UN WATER

United Nations
Educational, Scientific and
Cultural Organization

The United Nations
World Water Development Report 2019

Leaving no one behind

Facts and Figures

United Nations
Educational, Scientific and
Cultural Organization

World Water
Assessment
Programme

Sustainable
Development
Goals

Water availability and demand

Figure 1 provides a global overview of countries experiencing different levels of water stress (the ratio of total freshwater withdrawn annually by all major sectors, including environmental water requirements, to the total amount of renewable freshwater resources, expressed as a percentage).

Over 2 billion people live in countries experiencing high water stress. Recent estimates show that 31 countries experience water stress between 25% (which is defined as the minimum threshold of water stress) and 70%. Another 22 countries are above 70% and are therefore under serious water stress (UN, 2018a).[1]

Growing water stress indicates substantial use of water resources, with greater impacts on resource sustainability, and a rising potential for conflicts among users.

It has been estimated that about 4 billion people, representing nearly two-thirds of the world population, experience severe water scarcity during at least one month of the year (Mekonnen and Hoekstra, 2016).

Water use has been increasing worldwide by about 1% per year since the 1980s (AQUASTAT, n.d.). Global water demand is expected to continue increasing at a similar rate until 2050, accounting for an increase of 20 to 30% above the current level of water use (Burek et al., 2016). This steady rise has principally been led by surging demand in developing countries and emerging economies. However, per capita water use in the majority of these countries remains far below water use in developed countries — they are merely catching up.

Agriculture (including irrigation, livestock and aquaculture) is by far the largest water consumer, accounting for 69% of annual water withdrawals globally. Industry (including power generation) accounts for 19% and households for 12% (AQUASTAT, n.d.).

Although specific projections can vary somewhat, agriculture's share of total water use is likely to fall in comparison with other sectors, but it will remain the largest user overall over the coming decades, in terms of both water withdrawal and water consumption[2].

Approximately 80% of the global cropland is rainfed, and 60% of the world's food is produced on rainfed land. Research from different parts of the world shows that supplemental irrigation in rainfed agricultural systems double or even triple rainfed yields per hectare for crops such as wheat, sorghum and maize (Oweis and Hachum, 2003; Rockström et al., 2007; HLPE, 2015).

Access to water resources is often related to land tenure — particularly in rural settings. Less than 20% of the world's landholders are women. In North Africa and Western Asia they represent fewer than 5% (FAO/IFAD/WFP, 2012).

Water quality

Worldwide, over 80% of all wastewater returns to the environment without being treated (WWAP, 2017).

Several water-related diseases, including cholera and schistosomiasis, remain widespread across many developing countries, where only a very small fraction (in some cases less than 5%) of domestic and urban wastewater is treated prior to its release into the environment (WWAP, 2017).

Nutrient loadings remain one of the most prevalent forms of water pollution and the majority of nutrient emissions originate from agriculture. "*However, the rapidly growing cities in the developing countries are projected to become major sources of nutrient emissions*" (PBL Netherlands Environmental Assessment Agency, 2018. p. 42), especially where a rapidly growing number of households lack adequate wastewater treatment systems.

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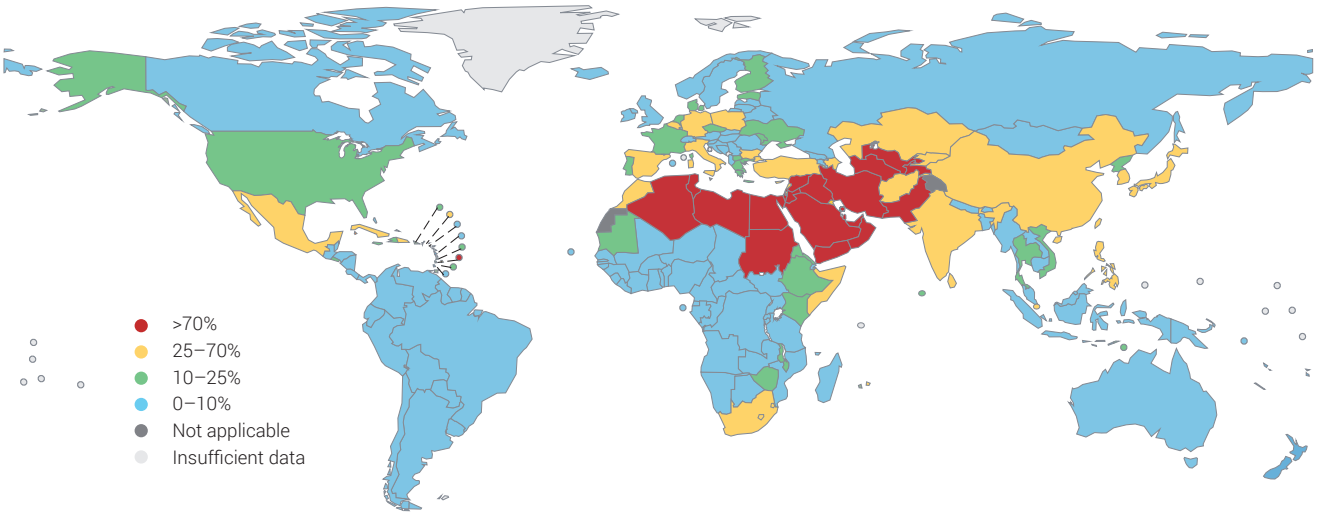
[1] For all sources cited in this document, please refer to the full report available at www.unesco.org/water/wwap.

