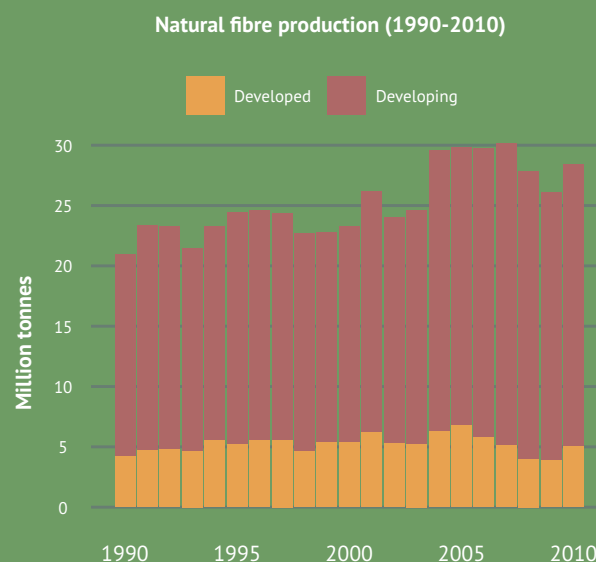
Chart 121: Driven by mandates, growth in world bioenergy production is around 2 percent per annum



Source: IEA

Metalink: [P4.ENV.IEA.BIO.BF.QP, p. 349](#)

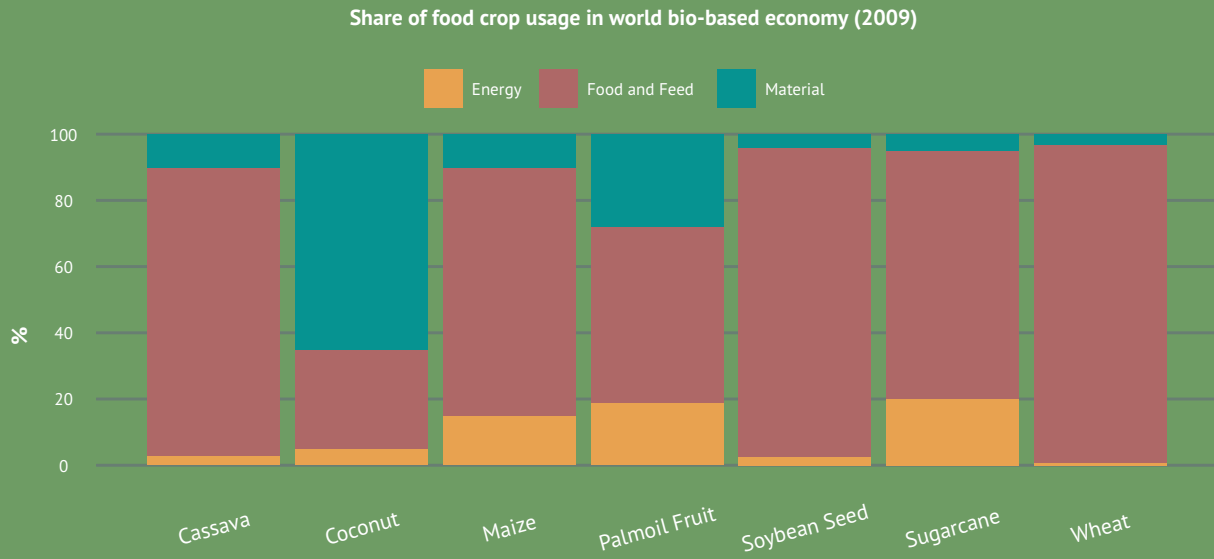
Chart 122: Developing countries are by the far the largest producers of natural fibres



Source: FAO, Statistics Division

Metalink: [P4.ENV.FAO.BIO.NF.QP, p. 344](#)

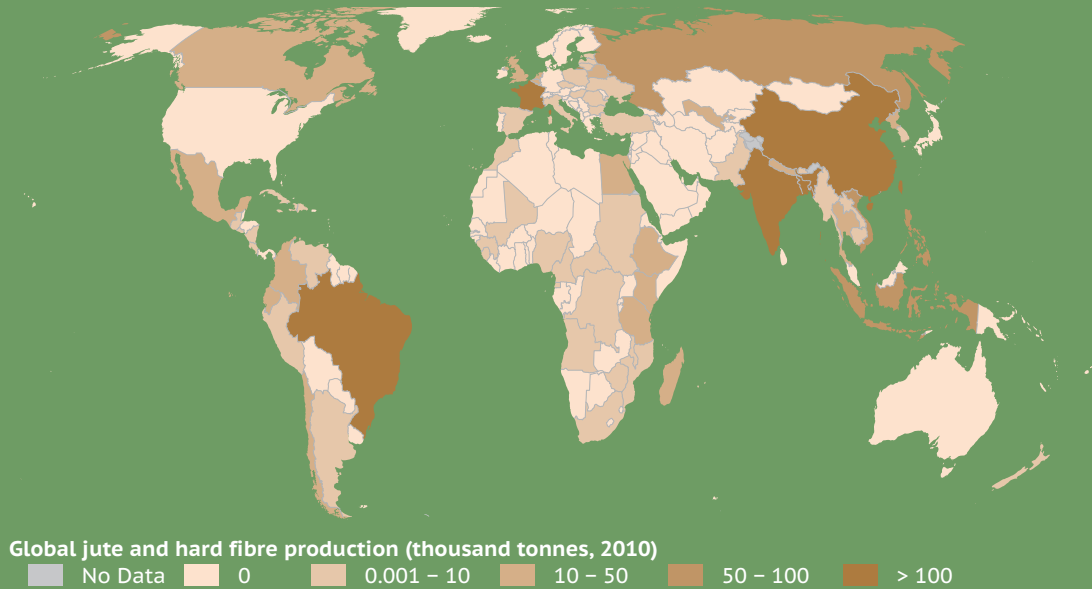
Chart 123: A substantial share of traditional food crops enter industry as a renewable material or as an energy feedstock



Source: FAO, Statistics Division

Metalink: P4.ENV.FAO.BIO.FD.FDSTK, p. 344

Map 70: Sisal, jute, abaca and coir can become the backbone of the bio-based economy offering opportunities for developing countries



Source: FAO, Statistics Division

Metalink: P4.ENV.FAO.BIO.CT.QP, p. 344

TABLE 48: Land indicators

	Average net annual change in forest area	Forest area	Other wooded area	Carbon content in topsoil	Carbon stock in living forest biomass	Land use change			
							cropland	pasture	forest
						% p.a.	% p.a.	% p.a.	% p.a.
						1990-2010	1990-2009	1990-2009	1990-2009
WORLD	-0.2	4 033 060	1 223 797	1.5	270 265	0.0	0.0	-0.2	
DEVELOPING REGIONS	-0.3	2 231 023		1.3	190 740	0.7	0.8	-0.3	
AFRICA	-0.5	674 419	381 103	0.9	55 736	1.1	0.1	-0.5	
North Africa	0.2	8 623		0.6	348	0.3	0.2	0.1	
Algeria	-0.6	1 492	2 685	0.8	70	0.5	0.3	-0.6	
Egypt	2.3	70	56	0.4	7	1.8		2.4	
Libya	0.0	217	330	0.5	6	-0.3	0.1	0.0	
Morocco	0.1	5 131	2 231	0.8	223	-0.2	0.0	0.1	
Tunisia	2.3	1 006	2 504	0.7	9	0.1	1.3	2.0	
Sub-Saharan Africa	-0.5	665 797		1.0	55 388	1.6	0.3	-0.4	
Angola	-0.2	58 480	0	0.6	4 385	1.2	-0.0	-0.2	
Benin	-1.2	4 561	3 178	0.8	263	2.5	0.0	-1.2	
Botswana	-0.9	11 351	34 791	0.6	646	-2.7	0.0	-0.9	
Burkina Faso	-1.0	5 649	10 911	0.8	292	2.7	0.0	-1.0	
Burundi	-2.6	172	722	1.0	17	-0.2	0.4	-2.6	
Cameroon	-1.0	19 916	12 715	1.1	2 696	0.1	0.0	-1.0	
Cape Verde	1.9	85	0	1.2	5	2.0	0.0	2.0	
Central African Republic	-0.1	22 605	10 122	0.9	2 861	0.1	0.3	-0.1	
Chad	-0.6	11 525	8 847	0.9	635	1.4	0.0	-0.6	
Comoros	-6.7	3	0	1.6		1.1	0.0	-6.4	
Congo	-0.1	22 411	10 513	1.5	3 438	0.4	0.0	-0.1	
Côte d'Ivoire	0.1	10 403	3 026	0.9	1 842	1.0	0.1	0.1	
Congo, Dem. Rep.	-0.2	154 135	11 513	1.1	19 639	-0.3	0.0	-0.2	
Djibouti	0.0	6	220	0.5		3.7	1.4	0.0	
Equatorial Guinea	-0.7	1 626	8	1.0	203	-0.7	0.0	-0.7	
Eritrea	-0.3	1 532	7 153	0.6					
Ethiopia	-1.0	12 296	44 650	0.9	219				
Gabon	0.0	22 000	0	1.0	2 710	0.2	-0.0	0.0	
Gambia	0.4	480	103	0.9	32	4.2	-2.8	0.4	
Ghana	-2.0	4 940	0	0.9	381	2.9	-0.1	-2.0	
Guinea	-0.5	6 544	5 850	1.3	619	0.3	-0.0	-0.5	
Guinea-Bissau	-0.5	2 022	230	1.1	96	2.2	0.0	-0.5	
Kenya	-0.3	3 467	39 035	0.9	476	0.5	0.0	-0.3	
Lesotho	0.5	44	97	1.3	2	0.3	0.0	0.5	
Liberia	-0.6	4 329	0	1.1	585	1.1	0.0	-0.6	
Madagascar	-0.4	12 553	15 688	1.1	1 626	0.3	0.6	-0.4	
Malawi	-0.9	3 237	0	1.3	144	2.4	0.0	-0.9	
Mali	-0.6	12 490	8 227	0.7	282	6.0	0.8	-0.6	
Mauritania	-2.7	242	3 060	0.9	7	-0.1	0.0	-2.7	
Mauritius	-0.5	35	12	1.9	2	-0.8	0.0	-0.5	
Mozambique	-0.5	39 022	14 566	0.8	1 692	1.9	0.0	-0.5	
Namibia	-0.9	7 290	8 290	0.3	210	1.1	0.0	-0.9	
Niger	-2.4	1 204	11 440	0.6	37	1.6	1.4	-2.4	
Nigeria	-3.2	9 041	4 333	0.8	1 085	0.8	-0.3	-3.1	
Rwanda	1.6	435	61	8.3	39	1.5	-2.6	1.5	
Senegal	-0.5	8 473	6 085	0.8	340	1.2	-0.1	-0.5	
Seychelles	0.0	41	0		4	-1.5		0.0	
Sierra Leone	-0.7	2 726	198	1.2	216	3.6	-0.0	-0.7	
Somalia	-1.0	6 747	0	0.5	394	-0.1	0.0	-1.0	
Sudan	-0.4	69 949	50 224	0.7	1 393	2.4	0.3	-0.5	
South Africa	0.0	9 241	24 588	0.6	807	0.4	0.1	0.0	
Swaziland	0.9	563	427	1.7	22	-0.1	-0.1	0.9	
Tanzania, Utd. Rep.	-1.1	33 428	11 619	1.6	2 019	0.7	0.0	-1.1	
Togo	-4.3	287	1 246	0.9		0.4	0.0	-4.1	
Uganda	-2.3	2 988	3 383	1.1	109	1.4	0.0	-2.3	
Zambia	-0.3	49 468	6 075	1.6	2 416	0.8	0.6	-0.3	
Zimbabwe	-1.7	15 624	0	0.5	492	1.9	1.0	-1.7	

TABLE 48: Land indicators (continued)

	Average net annual change in forest area	Forest area	Other wooded area	Carbon content in topsoil	Carbon stock in living forest biomass	Land use change		
	% p.a.	thousand ha	thousand ha	% weight	giga tonnes	cropland	pasture	forest
	1990-2010	2010	2009*	2009*	1990-2009	1990-2009	1990-2009	1990-2009
ASIA	0.1	567 207		1.3	34 883	0.4	1.6	0.3
Central Asia	0.1	12 076		0.7	227			
Kazakhstan	-0.2	3 309	16 482	1.0	137			
Kyrgyzstan	0.7	954	390	1.2	56			
Tajikistan	0.0	410	244	0.9	3			
Turkmenistan	0.0	4 127	0	0.3	12			
Uzbekistan	0.4	3 276	1 218	0.5	19			
East Asia	0.1	443 711		1.7	29 253	0.2	-0.1	0.1
Brunei Darussalam	-0.4	380	50	10.2	72	1.5	-2.0	-0.4
Cambodia	-1.2	10 094	133	1.0	464	0.3	4.5	-1.2
China	1.4	206 861	102 012	1.1	6 203	-0.3	0.0	1.4
Indonesia	-1.1	94 432	21 003	5.2	13 017	1.5	-0.9	-1.2
Korea, DPR	-1.8	5 666	0	1.6	171	0.8	0.0	-1.8
Korea, Republic of	-0.1	6 222	0	1.3	268	-0.8	-1.0	-0.1
Lao, PDR	-0.5	15 751	4 834	1.0	1 074	2.9	0.5	-0.5
Malaysia	-0.4	20 456	0	3.5	3 212	0.5	0.2	-0.4
Mongolia	-0.7	10 898	1 947	1.1	583	-1.8	-0.4	-0.7
Myanmar	-1.0	31 773	20 113	1.3	1 654	1.0	-0.8	-1.1
Philippines	0.8	7 665	10 128	1.3	663	0.3	0.9	0.8
Singapore	0.0	2	0	0.6		-5.4		0.0
Thailand	-0.1	18 972	0	1.0	880	-0.4	0.1	-0.2
Viet Nam	2.0	13 797	1 124	1.3	992	2.2	3.4	2.0
South Asia	0.2	92 734		1.0	4 271	0.0	-1.0	0.1
Afghanistan	0.0	1 350	29 471	0.9	38	-0.1	0.0	0.0
Bangladesh	-0.2	1 442	2 498	1.9	80	-0.7	0.0	-0.2
Bhutan	0.3	3 249	613	1.1	336	-2.2	1.6	0.3
India	0.3	68 434	4 795	0.9	2 800	0.0	-0.6	0.3
Iran (Islamic Rep.)	0.0	11 075	5 423	1.0	258	0.7	-2.2	0.0
Maldives	0.0	1	0			-0.7	0.0	0.0
Nepal	-1.4	3 636	1 897	1.3	485	0.4	-0.2	-1.5
Pakistan	-2.0	1 687	1 455	0.9	213	0.1	0.0	-2.0
Sri Lanka	-1.2	1 860	0	0.9	61	0.7	0.0	-1.2
West Asia	0.5	18 686		0.8	1 132	-0.2	1.6	1.9
Armenia	-1.4	262	45	1.6	13			
Azerbaijan	0.0	936	54	1.2	54			
Bahrain		1	0	0.3		-0.3	0.0	5.1
Cyprus	0.4	173	240	1.0	3	-1.4	-0.8	0.4
Georgia	-0.1	2 742	51	1.1	212			
Iraq	0.1	825	329	0.6		-1.3	0.0	0.1
Jordan	0.0	98	273	1.0	2	0.7	-0.3	0.0
Kuwait	3.5	6	0	0.4		6.0	0.0	2.9
Lebanon	0.2	137	220	1.2	2	-0.3	1.5	0.2
Occupied Palestinian Territory	0.0	9	0			-0.2	-0.0	0.1
Saudi Arabia	0.0	977	1 822	0.6	6	-0.1	1.9	0.0
Syrian Arab Republic	1.4	491	266	0.8		0.0	0.2	1.4
Turkey	0.8	11 334	12 921	1.0	822	-0.7	1.0	0.8
United Arab Emirates	1.3	317	192	0.5	16	8.6	1.5	1.4
Yemen	0.0	549	1 906	0.6	5	-0.6	0.0	0.0
LATIN AMERICA & THE CARIBBEAN	-0.5	955 584		1.9	97 511	0.6	0.2	-0.5
Argentina	-0.8	29 400	61 471	1.5	3 062	0.8	0.4	-0.8
Bahamas	0.0	515	36	0.4		1.0	0.0	0.0
Barbados	0.0	8	1	1.6		0.0	0.0	0.0
Belize	-0.6	1 393	113	1.6	171	1.5	0.1	-0.6
Bolivia (Plur. State)	-0.5	57 196	2 473	1.0	4 442	3.0	-0.0	-0.5
Brazil	-0.5	519 522	43 772	1.2	62 607	0.9	0.3	-0.5
Chile	0.3	16 231	14 658	2.2	1 349	-2.9	0.5	0.3
Colombia	-0.2	60 499	22 727	3.8	6 805	-2.1	-0.1	-0.2
Costa Rica	0.1	2 605	12	3.3	238	-0.1	-1.7	0.0

