



# Development prospects for the Horn of Africa countries to 2040

## Basic Infrastructure

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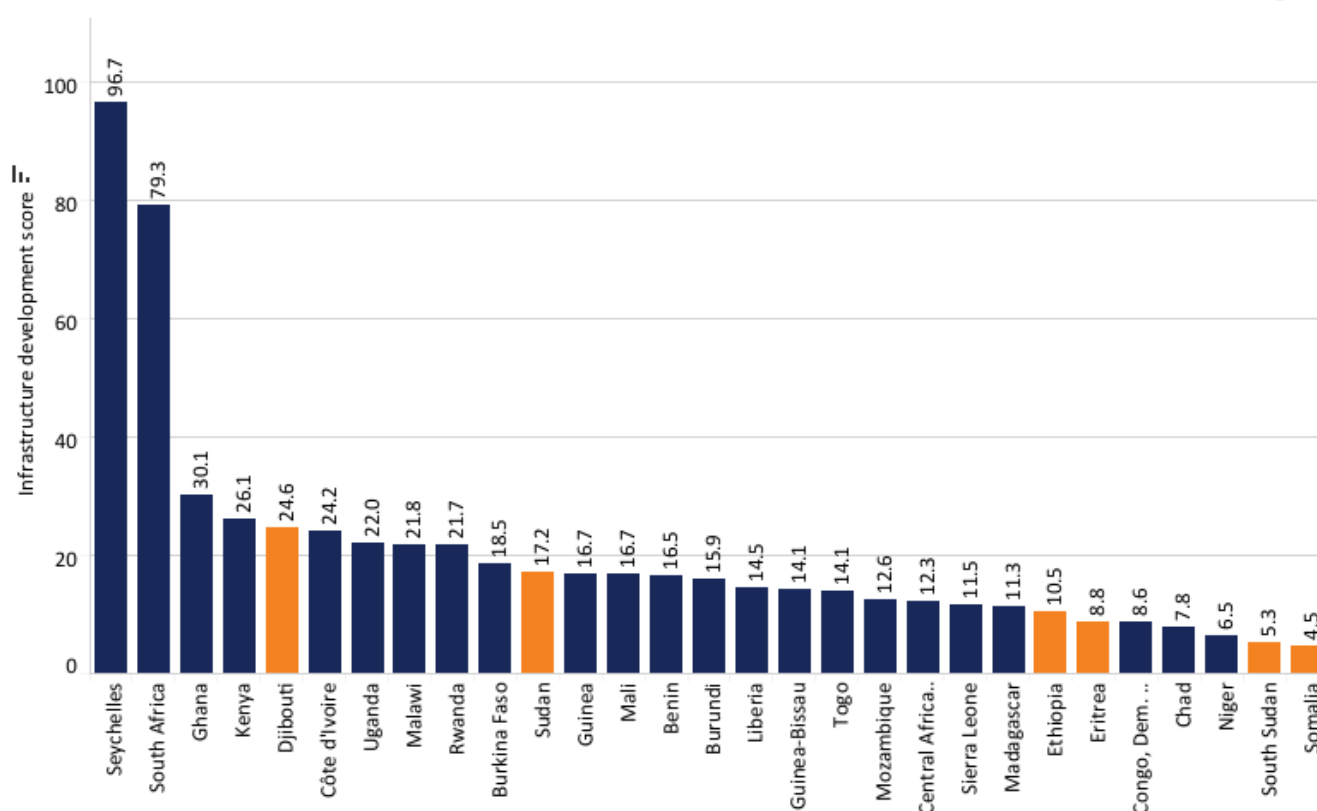
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## Basic Infrastructure

Infrastructure, whether in transportation, telecommunications, electricity or water and sanitation, is severely lacking across the Horn region. Most Horn nations ranked near the bottom in infrastructure development as measured by the Africa Infrastructure Development Index (AIDI) produced by the African Development Bank.[1]

The AIDI is made up of four composite indexes for electricity, transport, ICT and water and sanitation. Based on the overall Infrastructure Development Index, Djibouti has the highest infrastructure development score in the Horn region while South Sudan and Somalia have the lowest level of infrastructure development in the region and Africa as a whole (Chart 22).