[2] **Water withdrawal**: The volume of water removed from a source; by definition withdrawals are always greater than or equal to consumption. **Water consumption**: The volume withdrawn that is not returned to the source (i.e. it is evaporated or transported to another location) and by definition is no longer available for other uses locally.

FIGURE 1 **Level of physical water stress**



Source: UN (2018a, p. 72, based on data from AQUASTAT). © 2018 United Nations. Reprinted with the permission of the United Nations.

Floods and droughts

For the most part, dry areas will tend to become drier and wet areas wetter, such that climate change will likely exacerbate water stress in areas that are already the most affected.

About 90% of all natural disasters are water-related. Over the period 1995–2015, floods accounted for 43% of all documented natural disasters, affecting 2.3 billion people, killing 157,000 more and causing US$662 billion in damage (CRED/UNISDR, 2015).

Droughts accounted for 5% of natural disasters, affecting 1.1 billion people, killing 22,000 more, and causing US$100 billion in damage over the same 20-year period (CRED/UNISDR, 2015).

An average of 25.3 million people are displaced each year by sudden-onset disasters (IDMC, 2018). While figures can vary greatly from year to year depending on the occurrence and magnitude of disasters, the overall risk of being displaced by disasters has doubled since the 1970s mainly due to population growth and increased exposure and vulnerability to natural hazards, a trend likely to continue with the adverse effects of climate change.

Excluded from these figures are those people that move due to slow-onset events and stressors (e.g. chronic drought, sea level rise, desertification, or ecosystem loss, among others), as factors behind such movements are often complex.

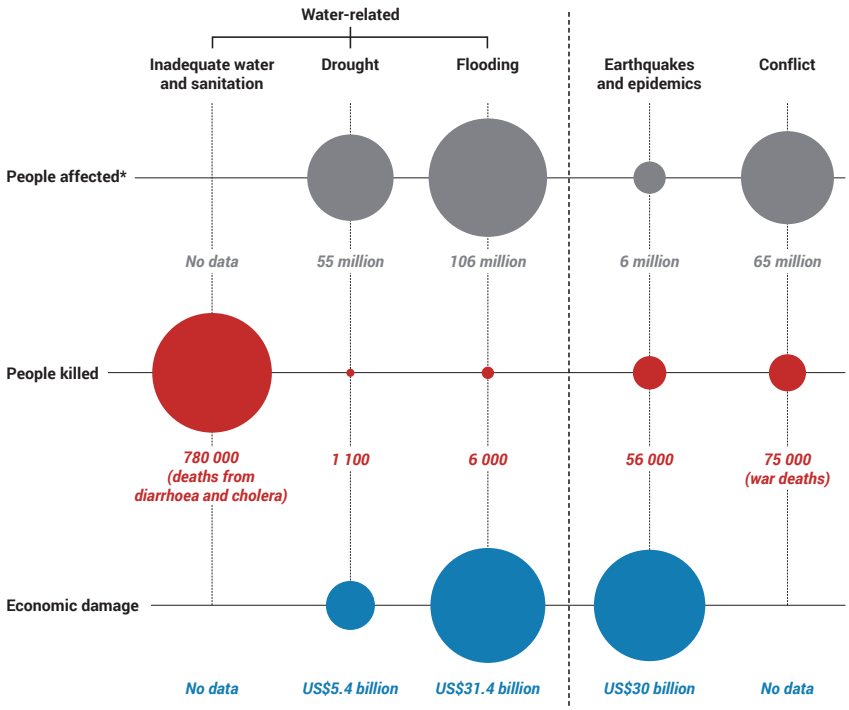
There is growing evidence that the depletion of natural resources, such as water, due to a combination of excessive use, environmental degradation and climate change, can be a major driver of migration (FAO/GWP/Oregon State University, 2018).

Climate change is expected to increase the frequency and magnitude of extreme weather events.

However, in terms of both the number of people affected and (especially) the number of people killed, the impacts of floods, droughts and conflicts are grossly outweighed by the number of those affected or killed by inadequate drinking water and sanitation services (Figure 2).

Small-scale, local and fit-to-purpose dams and reservoirs can contribute to water security and flood protection, as well as provide renewable energy for local populations.

FIGURE 2 **Average annual impact from inadequate drinking water and sanitation services,[3] water-related disasters, epidemics and earthquakes, and conflicts**



*People affected are defined as those requiring immediate assistance during a period of emergency; this may include displaced or evacuated people.

Source: Adapted from PBL Netherlands Environmental Assessment Agency (2018, p. 14). Licensed under Creative Commons Attribution 3.0 Unported (CC BY 3.0).

