**Food and Agriculture Organization
of the United Nations**

Land use statistics and indicators

Global, regional and country trends

1990–2019

FAO Statistics Division

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HIGHLIGHTS

→ **In 2019, world total agricultural land was 4.8 billion hectares and about one-third of the global land area. One-third of it was cropland (1.6 billion hectares) while the remaining two-thirds were permanent meadows and pastures that were used for livestock (3.2 billion hectares).**

→ **Agricultural land slightly decreased by 1 percent since 1990, due to a combined 5 percent increase in cropland and a 4 percent decrease in land used for permanent meadows and pastures.**

→ **In 2019, of the two main components of cropland, land used for permanent crops (perennials and tree crops) was 170 million hectares, while arable land (mostly annual crops) was 1.4 billion hectares. Land under permanent crops increased by 50 percent since 1990, whereas arable land area remained constant.**

→ **In 2019, world per capita agricultural land was 0.6 hectares per capita, having decreased by 30 percent since 1990. These figures suggest an increased efficiency of agricultural land use with respect to the needs of a growing population.**

→ **Global forest land area was close to 4.1 billion hectares in 2019, down by 4 percent since 1990.**

→ **World total area equipped for irrigation was 340 million hectares in 2019, 22 percent of cropland area. It increased by 30 percent since 1990. The area under organic agriculture was about 70 million hectares in 2019, and more than three times larger since 2004, the beginning of recording.**

→ **In 2019, regional agricultural land was the largest in Asia (1.7 billion hectares, one-third of which in China alone) and Africa (1.1 billion hectares) on an absolute basis. On a per capita basis, the highest values were in Oceania (9 hectares per capita) and Northern America (1.2 hectares per capita).**

LAND USE AND LAND USE INDICATORS

BACKGROUND

Land – together with agro-climate, topography, vegetation, soils and other natural resources – is the basis for agriculture, and the interaction between these components and human management choices is vital for determining the productivity and sustainability of agro-ecosystems.

Land use statistics describe both the activities undertaken for the purpose of economic production, and more recently for the maintenance and restoration of environmental functions (FAO and UN, 2020). The term "use" implies the existence of some human intervention or management, including the institutional arrangements put in place for administrative purposes. Land in use therefore includes areas that are under the active management of institutional units of a country.

FAO land use classification is an international statistical standard for the World Census of Agriculture, and environmental statistics alike, as well as for the System of Environmental-Economic Accounting (SEEA, see FAO and UN, 2020). Additionally, the FAO land use classification is consistent with the land use classes of the Intergovernmental Panel on Climate Change (IPCC), used by countries for reporting to the United Nations Framework Convention on Climate Change (UNFCCC) (see Explanatory notes for more details on FAO land use categories).

Since the 1950s and in line with the first article of its Constitution, FAO collects annual land use data from countries via a standard Land Use, Irrigation and Agricultural Practices questionnaire, integrated every five years with independent information on forest land area collected via the FAO Global Forest Resources Assessment (FAO, 2020). Resulting Land use statistics and Land use indicators are published in FAOSTAT (FAO, 2021a and 2021b). Together they provide information on the full land use matrix by country.
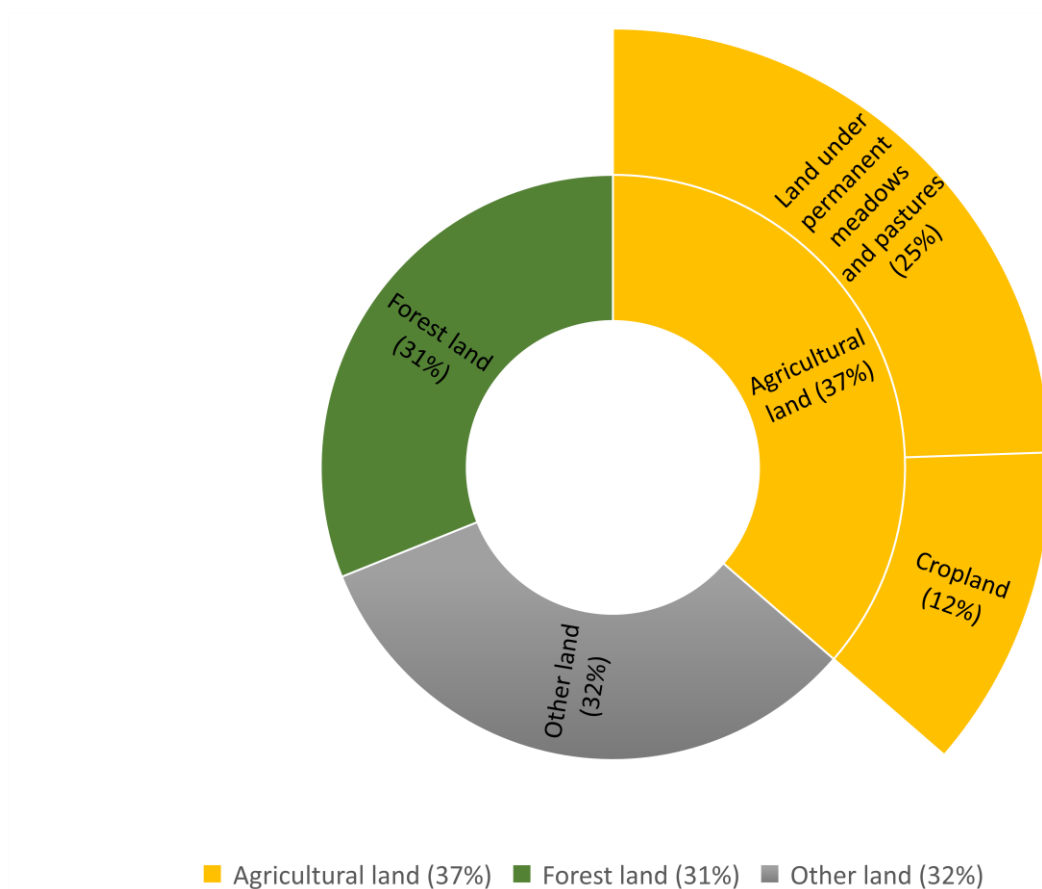
This analytical brief reports the main results and changes over time in land use statistics with a focus on agricultural land uses, including important irrigation and agricultural practices, and with details at the global, regional and country levels during the period 1990–2019.