**Chart 22: Infrastructure development in selected sub-Saharan African countries, 2020**



Source: Data from the African Development Bank

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## Energy and electricity

Energy plays a significant role in improving people's livelihoods. When low-cost and reliable electricity is available, it has a positive effect on productivity, industrialisation and poverty reduction. Access to reliable and affordable energy, particularly electricity, is crucial to any modern economy, especially in this era of the digital revolution.

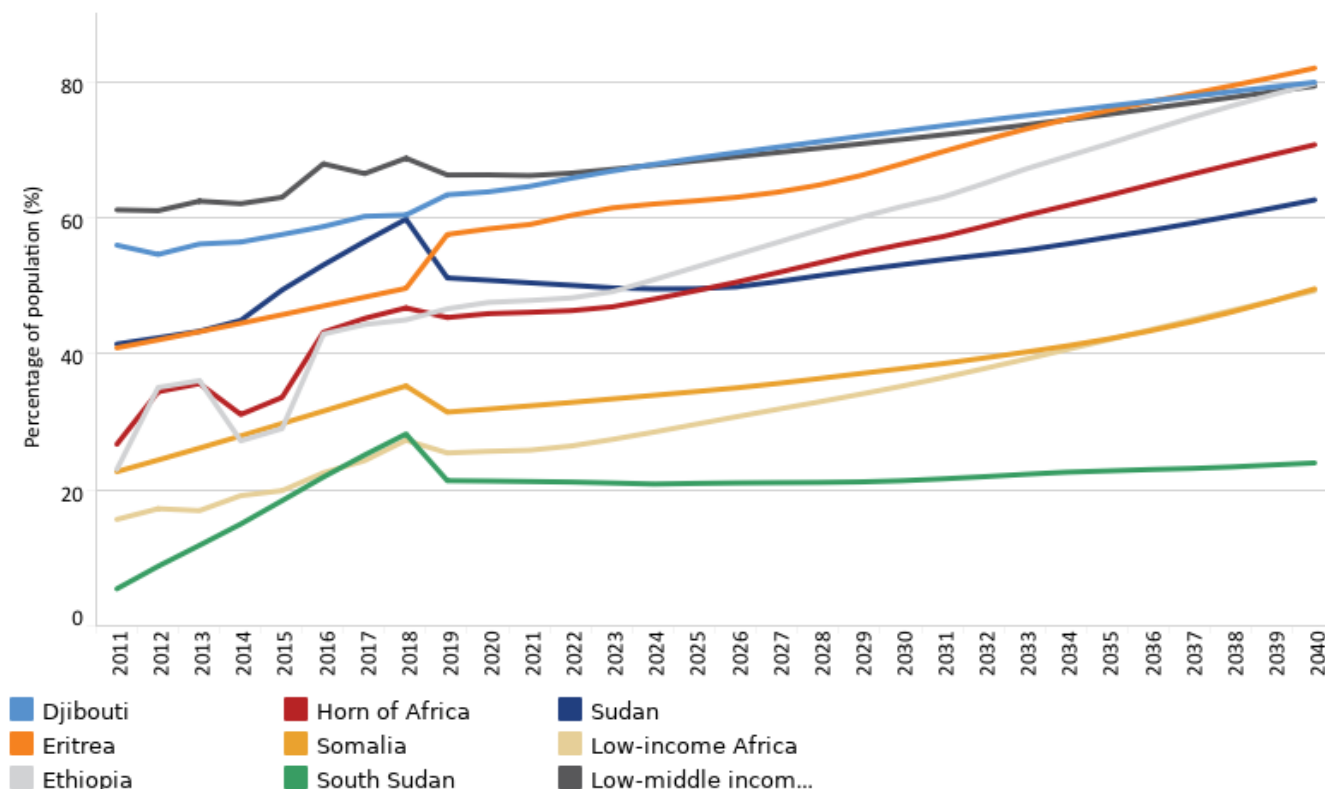
Despite this, only 45% of the population in the Horn region had access to electricity in 2019. This access rate is, however, above the average for low-income Africa, which was about 25.4% in the same year. Chart 23 shows the trend in electricity



access in the Horn of Africa. On the Current Path, 56% of the population in the Horn of Africa will have access to electricity by 2030, and about 71% in 2040. This is above the projected average for low-income Africa (49.2%) but below the projected average for lower middle-income Africa (79.3%) in 2040.