Water supply and sanitation services

There has been progress during the implementation phase of the Millennium Development Goals (MDGs). In 2015, 181 countries had achieved over 75% coverage with at least basic drinking water services, and the global population using at least a basic drinking water service increased from 81 to 89% between 2000 and 2015. However, about three out of ten people (2.1 billion people, or 29% of the global population) did not use a safely managed drinking water service[4] in 2015, 844 million people still lacked even a basic drinking water service[5] (Figure 3).

Coverage of safely managed water services varies considerably across regions (from only 24% in Sub-Saharan Africa to 94% in Europe and Northern America), wealth quintiles and subnational regions. Of all the people using safely managed drinking water services, only about one out of three (1.9 billion) lived in rural areas (WHO/UNICEF, 2017a).

Among the countries that had a coverage of less than 95% in 2015, only one in five is on track to achieving universal basic water services by 2030 (UN, 2018a).

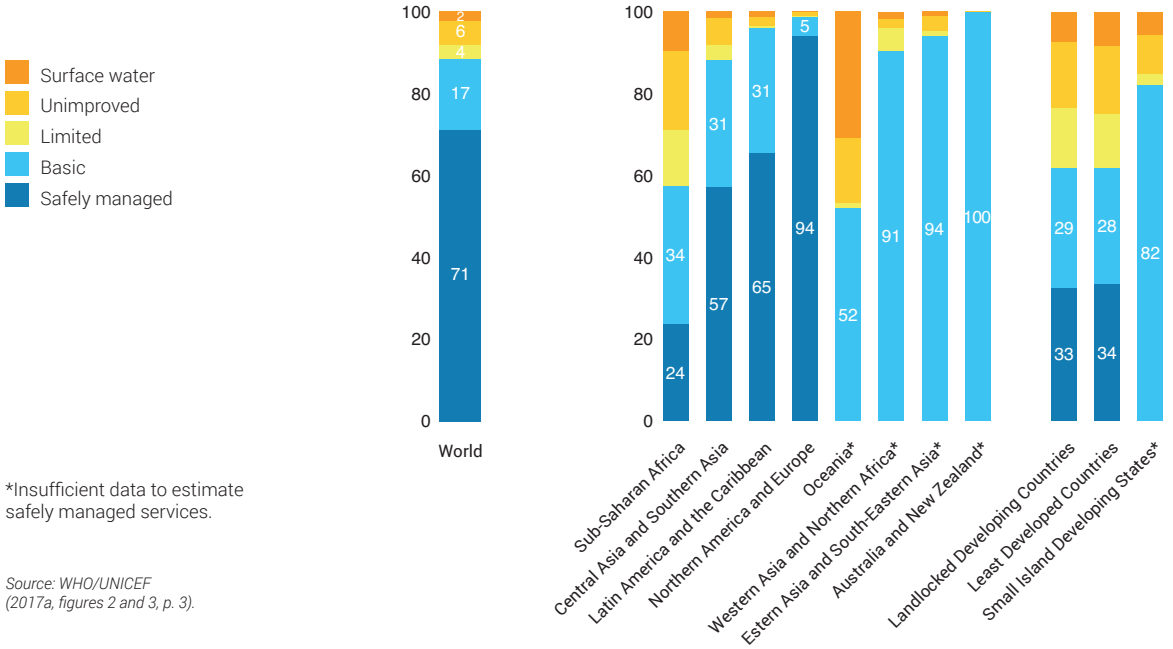
Progress was also achieved in sanitation coverage during the implementation phase of the MDGs. By 2015, 154 countries had achieved a coverage of over 75% for at least basic sanitation services. The global population using at least a basic sanitation service increased from 59 to 68% between 2000 and 2015.

[3] In 2015, an estimated 2.1 billion people lacked access to safely managed drinking water services and 4.5 billion lacked access to safely managed sanitation services (WHO/UNICEF, 2017a). However, there are no data available estimating what proportion of these people were 'affected', nor what the resulting overall economic damage would equate too.

[4] Drinking water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination ('improved' sources include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water).

[5] Drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing.