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						% p.a.	% p.a.	% p.a.	% p.a.
						1990-2010	1990-2009	1990-2009	1990-2009
		thousand ha	thousand ha	% weight	giga tonnes				
Cuba	1.7	2 870	299	1.2	226	0.2	-0.5	1.7	
Dominica	-0.5	45	0	5.1		1.8	0.0	-0.6	
Dominican Republic	0.0	1 972	850	1.0	114	-0.3	-0.0	0.0	
Ecuador	-1.7	9 865	1 519	2.1		-0.7	0.1	-1.7	
El Salvador	-1.4	287	384	1.8		0.6	0.3	-1.3	
French Guiana	-0.1	8 082	0	1.3	1 651	1.4	-1.0	-0.1	
Grenada	0.0	17	1	1.6	1	-0.2	0.0	0.0	
Guatemala	-1.3	3 657	1 811	2.1	281	1.7	-1.3	-1.3	
Guyana	0.0	15 205	3 580	3.5	1 629	-0.6	0.0	0.0	
Haiti	-0.7	101	0	0.9	5	1.1	-0.1	-0.7	
Honduras	-2.2	5 192	1 475	1.4	330	-1.3	0.8	-2.2	
Jamaica	-0.1	337	271	1.7	48	0.0	-0.6	-0.1	
Mexico	-0.4	64 802	20 181	3.0	2 043	0.3	-0.2	-0.4	
Netherlands Antilles	0.0	1	33	2.3		0.0		0.0	
Nicaragua	-1.8	3 114	2 219	1.8	349	1.9	0.9	-1.8	
Panama	-0.8	3 251	1 581	1.8	367	0.3	0.2	-0.8	
Paraguay	-0.9	17 582	0	1.0		3.1	0.7	-0.9	
Peru	-0.2	67 992	22 832	1.6	8 560	0.7	-0.3	-0.2	
St. Kitts & Nevis	0.0	11	2	5.1		-4.5	-2.2	0.0	
St. Lucia	0.3	47	0	1.6		-3.0	-3.6	0.4	
St. Vincent & Grenadines	0.4	27	3	1.6		-1.2	0.0	0.3	
Suriname	-0.0	14 758	0	3.4	3 165	-0.3	-0.7	-0.0	
Trinidad & Tobago	-0.3	226	121	1.8	19	-2.1	0.8	-0.3	
Uruguay	3.2	1 744	17	2.7		2.0	-0.2	3.3	
Venezuela (Boliv. Rep. of)	-0.6	46 275	7 317	1.5		-0.3	-0.1	-0.6	
OCEANIA	-0.4	33 812		2.0	2 610	1.0	0.8	-0.4	
Fiji	0.3	1 014	144	1.4		0.1	0.2	0.3	
French Polynesia	5.3	155	50		21	0.3	0.0	5.4	
New Caledonia	0.0	839	371	1.4	60	-1.2	0.5	0.0	
Papua New Guinea	-0.5	28 726	4 474	2.2	2 306	1.4	1.8	-0.5	
Samoa	1.4	171	85	2.3		-0.1	2.2	1.5	
Solomon Islands	-0.2	2 213	129	1.4	182	1.0	2.5	-0.2	
Tonga	0.0	9	57	3.5	1	-0.2	0.0	0.0	
Vanuatu	0.0	440	476	2.0		1.1	1.0	0.0	
DEVELOPED REGIONS	0.1	1 801 865		2.6	79 522	1.5	0.3	3.5	
NORTH AMERICA	0.1	614 160		1.8	33 216	-0.5	-0.0	0.1	
Bermuda	0.0	1	0			-1.6		0.0	
Canada	0.0	310 134	91 951	4.3	13 908	0.0	-0.2	0.0	
United States of America	0.1	304 022	41 926	1.5	19 308	-0.7	-0.0	0.1	
ASIA & OCEANIA	-0.1	182 702		2.0	1 297	-0.3	-0.8	-0.1	
Australia	-0.2	149 300	135 367	0.6		-0.1	-0.7	-0.1	
Israel	0.8	154	34	1.0	5	-0.6	-0.3	0.8	
Japan	0.0	24 979	0	2.3		-0.7		0.0	
New Zealand	0.3	8 269	2 557	1.9	1 292	-8.1	-1.1	0.4	
EUROPE	0.1	1 005 001	109 705	3.0	45 009	-1.2	-4.3	-0.0	
Albania	-0.1	776	255	1.2	49	-0.0	1.0	-0.1	
Belarus	0.5	8 630	520	5.1	611				
Bosnia & Herzegovina	-0.1	2 185	549	1.3	118				
Croatia	0.2	1 920	759	1.3	253				
European Union	0.4	156 865		2.9	9 819	-0.1	-0.3	0.9	
Iceland	6.2	30	96	2.4		0.0	0.0	6.5	
Macedonia, FYR	0.5	998	143	1.1	60				
Montenegro	0.0	543	175		33				
Norway	0.5	10 065	2 703	1.7	395	-0.2	2.4	0.5	
Republic of Moldova	1.0	386	70	2.1	29				
Russian Federation	0.0	809 090	78 870	3.9	32 500				
Serbia	0.8	2 713	485		240				
Switzerland	0.4	1 240	71	2.1	143	-0.0	-0.2	0.4	
Ukraine	0.2	9 705	948	2.3	761				

TABLE 49: Forestry indicators

	Forest characteristics			Primary designated functions of forest				
	primary forest	other naturally regenerated forest	planted forest	production	protection and conservation	social services	multiple use	other or unknown
	million ha	million ha	million ha	%	%	%	%	%
	2010	2010	2010	2010	2010	2010	2010	2010
WORLD				30	20	4	24	23
DEVELOPING REGIONS				32	33	2	26	8
AFRICA				30	17	1	17	35
North Africa				14	48	0	38	0
Algeria	0.0	1.1	0.4	35	65		0	0
Egypt	0.0	0.0	0.1	2	52	0	46	0
Libya	0.0	0.0	0.2	0	100	0	0	0
Morocco	0.0	4.5	0.6	21	12	0	67	0
Tunisia	0.0	0.3	0.7	24	45	0	32	0
Sub-Saharan Africa				28	16	1	20	36
Angola	0.0	58.4	0.1	4	3	0	0	93
Benin	0.0	4.5	0.0	31	28		40	0
Botswana	0.0	11.4	0.0	0	0	0	100	0
Burkina Faso	0.0	5.5	0.1	11	6		84	0
Burundi	0.0	0.1	0.1	9	0	0	0	91
Cameroon				73	20	1	6	
Cape Verde	0.0	0.0	0.1	80	20	0	0	0
Central African Republic	2.4	20.2	0.0	21	1	0	78	0
Chad	0.2	11.3	0.0	90		0	0	0
Comoros	0.0	0.0	0.0	33	67	0	0	0
Congo	7.4	14.9	0.1	88	4	0	7	0
Côte d'Ivoire	0.6	9.4	0.3	89	11		0	0
Congo, Dem. Rep.			0.1	5	17	0	0	78
Djibouti	0.0	0.0	0.0	0	0	0	100	0
Equatorial Guinea	0.0	1.6		5	36	3	53	3
Eritrea	0.0	1.5	0.0	2	6	0	1	91
Ethiopia	0.0	11.8	0.5	4	0	0	96	0
Gabon	14.3	7.6	0.0	45	18		36	0
Gambia	0.0	0.5	0.0		21	0	5	73
Ghana	0.4	4.3	0.3	23	8	1	0	68
Guinea	0.1	6.4	0.1	2	55	0	7	36
Guinea-Bissau	0.0	2.0	0.0	29	67	3	0	0
Kenya	0.7	2.6	0.2	6	94	0	0	0
Lesotho	0.0	0.0	0.0	24	0	0	76	0
Liberia	0.2	4.1	0.0	25	4	0	0	71
Madagascar	3.0	9.1	0.4	26	39	0	34	0
Malawi	0.9	1.9	0.4	37	23	0	0	40
Mali	0.0	12.0	0.5	47	38	0	15	0
Mauritania	0.0	0.2	0.0	0	27	0	73	0
Mauritius	0.0	0.0	0.0	30	61	7	2	0
Mozambique	0.0	39.0	0.1	67	33	0	0	0
Namibia	0.0	7.3		0	9	0	22	69
Niger	0.2	0.8	0.1	1		0	81	0
Nigeria	0.0	8.7	0.4	29	28	0	0	43
Rwanda	0.0	0.1	0.4	74	12	0	14	0
Senegal	1.6	6.5	0.5	60			22	0
Seychelles	0.0	0.0	0.0	1	21	0	14	64
Sierra Leone	0.1	2.6	0.0	9	7	0	0	84
Somalia	0.0	6.7	0.0		0	0	100	0
Sudan	14.0	49.9	6.1	50	20	0	0	30
South Africa	0.9	6.5	1.8	19	10	0	71	0
Swaziland	0.0	0.4	0.1	25	0	0	0	75
Tanzania, Utd. Rep.	0.0	33.2	0.2	71	6	0	24	0
Togo	0.0	0.2	0.0	68	32	0	0	0
Uganda	0.0	2.9	0.1	12	36	15	0	37
Zambia	0.0	49.4	0.1	24	22	0	17	37
Zimbabwe	0.8	14.7	0.1	10	8	0	82	0

TABLE 49: Forestry indicators (continued)

	Forest characteristics			Primary designated functions of forest				
	primary forest	other naturally regenerated forest	planted forest	production	protection and conservation	social services	multiple use	other or unknown
	million ha	million ha	million ha	%	%	%	%	%
	2010	2010	2010	2010	2010	2010	2010	2010
ASIA				36	36	1	26	1
Central Asia				1	75	4	20	0
Kazakhstan	0.0	2.4	0.9	0	16	13	71	0
Kyrgyzstan	0.3	0.6	0.1	0	84	1	15	0
Tajikistan	0.3	0.0	0.1	5	95	0	0	0
Turkmenistan	0.1	4.0	0.0	0	100	0	0	0
Uzbekistan	0.1	2.6	0.6		99	0	0	0
East Asia				42	40	0	12	6
Brunei Darussalam	0.3	0.1	0.0	58	26	1	0	15
Cambodia	0.3	9.7	0.1	33	44	1	4	17
China	11.6	118.1	77.2	41	33	2	24	0
Indonesia	47.2	43.6	3.5	53	40	0	0	7
Korea, DPR	0.8	4.1	0.8	86	14	0	0	0
Korea, Republic of	3.0	1.4	1.8	77	6	9	7	0
Lao, PDR	1.5	14.0	0.2	23	77		0	0
Malaysia	3.8	14.8	1.8	62	23	0	15	0
Mongolia	5.2	5.6	0.1	7	92	1	0	0
Myanmar	3.2	27.6	1.0	62	11	0	27	0
Philippines	0.9	6.5	0.4	76	24	0	0	0
Singapore	0.0	0.0	0.0	0	100	0	0	0
Thailand	6.7	8.3	4.0	14	54	1	0	32
Viet Nam	0.1	10.2	3.5	47	53	0	0	0
South Asia				26	36	0	27	10
Afghanistan				0	0	0	100	0
Bangladesh	0.4	0.8	0.2	49	25	1	25	0
Bhutan	0.4	2.8	0.0	16	73	0	0	11
India	15.7	42.5	10.2	25	45	0	30	0
Iran (Islamic Rep.)	0.2	10.0	0.8	14	1	0	85	0
Maldives								
Nepal	0.5	3.1	0.0	10	26	0	23	40
Pakistan	0.0	1.3	0.3	32	13	0	55	0
Sri Lanka	0.2	1.5	0.2	9	31	0	60	0
West Asia				25	35	0	40	0
Armenia	0.0	0.2	0.0	24	46	0	30	0
Azerbaijan	0.4	0.5	0.0	0	100	0	0	0
Bahrain	0.0	0.0	0.0	0	100	0	0	0
Cyprus	0.0	0.1	0.0	24	2	8	28	38
Georgia	0.5	2.1	0.2	0	87	13	0	0
Iraq	0.0	0.8	0.0	0	100	0	0	0
Jordan	0.0	0.1	0.0	0	99	1	0	0
Kuwait	0.0	0.0	0.0	0	100	0	0	0
Lebanon	0.0	0.1	0.0	6	28	0	66	0
Occupied Palestinian Territory								
Saudi Arabia	0.4	0.6	0.0	0	0	0	100	0
Syrian Arab Republic	0.0	0.2	0.3	0	0	0	100	0
Turkey	1.0	6.9	3.4	70	25		6	0
United Arab Emirates	0.0	0.0	0.3	0	0	0	100	0
Yemen	0.0	0.5	0.0	0	0	0	100	0
LATIN AMERICA & THE CARIBBEAN				14	21	14	20	31
Argentina	1.7	26.3	1.4	5	4	0	9	83
Bahamas	0.0	0.5	0.0					
Barbados	0.0	0.0		0	4	0	0	96
Belize	0.6	0.8	0.0	0	43	0	0	57
Bolivia (Plur. State)	37.2	20.0	0.0	0	19	0	81	
Brazil	476.6	35.5	7.4	7	17	23	4	49
Chile	4.4	9.4	2.4	46	43	0	11	0
Colombia	8.5	51.6	0.4	13	15	0	0	72
Costa Rica	0.6	1.7	0.2	14	35	4	15	32

TABLE 49: Forestry indicators (continued)

	Forest characteristics			Primary designated functions of forest				
	primary forest	other naturally regenerated forest	planted forest	production	protection and conservation	social services	multiple use	other or unknown
	million ha	million ha	million ha	%	%	%	%	%
	2010	2010	2010	2010	2010	2010	2010	2010
Cuba	0.0	2.4	0.5	31	68		0	0
Dominica	0.0	0.0						
Dominican Republic								
Ecuador	4.8	4.9	0.2	2	73	0	21	4
El Salvador	0.0	0.3	0.0	24	16	0	60	0
French Guiana	7.7	0.4	0.0	0	30	0	52	18
Grenada	0.0	0.0		1	17	0	0	82
Guatemala	1.6	1.9	0.2	28	63	0	0	9
Guyana	6.8	8.4	0.0	97	1	2	0	0
Haiti	0.0	0.1	0.0	54	4	0	0	42
Honduras	0.5	4.7	0.0	21	66	13	0	0
Jamaica	0.1	0.2	0.0	2	25	0	6	66
Mexico	34.3	27.3	3.2	5	13	0	82	0
Netherlands Antilles								
Nicaragua	1.2	1.9	0.1	20	71	0	2	8
Panama	0.0	3.2	0.1	14	43	0	43	0
Paraguay	1.9	15.7	0.0				0	89
Peru	60.2	6.8	1.0	37			26	10
St. Kitts & Nevis				0	0	0	100	0
St. Lucia	0.0	0.0	0.0	0	5	0	19	76
St. Vincent & Grenadines	0.0	0.0						
Suriname	14.0	0.7	0.0	27	15	0	4	55
Trinidad & Tobago	0.1	0.1	0.0	34	32	4	32	0
Uruguay	0.3	0.5	1.0	64	36	0	0	0
Venezuela (Boliv. Rep. of)				49	51	0	0	0
OCEANIA				21	11	0	15	54
Fiji	0.4	0.4	0.2	17	18	0	65	0
French Polynesia	0.0	0.1	0.0	4	7	0	0	90
New Caledonia	0.4	0.4	0.0	2	24	7	0	67
Papua New Guinea	26.2	2.4	0.1	25	5	0	5	66
Samoa		0.1	0.0	47	37	4	5	7
Solomon Islands	1.1	1.1	0.0	17	50		0	33
Tonga	0.0	0.0	0.0	11	89	0	0	0
Vanuatu								
DEVELOPED REGIONS				35	28	4	29	6
NORTH AMERICA				27	23	0	50	1
Bermuda								
Canada	165.4	135.7	9.0	1	5	0	87	7
United States of America	75.3	203.4	25.4	30	25	0	46	0
ASIA & OCEANIA				14	61	10	8	6
Australia	5.0	142.4	1.9	1	15	0	39	45
Israel	0.0	0.1	0.1	0	33	3	64	0
Japan	4.7	9.9	10.3	17	70	13	0	0
New Zealand	2.1	4.3	1.8	24	77	0	0	0
EUROPE				52	13	2	11	23
Albania	0.1	0.6	0.1	79	21	0	0	0
Belarus	0.4	6.4	1.9	50	33	18	0	0
Bosnia & Herzegovina	0.0	1.2	1.0	56	1	0	0	43
Croatia	0.0	1.8	0.1	82	7	2	9	0
European Union				39	26	3	32	3
Iceland	0.0	0.0	0.0	20		19	44	4
Macedonia, FYR	0.0	0.9	0.1	81	0	0	0	19
Montenegro				64	15	0	0	21
Norway	0.2	8.4	1.5	60	29	0	11	0
Republic of Moldova	0.0	0.4	0.0	0	27	26	47	0
Russian Federation	256.5	535.6	17.0	51	11	2	10	26
Serbia	0.0	2.5	0.2	89	12			0
Switzerland	0.0	1.0	0.2	40	8	5	0	47
Ukraine	0.1	4.8	4.8	46	35	19	0	0