GLOBAL

The world land area, excluding Antarctica is about 13 billion hectares (ha), reaching 13.5 billion ha if inland waters are included. In 2019, agricultural land, forest land and other land (including for example barren and desert areas, urban land, infrastructure) occupied about one-third each of the total (Figure 1). More specifically, in 2019 agricultural land area was about 4.8 billion ha (37 percent of world land area); forest land 4.1 billion ha; and other land 4.2 billion ha. Within agricultural land, cropland area was 1.6 billion ha (12 percent of world land area), whereas permanent meadows and pastures covered 3.2 billion ha, or one-fourth of the world land area. These global shares remained virtually constant since 1990.

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Figure 1: Global land area composition in 2019

Land under permanent meadows and pastures (25%)

Agricultural land (37%)

Forest land (31%)

Cropland (12%)

Other land (32%)

■ Agricultural land (37%) ■ Forest land (31%) ■ Other land (32%)

Source: FAO, 2021a.

Between 1990 and 2019, the agricultural land area decreased by 1 percent (compared to a 4 percent decrease for forest land). This was the result of an increase until the early 2000s and a reduction afterwards (Figure 2). Likewise, the area of agricultural land per capita decreased over the past several decades. It was 0.6 ha per capita – one-third of which used for cropland – down by 30 percent since 1990 (Figure 2). While the decrease observed in per capita agricultural land since 1990 did not affect total food production during the same period, which in fact increased significantly, the ongoing decreasing trend nonetheless highlights the need for continuous monitoring as a critical indicator of sustainability.
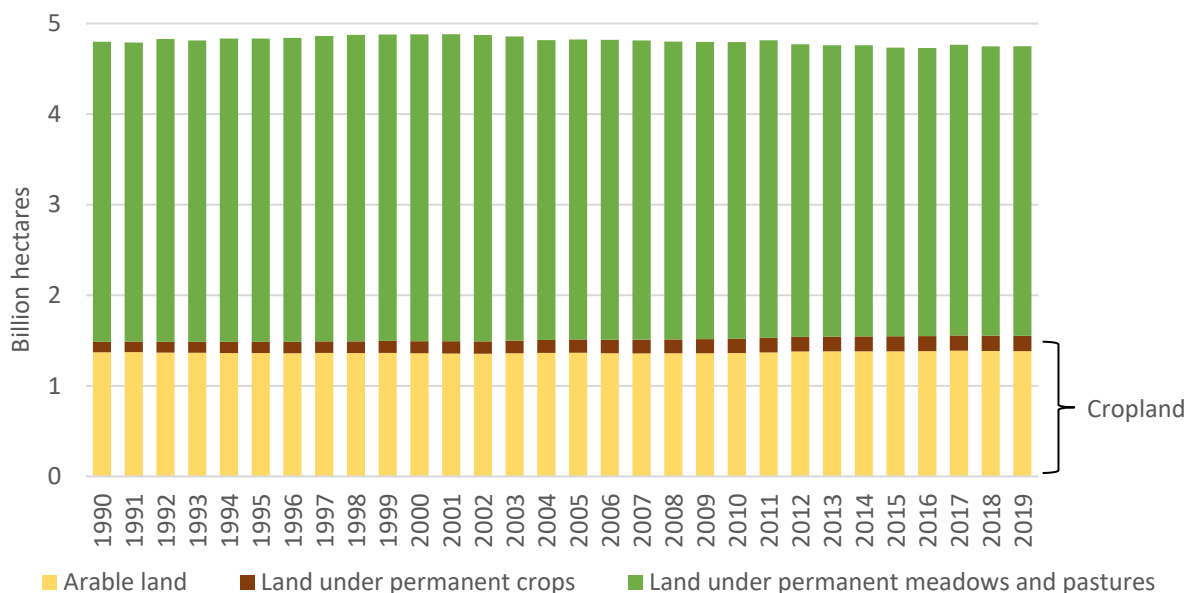
Within agricultural land, cropland area increased by 5 percent during 1990–2019, whereas land area under permanent meadows and pastures decreased by 4 percent. The increase in cropland area was largely due to the area of permanent crops – such as olives, oil palm, cocoa and tea – which increased by nearly 50 percent to reach some 170 million ha in 2019, about one-tenth of total cropland area. Conversely, the area of cropland cultivated with annual/temporary crops did not vary significantly over the period 1990–2019 (Figure 3).