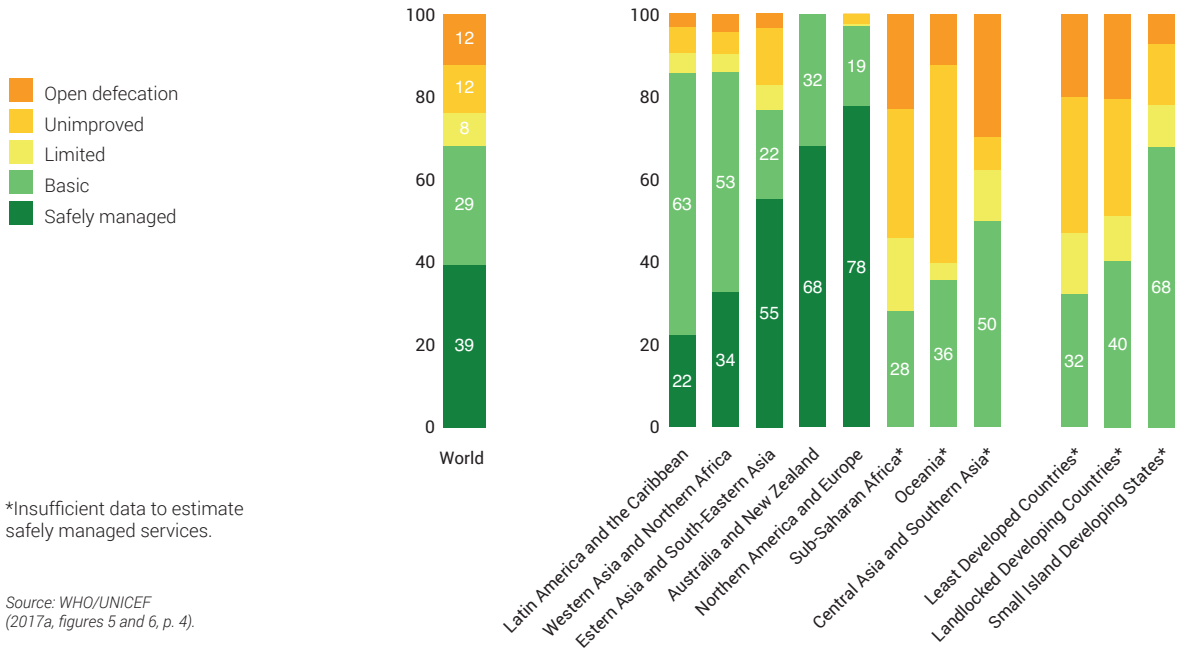
FIGURE 3 **Global and regional drinking water coverage, 2015 (%)**



*Insufficient data to estimate safely managed services.

Source: WHO/UNICEF (2017a, figures 2 and 3, p. 3).

FIGURE 4 **Global and regional sanitation coverage, 2015 (%)**



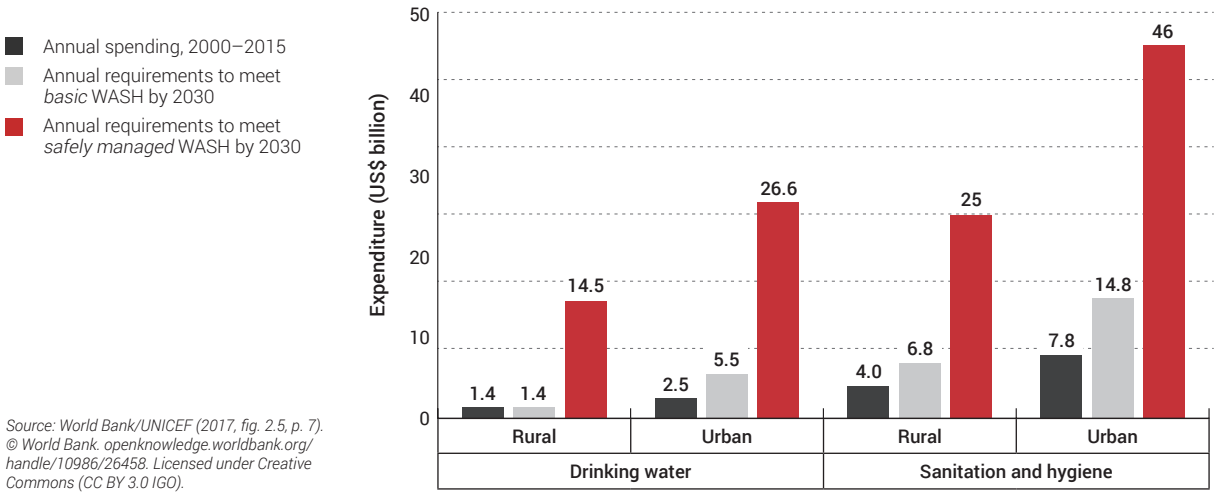
*Insufficient data to estimate safely managed services.

Source: WHO/UNICEF (2017a, figures 5 and 6, p. 4).

Worldwide, only 2.9 billion people (or 39% of the global population) used safely managed sanitation services[6] in 2015 (Figure 4). Two out of five of these people (1.2 billion) lived in rural areas.

[6] Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite ('improved' facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs).

FIGURE 5 **Additional resources needed to meet targets for basic and safely managed WASH services**



Source: World Bank/UNICEF (2017, fig. 2.5, p. 7). © World Bank. openknowledge.worldbank.org/handle/10986/26458. Licensed under Creative Commons (CC BY 3.0 IGO).

Another 2.1 billion people had access to 'basic' sanitation services.[7] The remaining 2.3 billion (one out of every three people) lacked even a basic sanitation service, of which 892 million people still practiced open defecation (WHO/UNICEF, 2017a).

Among the countries with a coverage of less than 95% in 2015, only one out of ten is on track to achieving universal basic sanitation by 2030 (UN, 2018a).