TABLE 50: Water withdrawal

	Water withdrawal by sector						Water withdrawal		% of freshwater resources withdrawn	
	agricultural		industrial		municipal		total	per capita	total	by agriculture
	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	m ³ /yr	%	%
	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*
WORLD	2 745 009	70	729 178	19	466 869	12	3 941 055	607	9.3	6.5
DEVELOPING REGIONS										
AFRICA										
North Africa										
Algeria	3 940	61	951	15	1 581	24	6 472	197	55.5	33.8
Egypt	59 000	86	4 000	6	5 300	8	68 300	920	119.2	103.0
Libya	3 584	83	132	3	610	14	4 326	750	721.0	597.3
Morocco	11 010	84	477	4	1 628	12	13 115	432	45.2	38.0
Tunisia	2 165	82	110	4	365	14	2 640	266	57.5	47.1
Sub-Saharan Africa										
Angola	210	27	240	31	320	42	769	47	0.5	0.1
Benin	59	45	30	23	41	32	130	17	0.5	0.2
Botswana	80	39	39	19	88	42	207	110	1.7	0.7
Burkina Faso	690	63	22	2	376	35	1 087	77	8.7	5.5
Burundi	222	79	15	5	43	15	280	39	2.2	1.8
Cameroon	730	68	105	10	247	23	1 081	62	0.4	0.3
Cape Verde	20	91	0	2	2	7	22	47	7.3	6.7
Central African Republic	1	1	12	16	60	82	73	18	0.1	0.0
Chad	190	48	104	26	104	26	397	41	0.9	0.4
Comoros	5	47	1	5	5	48	10	16	0.8	0.4
Congo	4	4	24	26	64	69	92	26	0.0	0.0
Côte d'Ivoire	600	39	318	20	636	41	1 554	86	1.9	0.7
Congo, Dem. Rep.	110	15	147	20	465	64	722	13	0.1	0.0
Djibouti	3	16	0	0	16	84	19	24	6.3	1.0
Equatorial Guinea	1	5	3	15	16	80	20	33	0.1	0.0
Eritrea	550	95	1	0	31	5	582	130	9.2	8.7
Ethiopia	5 204	86	51	1	810	13	6 065	82	5.0	4.3
Gabon	50	34	14	9	85	57	149	109	0.1	0.0
Gambia	20	24	21	26	41	50	82	55	1.0	0.3
Ghana	652	66	95	10	235	24	982	45	1.8	1.2
Guinea	1 360	83	56	3	225	14	1 641	182	0.7	0.6
Guinea-Bissau	144	76	12	6	34	18	190	139	0.6	0.5
Kenya	2 165	79	100	4	470	17	2 735	77	8.9	7.1
Lesotho	10	20	20	40	20	40	50	24	1.7	0.3
Liberia	60	31	53	28	80	41	194	61	0.1	0.0
Madagascar	14 310	97	162	1	296	2	14 768	826	4.4	4.2
Malawi	810	81	48	5	143	14	1 001	78	5.8	4.7
Mali	5 900	90	56	1	590	9	6 546	497	6.5	5.9
Mauritania	1 500	92	32	2	95	6	1 627	534	14.3	13.2
Mauritius	491	68	20	3	214	30	725	577	26.4	17.8
Mozambique	550	65	36	4	254	30	840	40	0.4	0.3
Namibia	213	71	14	5	73	24	300	144	1.7	1.2
Niger	2 080	86	33	1	294	12	2 407	185	7.2	6.2
Nigeria	5 510	48	1 965	17	4 099	35	11 574	83	4.0	1.9
Rwanda	102	55	21	11	61	33	184	20	1.9	1.1
Senegal	2 065	93	58	3	98	4	2 221	204	5.7	5.3
Seychelles	1	7	4	28	9	66	14	163		
Sierra Leone	350	68	56	11	111	21	517	100	0.3	0.2
Somalia	3 281	99	2	0	15	0	3 298	394	22.4	22.3
Sudan	36 070	96	300	1	1 143	3	37 513	977	58.2	55.9
South Africa	7 836	57	948	7	4 893	36	13 677	286	27.4	15.7
Swaziland	1 006	94	21	2	41	4	1 068	967	23.7	22.3
Tanzania, Utd. Rep.	4 632	89	25	0	527	10	5 184	134	5.4	4.8
Togo	76	34	6	3	141	63	223	41	1.5	0.5
Uganda	120	43	44	16	115	41	279	10	0.4	0.2
Zambia	1 320	76	130	7	290	17	1 740	152	1.7	1.3
Zimbabwe	3 318	79	298	7	589	14	4 205	335	21.0	16.6

TABLE 50: Water withdrawal (continued)

	Water withdrawal by sector						Water withdrawal		% of freshwater resources withdrawn	
	agricultural		industrial		municipal		total	per capita	total	by agriculture
	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	m ³ /yr	%	%
	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*
ASIA										
Central Asia										
Kazakhstan	28 630	84	5 051	15	516	2	34 197	2 254	31.2	26.1
Kyrgyzstan	9 450	94	310	3	320	3	10 080	1 999	43.7	40.9
Tajikistan	10 960	92	560	5	440	4	11 960	1 853	74.8	68.6
Turkmenistan	24 040	97	270	1	597	2	24 907	5 246	100.8	97.2
Uzbekistan	54 370	91	1 644	3	3 794	6	59 808	2 305	118.6	107.9
East Asia										
Brunei Darussalam										
Cambodia	2 053	94	33	2	98	4	2 184	163	0.5	0.4
China	358 000	65	128 600	23	67 530	12	554 130	414	19.5	12.6
Indonesia	92 760	71	24 650	19	13 990	11	131 400	578	6.5	4.6
Korea, DPR	6 610	76	1 145	13	903	10	8 658	365	11.2	8.6
Korea, Republic of	15 800	62	3 050	12	6 620	26	25 470	541	36.5	22.7
Lao, PDR	3 960	93	170	4	130	3	4 260	740	1.3	1.2
Malaysia	4 520	34	4 788	36	3 902	30	13 210	506	2.3	0.8
Mongolia	227	44	162	32	122	24	511	201	1.5	0.7
Myanmar	29 570	89	498	1	3 323	10	33 391	721	2.9	2.5
Philippines	67 070	82	8 254	10	6 235	8	81 559	953	17.0	14.0
Singapore	8	0	1 221	53	1 078	47	2 307	541	384.4	1.3
Thailand	51 790	90	2 777	5	2 739	5	57 306	859	13.1	11.8
Viet Nam	77 750	95	3 074	4	1 206	1	82 030	986	9.3	8.8
South Asia										
Afghanistan	22 840	98	170	1	203	1	23 213	841	35.7	35.1
Bangladesh	31 500	88	770	2	3 600	10	35 870	255	2.9	2.6
Bhutan	318	94	3	1	17	5	338	513	0.4	0.4
India	688 000	90	17 000	2	56 000	7	761 000	668	39.8	36.0
Iran (Islamic Rep.)	86 000	92	1 100	1	6 200	7	93 300	1 338	67.9	62.5
Maldives	0	0	0	5	6	95	6	20	19.7	0.0
Nepal	9 610	98	30	0	148	2	9 787	359	4.7	4.6
Pakistan	172 400	94	1 400	1	9 650	5	183 450	1 156	74.3	69.9
Sri Lanka	11 310	87	831	6	805	6	12 946	652	24.5	21.4
West Asia										
Armenia	1 859	66	125	4	843	30	2 827	922	36.4	23.9
Azerbaijan	9 330	76	2 360	19	521	4	12 211	1 422	35.2	26.9
Bahrain	159	45	20	6	178	50	357	493	308.1	137.2
Cyprus	159	86	6	3	19	10	184	178	23.6	20.4
Georgia	1 055	65	208	13	358	22	1 621	362	2.6	1.7
Iraq	52 000	79	9 700	15	4 300	7	66 000	2 412	87.3	68.8
Jordan	611	65	38	4	291	31	941	176	100.4	65.2
Kuwait	492	51	23	2	448	47	964	426	4 817.5	2 459.5
Lebanon	780	60	150	11	380	29	1 310	323	29.1	17.3
Occupied Palestinian Territory	189	45	29	7	200	48	418	118	49.9	22.6
Saudi Arabia	20 830	88	710	3	2 130	9	23 670	985	986.3	867.9
Syrian Arab Republic	14 670	88	615	4	1 475	9	16 760	907	99.8	87.3
Turkey	29 600	74	4 300	11	6 200	15	40 100	588	18.8	13.9
United Arab Emirates	3 312	83	69	2	617	15	3 998	983	2 665.3	2 208.0
Yemen	3 235	91	65	2	265	7	3 565	173	169.8	154.0
LATIN AMERICA & THE CARIBBEAN										
Argentina	21 520	64	4 396	13	7 820	23	33 736	872	4.1	2.6
Bahamas										
Barbados	20	30	26	40	20	30	66	244	82.8	25.0
Belize	30	20	110	73	10	7	150	534	0.8	0.2
Bolivia (Plur. State)	1 160	51	401	18	729	32	2 290	250	0.4	0.2
Brazil	31 700	55	10 140	17	16 230	28	58 070	312	0.7	0.4
Chile	7 970	68	2 610	22	1 172	10	11 752	721	1.3	0.9
Colombia	4 920	37	582	4	7 845	59	13 347	310	0.6	0.2
Costa Rica	1 430	53	460	17	790	29	2 680	622	2.4	1.3

TABLE 50: Water withdrawal (continued)

	Water withdrawal by sector						Water withdrawal		% of freshwater resources withdrawn	
	agricultural		industrial		municipal		total	per capita	total	by agriculture
	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	% of total	million m ³ /yr	m ³ /yr	%	%
	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*	2005*
Cuba	5 640	74	761	10	1 187	16	7 588	674	19.9	14.8
Dominica										
Dominican Republic	2 240	60	80	2	1 444	38	3 764	406	17.9	10.7
Ecuador	13 960	88	549	3	1 293	8	15 802	1 177	3.7	3.3
El Salvador	760	53	256	18	410	29	1 426	236	5.7	3.0
French Guiana										
Grenada										
Guatemala	1 610	51	1 063	33	512	16	3 185	250	2.9	1.4
Guyana	1 600	95	20	1	61	4	1 682	2 254	0.7	0.7
Haiti	930	75	52	4	258	21	1 240	133	8.8	6.6
Honduras	690	45	492	32	344	23	1 526	222	1.6	0.7
Jamaica	200	33	138	22	275	45	612	228	6.5	2.1
Mexico	61 200	77	7 400	9	11 200	14	79 800	749	17.5	13.4
Netherlands Antilles										
Nicaragua	1 080	67	74	5	466	29	1 620	299	0.8	0.5
Panama	230	45	19	4	263	51	512	158	0.3	0.2
Paraguay	350	71	40	8	100	20	490	83	0.1	0.1
Peru	16 420	82	1 983	10	1 642	8	20 045	727	1.0	0.9
St. Kitts & Nevis										
St. Lucia										
St. Vincent & Grenadines										
Suriname	620	93	20	3	30	4	670	1 343	0.5	0.5
Trinidad & Tobago	20	8	66	25	174	67	260	197	6.8	0.5
Uruguay	3 170	87	80	2	410	11	3 660	1 101	2.6	2.3
Venezuela (Boliv. Rep. of)	3 970	40	793	8	5 123	52	9 886	371	0.8	0.3
OCEANIA										
Fiji	50	59	10	11	25	30	85	103	0.3	0.2
French Polynesia										
New Caledonia										
Papua New Guinea	1	0	168	43	224	57	392	64	0.0	0.0
Samoa										
Solomon Islands										
Tonga										
Vanuatu										
DEVELOPED REGIONS										
NORTH AMERICA										
Bermuda										
Canada	5 410	12	31 570	69	8 990	20	45 970	1 424	1.6	0.2
United States of America	192 400	40	220 600	46	65 440	14	478 440	1 612	15.6	6.3
ASIA & OCEANIA										
Australia	16 660	74	2 400	11	3 520	16	22 580	1 107	4.6	3.4
Israel	1 129	58	113	6	712	36	1 954	296	109.8	63.4
Japan	56 840	63	15 800	18	17 400	19	90 040	712	20.9	13.2
New Zealand	3 533	74	200	4	1 020	21	4 753	1 150	1.5	1.1
EUROPE										
Albania	1 060	57	232	13	561	30	1 853	590	4.4	2.5
Belarus	840	20	2 268	53	1 134	27	4 242	432	7.3	1.4
Bosnia & Herzegovina										
Croatia	11	2	86	14	534	85	631	142	0.6	0.0
European Union										
Iceland	70	42	14	8	81	49	165	556	0.1	0.0
Macedonia, FYR	126	12	685	67	217	21	1 028	504	16.1	2.0
Montenegro										
Norway	845	29	1 261	43	833	28	2 939	636	0.8	0.2
Republic of Moldova	760	42	883	49	146	8	1 789	475	15.4	6.5
Russian Federation	13 200	20	39 600	60	13 400	20	66 200	460	1.5	0.3
Serbia	77	2	3 361	82	683	17	4 121			
Switzerland	50	2	1 503	59	1 004	39	2 557	345	4.8	0.1
Ukraine	19 690	52	13 440	36	4 614	12	37 744	804	27.0	14.1

TABLE 51: Agricultural emissions and pollution

	Greenhouse gas emissions		Methane emissions		Nitrous oxide emissions	
	by agriculture	share of agriculture in total	total	by agriculture	total	by agriculture
	gigagrams CO ₂ equivalent 2008	% 2008*	kt of CO ₂ equivalent 2005*	% 2005*	kt of CO ₂ equivalent 2005*	% 2005*
WORLD			7 140 000	42.6	2 850 000.0	66.2
DEVELOPING REGIONS				50.1		73.1
AFRICA				42.8		75.5
North Africa			134 660	29.2	33 370.0	74.0
Algeria		5.9	54 200	8.2	4 900.0	58.6
Egypt		16.5	47 000	31.7	19 000.0	80.0
Libya			14 700	5.7	1 290.0	51.9
Morocco		35.0	10 600	51.7	5 810.0	82.6
Tunisia		23.9	8 160	25.5	2 370.0	66.4
Sub-Saharan Africa						
Angola			45 400	27.9	38 900.0	38.4
Benin		96.5	4 080	47.8	2 900.0	61.5
Botswana		54.5	4 500	84.1	3 080.0	92.0
Burkina Faso		78.9				
Burundi		97.9				
Cameroon		61.7	18 500	42.4	9 130.0	75.9
Cape Verde		13.4				
Central African Republic		43.0				
Chad		91.0				
Comoros		85.6				
Congo		15.7	5 580	31.9	3 570.0	51.8
Côte d'Ivoire		71.8	11 000	17.4	7 360.0	29.3
Congo, Dem. Rep.		75.2				
Djibouti		40.4				
Equatorial Guinea						
Eritrea		33.1	2 470	73.2	1 190.0	90.9
Ethiopia		80.6	52 200	72.5	30 500.0	88.8
Gabon			8 220	1.1	482.0	23.3
Gambia		21.0				
Ghana		40.3	8 990	39.5	4 900.0	70.5
Guinea		50.0				
Guinea-Bissau		86.8				
Kenya		56.4	22 100	65.5	10 500.0	88.8
Lesotho		51.6				
Liberia						
Madagascar		90.5				
Malawi		45.3				
Mali		87.4				
Mauritania		81.6				
Mauritius		6.8				
Mozambique		56.2	12 800	44.2	9 500.0	71.4
Namibia		64.4	5 060	94.9	3 800.0	94.3
Niger		78.0				
Nigeria		20.8	130 000	19.8	21 600.0	77.3
Rwanda		40.2				
Senegal		37.1	7 130	68.3	4 080.0	88.5
Seychelles		10.7				
Sierra Leone						
Somalia						
Sudan		83.5	67 400	85.2	49 500.0	92.6
South Africa		9.3	63 800	31.4	24 000.0	59.8
Swaziland		16.4				
Tanzania, Utd. Rep.		75.8	32 000	63.2	21 600.0	78.8
Togo		71.2	2 890	39.8	1 740.0	67.5
Uganda		90.3				
Zambia		41.6	19 300	59.3	25 100.0	71.7
Zimbabwe		20.7	9 540	73.3	6 110.0	85.2