Figure 2: Absolute and per capita values of global agricultural land, 1990–2019
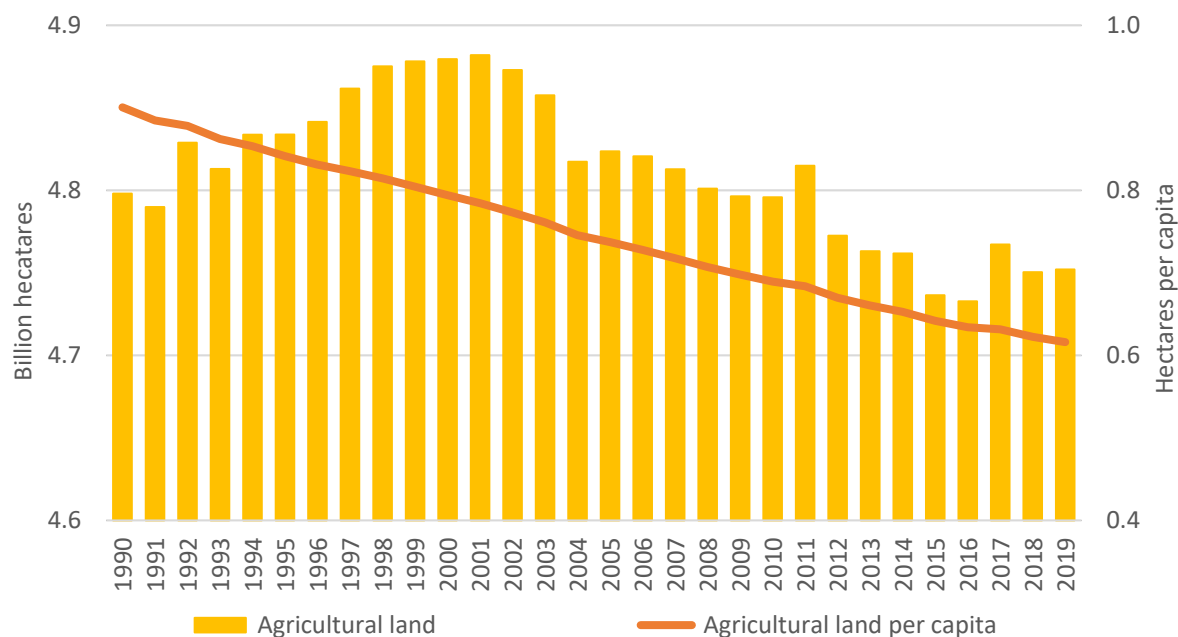
Source: FAO, 2021a and 2021c.

Figure 3: Global agricultural land by component, 1990–2019

Source: FAO, 2021a.

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Inland waters and other land

Averaged over the period 1900–2019, the global annual extent of inland waters was 430 million hectares, close to 3 percent of the total land area.

Other land was about one-third of the global land area and on average 4 billion ha over the period 1990–2019. This category includes the land used for purposes other than agriculture or forestry (for example urban zones or barren areas).

Irrigation and agricultural practices

In 2019, land area equipped for irrigation covered about 340 million hectares, or nearly 22 percent of total cropland area. It increased by 30 percent since 1990. Land area equipped for irrigation does not coincide with the area actually irrigated, for which the associated statistics have insufficient temporal and geographical coverage due to low response rate.