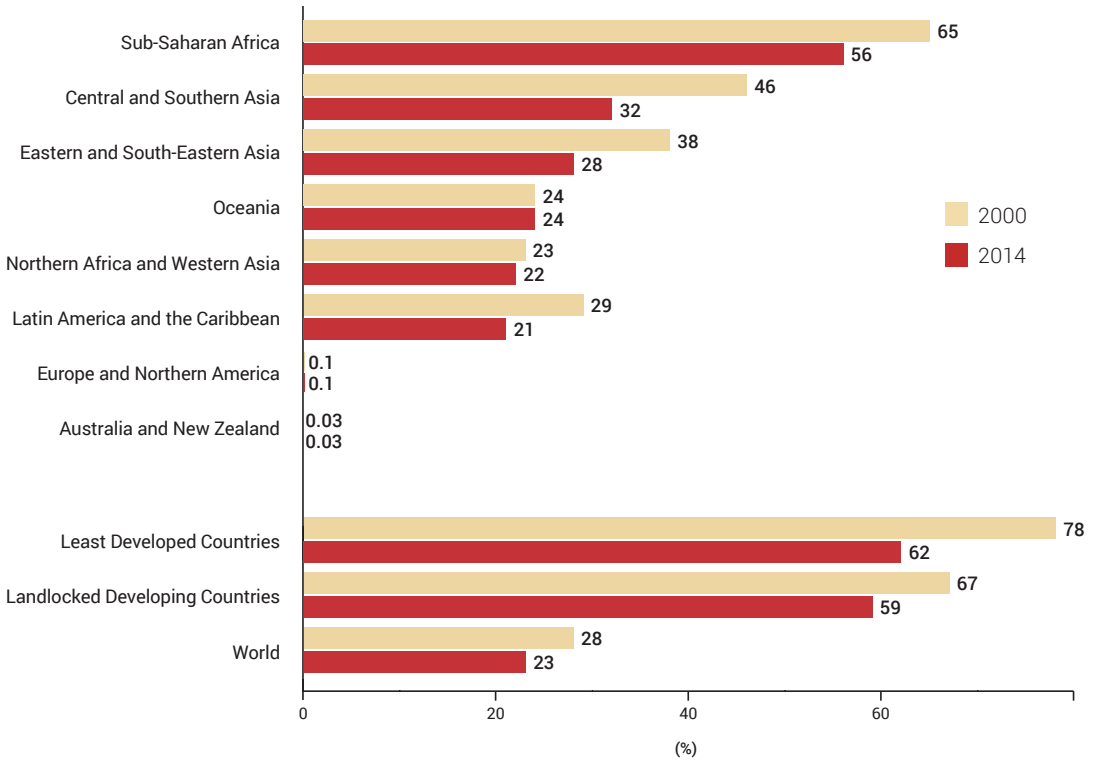
Results of UN-Water's Global Analysis and Assessment of Sanitation and Drinking-Water (GLASS) 2017 study (WHO, 2017b) suggest that the insufficiency of financial resources is a major constraint to achieving higher investment levels in most countries. Although government water supply, sanitation and hygiene (WASH) budgets are increasing at an annual average real rate of 4.9%, over 80% of monitored countries report having insufficient financing to attain their drinking water, sanitation and water quality national objectives in urban areas, while this share increases to 90% when referring to rural areas.

A study by Hutton and Varughese (2016) concludes that current levels of funding towards WASH services are mainly below the capital costs required to meet basic WASH services by 2030 (see Figure 5). Furthermore, these requirements fall far behind the investment needs for achieving safe WASH services (SDG target 6.1. and 6.2). To that end, a threefold increase in current annual investment levels (to US$114 billion) would be required. The estimated resource needs do not include operation and maintenance costs, thus, the actual funding requirements are even higher.

The support of the international donor community will remain critical in the developing world but cannot be the main source of funding. The WASH-related part of official development assistance (ODA) has stabilized at about 5% of total ODA commitments over the last years, and is unlikely to increase dramatically in the future (UN, 2018a). It will be incumbent upon national governments to dramatically increase the amounts of public funding made available for the expansion of WASH services.

[7] Use of improved facilities that are not shared with other households.

FIGURE 6 **Proportion of urban population living in slums, 2000 and 2014**



Source: UN (2017, p. 40). © 2017 United Nations. Reprinted with the permission of the United Nations.

Population growth and human settlements

The global population reached 7.6 billion people as of June 2017. It is expected to further increase to 9.8 billion by 2050 (UNDESA, 2017a).

Africa and Asia account for nearly all current population growth, although Africa is expected to be the main contributor beyond 2050 (UNDESA, 2017a).

Over half (54%) of the global population currently lives in cities. The ratio of urban-to-rural population is expected to increase to two-thirds (66.4%) by 2050 (UNICEF, 2017).

In 2015, two out of five people in rural areas had access to piped water supplies (a form of 'improved' supply, but not necessarily a 'safely managed' supply), whereas four out of five people in urban areas had piped supplies. Sewer connections dominate in urban areas, where they are used by 63% of the population, compared to only 9% in rural areas (WHO/UNICEF, 2017a).