TABLE 51: Agricultural emissions and pollution (continued)

	Greenhouse gas emissions		Methane emissions		Nitrous oxide emissions	
	by agriculture	share of agriculture in total	total	by agriculture	total	by agriculture
	gigagrams CO ₂ equivalent 2008	% 2008*	kt of CO ₂ equivalent 2005*	% 2005*	kt of CO ₂ equivalent 2005*	% 2005*
ASIA			3 319 510	50.5	1 112 482.9	72.4
Central Asia			122 190	37.8	34 770.0	77.3
Kazakhstan	12 101.5	4.9	47 100	25.3	17 600.0	62.5
Kyrgyzstan		16.1	3 590	72.3	1 510.0	72.6
Tajikistan		55.0	3 900	68.6	1 380.0	86.9
Turkmenistan		9.0	28 000	21.6	4 280.0	78.1
Uzbekistan		8.2	39 600	33.7	10 000.0	84.2
East Asia				43.1		71.6
Brunei Darussalam			5 770	0.2	609.0	14.6
Cambodia		82.7	20 200	76.1	5 790.0	66.1
China		14.9	1 332 820	38.6	467 422.0	73.9
Indonesia		25.3	209 000	46.4	123 000.0	71.5
Korea, DPR		5.8	18 200	23.5	3 420.0	62.3
Korea, Republic of		3.0	32 100	38.6	13 500.0	35.9
Lao, PDR		83.0				
Malaysia		5.1	46 500	12.4	15 100.0	64.9
Mongolia		36.5	6 070	92.1	3 490.0	93.2
Myanmar			77 200	69.0	30 900.0	42.9
Philippines		32.8	51 900	63.7	13 000.0	73.1
Singapore			2 240	1.2	1 070.0	2.8
Thailand		34.6	83 300	66.0	22 300.0	65.5
Viet Nam		47.9	83 000	63.9	23 000.0	83.0
South Asia				63.1		74.4
Afghanistan						
Bangladesh		61.2	92 400	70.5	21 400.0	83.1
Bhutan		82.2				
India		28.4	584 000	64.4	213 000.0	73.4
Iran (Islamic Rep.)		7.9	115 000	18.2	26 600.0	75.3
Maldives						
Nepal		87.2	22 100	82.9	4 520.0	76.8
Pakistan		38.6	137 000	63.5	26 800.0	74.2
Sri Lanka		39.4	10 200	65.2	2 060.0	65.1
West Asia			268 320	26.4	60 731.9	63.3
Armenia		17.9	2 960	36.7	580.0	81.6
Azerbaijan		8.5	36 600	13.6	2 630.0	77.5
Bahrain		0.2	2 770	0.6	81.9	16.0
Cyprus			616	44.0	292.0	65.5
Georgia		27.1	4 410	50.8	2 020.0	56.9
Iraq			15 900	18.6	3 440.0	63.3
Jordan		0.9	1 800	21.8	667.0	55.4
Kuwait			14 400	1.1	650.0	16.9
Lebanon		7.0	1 000	25.5	672.0	58.8
Occupied Palestinian Territory						
Saudi Arabia		6.9	48 200	4.0	6 500.0	46.1
Syrian Arab Republic			12 500	28.1	5 510.0	78.1
Turkey	25 043.0	6.8	64 300	33.6	32 800.0	66.4
United Arab Emirates		3.4	23 300	2.6	1 170.0	43.6
Yemen		35.2	6 680	54.9	3 250.0	72.5
LATIN AMERICA & THE CARIBBEAN				56.8		74.5
Argentina		44.3	102 000	70.6	49 800.0	89.2
Bahamas		1.0				
Barbados		1.6				
Belize		4.3				
Bolivia (Plur. State)		26.7	30 300	34.1	15 100.0	36.5
Brazil		48.2	492 000	61.1	236 000.0	67.0
Chile		24.4	18 100	39.4	8 140.0	73.4
Colombia		44.6	58 100	68.0	21 300.0	86.1
Costa Rica		38.0	2 580	67.2	1 330.0	85.4

TABLE 51: Agricultural emissions and pollution (continued)

	Greenhouse gas emissions		Methane emissions		Nitrous oxide emissions	
	by agriculture	share of agriculture in total	total	by agriculture	total	by agriculture
	gigagrams CO ₂ equivalent 2008	% 2008*	kt of CO ₂ equivalent 2005*	% 2005*	kt of CO ₂ equivalent 2005*	% 2005*
Cuba		25.6	9 450	62.4	6 360.0	78.7
Dominica		9.7				
Dominican Republic		21.6	6 080	63.7	2 260.0	76.8
Ecuador		27.3	17 100	57.7	4 570.0	84.9
El Salvador		49.4	3 130	53.1	1 380.0	76.2
French Guiana						
Grenada		0.0				
Guatemala		59.9	8 310	48.8	5 380.0	56.8
Guyana		41.6				
Haiti		80.1	4 010	56.2	1 440.0	84.2
Honduras		31.2	5 190	78.4	2 870.0	85.9
Jamaica		92.3	1 300	50.3	599.0	59.0
Mexico		7.1	128 000	42.3	42 500.0	75.2
Netherlands Antilles			123	3.2	55.1	5.8
Nicaragua		55.8	6 020	74.8	3 340.0	91.7
Panama		44.2	3 220	79.2	1 200.0	83.7
Paraguay		97.0	15 400	84.1	9 070.0	82.6
Peru		35.7	17 200	61.3	7 560.0	81.9
St. Kitts & Nevis		25.8				
St. Lucia		2.9				
St. Vincent & Grenadines		64.4				
Suriname		25.2				
Trinidad & Tobago		2.1	10 100	0.7	230.0	60.3
Uruguay		80.8	19 600	94.3	7 020.0	96.9
Venezuela (Boliv. Rep. of)		17.1	61 200	40.0	14 900.0	75.2
OCEANIA						
Fiji		35.5				
French Polynesia						
New Caledonia						
Papua New Guinea		77.2				
Samoa		76.8				
Solomon Islands						
Tonga		26.9				
Vanuatu		78.5				
DEVELOPED REGIONS			2 036 767	38.8	912 955.6	52.1
NORTH AMERICA				34.3		56.6
Bermuda						
Canada	62 457.8	8.5	89 300	29.3	40 200.0	58.9
United States of America	427 528.5	6.2	548 000	34.8	317 000.0	56.4
ASIA & OCEANIA				67.7		37.7
Australia	87 394.7	15.9	126 000	55.1	63 000.0	78.2
Israel		4.5	3 520	31.2	1 790.0	53.0
Japan	25 844.9	2.0	42 800	71.2	29 800.0	27.9
New Zealand	34 826.3	46.4	27 600	90.2	12 900.0	94.2
EUROPE			1 199 547	34.6	448 265.6	53.1
Albania		34.0	2 410	70.8	1 040.0	78.4
Belarus	22 746.9	25.0	11 500	70.9	11 700.0	72.9
Bosnia & Herzegovina		13.5	2 740	42.4	1 200.0	57.8
Croatia	3 359.4	10.8	3 860	33.3	2 850.0	52.4
European Union			536 000	40.6	327 000.0	56.3
Iceland	566.4	11.6	402	53.5	418.0	79.7
Macedonia, FYR		8.8	1 400	46.6	599.0	63.9
Montenegro		12.3				
Norway	4 356.1	8.0	16 900	12.6	4 740.0	39.0
Republic of Moldova		17.9	3 370	29.4	849.0	73.5
Russian Federation	144 092.1	6.4	563 000	9.1	76 100.0	44.3
Serbia		14.3	7 780	43.7	4 580.0	63.6
Switzerland	5 689.2	10.7	4 750	67.6	2 410.0	59.3
Ukraine	34 636.4	8.1	70 400	23.3	26 100.0	45.6

TABLE 52: Agricultural pollution

	Energy use		Air pollution	Water pollution			
	by agriculture	share of agriculture in total	urban	food industry	paper and pulp industry	textile industry	wood industry
	kt of oil equivalent	%	annual PM ₁₀ [mg/m ³]	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions
	2009*	2009*	2004	2007*	2007*	2007*	2007*
WORLD		2.0	72				
DEVELOPING REGIONS			81				
AFRICA			79				
North Africa			93				
Algeria			65				
Egypt	2 618.6	5.3	136	20.0	4.0	31.1	0.6
Libya	224.9	2.1	121				
Morocco	1 721.6	14.8	27	16.3	2.9	43.5	2.0
Tunisia	423.7	6.5	46				
Sub-Saharan Africa			76				
Angola	4.1	0.0	113				
Benin			51				
Botswana	20.3	1.1	25	43.8	2.4	3.9	
Burkina Faso			97				
Burundi			99				
Cameroon	4.4	0.1	86				
Cape Verde			33				
Central African Republic			24				
Chad			73				
Comoros			125				
Congo			74				
Côte d'Ivoire	64.9	1.1					
Congo, Dem. Rep.	0.1	0.0	57				
Djibouti			68				
Equatorial Guinea			12				
Eritrea			109	27.3	4.4	29.0	0.1
Ethiopia	26.0	0.2	88	34.7	6.0	27.9	1.5
Gabon	8.3	0.5	13				
Gambia			138	48.6	1.3	13.3	18.7
Ghana	91.5	1.2	42	18.6	3.8	10.2	33.3
Guinea			63				
Guinea-Bissau			84				
Kenya	110.4	0.9	38				
Lesotho			94	2.6	0.5	93.5	
Liberia			39				
Madagascar			51	7.6	1.6	58.9	6.3
Malawi			88	82.1	1.4	7.5	1.1
Mali			102				
Mauritania			42				
Mauritius			47	14.7	3.6	63.9	0.7
Mozambique	7.2	0.1	44				
Namibia	223.4	13.9	50				
Niger			86				
Nigeria			95				
Rwanda			100	77.1		1.9	2.9
Senegal	6.1	0.3	93	44.6	6.3	10.5	0.8
Seychelles							
Sierra Leone			69				
Somalia			35				
Sudan	54.1	0.5	219	57.5	1.9	8.0	1.7
South Africa	1 535.0	2.2	24	15.7	6.6	10.4	4.2
Swaziland			71				
Tanzania, Utd. Rep.	717.7	4.2	38	61.2	4.8	12.7	2.9
Togo			45				
Uganda			33	34.8	7.8	17.2	2.3
Zambia	39.7	0.7	71				
Zimbabwe	641.4	7.7	43	21.5	4.7	25.2	1.7

TABLE 52: Agricultural pollution (continued)

	Energy use		Air pollution	Water pollution			
	by agriculture	share of agriculture in total	urban	food industry	paper and pulp industry	textile industry	wood industry
	kt of oil equivalent	%	annual PM ₁₀ [mg/m ³]	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions
	2009*	2009*	2004	2007*	2007*	2007*	2007*
ASIA			87				
Central Asia			59				
Kazakhstan	942.0	2.5	25	18.7	2.4	4.0	0.6
Kyrgyzstan	141.9	5.1	36	24.2	6.3	9.8	1.6
Tajikistan	355.4	17.9	57	18.0	2.7	38.4	0.3
Turkmenistan	254.0	2.2	73				
Uzbekistan	1 955.9	5.5	81				
East Asia			79				
Brunei Darussalam	1.0	0.2	48				
Cambodia	117.4	2.5	51	18.1	0.9	33.6	8.2
China			80	7.4	3.9	20.6	1.7
Indonesia	2 687.9	1.8	114	23.1	4.0	29.2	6.3
Korea, DPR			88				
Korea, Republic of	1 774.2	1.2	43	6.3	5.4	9.3	0.9
Lao, PDR			25	9.2	2.2	49.2	21.4
Malaysia	209.6	0.5	28	9.1	4.9	6.6	7.8
Mongolia	49.8	2.1	16	27.2	5.1	41.6	5.4
Myanmar	1.0	0.0	75				
Philippines	129.5	0.6	34	14.4	4.2	21.6	2.1
Singapore	5.0	0.0	48	5.3	5.5	2.3	0.5
Thailand	3 424.8	4.5	77	16.4	4.2	20.5	2.8
Viet Nam	598.7	1.1	66	12.7	3.5	40.2	3.3
South Asia			98				
Afghanistan			27	14.1	19.7	23.3	
Bangladesh	1 174.9	5.1	157	7.6	2.3	79.3	0.5
Bhutan			13				
India	17 387.3	3.9	84				
Iran (Islamic Rep.)	6 145.7	3.8	68	16.1	2.8	11.2	0.7
Maldives			54				
Nepal	113.4	1.1	161	19.2	3.9	29.4	2.0
Pakistan	894.3	1.3	165	15.1	1.9	55.6	0.4
Sri Lanka	9.2	0.1	93	22.4	4.3	43.6	2.5
West Asia			86				
Armenia	10.7	0.6	84				
Azerbaijan	361.2	5.5	64	19.6	3.0	11.7	1.5
Bahrain	3.8	0.1	65				
Cyprus	37.0	2.1	60	36.3	8.9	5.1	8.0
Georgia	77.9	3.1	46				
Iraq			167	16.9	25.6	9.2	
Jordan	152.5	3.2	69	20.8	6.2	18.6	2.3
Kuwait			129				
Lebanon			43	25.5	7.5	16.7	4.5
Occupied Palestinian Territory							
Saudi Arabia	435.3	0.4	91	20.0	6.9	14.4	3.3
Syrian Arab Republic	265.8	2.0	89	19.9	1.9	32.0	5.2
Turkey	4 726.9	6.5	56	12.4	3.8	32.2	1.7
United Arab Emirates	33.9	0.1	109				
Yemen	995.9	18.7	82	35.9	2.1	15.5	5.1
LATIN AMERICA & THE CARIBBEAN			46				
Argentina	3 324.1	6.3	78	30.5	8.3	14.3	2.1
Bahamas			18	42.0	19.7	6.4	0.4
Barbados			95				
Belize			12				
Bolivia (Plur. State)	2.3	0.1	72	35.4	9.8	18.4	5.3
Brazil	9 453.2	5.0	35				
Chile			62	35.1	6.3	9.1	6.9
Colombia	1 646.5	7.1	42	21.3	8.9	24.1	0.9
Costa Rica	64.4	1.9	40				

TABLE 52: Agricultural pollution (continued)

	Energy use		Air pollution	Water pollution			
	by agriculture	share of agriculture in total	urban	food industry	paper and pulp industry	textile industry	wood industry
	kt of oil equivalent	%	annual PM ₁₀ [mg/m ³]	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions	% of total BOD emissions
	2009*	2009*	2004	2007*	2007*	2007*	2007*
Cuba	181.3	2.5	38				
Dominica			34				
Dominican Republic	143.9	2.6	36	18.6	1.3	73.1	0.1
Ecuador	106.9	1.1	34	46.4	7.8	12.3	2.2
El Salvador	6.6	0.2	48				
French Guiana							
Grenada			49				
Guatemala	6.0	0.1	60				
Guyana			13				
Haiti			47	28.9	1.6	28.7	0.5
Honduras	3.0	0.1	69				
Jamaica	551.4	22.2	43				
Mexico	3 596.5	3.3	49	18.9	7.1	17.0	4.8
Netherlands Antilles							
Nicaragua	14.3	0.7	32				
Panama	14.0	0.5	58	55.2	11.6	4.7	1.6
Paraguay			103	42.6	9.3	11.0	4.5
Peru	377.6	2.7	62				
St. Kitts & Nevis			33				
St. Lucia			74				
St. Vincent & Grenadines			56				
Suriname			13				
Trinidad & Tobago	8.3	0.2	22	39.3	18.2	7.7	8.5
Uruguay	36.2	1.1	154				
Venezuela (Boliv. Rep. of)	39.3	0.1	16				
OCEANIA			12				
Fiji			17	32.7	5.3	40.8	4.0
French Polynesia							
New Caledonia							
Papua New Guinea			11				
Samoa							
Solomon Islands			16				
Tonga				67.3	5.0	4.4	7.3
Vanuatu			10				
DEVELOPED REGIONS			30				
NORTH AMERICA			24				
Bermuda							
Canada	3 372.1	1.7	21	14.0	8.9	7.3	6.5
United States of America	14 313.0	1.0	24	12.0	8.1	4.3	4.1
ASIA & OCEANIA			31				
Australia	2 164.6	2.8	18				
Israel	145.3	1.0	53	16.4	8.9	7.9	1.2
Japan	1 874.0	0.6	33	15.0	7.0	5.3	2.0
New Zealand	522.5	4.2	16	31.1	12.2	5.8	8.0
EUROPE			33				
Albania	75.7	5.0	58	39.8		60.2	
Belarus	1 098.2	5.7	9				
Bosnia & Herzegovina	5.8	0.2	22				
Croatia	249.0	3.6	35	17.6	7.2	14.5	4.9
European Union			33				
Iceland	41.8	1.5	21				
Macedonia, FYR	18.2	1.1	29	15.1	4.7	44.7	2.9
Montenegro							
Norway	327.8	1.7	22	19.1	12.1	2.0	6.0
Republic of Moldova	51.4	3.1	41	95.2	3.8		
Russian Federation	8 344.1	2.0	25	17.9	4.9	6.3	4.2
Serbia	123.2	1.5					
Switzerland	267.9	1.3	27				
Ukraine	1 615.4	2.5	29	19.7	4.3	5.6	2.1