In 2019, the agricultural area under organic agriculture surpassed 72 million ha worldwide, more than triple its value of 22 million ha in 2004, the first year for which these statistics were available. In 2019, the amount of agricultural area under organic practices was 1.5 percent of the global agricultural land and 4 percent of total cropland area. The EU (Eurostat, 2021) reports these statistics as a proxy in reporting on SDG indicator 2.4.1 on sustainable and productive agriculture.

REGIONAL

With nearly 1.7 billion hectares in 2019, Asia was the region with the largest area of agricultural land, one-third of which was located in China. Africa and Latin America (comprising Central and South America) followed with about 1.1 billion ha and nearly 700 million ha respectively. North America and Europe had a similar extent, about 460 million ha each and Oceania had the smallest area (370 million ha) (Figure 4).

Although the distribution of permanent meadows and pastures drives the regional distribution of agricultural land, the regions exhibited some significant differences. Oceania had the largest proportion of meadows and pastures, with cropland covering less than one-tenth of the agricultural land. Conversely, permanent meadows and pastures occupied about one-third of the agricultural land in Europe. In Africa, Latin America and Asia, the land under permanent meadows and pastures was about three-fourths of the total. Finally, the agricultural area in Northern America was two-fifths cropland and three-fifths pastures.

In 2019, Asia had the largest extent of cropland, with 600 million ha (of which more than one-fifth was in China). Europe and Africa followed with 290 and 280 million ha each. The area of cropland was nearly 200 million ha in North America and about 170 million ha in Latin America. Oceania, at 35 million ha, had the smallest extent.

In 2019, Europe had the largest area of forest (over 1 billion ha) followed by Latin America with nearly 1 billion ha. Africa, Northern America and Asia had all close to 650 million ha of forest. China accounted for about 35 percent of the forest land in Asia. Oceania had the smallest area, with about 190 million ha.

In 2019, the global per capita value of agricultural land (0.6 hectares per person) masked large differences between the regions (Figure 5). With nearly 9 ha, Oceania had a value per capita nearly ten times larger than other regions. In 2019, Northern America had 1.3 ha per capita, followed by Latin America and Africa with similar values (1.1 and 0.9 ha per person each). Europe and Asia closed the
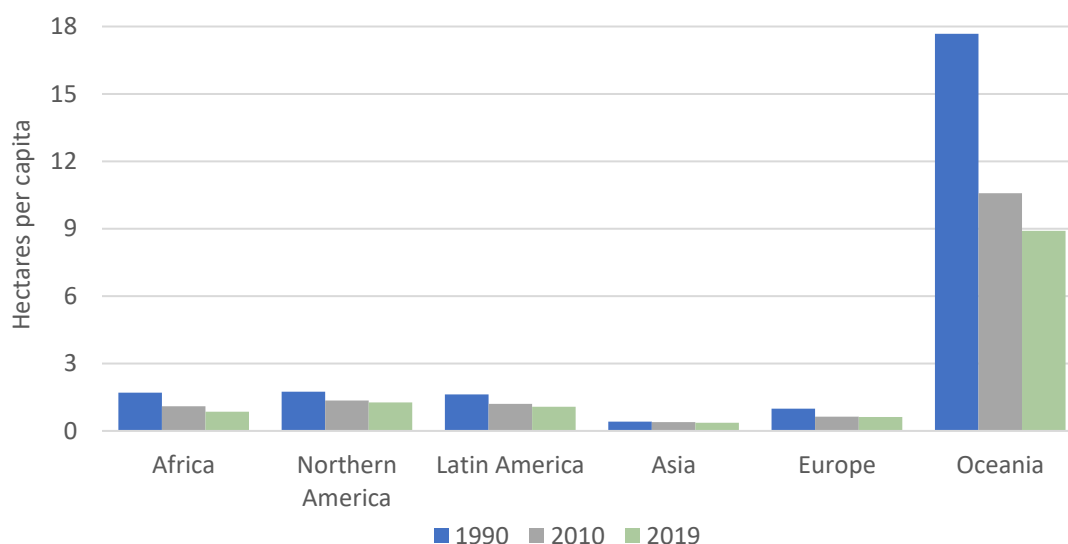
ranking with 0.6 and 0.4 ha per capita, respectively. Over 1990–2019, all the regions showed a reduction in the per capita value. Oceania and Africa both recorded a 50 percent decline since 1990. They were followed by Latin America and Europe, where the values of agricultural land per capita decreased by 35 percent. In Northern America, the value in 2019 was almost 30 percent smaller than in 1990. In Asia, where regional values and trends were largely driven by China, the per capita value declined by 14 percent since 1990. The rates of decrease overall slowed down in the regions in the 2010s.