At the country level, electricity access ranges from 63% (highest) in Djibouti to 21.3% (lowest) in South Sudan. On the Current Path, Djibouti will have the highest electricity access rate (about 80%) by 2040, on par with lower middle-income Africa, while South Sudan will record the lowest access rate (24%).

**Chart 23: Access to electricity, Horn of Africa and other groups**



Source: Forecast in IFs version 7.63, historical data from World Bank

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The energy needs of Djibouti are met almost entirely through the import of fossil fuels, and it also imports most of its electricity. The main energy sources of the population are electricity, liquid petroleum gas and kerosene.[2]

Djibouti before 2011 was 100% dependent on heavy fuel oil and diesel thermal power plants for energy that exposed the country to fluctuating oil prices. Now, 65% of the country's electricity needs are provided through an interconnection with the Ethiopian grid.[3] Local power production, now accounting for around 35% of the energy supply, continues to be generated through local heavy fuel oil or diesel thermal power plants, with a total power generation capacity of 126 MW.

Cognisant of the strategic importance of a reliable and stable energy supply, the government of Djibouti has taken steps to increase energy security by putting more emphasis on renewable energy. The country's National Development Plan, Vision 2035, plans a transition from fossil thermal to 100% renewable energy. In this vein, legislation has been passed to open

electricity generation to private sector involvement. The law provides a tax exemption for all renewable energy equipment.[4] This is a critical step towards the exploration of the country's untapped renewable energy resources (geothermal, wind and solar resources).

Ethiopia has abundant renewable energy resources and has the potential to generate over 60 000 MW of electric power from hydroelectric, wind, solar and geothermal sources.[5] Despite this energy potential, Ethiopia is experiencing energy shortages. Over the past decade, the Ethiopian government has managed to expand the electricity grid to nearly 60% of the country—from only 667 towns and villages to approximately 6 000. has managed to expand the electricity grid to nearly 60% of the country—from only 667 towns and villages to approximately 6 000.[6]

However only 45% of the population has access to electricity. This means that more than 60 million people are still without access to electricity in Ethiopia. On the Current Path, access to electricity in the country is projected to be 74.5% by 2040, but the target is universal energy access by 2025, with 35% being off-grid and 65% grid.

Ethiopia currently has about 4 500 MW of installed electricity generation with 89% of the installed generation capacity from hydropower, while 8% and 3% are from wind and thermal sources respectively. The government aims to increase generating capacity to 25 000 MW by 2030 (22 000 MW of hydro; 1 000 MW of geothermal; and 2 000 MW of wind).[7]

The Grand Ethiopian Renaissance Dam (GERD), with a projected installed capacity of 5 600 MW, will contribute significantly to achieve this target. However, the GERD is the subject of a regional dispute as Sudan and Egypt are concerned that the rapid filling of the dam will undermine their water supplies, which come almost entirely from the Nile. A mutually agreed solution would help Ethiopia boost its industrialisation and economic development and earn hard currency through the export of electricity.

Eritrea's electric power is provided through fossil

fuels. Electricity is available only at a limited part of the country through the Eritrean Electricity Authority. Electricity access remains low for rural villagers. About 90% of the current installed generation capacity of 160 MW is from diesel generators (Hirgigo 132 MW and Belesa 17 MW).[8] The existing electricity distribution network is outdated and prone to failures. In 2019, IFs forecast the national electrification rate in Eritrea at 57% (33% in rural areas, 74% in urban areas).

Somalia's energy sector faces significant challenges due to a weak regulatory environment, lack of sufficiently trained labour, weak infrastructure, insecurity and political instability, among others. The country's national electricity grid collapsed during the civil war in 1991 and is now provided by private firms. Despite the recent progress made by the private sector in increasing electricity production and distribution, annual electricity consumption per capita in Somalia is among the lowest in Africa. Consumers pay a high rate of 50-125 cents/kWh compared to 0.6 cents/kWh in Ethiopia.[9]

To date, there is an installed generation capacity of 106 MW (diesel 100 MW; solar/wind: 6 MW). A recent African Development Bank report reveals that Somalia has the highest potential of wind energy resources of any African nation. It could generate 30 000 to 45 000 MW of electricity from wind. As of 2019, only 31% of the population has access to electricity. On the Current Path, access to electricity in Somalia is projected to reach 45.8% by 2040.