TABLE 53: Conservation and renewable feedstocks

	Conservation		Production						
	Nationally protected area	Organic agriculture	biofuel			natural fibre		recovered paper	
	% of total area	% of total area	kt of oil equivalent	kt of oil equivalent	% p.a.	thousand tonnes	% p.a.	thousand tonnes	% p.a.
	%	%	2000	2009	growth: 2000-2009	2010	growth: 1961-2010	2010	growth: 1961-2010
WORLD	12.5		954 280.6	1 132 462.3	1.9	28 443	1.3	207 821	
DEVELOPING REGIONS			806 946.9	933 515.9	1.6	23 311	1.9	75 718	
AFRICA			202 193.4	258 488.2	2.8	1 380	0.3	1 649	
North Africa			2 910.8	3 566.6	2.3	150	-1.7	487	
Algeria	6.3	0.0	76.5	57.2	-3.2	0	-7.4	32	
Egypt	5.9	1.5	1 325.1	1 567.3	1.9	148	-1.7	380	
Libya	0.1		139.6	168.0	2.1				
Morocco	1.5	0.0	436.0	480.1	1.1	2	-0.3	35	
Tunisia	1.3	1.7	933.6	1 294.0	3.7	1	2.5	40	
Sub-Saharan Africa			199 282.7	254 921.6	2.8	1 230	0.8	1 162	
Angola	12.4	0.0	5 538.2	7 150.4	2.9	2	-6.6		
Benin	23.8	0.0	1 445.0	1 995.6	3.7	76	10.5		
Botswana	30.9		542.6	483.2	-1.3	0	-3.0		
Burkina Faso	13.9	0.1				190	11.8		
Burundi	4.8	0.0				1	-3.0		
Cameroon	9.2	0.0	4 984.7	4 436.5	-1.3	62	4.1		
Cape Verde	2.5								
Central African Republic	14.7					4	-2.1		
Chad	9.4					26	0.9		
Comoros	0.0	0.8				0	-100.0		
Congo	9.4		587.6	716.9	2.2				
Côte d'Ivoire	22.6	0.1	4 223.6	7 780.4	7.0	81	8.2	6	
Congo, Dem. Rep.	10.0	0.0	15 758.4	21 473.1	3.5	14	-1.7		
Djibouti	0.0								
Equatorial Guinea	19.2					0	-1.4		
Eritrea	5.0		507.7	561.3	1.1				
Ethiopia	18.4	0.4	17 423.9	30 052.0	6.2	57		2	
Gabon	14.9		924.6	1 108.7	2.0				
Gambia	1.5					0			
Ghana	14.0	0.2	5 315.2	6 456.0	2.2	9			
Guinea	6.8					13	10.5		
Guinea-Bissau	16.1					2			
Kenya	11.6	0.0	11 245.0	14 233.7	2.7	25	-2.0	38	
Lesotho	0.5	0.0							
Liberia	18.1								
Madagascar	2.9	0.0				29	0.3	2	
Malawi	15.0	0.0				6	1.0		
Mali	2.4	0.1				79	7.6		
Mauritania	0.5								
Mauritius	4.5	0.0				0	-4.8	3	
Mozambique	15.8	0.0	6 417.6	7 987.8	2.5	62	-0.2	5	
Namibia	14.5	0.0	172.9	205.7	1.9	1			
Niger	6.8	0.0				3	2.5		
Nigeria	12.8	0.0	74 154.7	91 907.2	2.4	161	2.4	8	
Rwanda	10.0	0.2				0	-100.0		
Senegal	24.1	0.3	1 163.6	1 208.5	0.4	6	8.0	0	
Seychelles	42.0							0	
Sierra Leone	5.0	2.1				5	-0.5		
Somalia	0.6					2	1.7		
Sudan	4.9	0.3	11 055.9	10 754.4	-0.3	62	-1.3	6	
South Africa	6.9	0.1	12 872.4	14 428.8	1.3	12	0.5	1 015	
Swaziland	3.0	0.0				1	-2.8	6	
Tanzania, Utd. Rep.	27.7	0.2	12 457.8	17 204.6	3.7	130	-1.3		
Togo	11.3	0.1	1 756.1	2 183.1	2.4	11	2.7		
Uganda	9.7	1.6				26	-2.0		
Zambia	36.0	0.0	5 144.1	6 357.0	2.4	29			
Zimbabwe	28.0	0.0	5 591.0	6 236.6	1.2	42	7.1	70	

TABLE 53: Conservation and renewable feedstocks (continued)

	Conservation		Production						
	Nationally protected area	Organic agriculture	biofuel			natural fibre		recovered paper	
	% of total area	% of total area	kt of oil equivalent	kt of oil equivalent	% p.a.	thousand tonnes	% p.a.	thousand tonnes	% p.a.
	%	%	2000	2009	2000-2009 growth:	2010	1961-2010 growth:	2010	1961-2010 growth:
ASIA			514 021.4	551 414.6	0.8	20 069	2.4	64 308	
Central Asia			77.1	160.4	8.5	1 737		15	
Kazakhstan	2.5	0.1	73.3	156.6	8.8	92		15	
Kyrgyzstan	6.9	0.1	3.6	3.6	0.0	24			
Tajikistan	4.1	0.0	0.0	0.0		102			
Turkmenistan	3.0		0.0	0.0		360			
Uzbekistan	2.3	0.0	0.2	0.2	0.0	1 158			
East Asia			314 238.1	328 508.1	0.5	6 749	3.0	60 688	
Brunei Darussalam	42.9		0.0	0.0					
Cambodia	24.0	0.2	3 202.5	3 663.9	1.5	2	-4.7	20	
China	16.6	0.4	203 682.3	203 672.2	-0.0	6 330	3.7	44 105	
Indonesia	14.1	0.1	49 224.0	52 980.6	0.8	93	1.2	3 934	
Korea, DPR	4.0		1 004.8	1 046.1	0.4	28	3.5		
Korea, Republic of	2.4	0.7	232.7	691.4	12.9	0	-14.0	8 857	
Lao, PDR	16.3	0.2				4	2.0		
Malaysia	17.9	0.0	2 546.8	3 205.2	2.6	0	-100.0	1 200	
Mongolia	13.4		99.6	103.3	0.4				
Myanmar	6.3	0.0	9 175.0	10 530.7	1.5	71	3.0	38	
Philippines	10.9	0.4	8 102.5	6 922.4	-1.7	73	-0.6	326	
Singapore	5.4		0.0	0.0				275	
Thailand	19.6	0.1	14 592.9	20 537.7	3.9	49	-3.6	1 856	
Viet Nam	6.2	0.1	22 374.8	25 154.6	1.3	99	2.0	77	
South Asia			192 321.5	217 463.7	1.4	10 829	1.9	1 110	
Afghanistan	0.4	0.0				18	0.1		
Bangladesh	1.6	0.0	7 603.4	8 812.9	1.7	1 224	-0.2		
Bhutan	28.3					0			
India	5.3	0.7	148 879.2	165 421.9	1.2	7 544	2.3	850	
Iran (Islamic Rep.)	7.1	0.0	351.6	403.4	1.5	72	-1.0	80	
Maldives									
Nepal	17.0	0.2	6 987.9	8 544.7	2.3	21	-0.9	4	
Pakistan	10.3	0.1	24 027.6	29 531.3	2.3	1 949	3.7	163	
Sri Lanka	20.8	0.1	4 471.8	4 749.5	0.7	0	-100.0	13	
West Asia			7 384.7	5 282.4	-3.7	754	1.5	2 495	
Armenia	8.0	0.0	1.0	1.0	0.0			0	
Azerbaijan	7.1	0.4	1.6	0.0	-100.0	13		0	
Bahrain	1.3		0.0	0.0				40	
Cyprus	11.0	3.0	8.8	16.1	7.0	0	-100.0	45	
Georgia	3.7	0.0	645.1	382.0	-5.7			10	
Iraq	0.1		26.3	26.3	0.0	16	1.4	6	
Jordan	9.4	0.1	2.3	4.9	8.5			3	
Kuwait	1.6		0.0	0.0				170	
Lebanon	0.5	0.5	128.6	120.0	-0.8				
Occupied Palestinian Territory		0.3							
Saudi Arabia	31.3	0.0	0.0	0.0				1 000	
Syrian Arab Republic	0.6	0.3	5.0	6.4	2.8	246	1.5		
Turkey	1.9	1.3	6 497.4	4 641.4	-3.7	471	1.5	1 016	
United Arab Emirates	5.6	0.1	0.0	0.0				170	
Yemen	0.5		77.4	100.3	2.9	8	1.0		
LATIN AMERICA & THE CARIBBEAN			90 732.1	123 613.2	3.5	1 862	0.0	9 761	
Argentina	5.4	3.1	2 955.4	3 269.4	1.1	233	1.3	900	
Bahamas	13.7								
Barbados	0.1								
Belize	27.9	0.8							
Bolivia (Plur. State)	18.2	0.1	723.1	1 102.2	4.8	29	7.1		
Brazil	28.0	0.7	46 484.2	76 701.2	5.7	1 290	1.3	4 019	
Chile	16.5	0.5	4 255.8	5 051.5	1.9	16	2.4	489	
Colombia	20.4	0.1	4 393.8	4 455.4	0.2	26	-2.6	633	
Costa Rica	20.9	0.4	248.0	772.1	13.4	1	-0.9	29	

TABLE 53: Conservation and renewable feedstocks (continued)

	Nationally protected area	Organic agriculture	Production						
	% of total area	% of total area	biofuel			natural fibre		recovered paper	
	%	%	kt of oil equivalent	kt of oil equivalent	% p.a.	thousand tonnes	% p.a.	thousand tonnes	% p.a.
	2009*	2009	2000	2009	growth: 2000-2009	2010	growth: 1961-2010	2010	growth: 1961-2010
Cuba	6.2	0.2	4 665.6	1 817.2	-9.9	10	-1.1	28	
Dominica	21.7								
Dominican Republic	22.1	6.5	1 355.4	1 765.7	3.0	1	-4.0	15	
Ecuador	25.1	0.9	697.4	615.6	-1.4	31	4.4	150	
El Salvador	0.8	0.4	1 342.7	1 724.9	2.8	4	-5.0	5	
French Guiana		11.5							
Grenada	1.7	0.3				0	-3.7		
Guatemala	30.6	0.3	3 898.7	5 123.9	3.1	1	-5.9	18	
Guyana	4.9	0.3							
Haiti	0.3	0.0	1 517.4	1 848.9	2.2	8	-2.5		
Honduras	18.2	0.4	1 327.8	1 954.3	4.4	1	-1.1	51	
Jamaica	18.9	0.1	579.0	516.9	-1.3	0	-0.8	0	
Mexico	11.1	0.3	8 939.3	8 382.8	-0.7	170	-2.5	3 039	
Netherlands Antilles			0.0	0.0					
Nicaragua	36.7	0.7	1 419.3	1 416.3	-0.0	6	-3.6		
Panama	18.7	0.2	461.5	330.9	-3.6			13	
Paraguay	5.4	0.2	2 237.6	2 708.5	2.1	5	-1.1	30	
Peru	13.6	0.9	2 234.1	2 439.5	1.0	21	-3.7	72	
St. Kitts & Nevis	3.6					0	-100.0		
St. Lucia	14.3							1	
St. Vincent & Grenadines	10.9					0	-100.0		
Suriname	11.4	0.0							
Trinidad & Tobago	31.2		33.7	11.6	-11.1			7	
Uruguay	0.3	6.3	421.4	1 063.8	10.8	0	-100.0	21	
Venezuela (Boliv. Rep. of)	53.7	0.0	540.8	540.8	0.0	9	-1.3	237	
OCEANIA						0	-0.5		
Fiji	1.3	0.0							
French Polynesia	0.4								
New Caledonia	5.5								
Papua New Guinea	3.1	0.3							
Samoa	3.4	14.5				0	-0.5		
Solomon Islands	0.1	4.3							
Tonga	14.5								
Vanuatu	4.3	4.8							
DEVELOPED REGIONS			147 333.7	198 946.4	3.4	5 132	0.7	132 103	
NORTH AMERICA			72 397.4	85 615.6	1.9	3 970	0.5	50 317	3.7
Bermuda	5.6								
Canada	8.0	1.0	11 527.7	11 310.1	-0.2	28	12.2	3 444	
United States of America	14.8	0.5	60 869.6	74 305.4	2.2	3 942	0.5	46 873	3.6
ASIA & OCEANIA			10 590.8	11 714.6	1.1	397	5.6	25 547	
Australia	10.5	2.9	4 856.0	5 690.8	1.8	387	10.0	3 187	
Israel	18.7	1.1	4.4	20.7	18.9	7	-1.4	305	
Japan	16.3	0.2	4 691.8	4 908.3	0.5	0	-100.0	21 800	5.2
New Zealand	25.8	1.1	1 038.5	1 094.9	0.6	3	5.5	255	
EUROPE			64 345.6	101 616.2	5.2	766	-2.5	56 239	5.0
Albania	9.8	0.0	260.0	213.0	-2.2	0	-6.2	0	
Belarus	7.3		814.6	1 334.9	5.6	46		0	
Bosnia & Herzegovina	0.6	0.0	179.6	183.1	0.2			35	
Croatia	7.3	1.4	373.4	438.3	1.8	0		0	
European Union	14.9		55 379.0	93 088.5	5.9	638	0.5	51 989	4.9
Iceland	9.7	0.3	0.0	0.4				20	
Macedonia, FYR	4.8	0.1	206.2	195.2	-0.6	0		2	
Montenegro	13.3	0.9						0	
Norway	14.4	5.6	1 219.9	1 067.1	-1.5			474	4.7
Republic of Moldova	1.4	1.3	58.8	71.6	2.2			3	
Russian Federation	9.0	0.0	4 005.7	2 936.1	-3.4	80		2 100	
Serbia	6.0	0.2	869.2	276.3	-12.0			25	
Switzerland	22.8	7.4	726.2	932.5	2.8			1 298	4.2
Ukraine	3.5	0.7	261.5	895.3	14.7	1		339	

TABLE 54: Forestry production

	Production of selected forest products					
	industrial roundwood		woodfuel		total roundwood	
	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010
WORLD	1 537.2	1.5	1 868.0	0.7	3 405.2	1.0
DEVELOPING REGIONS	538.9	2.8	1 670.4	0.7	2 209.3	1.0
AFRICA	74.2	2.3	616.7	1.8	690.8	1.9
North Africa	1.1	1.5	29.2	0.8	30.3	0.8
Algeria	0.1	-0.4	8.2	2.2	8.3	2.1
Egypt	0.3	3.2	17.5	1.1	17.8	1.2
Libya	0.1	3.5	1.0	2.5	1.1	2.5
Morocco	0.4	0.7	0.4	-5.1	0.8	-3.9
Tunisia	0.2	3.0	2.2	1.1	2.4	1.2
Sub-Saharan Africa	73.1	2.4	587.4	2.3	660.5	2.3
Angola	1.1	1.1	4.0	2.6	5.1	2.2
Benin	0.4	2.5	6.3	0.5	6.7	0.6
Botswana	0.1	2.5	0.7	0.4	0.8	0.5
Burkina Faso	1.2	3.7	12.8	1.5	14.0	1.7
Burundi	0.9	7.5	9.8	2.1	10.7	2.3
Cameroon	2.6	2.6	9.9	0.8	12.5	1.0
Cape Verde			0.2	1.8	0.2	1.8
Central African Republic	0.8	2.7	2.0	0.5	2.8	1.0
Chad	0.8	1.8	7.1	2.0	7.8	2.0
Comoros	0.0		0.3	3.8	0.3	4.0
Congo	2.4	3.2	1.3	1.0	3.8	2.1
Côte d'Ivoire	1.5	-0.1	8.9	0.7	10.4	0.6
Congo, Dem. Rep.	4.6	2.1	76.6	3.0	81.2	2.9
Djibouti	0.0	-100.0	0.4		0.4	10.2
Equatorial Guinea	0.5	1.1	0.4	0.8	1.0	1.0
Eritrea	0.0		1.3		1.3	
Ethiopia	2.9		101.3		104.2	
Gabon	3.4	1.4	1.1	2.3	4.5	1.6
Gambia	0.1	6.2	0.7	2.5	0.8	2.7
Ghana	1.2	-0.9	37.8	3.7	39.0	3.2
Guinea	0.7	1.9	12.0	0.6	12.6	0.7
Guinea-Bissau	0.1	0.7	2.6	3.9	2.7	3.6
Kenya	1.2	2.1	26.4	2.4	27.6	2.4
Lesotho			2.1	0.7	2.1	0.7
Liberia	0.5	2.4	7.0	3.1	7.5	3.1
Madagascar	0.3	-0.8	13.1	3.7	13.4	3.4
Malawi	1.4	4.7	5.4	1.1	6.8	1.5
Mali	0.4	1.7	5.3	1.5	5.7	1.5
Mauritania	0.0	0.0	1.8	2.1	1.8	2.1
Mauritius	0.0	-2.9	0.0	-3.1	0.0	-3.1
Mozambique	1.4	1.1	16.7	1.9	18.1	1.8
Namibia			0.8	1.8	0.8	1.8
Niger	0.7	3.6	2.9	0.6	3.6	0.9
Nigeria	9.4	2.9	63.2	1.1	72.6	1.3
Rwanda	1.2	6.6	5.0	1.2	6.2	1.6
Senegal	0.8	2.2	5.4	1.3	6.2	1.4
Seychelles	0.0		0.0		0.0	
Sierra Leone	0.1	0.5	5.6	-0.0	5.7	0.0
Somalia	0.1	2.0	12.5	3.2	12.6	3.2
Sudan	2.2	1.8	18.8	1.4	20.9	1.4
South Africa	18.9	2.9	12.0	5.8	30.9	3.6
Swaziland	0.3	1.8	1.1		1.4	4.8
Tanzania, Utd. Rep.	2.3	2.2	22.8	1.3	25.1	1.4
Togo	0.2	1.5	4.4	0.5	4.6	0.5
Uganda	4.1	3.4	39.6	2.1	43.7	2.2
Zambia	1.3	3.1	9.1	2.1	10.4	2.2
Zimbabwe	0.7	2.9	8.7	1.6	9.5	1.7