Figure 4: Agricultural land by region and component, 2019
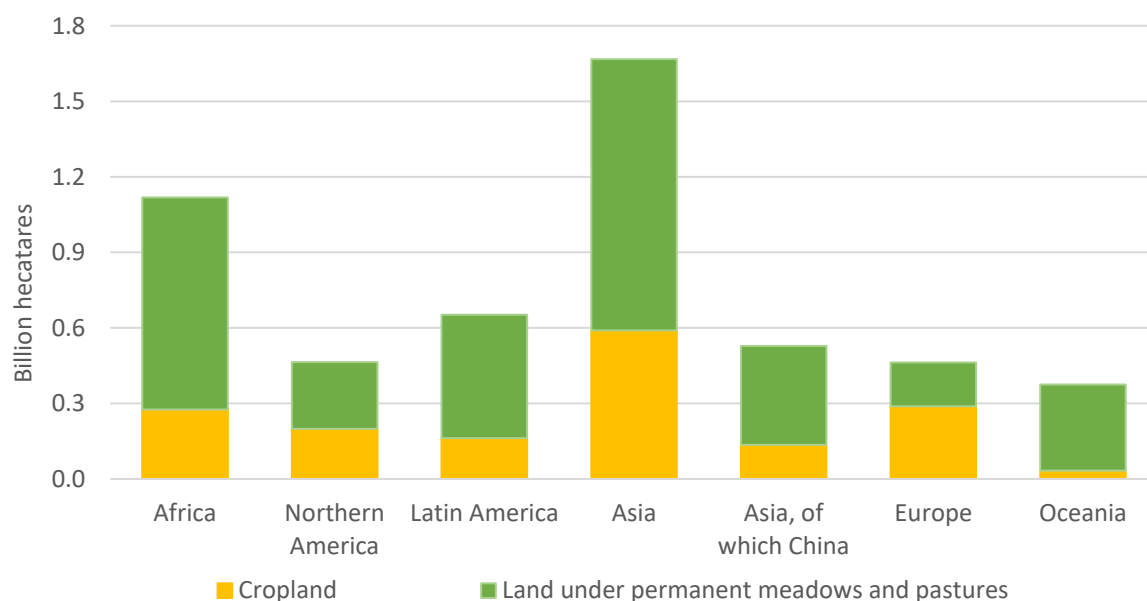
Source: FAO, 2021a.

Figure 5: Agricultural land per capita by region, 1990, 2010 and 2019

Source: FAO, 2021a and 2021c.

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Irrigation and agricultural practices

In 2019, Asia, with nearly 240 million hectares (30 percent of which was in China), had more than two-thirds of all land equipped for irrigation in the world. The Americas were a distant second, with over 50 million ha. Asia and Latin America were the regions with the highest relative share of land equipped for irrigation to the total cropland area (about 40 percent). This proportion however reached 55 percent in China. Much lower shares were found in Northern America (14 percent), Oceania and Europe (10 and 9 percent respectively) and Africa (nearly 6 percent).

In 2019, about half of the global agricultural area under organic agriculture was in Oceania (36 million hectares) and nearly one-fifth was in Europe (16 million hectares).

COUNTRY

In 2019, India had the largest total cropland area, with nearly 170 million hectares. It was closely followed by the United States of America (160 million ha), China (about 140 million ha), the Russian Federation (125 million ha) and Brazil (nearly 65 million ha). The remaining highest-ranking countries (Indonesia, Nigeria, Canada, Ukraine and Argentina) had values between 50 and 30 million ha (Figure 6).

Over the period 1990–2019, the top ten countries by the extent of cropland showed diverse trends. In India and China, the cropland area remained constant or showed little variation. The area of cropland declined in the United States of America (-15 percent), the Russian Federation (-8 percent), Canada (-6 percent) and Ukraine (-2 percent). Conversely, large increments were recorded in Indonesia (+60 percent), Nigeria (+26 percent) and to a lesser extent in Argentina (+22 percent) and Brazil (+13 percent).