However, the proportion of urban households with access to improved water supply and sanitation services decreases substantially when adjusting for additional indicators related to water (quantity, time and cost) and sanitation (distance, cleanliness, hand-washing and safety) (UN-Habitat, 2006).

Although the overall proportion of the urban population living in slums worldwide fell from 28% in 2000 to 23% in 2014, in absolute terms, the number of urban residents living in slums rose from 792 million to an estimated 880 million over the same period. In Least Developed Countries (LDCs), nearly two-thirds (62%) of urban dwellers live in slum conditions (Figure 6). Slums remain most pervasive in Sub-Saharan Africa (UN, 2017).

Piped water is the least costly method to transport water. However, it is far too often unavailable to the poor, thus aggravating inequality, especially in urban slums and in remote and rural areas.

People living in informal settlements have to pay a much higher cost for water, often 10 or 20 times the cost of their more affluent neighbours (UNDP, 2006). The poor end up paying dearly for what the rich get (almost) for free.

The number of people without access to electricity fell from 1.7 billion in 2000 to 1.1 billion in 2016 (IEA, 2017). Of those gaining access to electricity worldwide since 2010, the vast majority (80%) are in urban settlements (UNSD, n.d.).

Poverty, health and nutrition

The absolute number of people living in extreme poverty (US$1.90 per day) fell from 1.85 billion in 1990 to 0.76 billion in 2013. Sub-Saharan Africa is the only region that registered an increase in the absolute number of people in extreme poverty between 1990 and 2013, although the overall share of people in extreme poverty in the region dropped from 54% to 41% over that period (World Bank, n.d.).

Poverty is by no means limited to developing countries. An estimated 30 million children — one in eight — living in the world's richest countries are growing up poor (UNICEF, 2014).

Two billion people now live in countries where development outcomes are affected by fragility, conflict and violence. By 2030, 46% of the global poor could live in fragile and conflict-affected situations (World Bank, n.d.).

Approximately three-quarters (74%) of people living in extreme poverty live in rural areas (FAO, 2017b) and the vast majority of the rural poor are in fact smallholders who themselves suffer from food insecurity and malnutrition.

According to the World Health Organization (WHO, 2017a), approximately 50 litres of water per person per day are needed to ensure that most basic needs are met while keeping public health risks at a low level.

Almost half of people drinking water from unprotected sources live in Sub-Saharan Africa (WHO/UNICEF, 2017a).

Waterborne diseases remain a significant disease burden among vulnerable and disadvantaged groups worldwide, especially among low-income economies where 4% of the population (an estimated 25.5 million people) suffered from diarrhoea in 2015, among whom 60% were children under the age of five (WHO, 2016b).

The number of chronically undernourished people on the planet increased from 777 million in 2015 to 815 million in 2016. Deteriorations in food security have particularly been observed in situations of conflict, especially when combined with droughts or floods. The situation has worsened in particular in parts of Sub-Saharan Africa, South-Eastern Asia and Western Asia (FAO/IFAD/UNICEF/WFP/WHO, 2017).

Globally, 155 million children under five years of age suffer from stunted growth (FAO/IFAD/UNICEF/WFP/WHO, 2017). Lack of access to WASH contributes to undernutrition by transmitting pathogens, while infections inhibit nutritional uptake (World Bank, 2017a). These factors are related to retarded growth among children (UN, 2018a).

It has been estimated that, to end hunger by 2030, additional investments in agriculture amounting to US$265 billion a year between 2016 and 2030 will be required at the global level, US$41 billion of which should be committed to social protection to reach the poorest in rural areas; and US$198 billion for pro-poor investment in productive and inclusive livelihood schemes, including regarding water (FAO/IFAD/WFP, 2015b).

Coverage of basic handwashing facilities with soap and water varied (on a regional average) from 15% in Sub-Saharan Africa to 76% in Western Asia and Northern Africa. However, data available for 2015 (representing only 30% of the global population) were insufficient to produce a global estimate, or estimates for other SDG regions. (WHO/UNICEF, 2017a).

Evidence from global (Whittington et al., 2012; Hutton, 2012a) as well as country studies (Hutton et al., 2014) generally shows high returns on WASH spending, for example, with a global average benefit–cost ratio of 5.5 for improved sanitation and 2 for improved drinking water once additional benefits (e.g. health and education) are factored in.

Drivers of inequality, discrimination and vulnerability

Gender inequalities in access to water are large and persistent in many countries. According to the Human Development Index (HDI), women worldwide have a lower HDI value, on average, compared to men (up to 20%, in South Asia), which hints at the widespread impact of the inequalities affecting women (UNDP, 2016).

Three-quarters of households without access to drinking water on their premises task women and girls with the primary responsibility to collect it (UNICEF, 2016). Although water collection routines vary in different parts of the world in terms of frequency, a study of time and water poverty in 25 Sub-Saharan African countries estimated that women spend at least 16 million hours a day collecting drinking water, while men spend 6 million hours, and children 4 million hours on the task (WHO/UNICEF, 2012).