TABLE 54: Forestry production (continued)

	Production of selected forest products					
	industrial roundwood		woodfuel		total roundwood	
	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010
ASIA	250.8	2.3	764.9	-0.1	1 015.7	0.2
Central Asia	0.1		0.4		0.5	
Kazakhstan	0.1		0.3		0.3	
Kyrgyzstan	0.0		0.0		0.0	
Tajikistan	0.0		0.1		0.1	
Turkmenistan	0.0		0.0		0.0	
Uzbekistan	0.0		0.0		0.0	
East Asia	203.8	2.3	367.1	-1.0	570.9	-0.4
Brunei Darussalam	0.1	2.2	0.0	-2.7	0.1	0.8
Cambodia	0.1	-3.8	8.4	-1.1	8.5	-1.1
China	102.4	2.2	188.8	-0.8	291.3	-0.2
Indonesia	54.1	4.8	59.7	-2.8	113.8	-1.5
Korea, DPR	1.5	1.9	6.0	2.0	7.5	2.0
Korea, Republic of	3.2	2.0	2.5	-0.3	5.7	0.7
Lao, PDR	0.2	2.4	5.9	0.4	6.2	0.4
Malaysia	19.7	2.2	2.8	-1.6	22.5	1.1
Mongolia	0.0	-4.2	0.8	0.5	0.8	-0.4
Myanmar	4.3	1.3	38.3	2.9	42.5	2.7
Philippines	3.6	-1.6	12.4	-0.8	16.0	-1.0
Singapore						
Thailand	8.7	2.3	19.3	-0.1	28.0	0.3
Viet Nam	5.8	2.4	22.0	0.6	27.9	0.9
South Asia	31.0	1.5	390.5	1.4	421.5	1.4
Afghanistan	1.8	1.7	1.6	2.2	3.4	1.9
Bangladesh	0.3	-1.6	27.3	1.0	27.6	1.0
Bhutan	0.2		4.8	1.2	5.1	1.3
India	23.2	2.6	309.3	1.4	332.5	1.5
Iran (Islamic Rep.)	0.7	-4.0	0.1	-6.1	0.8	-4.3
Maldives			0.0	1.3	0.0	1.3
Nepal	1.3	1.4	12.5	0.7	13.8	0.8
Pakistan	3.0	3.3	29.7	1.8	32.6	1.9
Sri Lanka	0.6	0.1	5.2	-0.1	5.8	-0.1
West Asia	15.9	4.5	6.9	-0.1	22.8	1.9
Armenia	0.0		0.0		0.0	
Azerbaijan	0.0		0.0		0.0	
Bahrain			0.0	1.9	0.0	1.9
Cyprus	0.0	-3.7	0.0	-2.7	0.0	-3.4
Georgia	0.1		0.7		0.8	
Iraq	0.1	1.9	0.1	3.2	0.2	2.7
Jordan	0.0	1.4	0.3	3.2	0.3	3.2
Kuwait			0.0	5.3	0.0	5.3
Lebanon	0.0	-0.2	0.0	-1.4	0.0	-1.1
Occupied Palestinian Territory						
Saudi Arabia			0.2	5.8	0.2	5.8
Syrian Arab Republic	0.0	0.6	0.0	-1.2	0.1	-0.3
Turkey	15.7	4.6	4.9	-0.8	20.6	1.8
United Arab Emirates			0.0	9.2	0.0	9.2
Yemen			0.4	3.1	0.4	3.1
LATIN AMERICA & THE CARIBBEAN	207.5	3.8	282.9	1.1	490.4	1.8
Argentina	9.8	3.3	4.6	-1.4	14.4	0.5
Bahamas	0.0	-5.4	0.0	0.6	0.0	-3.4
Barbados	0.0		0.0	0.2	0.0	1.8
Belize	0.0	-1.4	0.1	2.4	0.2	0.7
Bolivia (Plur. State)	0.9	5.0	2.3	1.1	3.3	1.7
Brazil	128.4	4.2	143.1	1.0	271.5	2.0
Chile	34.6	5.1	12.7	3.5	47.2	4.6
Colombia	2.4	-0.5	8.8	1.0	11.2	0.6
Costa Rica	1.3	2.2	3.4	0.1	4.7	0.5

TABLE 54: Forestry production (continued)

	Production of selected forest products					
	industrial roundwood		woodfuel		total roundwood	
	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010	million m ³	% p.a. growth: 1961-2010
Cuba	0.7	1.5	1.1	-0.6	1.9	-0.0
Dominica			0.0	-0.8	0.0	-0.8
Dominican Republic	0.0	-6.6	0.9	1.7	0.9	0.6
Ecuador	2.1	2.2	4.9	2.1	7.0	2.1
El Salvador	0.7	3.8	4.2	1.1	4.9	1.3
French Guiana	0.1	2.7	0.1	4.3	0.2	3.5
Grenada						
Guatemala	0.5	1.1	18.1	2.5	18.5	2.4
Guyana	0.5	1.8	0.8	0.1	1.4	0.6
Haiti	0.2	0.0	2.0	1.0	2.3	0.9
Honduras	0.5	-0.9	8.6	0.2	9.1	0.2
Jamaica	0.2	10.8	0.5	13.7	0.7	12.7
Mexico	6.9	2.0	38.8	1.0	45.7	1.1
Netherlands Antilles			0.0	0.4	0.0	0.4
Nicaragua	0.1	-4.1	6.1	0.8	6.2	0.6
Panama	0.2	0.8	1.0	-0.6	1.2	-0.4
Paraguay	4.0	4.9	6.6	2.8	10.6	3.4
Peru	1.4	2.1	7.3	1.2	8.7	1.3
St. Kitts & Nevis						
St. Lucia			0.0	0.8	0.0	0.8
St. Vincent & Grenadines			0.0	-1.0	0.0	-1.0
Suriname	0.2	0.1	0.0	-1.2	0.3	-0.2
Trinidad & Tobago	0.0	-1.6	0.0	0.6	0.1	-1.0
Uruguay	9.4	8.1	2.4	0.8	11.9	3.8
Venezuela (Boliv. Rep. of)	2.3	4.1	4.1	2.2	6.4	2.8
OCEANIA	6.4	7.1	5.9	1.0	12.3	2.4
Fiji	0.4	4.3	0.0	1.0	0.5	3.8
French Polynesia	0.0		0.0	0.8	0.0	1.3
New Caledonia	0.0	1.0	0.0	1.1	0.0	1.0
Papua New Guinea	4.5	7.1	5.5	1.0	10.0	2.1
Samoa	0.0	3.6	0.1	0.5	0.1	0.6
Solomon Islands	1.5	10.7	0.1	1.7	1.6	6.7
Tonga	0.0		0.0	0.4	0.0	1.7
Vanuatu	0.0	12.2	0.1		0.1	15.5
DEVELOPED REGIONS	998.3	1.0	197.6	0.7	1 195.9	1.0
NORTH AMERICA	429.8	0.5	43.3	-0.2	473.1	0.4
Bermuda						
Canada	129.6	0.8	2.9	-1.7	132.5	0.7
United States of America	300.2	0.4	40.4	-0.0	340.7	0.3
ASIA & OCEANIA	64.3	-0.0	4.7	-2.9	69.1	-0.4
Australia	25.1	1.8	4.7	0.6	29.8	1.5
Israel	0.0	-0.0	0.0	-3.0	0.0	-0.5
Japan	17.2	-2.1	0.1	-10.0	17.3	-2.7
New Zealand	22.0	3.1	0.0	-100.0	22.0	2.9
EUROPE	504.2	0.1	149.5	-0.4	653.7	-0.0
Albania	0.1	-3.6	0.3	-2.2	0.4	-2.6
Belarus	8.1		2.3		10.4	
Bosnia & Herzegovina	2.4		1.3		3.6	
Croatia	3.4		1.1		4.5	
European Union	336.4	1.1	84.9	0.4	421.3	1.0
Iceland	0.0		0.0		0.0	
Macedonia, FYR	0.1		0.5		0.6	
Montenegro	0.2		0.2		0.4	
Norway	8.3	0.1	2.1	0.5	10.4	0.1
Republic of Moldova	0.0		0.3		0.4	
Russian Federation	132.8		40.2		173.0	
Serbia	1.4		6.2		7.6	
Switzerland	3.4	0.7	1.5	0.3	4.9	0.6
Ukraine	7.5		8.6		16.1	

TABLE 55: Forestry production: finished products

	Production of selected forest products							
	sawnwood		wood-based panels		paper and paperboard		wood pulp	
	million m ³	% p.a.	million m ³	% p.a.	million tonnes	% p.a.	million tonnes	% p.a.
	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010
WORLD	390.7	1.3	283.1	5.2	399.8	3.6	168.3	
DEVELOPING REGIONS	136.5	2.7	156.9	9.9	171.4	7.3	41.9	
AFRICA	8.4	2.2	2.8	4.8	3.8	5.0	2.7	4.6
North Africa	0.2	1.3	0.2	6.6	1.0	4.2	0.3	
Algeria	0.0	-3.0	0.0		0.0	0.3		
Egypt	0.0		0.1	5.1	0.7	5.4	0.0	
Libya	0.0	3.8			0.0	2.0		
Morocco	0.1	2.8	0.0	3.7	0.1	2.5	0.2	5.0
Tunisia	0.0	4.4	0.1		0.2	7.3		
Sub-Saharan Africa	8.3	2.2	2.6		2.8		2.5	
Angola	0.0	-5.2	0.0		0.0	-100.0	0.0	
Benin	0.1	4.9						
Botswana								
Burkina Faso	0.0							
Burundi	0.1							
Cameroon	0.8	4.5	0.1	4.5	0.0		0.0	
Cape Verde								
Central African Republic	0.1	1.9	0.0					
Chad	0.0							
Comoros								
Congo	0.2	3.6	0.1	3.9	0.0			
Côte d'Ivoire	0.5	2.9	0.5	10.2				
Congo, Dem. Rep.	0.1	-1.8	0.0	-4.5	0.0	3.3		
Djibouti								
Equatorial Guinea	0.0	-2.6	0.0					
Eritrea								
Ethiopia	0.0		0.1		0.1			
Gabon	0.2	4.3	0.3	2.6				
Gambia	0.0							
Ghana	0.5	0.4	0.4	8.3				
Guinea	0.0	1.2	0.0					
Guinea-Bissau	0.0	1.4						
Kenya	0.1	2.2	0.1		0.0	-100.0	0.0	
Lesotho								
Liberia	0.1	1.2	0.0					
Madagascar	0.1	1.7	0.0		0.0		0.0	
Malawi	0.0	2.9	0.0					
Mali	0.0	0.7						
Mauritania	0.0		0.0		0.0			
Mauritius	0.0	-0.3	0.0		0.0		0.0	
Mozambique	0.2	1.0	0.0	-0.8	0.0			
Namibia								
Niger	0.0							
Nigeria	2.0	3.5	0.1	3.3	0.0		0.0	
Rwanda	0.1		0.0					
Senegal	0.0	0.3			0.0			
Seychelles	0.0		0.0		0.0		0.0	
Sierra Leone	0.0	-1.3						
Somalia	0.0	2.1	0.0					
Sudan	0.1	1.9	0.0		0.0			
South Africa	1.9	1.8	0.7	4.1	2.5	5.3	2.3	4.5
Swaziland	0.1	2.5	0.0		0.0		0.0	0.9
Tanzania, Utd. Rep.	0.0	-2.9	0.0	5.1	0.0		0.1	
Togo	0.0	6.5	0.0					
Uganda	0.1	2.2	0.0	4.0	0.0			
Zambia	0.2	3.4	0.0		0.0			
Zimbabwe	0.6	4.9	0.1		0.1	5.2	0.0	5.2

TABLE 55: Forestry production: finished products (continued)

	Production of selected forest products							
	sawnwood		wood-based panels		paper and paperboard		wood pulp	
	million m ³	% p.a.	million m ³	% p.a.	million tonnes	% p.a.	million tonnes	% p.a.
	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010
ASIA	84.9	2.8	137.3	11.4	146.9	8.0	18.1	
Central Asia	0.2		0.1		0.2		0.0	
Kazakhstan	0.1		0.1		0.2		0.0	
Kyrgyzstan	0.1				0.0			
Tajikistan	0.0		0.0		0.0		0.0	
Turkmenistan								
Uzbekistan	0.0		0.0		0.0		0.0	
East Asia	60.6	2.5	125.8	11.9	127.6	8.1	15.4	
Brunei Darussalam	0.1	3.0						
Cambodia	0.0	-3.8	0.0	4.3	0.0	-100.0		
China	37.7	2.5	103.7	13.1	96.5	7.7	7.5	4.9
Indonesia	4.2	1.8	4.6	16.4	11.5	15.5	5.7	
Korea, DPR	0.3	0.0			0.1	0.6	0.1	
Korea, Republic of	3.8	4.7	3.5	9.3	11.1	11.0	0.5	6.4
Lao, PDR	0.1	6.1	0.0					
Malaysia	4.3	2.0	6.9	13.9	1.6		0.1	
Mongolia	0.3	1.4	0.0					
Myanmar	1.6	2.5	0.1	11.2	0.0		0.0	
Philippines	0.4	-2.1	0.5	2.0	1.1	5.3	0.2	6.6
Singapore	0.0	5.9	0.4		0.1			
Thailand	2.9	2.4	5.4	11.8	4.3	14.5	1.0	
Viet Nam	5.0	5.0	0.6		1.3	11.6	0.3	
South Asia	17.7	3.8	4.7	8.3	11.9	6.5	2.7	8.6
Afghanistan	0.4	1.9	0.0					
Bangladesh	0.4	0.6	0.0		0.1	-0.2	0.0	1.2
Bhutan	0.0		0.0		0.0			
India	14.8	4.4	3.0	7.6	10.3	6.6	2.3	10.4
Iran (Islamic Rep.)	0.0	-2.6	0.9		0.4	9.5	0.2	
Maldives								
Nepal	0.6	2.0	0.1		0.0			
Pakistan	1.4	5.4	0.5	11.7	1.1	8.6	0.1	6.6
Sri Lanka	0.1	-1.3	0.2	5.9	0.0	3.6	0.0	
West Asia	6.3		6.7		7.1		0.1	
Armenia	0.0		0.0		0.0		0.0	
Azerbaijan	0.0		0.0		0.0		0.0	
Bahrain					0.0			
Cyprus	0.0	-3.7	0.0		0.0		0.0	
Georgia	0.1		0.0		0.0		0.0	
Iraq	0.0	2.5	0.0		0.0			
Jordan					0.1			
Kuwait					0.1			
Lebanon	0.0	0.9	0.0	0.8	0.1	8.5		
Occupied Palestinian Territory								
Saudi Arabia					1.1			
Syrian Arab Republic	0.0	1.1	0.0	1.8	0.1			
Turkey	6.2	4.4	6.6	10.9	5.3	9.5	0.1	1.0
United Arab Emirates					0.3			
Yemen					0.0			
LATIN AMERICA & THE CARIBBEAN	43.0	2.6	16.6	7.1	20.7	5.2	21.1	
Argentina	2.2	2.1	1.2	5.8	1.5	2.8	0.7	5.5
Bahamas	0.0	-3.1						
Barbados					0.0			
Belize	0.0	-0.7						
Bolivia (Plur. State)	0.5	5.8	0.0	11.7	0.0	-100.0		
Brazil	25.1	2.8	9.6	7.5	9.8	6.1	14.5	8.2
Chile	6.4	4.1	2.7	10.5	1.2	4.8	4.1	7.1
Colombia	0.5	-1.4	0.3	4.2	1.1	6.0	0.2	
Costa Rica	0.5	1.4	0.1	5.0	0.0	4.2	0.0	