Figure 6: Top ten countries by cropland area and change, 1990–2019.
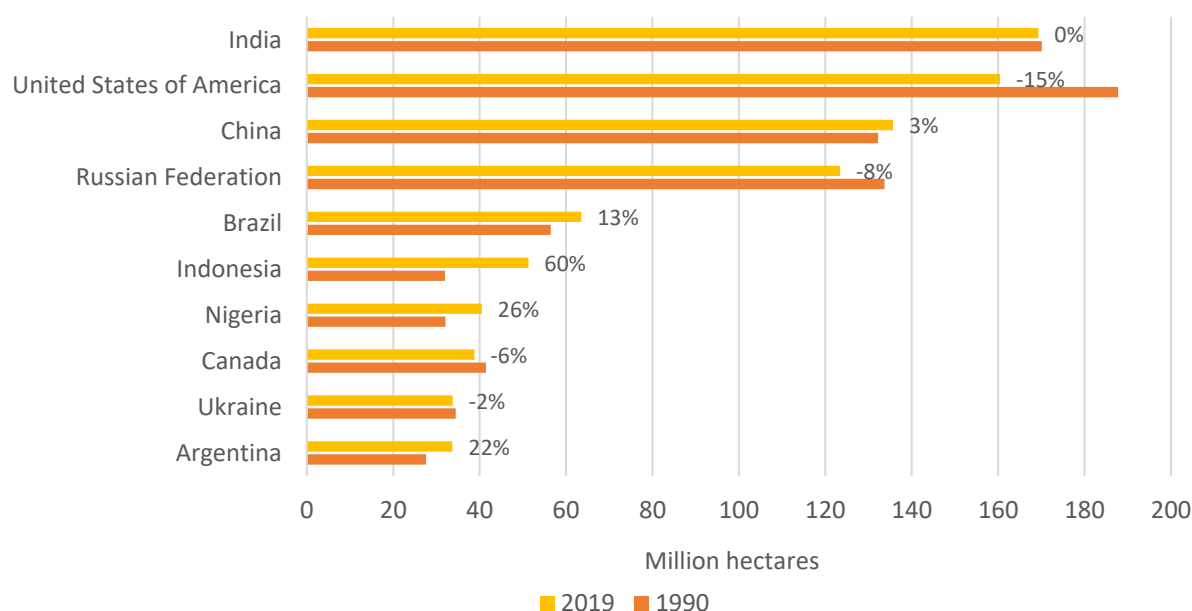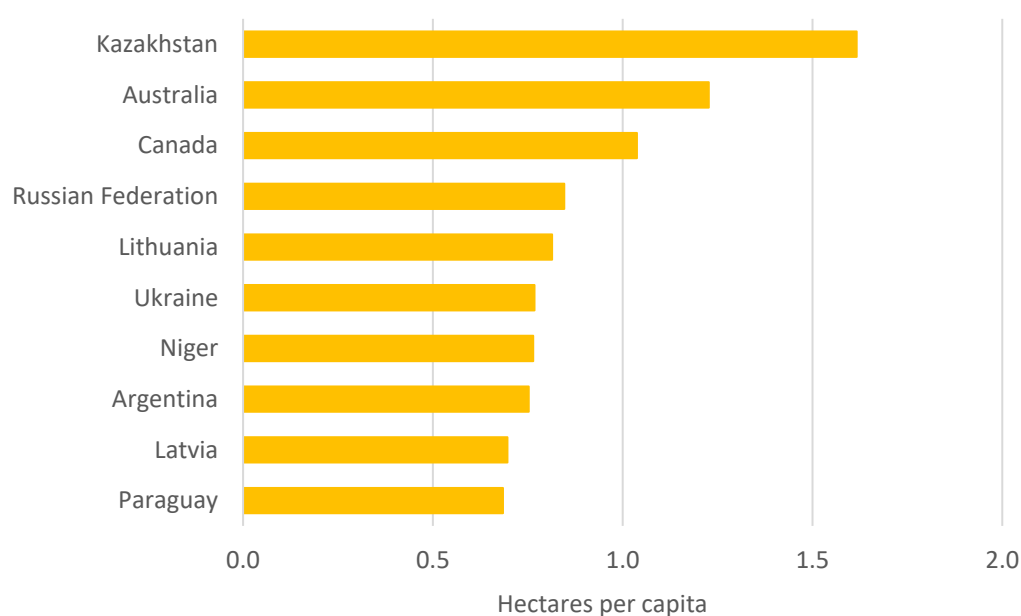

Source: FAO, 2021a.