Menstrual health management is rarely considered in a traditional sanitation context, and, as a result, women's reproductive and sexual health needs are not being fully met in many countries, with direct impacts on the well-being of women and girls.

Approximately 38% of healthcare facilities in 54 countries do not have access to basic water sources and around 20% do not have access to primary sanitation infrastructure (WHO/UNICEF, 2015a).

"*Improving water, sanitation and hygiene facilities in education institutions can have significant positive effects on health and education outcomes. Improved facilities, coupled with hygiene education, can also reduce absenteeism and increase demand for education, particularly among adolescent girls, who may drop out due to a lack of girls-only toilet facilities.*" (UNESCO, 2016, p. 308).

Literacy can be a major catalyst for eradicating poverty and improving hygiene and family health. Fifty years ago, almost one-quarter of youth lacked basic literacy skills compared to less than 10% in 2016. However, 750 million adults — two-thirds of whom are women — remain illiterate (UNESCO, 2017b).

People with disabilities can often face difficulties in accessing water access points and sanitation facilities, often not designed to account for their particular needs. About 1 billion people (15% of the world's population) experience some form of disability (WHO, 2015). Global prevalence is greater for women than men, standing at 19% and 12%, respectively. In low and middle-income countries, women are estimated to comprise up to three-quarters of persons with disabilities (UN Women, 2017).

Indigenous peoples number about 370 million, accounting for about 5% of the global population. They are over-represented among the poor (15% of the total and one-third of the world's 900 million extremely poor rural people),[8] the illiterate and the unemployed. Even in developed countries, indigenous peoples consistently lag behind the non-indigenous population in terms of most indicators of well-being, including access to water supply and sanitation services.

Migrants can face exceptional difficulties and challenges in accessing safe and reliable water supply and sanitation services in transit and destination areas.

Away from home, refugees and internally displaced people (IDPs) are among the most vulnerable and disadvantaged groups, often faced with barriers to access basic water supply and sanitation services. By the end of the year 2017, an unprecedented 68.5 million people around the world have been forcibly displaced from their homes as a result of conflict, persecution, or human rights violations (UNHCR, 2018a).

[8] Although these figures are frequently cited in several recent reports by United Nations agencies (among others), including ILO (2017b) as cited in this report, these estimates are based on reports published as far back as 2003 (i.e. World Bank, 2003).

Of those displaced due to armed conflict or persecution, 40.0 million are recognized as IDPs, forcibly displaced within their own country, while 25.4 million are refugees, who have fled across an international border, and 3.1 million are asylum-seekers awaiting their refugee status determination (UNHCR, 2018a). In addition, it is also estimated that there are more than 10 million stateless people who have been denied a nationality and fulfilment of basic rights such as water, sanitation, education, healthcare, employment and freedom of movement. During 2017, 16.2 million people were newly displaced due to conflict (UNHCR, 2018a). This included 11.8 million individuals displaced within the borders of their own countries (IDMC, 2018) and 2.9 million new refugees and asylum-seekers (UNHCR, 2018a).

Regional perspectives

The Arab region

The Arab region is the most water-stressed region in the world. Total renewable water resources stands at only 736 m^3 per person per year (AQUASTAT, n.d.). Water scarcity will continue to increase due to population growth and climate change. These trends have contributed to increased groundwater depletion, loss of arable land for agricultural production, and the movement of people when water resources are insufficient to support health, welfare and livelihoods.

In the entirety of the Arab region, some 51 million people (or 9% of the total population) lacked a basic drinking water service in 2015, 73% of whom lived in rural areas (WHO/UNICEF, 2018b).

High levels of internal displacement owing to conflict and violence also persist in the Arab region's LDCs, namely Somalia, Sudan and Yemen. Sudan hosts the largest number of IDPs among the Arab LDCs, with over 3.3 million at the end of 2016 (UNESCWA/IOM, 2017).

Natural disasters linked to climate change impacts have resulted in the displacement of over 240,000 people across the Arab region in 2016, the vast majority of them in the Arab LDCs (98%): 123,000 in the Sudan, 70,000 in Somalia, and 36,000 in Yemen (UNESCWA/IOM, 2017). This means that special attention must be focused on enhancing the resilience of this group of displaced people, to ensure that no one is left behind with respect to WASH services.

Asia and the Pacific

In 2016, 29 out of 48 countries in the region qualified as water-insecure due to low availability of water and unsustainable groundwater withdrawal (ADB, 2016). The increase in demand for irrigation for agriculture has led to severe groundwater stress in some areas, especially in two of Asia's major food baskets — the North China Plain and Northwest India (Shah, 2005).

High levels of water pollution worsen the situation in terms of drinking water availability, caused by the alarming rates of untreated wastewater released into surface water bodies — 80 to 90% in the Asia and the Pacific region — and high levels of chemical contamination in runoff water in some areas (UNESCAP, 2010).