The government of Sudan has invested extensively in the production and distribution of thermal and hydroelectric power over the past decade. Power generation capacity has doubled, rising from around 8 455 MW in 2011 to 17 064 MW in 2018.[10] Sudan also imports Ethiopian electricity. Despite this growth, the power demand exceeds the available supply regularly, resulting in frequent power outages. Fifty-one per cent of the population had access to electricity as of 2019, and by 2040, it is projected to be 61%.

Traditional biomass (firewood and charcoal) still provides most of the population's energy needs, with environmental and

health issues associated with it. Wind energy is not yet developed, although Sudan has the potential, with average wind speeds of 4.5 meters per second across 50% of the country.

Since its average sunshine duration ranges from 8.5 to 11 hours a day, Sudan is also considered one of the best countries for exploiting solar energy. To date Sudan's solar energy achievements are however very poor. It has no solar capacity attached to the grid and total installed photovoltaic capacity only comes to about 2 MW.<sup>[11]</sup> Improving the energy sector, which is vital for increasing production and reducing poverty in Sudan, still requires considerable investment.

In South Sudan, access to electricity is very limited. There has never been a backbone for electricity transmission since the colonial era and none was developed during rule from Khartoum.<sup>[12]</sup> Three isolated distribution networks situated in the three urban centres of Juba, Wau and Malakal constitute the only accessible network. Generation sources connected to the grid consist solely of thermal generators (diesel and heavy fuel oil).

Total installed capacity for the entire country is 30 MW. As of 2019, only 21% of the population had access to electricity, and suffer from routine power outages and lack of reliability.<sup>[13]</sup> The rest of the population relies, among others, on firewood, solar, petroleum, and individual generators. By 2040, access to electricity is estimated to be 24%, well below the average for low-income Africa. Overall, South Sudan and Somalia have the lowest per capita electricity usage in Africa.

## Transport and ICT infrastructure

The level of economic development in a country can be tracked by looking at its infrastructure in the transport and communication sectors. Chart 24 presents selected transport and communication indicators for the Horn of Africa countries. With a few exceptions, transport and communication infrastructures in the Horn are generally underdeveloped, although those of Sudan and Djibouti are relatively developed compared to Eritrea, Somalia and South Sudan.

The share of paved roads in the total road network ranges from 47% in Djibouti to 0.3% in South Sudan, while the number of Internet users ranges from 56% of the population in Djibouti to 1.3% in Eritrea. Sudan has the longest railway network and the highest number of mobile phone subscribers per 100 people in the Horn of Africa.

**Chart 24: Transport and communication indicators in the Horn of Africa, 2019**



Geography	Roads: Total (km)	Roads: Paved (%)	Railways (km)	Mobile phone subscriptions (per 100 people)	Users of internet as % of population
Djibouti	3,115	47	97	42	56
Eritrea	16,000	22	306	20	1
Ethiopia	120,171	16	659	36	19
Somalia	23,200	12	0	49	2
Sudan	31,000	34	4,180	77	31
South Sudan	90,200	3	248	33	8

Source: CIA World Factbook, World Development Indicators

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Due to a lack of proper maintenance and repairs caused by conflicts and political instability, transport infrastructures are in particularly poor condition in Somalia and South Sudan. For example South Sudan ranked 54th of 54 on the 2020 African Development Bank's Transport Composite Index.

The total length of South Sudan's road network is approximately 90 200 km, with only 300 km paved, and much of the rest in disrepair. During the rainy season, large parts of the country become inaccessible while bridges for crossing rivers are lacking in other areas. As a landlocked country, South Sudan depends on its neighbours for access to the sea, including connectivity with an undersea fibre-optic cable.[14]

Weak transport conditions constitute a significant impediment to South Sudan's economic and social activity. Around 60% of South Sudanese firms consider transport as a serious obstacle to doing business.[15] Somalia, on the other hand, has no railways and almost all its main roads are highly dilapidated.