TABLE 55: Forestry production: finished products (continued)

	Production of selected forest products							
	sawnwood		wood-based panels		paper and paperboard		wood pulp	
	million m ³	% p.a.	million m ³	% p.a.	million tonnes	% p.a.	million tonnes	% p.a.
	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010	2010	growth: 1961-2010
Cuba	0.2	1.1	0.1		0.0	-3.0		
Dominica	0.0							
Dominican Republic	0.0	-4.0			0.1	10.7		
Ecuador	0.5	1.0	0.6		0.2	12.6	0.0	
El Salvador	0.0	0.6			0.1	9.7		
French Guiana	0.0	2.8	0.0					
Grenada								
Guatemala	0.4	2.6	0.1	5.9	0.0	5.1		
Guyana	0.1	0.2	0.0	5.0				
Haiti	0.0	-1.0						
Honduras	0.3	-1.2	0.0	2.3	0.1		0.0	
Jamaica	0.1		0.0		0.0			
Mexico	3.6	2.7	0.8	5.1	5.4	5.5	0.3	1.3
Netherlands Antilles								
Nicaragua	0.1	-1.9	0.0	-0.8				
Panama	0.0	-1.4	0.0	1.9	0.0	-100.0		
Paraguay	0.6	5.1	0.2	9.1	0.0	7.4		
Peru	0.6	3.4	0.1		0.2	2.5	0.0	
St. Kitts & Nevis								
St. Lucia								
St. Vincent & Grenadines								
Suriname	0.1	0.7	0.0	-5.6				
Trinidad & Tobago	0.0	-1.6	0.0					
Uruguay	0.3	3.3	0.2	6.9	0.1	2.2	1.1	15.4
Venezuela (Boliv. Rep. of)	0.9	3.8	0.7	8.7	0.8	4.3	0.1	
OCEANIA	0.2	2.2	0.1					
Fiji	0.1	2.6	0.0					
French Polynesia								
New Caledonia	0.0	-0.8						
Papua New Guinea	0.1	1.3	0.1	4.5				
Samoa	0.0	4.8	0.0					
Solomon Islands	0.0	5.0	0.0					
Tonga	0.0							
Vanuatu	0.0							
DEVELOPED REGIONS	254.2	0.8	126.3	3.6	228.4	2.6	126.4	1.7
NORTH AMERICA	97.3	0.6	43.2	2.6	88.5	1.7	68.9	1.5
Bermuda								
Canada	38.7	2.0	9.9	3.9	12.7	1.0	18.9	1.2
United States of America	58.6	0.0	33.3	2.3	75.8	1.9	50.0	1.6
ASIA & OCEANIA	18.2	-1.2	7.9	2.7	31.8	3.4	12.3	2.0
Australia	5.1	0.8	1.8	4.0	3.2	3.7	1.3	2.6
Israel	0.0		0.2	2.2	0.4	4.9	0.0	
Japan	9.4	-2.2	4.4	1.9	27.4	3.4	9.5	1.7
New Zealand	3.7	1.7	1.5	6.9	0.9	3.2	1.6	3.6
EUROPE	138.7	-0.5	75.1	4.1	108.0	3.1	45.2	1.5
Albania	0.0	-6.0	0.0	0.0	0.0		0.0	
Belarus	2.6		0.5		0.6		0.1	
Bosnia & Herzegovina	0.8		0.0		0.1		0.0	
Croatia	0.7		0.2		0.6		0.1	
European Union	100.4	1.0	60.7	4.4	94.6	3.4	36.9	1.8
Iceland	0.0		0.0		0.0		0.0	
Macedonia, FYR	0.0		0.0		0.0		0.0	
Montenegro	0.1		0.0		0.2		0.0	
Norway	2.1	0.6	0.6	2.2	1.7	1.5	2.0	0.6
Republic of Moldova	0.0		0.0		0.1		0.0	
Russian Federation	28.3		10.2		7.3		5.9	
Serbia	0.6		0.2		0.4		0.0	
Switzerland	1.5	0.4	1.0	3.7	1.6	2.3	0.1	-1.4
Ukraine	1.7		1.8		0.9		0.0	

Definitions and sources

Parties to the Cartagena Protocol on Biosafety

P4. ENV. CBD. GMO. CBP 

Page: map 68 (p. 314).

Countries which have deposited instruments of ratification, acceptance, approval or accession with the Depositary of the Cartagena Protocol on Biosafety, assumed by the Secretary General of the United Nations.

Source: www.cbd.int

Owner: Convention on Biological Diversity

Average precipitation in depth

P4. ENV. FAO. ACQ. CLIM. APD 

Page: map 63 (p. 302).

Long-term average (over space and time) of annual endogenous precipitation (produced in the country) in depth.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Area under bioenergy crops

P4. ENV. FAO. BIO. BF. HA

Page: chart 120 (p. 317).

The assumed land area required to produce a given annual quantity of biofuel production.

Source: Based on IEA biofuel production data

Owner: FAO

Cotton production

P4. ENV. FAO. BIO. CT. QP 

Page: map 70 (p. 319).

The production of fibres from vegetal origin, excluding cotton. This definition covers all fibres extracted from the stems of dicotyledonous plants, including ramie, flax, hemp, sisal, other agaves, abaca, coir, jute and kenaf.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Energy use by agriculture

P4. ENV. FAO. BIO. ENGY. AG 

Page: table 52 (p. 334).

Energy use is indicated by the annual use of energy at farm level by fuel type (GJ/ha), and the energy used to produce mineral fertilisers for agricultural use (GJ/ha).

Source: Statistics Division (FAOSTAT)

Owner: IEA

Energy use by agriculture as a share of total energy use

P4. ENV. FAO. BIO. ENGY. AGS 

Page: table 52 (p. 334).

Energy use is indicated by the annual use of energy at farm level by fuel type (GJ/ha), and the energy used to produce mineral fertilisers for agricultural use (GJ/ha), expressed as a ratio of total energy use.

Source: Statistics Division (FAOSTAT)

Owner: IEA

Share of feedstocks used in bioenergy production

P4. ENV. FAO. BIO. FD. FDSTK

Page: chart 123 (p. 319).

Estimated shares of commodity globally used in non-food sectors, including industrial renewable materials and bioenergy.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Greenhouse gas emissions by agriculture

P4. ENV. FAO. BIO. GHG. AG 

Page: table 51 (p. 331), chart 112 (p. 304).

Greenhouse gas emissions by agriculture: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Emissions from agricultural transport and energy use are excluded, as these sectors are not defined as part of the agriculture sector by the current IPCC guidance.

Source: Statistics Division (FAOSTAT)

Owner: UNFCCC

Contribution of the agricultural sector to total greenhouse gases

P4. ENV. FAO. BIO. GHG. AGS 

Page: table 51 (p. 331).

Contribution of the agricultural sector to total greenhouse gases: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Emissions from agricultural transport and energy use are excluded, as these sectors are not defined as part of the agriculture sector by the current IPCC guidance.

Source: Statistics Division (FAOSTAT)

Owner: UNFCCC

Production of industrial roundwood

P4. ENV. FAO. BIO. IR. QP 

Page: table 54 (p. 340).

The wood removed (volume of roundwood under bark) for production of goods and services other than energy production (woodfuel). It represents the sum of: sawlogs and veneer logs; pulpwood, round and split; and other industrial roundwood. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Natural fibre production

P4. ENV. FAO. BIO. NF. QP 

Page: table 53 (p. 337), chart 122 (p. 318).

Figures relate to the total domestic production whether inside or outside the agricultural sector, i.e. it includes non-commercial production and production from kitchen gardens. Unless otherwise indicated, production is reported at the farm level for crop and livestock products (i.e. in the case of crops, excluding harvesting losses) and in terms of live weight for fish items (i.e. the actual ex-water weight at the time of the catch). Natural fibre crops include Agave Fibres Nes, Cotton lint, Fibre

Crops Nes, Flax fibre and tow, Hemp Tow Waste, Jute, Manila Fibre (Abaca), Other Bastfibres, Ramie, Seed cotton and Sisal. .

Source: Statistics Division (FAOSTAT)

Owner: FAO

Organic agriculture area

P4.ENV.FAO.BIO.ORGAN.HA 

Page: chart 116, 117 (p. 309, 311), map 65 (p. 308).

Part of the area of the "Permanent crops" exclusively dedicated to organic agriculture (or which is going through the organic conversion process) and managed by applying organic agriculture methods. It is the portion of land area managed (cultivated) or wild harvested in accordance with specific organic standards or technical regulations and that has been inspected and approved by a certification body. Data are from FiBL (Research Institute of Organic Agriculture) and International Federation of Organic Agriculture Movements (IFOAM) (2011). Data Tables from the FiBL-IFOAM Survey on Organic Agriculture Worldwide. The Organic World Website (www.organic-world.net) published by the Research Institute of Organic Agriculture (FiBL), Frick, Switzerland. Available at <http://www.organic-world.net/statistics-data-tables.html>.

Source: Statistics Division (FAOSTAT)

Owner: FAO-FiBL-IFOAM

Organic agriculture (share of total area)

P4.ENV.FAO.BIO.ORGAN.SHA 

Page: table 53 (p. 337), map 66 (p. 310).

Organic agriculture area expressed as share of total area. Data are from FiBL (Research Institute of Organic Agriculture) and International Federation of Organic Agriculture Movements (IFOAM) (2011). Data Tables from the FiBL-IFOAM Survey on Organic Agriculture Worldwide. The Organic World Website (www.organic-world.net) published by the Research Institute of Organic Agriculture (FiBL), Frick, Switzerland. Available at <http://www.organic-world.net/statistics-data-tables.html>.

Source: Statistics Division (FAOSTAT)

Owner: FAO-FiBL-IFOAM

Production of paper and paperboard

P4.ENV.FAO.BIO.PP.QP 

Page: table 55 (p. 343).

The sum of Paper and Paperboard, Newsprint, Paper and Paperboard other than Newsprint, Printing and Writing Paper, Other Paper and Paperboard, Household and Sanitary Paper, Wrapping and Packaging Paper and Paperboard and Other Paper and Paperboard Not Elsewhere Specified. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of recovered paper

P4.ENV.FAO.BIO.RP.QP 

Page: table 53 (p. 337).

Waste and scraps of paper or paperboard that have been collected for re-use as a raw material for the manufacture of paper and paperboard. It includes: paper and paperboard that has been used for its original purpose and residues from paper and paperboard production. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of roundwood

P4.ENV.FAO.BIO.RW.QP 

Page: table 54 (p. 340).

All roundwood felled or otherwise harvested and removed. It comprises all wood obtained from removals, i.e. the quantities removed from forests and from trees outside the forest, including wood recovered from natural, felling and logging losses during the period, calendar year or forest year. It includes: all wood removed with or without bark, including wood removed in its round form, or split, roughly squared or in other form (e.g. branches, roots, stumps and burls (where these are harvested) and wood that is roughly shaped or pointed. In the production statistics, it represents the sum of: wood fuel, including wood for charcoal; sawlogs and veneer logs; pulpwood, round and split; and other industrial roundwood. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of sawnwood

P4.ENV.FAO.BIO.SW.QP 

Page: table 55 (p. 343).

Wood that has been produced from both domestic and imported roundwood, either by sawing lengthways or by a profile-chipping process and that, with a few exceptions, exceeds 5 mm in thickness. It includes: planks, beams, joists, boards, rafters, scantlings, laths, boxboards, sleepers and "lumber", etc., in the following forms: unplaned, planed, grooved, tongued, fingerjointed, chamfered, rabbeted, V-jointed, beaded, etc. It excludes: wooden flooring. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of wood-based panels

P4.ENV.FAO.BIO.WBP.QP 

Page: table 55 (p. 343).

The wood-based panels category is an aggregate category. In the production and trade statistics, it represents the sum of: veneer sheets, plywood, particle board, and

fibreboard. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of woodfuel

P4.ENV.FAO.BIO.WF.QP 

Page: table 54 (p. 340).

Roundwood that will be used as fuel for purposes such as cooking, heating or power production. It includes: wood harvested from main stems, branches and other parts of trees (where these are harvested for fuel) and wood that will be used for charcoal production (e.g. in pit kilns and portable ovens). The volume of roundwood used in charcoal production, is estimated by using a factor of 6.0 to convert from the weight (MT) of charcoal produced to the solid volume (CUM) of roundwood used in production. It is reported in cubic metres underbark (i.e. excluding bark). See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Production of wood pulp

P4.ENV.FAO.BIO.WP.QP 

Page: table 55 (p. 343).

Wood pulp is a fibrous material prepared from pulpwood, wood chips, particles, residues or recovered paper by mechanical and/or chemical process for further manufacture into paper, paperboard, fibreboard or other cellulose products. In the production and trade statistics, it represents the sum of: mechanical wood pulp; semi-chemical wood pulp; chemical wood pulp; and dissolving wood pulp. See <http://www.fao.org/forestry/62283/en/> for further information.

Source: Forestry Department (foresSTAT)

Owner: FAO

Cereal harvested area

P4.ENV.FAO.CC.CE.AH

Page: chart 114 (p. 305).

Data refer to the area from which cereal crops are gathered. Area harvested, therefore, excludes the area from which, although sown or planted, there was no harvest due to damage, failure, etc. If the crop under consideration is harvested more than once during the year as a consequence of successive cropping (i.e. the same crop is sown or planted more than once in the same field during the year), the area is counted as many times as harvested.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Cereal crop production

P4.ENV.FAO.CC.CE.QP

Page: chart 114 (p. 305).

Cereal crop production data refer to the actual harvested production from the field, excluding harvesting

losses and that part of crop not harvested for any reason. Production therefore includes the quantities of the commodity sold in the market (marketed production) and the quantities consumed or used by the producers (auto-consumption). When the production data available refers to a production period falling into two successive calendar years and it is not possible to allocate the relative production to each of them, it is usual to refer production data to that year into which the bulk of the production falls. Cereals include Wheat, Rice Paddy, Barley, Maize, Popcorn, Rye, Oats, Millets, Sorghum, Buckwheat, Quinoa, Fonio, Triticale, Canary Seed, Mixed Grain and Cereals Nes.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Long-term cereal yield variability

P4.ENV.FAO.CC.CE.YLD 


Page: chart 114 (p. 305).

Harvested production per unit of harvested area for cereals. Cereals include Wheat, Paddy Rice, Barley, Maize, Popcorn, Rye, Oats, Millet, Sorghum, Buckwheat, Quinoa, Fonio, Triticale, Canary seed, Mixed grain and Cereals, nes.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Long-term maize yield variability

P4.ENV.FAO.CC.MZ.YLD 

Page: chart 113 (p. 305).

Harvested production per unit of harvested area for maize crops. A grain with a high germ content. Includes white and yellow maize. .

Source: Statistics Division (FAOSTAT)

Owner: FAO

Land use change: cropland

P4.ENV.FAO.ESS.LAND.CROP 

Page: table 48 (p. 322), chart 100 (p. 288).

Change in arable land and permanent crops, where this land category is the sum of areas under "Arable land" and "Permanent crops".

Source: Statistics Division (FAOSTAT)

Owner: FAO

Land use change: pasture

P4.ENV.FAO.ESS.LAND.FOST 

Page: table 48 (p. 322), chart 100 (p. 288).

Change in forest land, where such land spans more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

Source: Statistics Division (FAOSTAT)

Owner: FAO

Land use change: forestryP4. ENV. FAO. ESS. LAND. PAST *Page:* table 48 (p. 322), chart 100 (p. 288).

Change in permanent meadows and pastures, where such land is used permanently (five years or more) to grow herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land).

Source: Statistics Division (FAOSTAT)*Owner:* FAO**Carbon stock in living forest biomass**P4. ENV. FAO. FOR. LCF. CSFO *Page:* table 48 (p. 322), chart 103 (p. 289).

Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage; and carbon biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Average annual rate of deforestation**P4. ENV. FAO. FOR. LCF. DEF *Page:* table 48 (p. 322), chart 99 (p. 287).