Despite observable progress in terms of access to safe drinking water, one in ten rural residents and 30% of the population living in landlocked developing countries did not have access to it in 2015 (OECD, n.d.). The same year, 1.5 billion people did not have access to improved sanitation facilities (UNESCAP, 2017).

While 89% of the population in urban areas in Eastern and South-Eastern Asia has access to safely managed drinking water services, in Central and Southern Asia this ratio drops to 61% (WHO/UNICEF, n.d.). Progress is stalling in North Asia, Central Asia and the Pacific, and in LDCs (UNESCAP, 2016).

Similar disparities can be observed across the region in terms of sanitation.

In Asia and the Pacific, the most disaster-prone region in the world, natural disasters are becoming more frequent and intense, and disaster risk is outpacing resilience (UNESCAP, 2018).

With over 50% of urban residents living in low-lying coastal zones, these cities and towns in Asia and the Pacific are particularly vulnerable to climate change and natural disasters.

Europe and North America

As of 2015, those 'left behind' in the region include 57 million people who do not have piped water at home, and 21 million people who still lack access to basic drinking water services. In addition, 36 million people lack access to basic sanitation, using unsafe, shared or unsustainable sanitation. Access to safely managed sanitation services remains a challenge in many countries, especially in rural areas (WHO/UNICEF, n.d.).

While the situation is particularly severe for a major part of the population in Eastern Europe, the Caucasus and Central Asia, many citizens in Western and Central Europe, as well as in North America, also suffer from the lack of or inequitable access to water and sanitation services.

Latin American and the Caribbean

In 2015, 65% of the population of Latin America and the Caribbean had access to safely managed drinking water services, but only 22% to safely managed sanitation services. In the same year, 96% used at least a basic water service and 86% at least a basic sanitation service (WHO/UNICEF, 2017a).

In the countries of the region, the levels of coverage of water supply and sanitation services are significantly lower in rural areas than in urban areas. In terms of access to at least a basic service, the difference between urban and rural areas is 13% for water supply and 22% for sanitation services (WHO/UNICEF, 2017a).

Sub-Saharan Africa

Periodic and chronic water scarcity represents a major challenge to Africa's path to development. Agriculture contributes 15% of the region's total gross domestic product (GDP), with national figures ranging from below 3% in Botswana and South Africa to more than 50% in Chad. Irrigation is heavily dependent on groundwater and evidence suggests that several aquifers are being depleted: a study by the National Aeronautics and Space Administration of the United States (NASA) (2015) reported that eight major aquifers in Africa experienced little to no refilling to offset water withdrawals between 2003 and 2013.

In 2015, only 24% of the population of Sub-Saharan Africa had access to improved drinking water. Average access to basic sanitation services was only 28% (WHO/UNICEF, 2017a).

Currently, 189 million of slum dwellers live in Sub-Saharan Africa (out of 883 million worldwide) (UN, 2018b).

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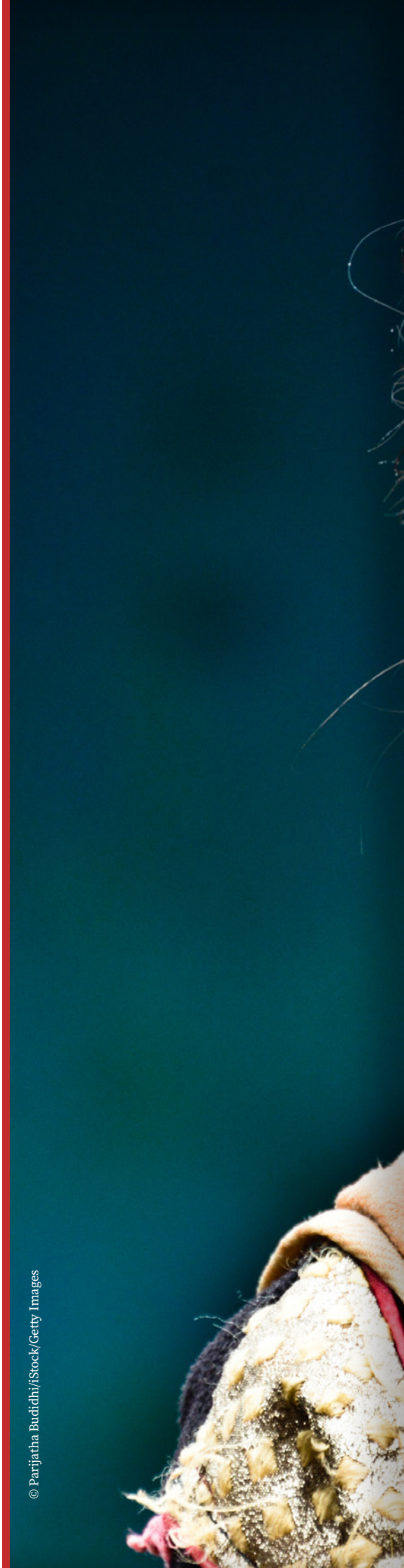

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