Note: The percent change for the Russian Federation and Ukraine is measured since 1992.
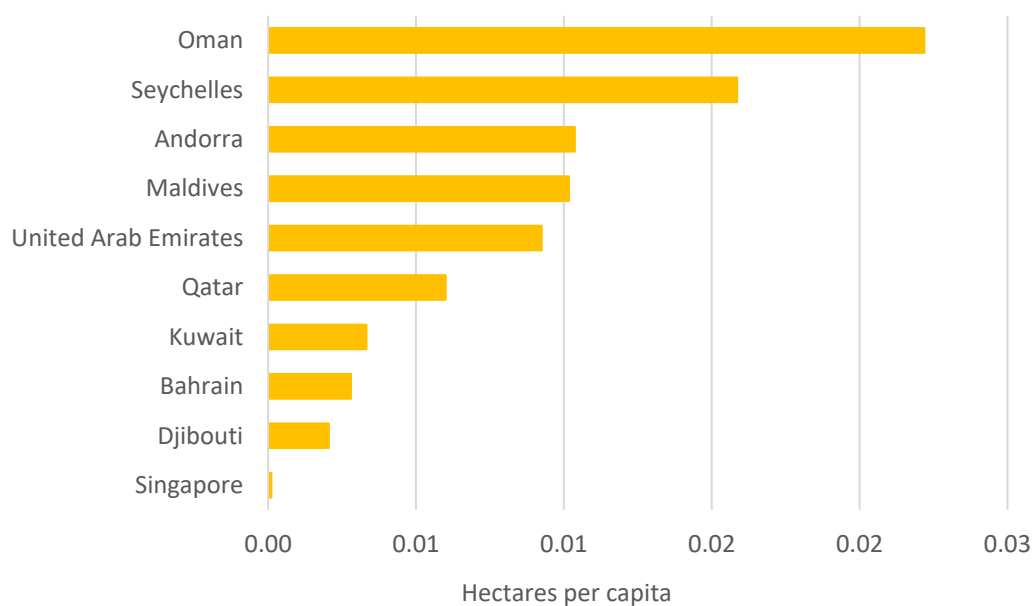
The analysis yields some additional insights when looking at the per capita values of cropland (Figures 7 and 8). In 2019, only three countries in the world had more than 1 hectare per capita of cropland. Kazakhstan, which ranked highest (1.6 ha per capita), was eight times higher than the global average (0.2 hectares per person). Australia and Canada followed with 1.2 and 1.0 ha per capita. The remaining countries in the highest ranking had close values ranging from 0.8 ha per person in the Russian Federation to 0.7 ha per capita in Paraguay. The bottom ten countries by per capita area of cropland, on the other hand, had at least ten times less cropland per person than the global average (Figure 8). Oman had about 200 square metres of cropland per capita, whereas Singapore, at the bottom of the list, had virtually no cropland available. The bottom ten countries are typically small in area (e.g. Andorra), and include several tropical islands (e.g. Maldives and Seychelles). Most are located in arid or semi-arid environments, where the climatic conditions limit cropland extent (e.g. Bahrain, Kuwait, Oman, United Arab Emirates). They also include intensive production systems coupled with high imports of agricultural products (e.g. Singapore).

Figure 7: Top ten countries by cropland area per capita, 2019

Source: FAO, 2021a and 2021c.

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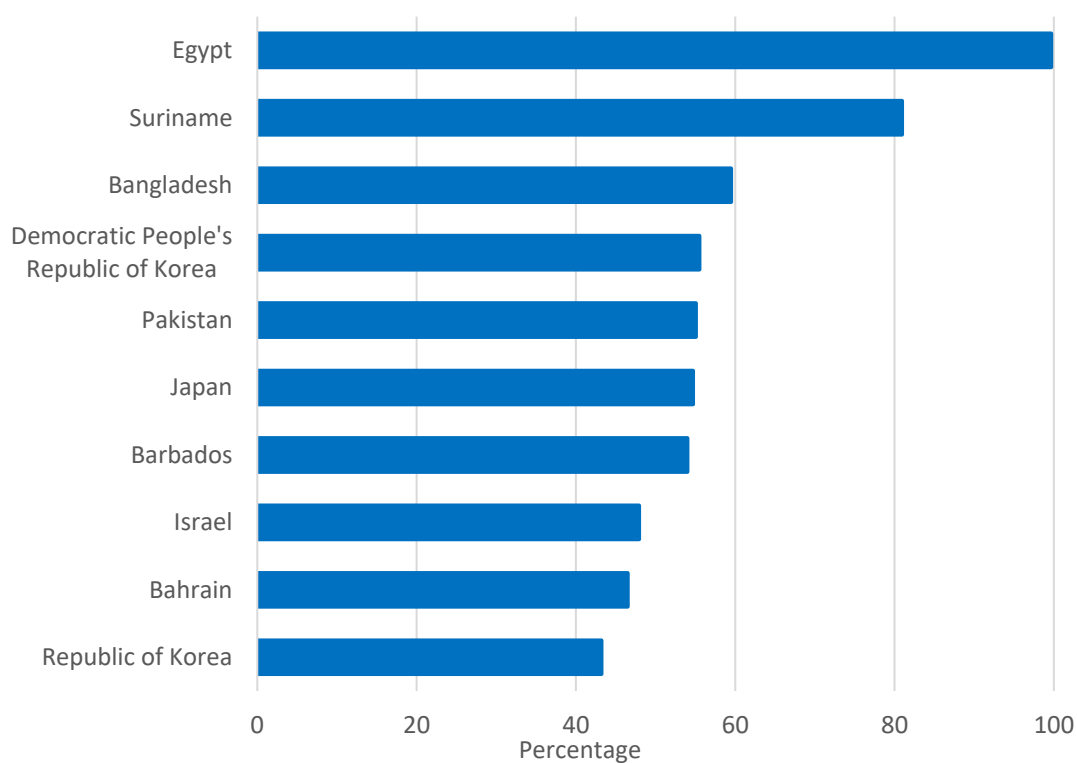**Figure 8: Bottom ten countries by cropland area per capita, 2019**

Source: FAO, 2021a and 2021c.