Rate of net loss of forest area.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Forest area**P4. ENV. FAO. FOR. LCF. FHA *Page:* table 48 (p. 322).

Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Forest area as % of total land area**P4. ENV. FAO. FOR. LCF. FOA *Page:* map 56 (p. 289).

Forest area expressed as a percentage of total land area. Land area is the total area of the country excluding area under inland water bodies. Possible variations in the data may be due to updating and revisions of the country data and not necessarily to any change of area.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Forest characteristics**P4. ENV. FAO. FOR. LCF. FOC *Page:* table 49 (p. 325), chart 101 (p. 288).

Naturally regenerated forest is forest predominantly composed of trees established through natural regeneration. Primary forest is naturally regenerated forest of

native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. Other naturally regenerated forest is forest where there are clearly visible indications of human activities. Planted forest is forest predominantly composed of trees established through planting and/or deliberate seeding.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Forest characteristics by region**

P4. ENV. FAO. FOR. LCF. FOCx

Page: chart 101 (p. 288).

Naturally regenerated forest is forest predominantly composed of trees established through natural regeneration. Primary forest is naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. Other naturally regenerated forest is forest where there are clearly visible indications of human activities. Planted forest is forest predominantly composed of trees established through planting and/or deliberate seeding.

Source: Global Forest Resources Assessment 2010*Owner:* FAO**Primary designated functions of forest**P4. ENV. FAO. FOR. LCF. PFF *Page:* table 49 (p. 325), chart 102 (p. 289).

The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use. Protected areas - areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means; Production - Forest area designated primarily for production of wood, fibre, bioenergy and/or non-wood forest products; Protection of soil and water - Forest area designated primarily for protection of soil and water; Conservation of biodiversity - Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas; Social services - Forest area designated primarily for social services; Multiple use - Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function; and Other - Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.

Source: Global Forest Resources Assessment 2010*Owner:* FAO

Global distribution of risks associated with main agricultural production systems

P4.ENV.FAO.FOR.LCF.SOLAW

Page: map 54 (p. 284).

See FAO (2011d) State of the World's Land and Water Resources for Food and Agriculture (SOLAW).

Source: Natural Resources and Environment Department
Owner: FAO

Average soil quality

P4.ENV.FAO.FOR.LCF.SQ 

Page: table 48 (p. 322), map 55 (p. 286).

Carbon content in the topsoil, average - Percentage in weight (%). Soils with organic carbon content less than 1% in weight are generally affected by soil degradation processes and erosion. On the other hand, soils with 1-10% organic carbon content have high agricultural value. .

Source: Statistics Division (FAOSTAT)

Owner: FAO, IIASA, ISRIC, ISSCAS, and JRC: Harmonized World Soil Database

Total water withdrawal

P4.ENV.FAO.NRL.WAT.TWW 

Page: table 50 (p. 328).

Annual quantity of water withdrawn for agricultural, industrial and municipal purposes. It includes renewable freshwater resources as well as potential over-abstraction of renewable groundwater or withdrawal of fossil groundwater and potential use of desalinated water or treated wastewater. It does not include in stream uses, which are characterized by a very low net consumption rate, such as recreation, navigation, hydropower, inland capture fisheries, etc.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Total water withdrawal per capita (m³/inhab/yr)

P4.ENV.FAO.NRL.WAT.TWWpc 

Page: table 50 (p. 328), map 57 (p. 290).

Total annual amount of water withdrawn per capita.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Agricultural water withdrawal

P4.ENV.FAO.NRL.WAT.WWA 


Page: table 50 (p. 328).

Annual quantity of water withdrawn for irrigation, livestock and aquaculture purposes. It includes renewable freshwater resources as well as over-abstraction of renewable groundwater or withdrawal of fossil groundwater, use of agricultural drainage water, (treated) wastewater and desalinated water. .

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Water withdrawal % by agriculture

P4.ENV.FAO.NRL.WAT.WWaperc 

Page: table 50 (p. 328).

Agricultural water withdrawal as percentage of total water withdrawal.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Share of freshwater resources withdrawn

P4.ENV.FAO.NRL.WAT.WWfr 


Page: table 50 (p. 328), chart 104 (p. 291).

Total freshwater withdrawn in a given year, expressed in percentage of the actual total renewable water resources (TRWR_actual). This parameter is an indication of the pressure on the renewable water resources.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Share of freshwater resources withdrawn by agriculture

P4.ENV.FAO.NRL.WAT.WWfrag 

Page: table 50 (p. 328), map 58 (p. 292).

Water withdrawn for irrigation in a given year, expressed in percent of the total actual renewable water resources (TRWR_actual). This parameter is an indication of the pressure on the renewable water resources caused by irrigation.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Industrial water withdrawal

P4.ENV.FAO.NRL.WAT.WWI 


Page: table 50 (p. 328).

Annual quantity of water withdrawn for industrial uses. It includes renewable water resources as well as potential over-abstraction of renewable groundwater or withdrawal of fossil groundwater and potential use of desalinated water or treated wastewater. This sector refers to self-supplied industries not connected to the public distribution network. The ratio between net consumption and withdrawal is estimated at less than 5%. It includes water for the cooling of thermoelectric plants, but it does not include hydropower. .

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Water withdrawal % by industry

P4.ENV.FAO.NRL.WAT.WWIperc 

Page: table 50 (p. 328).


Industrial water withdrawal as percentage of total water withdrawal.

Source: Land and Water Division (AQUASTAT)

Owner: FAO

Municipal water withdrawalP4. ENV. FAO. NRL. WAT. WWM *Page:* table 50 (p. 328).

Annual quantity of water withdrawn primarily for the direct use by the population. It includes renewable freshwater resources as well as potential over-abstraction of renewable groundwater or withdrawal of fossil groundwater and the potential use of desalinated water or treated wastewater. It is usually computed as the total water withdrawn by the public distribution network. It can include that part of the industries, which is connected to the municipal network. The ratio between the net consumption and the water withdrawn can vary from 5 to 15% in urban areas and from 10 to 50% in rural areas.

Source: Land and Water Division (AQUASTAT)*Owner:* FAO**Water withdrawal % by the municipal sector**P4. ENV. FAO. NRL. WAT. WWMperc *Page:* table 50 (p. 328).

Municipal water withdrawal as percentage of total water withdrawal.

Source: Land and Water Division (AQUASTAT)*Owner:* FAO**Saline soils**

P4. ENV. FAO. POL. SAL

Page: chart 105 (p. 293).

Saline soils are those which have an electrical conductivity of the saturation soil extract of more than 4 dS/m at 25°C. This value is generally used the world over although the terminology committee of the Soil Science Society of America has lowered the boundary between saline and non-saline soils to 2 dS/m in the saturation extract. Soluble salts most commonly present are the chlorides and sulphates of sodium, calcium and magnesium. Nitrates may be present in appreciable quantities only rarely. Sodium and chloride are by far the most dominant ions, particularly in highly saline soils, although calcium and magnesium are usually present in sufficient quantities to meet the nutritional needs of crops. Many saline soils contain appreciable quantities of gypsum (CaSO₄, 2H₂O) in the profile. Soluble carbonates are always absent. The pH value of the saturated soil paste is always less than 8.2 and more often near neutrality.

Source: Natural Resources and Environment Department*Owner:* FAO**Biofuel production**P4. ENV. IEA. BIO. BF. QP *Page:* table 53 (p. 337), chart 121 (p. 318), map 69 (p. 316).

Sum of ethanol and biodiesel production, reported in kilotonne of oil equivalent.

Source: Energy Balances of OECD Countries and Energy Balances of Non-OECD Countries, 2011 editions*Owner:* IEA**CO₂ concentration**

P4. ENV. IPCC. CC. CO2

Page: chart 111 (p. 304).

Data are reported as a dry air mole fraction defined as the number of molecules of carbon dioxide divided by the number of all molecules in air, including CO₂ itself, after water vapour has been removed. The mole fraction is expressed as parts per million (ppm).

Source: Global Climate Change: key indicators*Owner:* NASA**Global surface temperature (time series)**

P4. ENV. IPCC. CC. GST

Page: chart 109 (p. 301).

The global surface temperature is an estimate of the global mean surface air temperature. However, for changes over time, only anomalies, as departures from a climatology, are used, most commonly based on the area weighted global average of the sea surface temperature anomaly and land surface air temperature anomaly.

Source: IPCC Data Distribution Centre*Owner:* IPCC**Global surface temperature (current)**

P4. ENV. IPCC. CC. GSTG

Page: map 62 (p. 300).

The global surface temperature is an estimate of the global mean surface air temperature. However, for changes over time, only anomalies, as departures from a climatology, are used, most commonly based on the area weighted global average of the sea surface temperature anomaly and land surface air temperature anomaly.

Source: IPCC Data Distribution Centre*Owner:* IPCC**Genetically modified plants**

P4. ENV. ISAAA. BIO. GM. CROPS

Page: table 119 (p. 315).

Genetically modified (GM) crops that have been approved as shown in the ISAAA Approval Database. According to the ISAAA, they include species for commercialization and planting and/or for import for food and feed use. Entries in the database are sourced principally from Biotechnology Clearing House of approving countries and from country regulatory websites. See <http://www.isaaa.org/> for further information. In the absence of verification, FAO does not necessarily endorse these data.

Source: Clive James, Global Status of Commercialized Biotech and GM Crops: 2010*Owner:* International Service for the Acquisition of Agri-biotech Applications (ISAAA)**Area under GM crops (time series of economic regions)**P4. ENV. ISAAA. BIO. GM. HA *Page:* map 67 (p. 312).

Data refer to the area from which genetically modified (GM) crops are gathered. See <http://www.isaaa.org/> for

further information. In the absence of verification, FAO does not necessarily endorse these data.

Source: Clive James, *Global Status of Commercialized Biotech and GM Crops: 2010*

Owner: International Service for the Acquisition of Agri-biotech Applications (ISAAA)

Area under GM crops (current)

P4 . ENV . ISAAA . BIO . GM . RHA

Page: chart 118 (p. 313).

Data refer to the regions from which genetically modified (GM) crops are gathered. See <http://www.isaaa.org/> for further information. In the absence of verification, FAO does not necessarily endorse these data.

Source: Clive James, *Global Status of Commercialized Biotech and GM Crops: 2010*

Owner: International Service for the Acquisition of Agri-biotech Applications (ISAAA)

Sahel rainfall anomalies

P4 . ENV . JISAO . CLIM . SAHEL

Page: chart 110 (p. 303).

The Sahel is the ecoclimatic and biogeographic zone of transition between the Sahara desert in the North and the Sudanian Savannas in the south, covering from (west to east) Senegal, southern Mauritania, Mali, Burkina Faso, southern Algeria, Niger, northern Nigeria, Chad, Sudan (including Darfur and the southern part of Sudan), northern Ethiopia and Eritrea. The Sahel rainy season is centered on June through October, and the means are taken for those months. Documentation of the Sahel precipitation climatology, and additional analyses of the variability are provided on <http://jisao.washington.edu/data/sahel/>.

Source: JISAO data (<http://jisao.washington.edu/data/sahel/>)

Owner: Joint Institute for the Study of the Atmosphere and Ocean (JISAO)

Land with rainfed crop potential

P4 . ENV . LND . SUIT

Page: chart 98 (p. 285).

Calculations based on Bruinsma (2011).

Source: Agricultural Development Economics Division

Owner: FAO

Fish species, threatened

P4 . ENV . WBK . WDI . BIOD . FST

Page: chart 115 (p. 307).

Fish species are based on Froese, R. and Pauly, D. (eds). 2008. Threatened species are the number of species classified by the IUCN as endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known.

Source: World Bank (WDI)

Owner: FishBase database, www.fishbase.org

Mammal species, threatened

P4 . ENV . WBK . WDI . BIOD . MST

Page: chart 115 (p. 307).

Mammal species are mammals excluding whales and porpoises. Threatened species are the number of species classified by the IUCN as endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known.

Source: World Bank (WDI)

Owner: UNEP, World Conservation Monitoring Centre and International Union for Conservation of Nature

Plant species (higher), threatened

P4 . ENV . WBK . WDI . BIOD . PST

Page: chart 115 (p. 307).

Higher plants are native vascular plant species. Threatened species are the number of species classified by the IUCN as endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known.

Source: World Bank (WDI)

Owner: UNEP, World Conservation Monitoring Centre and International Union for Conservation of Nature

Nationally protected areas (% of total area)

P4 . ENV . WBK . WDI . CON . PROT 

Page: table 53 (p. 337), map 64 (p. 306).

Nationally protected areas are totally or partially protected areas of at least 1000 hectares that are designated as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use. Marine areas, unclassified areas, and littoral (intertidal) areas are not included. The data also do not include sites protected under local or provincial law.

Source: World Bank (WDI)

Owner: UNEP, World Conservation Monitoring Centre and International Union for Conservation of Nature

Agricultural methane emissions (% of total)

P4 . ENV . WBK . WDI . POL . AMTHE 

Page: table 51 (p. 331).

Agricultural methane emissions are emissions from animals, animal waste, rice production, agricultural waste burning (nonenergy, on-site), and savannah burning.

Source: World Bank (WDI)

Owner: IEA

Agricultural nitrous oxide emissions (% of total)

P4 . ENV . WBK . WDI . POL . ANOE 

Page: table 51 (p. 331).

Agricultural nitrous oxide emissions are emissions produced through fertilizer use (synthetic and animal manure), animal waste management, agricultural waste burning (nonenergy, on-site), and savannah burning.

Source: World Bank (WDI)

Owner: IEA

Methane emissions (kt of CO₂ equivalent)P4. ENV. WBK. WDI. POL. MTHE *Page:* table 51 (p. 331), chart 106 (p. 295).

Methane emissions are those stemming from human activities such as agriculture and from industrial methane production.

Source: World Bank (WDI)*Owner:* IEA**Agricultural methane emissions, total**P4. ENV. WBK. WDI. POL. MTHEA *Page:* chart 106 (p. 295), map 59 (p. 294).

Agricultural methane emissions are emissions from animals, animal waste, rice production, agricultural waste burning (nonenergy, on-site), and savannah burning.

Source: World Bank (WDI)*Owner:* IEA**Nitrous oxide emissions (thousand metric tons of CO₂ equivalent)**P4. ENV. WBK. WDI. POL. NOE *Page:* table 51 (p. 331), chart 107 (p. 297).

Nitrous oxide emissions are emissions from agricultural biomass burning, industrial activities, and livestock management.

Source: World Bank (WDI)*Owner:* IEA**Agricultural nitrous oxide emissions, total**P4. ENV. WBK. WDI. POL. NOEA *Page:* chart 107 (p. 297), map 60 (p. 296).

Agricultural nitrous oxide emissions are emissions produced through fertilizer use (synthetic and animal manure), animal waste management, agricultural waste burning (nonenergy, on-site), and savannah burning.

Source: World Bank (WDI)*Owner:* IEA**Pollution by industry in total BOD emissions**

P4. ENV. WBK. WDI. POL. WAT

Page: chart 108 (p. 299).

Industry shares of emissions of organic water pollutants refer to emissions from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: food and beverages (31). textiles (32). wood (33). paper and pulp (34). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

Source: World Bank (WDI)*Owner:* World Bank**Water pollution, food industry (% of total BOD emissions)**P4. ENV. WBK. WDI. POL. WATF *Page:* table 52 (p. 334), map 61 (p. 298).

Industry shares of emissions of organic water pollutants refer to emissions from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: food and beverages (31). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

Source: World Bank (WDI)*Owner:* World Bank**Water pollution, paper and pulp industry (% of total BOD emissions)**P4. ENV. WBK. WDI. POL. WATO *Page:* table 52 (p. 334).

Industry shares of emissions of organic water pollutants refer to emissions from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: paper and pulp (34). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

Source: World Bank (WDI)*Owner:* World Bank**Water pollution, textile industry (% of total BOD emissions)**P4. ENV. WBK. WDI. POL. WATT *Page:* table 52 (p. 334).

Industry shares of emissions of organic water pollutants refer to emissions from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: textiles (32). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

Source: World Bank (WDI)*Owner:* World Bank**Water pollution, wood industry (% of total BOD emissions)**P4. ENV. WBK. WDI. POL. WATW *Page:* table 52 (p. 334).

Industry shares of emissions of organic water pollutants refer to emissions from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: wood (33). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount

of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

Source: World Bank (WDI)

Owner: World Bank

Urban air pollution

P4. ENV. WHO. GHO. POL. UAP 

Page: table 52 (p. 334).

The mean annual concentration of fine suspended particles of less than 10 microns in diameters is a common measure of air pollution. The mean is a population-weighted average for urban population in cities above 100 000 inhabitants of a country.

Source: Global Health Observatory

Owner: WHO