Irrigation and agricultural practices

In 2019, China and India had the largest areas equipped for irrigation, above 70 million hectares each, followed distantly by the United States of America (close to 30 million ha), Pakistan (20 million ha), the Islamic Republic of Iran (10 million ha), Brazil (about 8 million ha) and Mexico, Indonesia, Thailand and Bangladesh with about 6 million ha each.

At the same time, Egypt was the country with the largest share of area equipped for irrigation over its total agricultural area (nearly 100 percent), followed by Suriname, Bangladesh, the Democratic People's Republic of Korea, Pakistan and Japan (all above 50 percent) (Figure 9).

Figure 9: Top ten countries by share of area equipped for irrigation in total agricultural land area, 2019

Source: FAO, 2021a.

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EXPLANATORY NOTES

The FAOSTAT domains Land use and Land use indicators are available for 198 countries and 43 territories over 1961–2019. Methodological and country notes are available as supplementary information in the two FAOSTAT domains.

 FAO annually collects from countries land use information via a standard questionnaire on Land Use, Irrigation and Agricultural Practices. The Land Use dataset implements the FAO Land Use classification disseminating data on 21 land use categories and 23 categories of irrigation and agricultural practices. Definitions for all land use categories are available within the FAO questionnaire. A full mapping of the corresponding FAO land use matrix is provided below (Table 1).

The FAO Land Use classification is used by the UN System of Environmental and Economic Accounting (SEEA); the UN Framework for the Development of Environmental Statistics (FDES); and the World Census of Agriculture. It is furthermore consistent with the land use classes of the Intergovernmental Panel on Climate Change, used for country reporting to the UN Framework Convention on Climate Change (UNFCCC).

FAO also collects forest data from countries via the Global Forest Resources Assessment (FAO, 2020) in five-year cycles. Data include detail on the forest categories 'Naturally regenerating forest' and 'Planted forest'. These data are disseminated in the FAOSTAT Land Use domain, with values in between FRA years (1990, 2000, 2010, 2015) linearly interpolated. Annual data for the period 2016–2020 are taken directly from the FRA.

Land use data provided by countries to FAO are typically sourced from national agricultural censuses or agricultural surveys, conducted at regular intervals, usually of 5–10 years. The rationale for sending annual FAO Land Use Questionnaires is because such cycles are not synchronized among countries. Changes in national definitions and data practices that may occur between collection cycles may cause breaks in time series. Intensive work is carried out with countries to reconcile this information against the background of the FAO land use definitions. When reconciliation is not possible, the nature of the time series break is documented in the FAOSTAT country notes, with information of the possible implications of such changes on relevant national and regional land use trends.

Official country documents including agricultural surveys and censuses, government websites and regional assessments but also sectoral studies are routinely used to fill missing information. Increasingly, land cover data derived from remote sensing products are also used to complement the FAOSTAT analysis.

The land use data disseminated in FAOSTAT are relevant to monitor sustainable and productive agriculture, forestry and fisheries activities at national, regional and global level. In particular, agricultural land statistics serve as a denominator to compute SDG indicator 2.4.1.

Table 1: FAO land use matrix

Country area	Land area	Agriculture	Agricultural land	Cropland	Arable land	
	Land area *Equipped for irrigation* *Actually irrigated*	**Agriculture** *Actually irrigated* *Organic*	**Agricultural land**	**Cropland** *Actually irrigated* *Organic* *Tillage*	**Arable land**	**Land under temporary crops**
						Land under temporary meadows & pastures
						Land with temporary fallow
					Land under permanent crops	
				Land under permanent meadows & pastures *Actually irrigated* *Organic*	**Cultivated**	
					Naturally growing	
Country area			**Land under protective cover** *Farm buildings and farmyards*			
		Forest land *Forestry* *Forestry actually irrigated*				
		Other land				
	Inland waters *Aquaculture* *Capture fisheries*					
	Coastal waters *Aquaculture* *Capture fisheries*					
Exclusive Economic Zone *Aquaculture* *Capture fisheries*						

Source: FAO, 2021a.

Note: Categories of the Land use domain are represented in bold. The additional categories in italics represent those under ''Irrigation and agricultural practices'' and "Aquaculture and fisheries'', mapping them onto the main categories of the Land use domain.

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