Ethiopia and Sudan have made significant progress in expanding their road network. For instance, Ethiopia's road network increased from 19 000 km in 1990 to 120 171 km in 2018 with 16% paved. The country has spent about US\$11 billion on road building over the past 20 years that now accounts for about 25% of the federal government's annual infrastructure spending.[16]

Ethiopia uses the neighbouring Djibouti as the main access to the sea for its import-export business. Initially this occurred via a paved road until the completion of an electrified railway line of 750 km connecting Addis Ababa with Djibouti at a cost of US\$4 billion. Peaceful relations with Eritrea open up new opportunities such as a planned railway line between Addis

Ababa and the Eritrean port of Assab, as well as two new roads linking the two countries.[17]

Like Ethiopia, Sudan has invested heavily in road infrastructure in recent years. Some 3 477 km of road, representing 33% of the network in 2011, were added to the road network during the period 2011–2018, taking the total paved road network to 10 595 km or 34% of the total road network in 2018.[18] Despite the significant increase in the length of the road network over the past decade, large portions of the country still lack roads.

Darfur remains the most disadvantaged region in terms of transport linkages to the rest of the country. Sudan needs considerable investment in its roads connecting remote regions to exploit its agricultural potential, and to use its strategic location to link four landlocked neighbours (South Sudan, Chad, Central Africa and Ethiopia) to Port Sudan on the Red Sea. Overall, the poor transport infrastructure delays or entirely restricts the movement of goods from one place to another in the Horn of Africa.

In terms of ICT, Ethiopia, Djibouti and Eritrea are the only three countries in the world that have maintained state monopoly on all telecommunication services, including fixed lines, mobile, Internet and broadband. As a consequence, penetration rates have remained low despite the progress made in recent years. For instance, only about 1% of the population in Eritrea and 19% in Ethiopia are Internet users.

The lack of competition prevents the market from living up to its potential. Opening the sector to competition and foreign investment would make quality telecommunication services available at affordable prices for the population. It would also allow these countries to have a vibrant digital economy while pushing innovations such as mobile money services.

Things are moving in this direction, especially in Ethiopia and Djibouti. As part of its ambitious plan to modernise the economy, the Ethiopian government has taken major steps to move from a state-oriented development model and liberalise key sectors, including telecommunications. In 2019, the Ethiopian Parliament passed a new telecommunications law that led to the establishment of an independent regulator, the Ethiopian Communications Authority.

Efforts to partially privatise the public operator Ethio Telecom and open the market to new licences are also under way.[19] In May 2021, the Ethiopian government granted telecoms operating licences worth US\$850 million to Kenya's Safaricom-led consortium.[20] Similarly, in line with the Djibouti Vision 2035 policy objectives, the government has put in place a specific strategy for ICT intending to develop the sector and generalise access to telecommunications services.

The expansion of digital access does come with some risks to governments. It provides the means for social mobilisation and greater access to information that could, if combined with a youth bulge, expanding education and limited opportunities, prove destabilising.

During the civil war, the public telecom infrastructure in Somalia was almost entirely dismantled. The mobile sector currently has seven private networks (Golis Telecom, Hormuud Telecom, NationLink Telecom, Somtel, Telcom, Telesom and Amtel) that boost the ICT sector along with submarine cables. This ends Somalia's dependence on costly satellite connectivity for internet access.[21]

A new telecommunications regulatory body has also been established with a mandate to address the problems with frequency spectrum coordination and interconnection between networks.[22] Mobile phone subscription (per 100 people) is 49 while users of the Internet as a percentage of the population stand at only 2%.[23]

Despite some improvements, the ICT sector in South Sudan is one of the world's least developed, while future growth of the sector is hindered by instability, insecurity, widespread poverty and low literacy rates. For these reasons the few private companies on the market have limited the areas in which they provide services.[24]

Sudan has one of the most liberalised ICT sectors in Africa. Zain, MTN, Sudatel and Canar are four licensed telecommunications operators in Sudan, all wholly owned by foreign firms, with the exception of Sudatel, in which the state owns a 22% share.[25] Recent connection to an undersea fibre-optic cable has led to access extensions, efficiency upgrades and reduced telecommunications costs.[26] In 2019, the number of cellphone subscribers stood at 77 per 100 individuals and mobile phone coverage reached around 80% of the country. Sudan has a high mobile subscription rate per 100 people relative to its peers. Thirty-one per cent of the population are Internet users, placing Sudan at a far higher pace relative to all the Horn nations (except Djibouti).

## Water and sanitation

Access to safe water and sanitation is uncertain for millions of people in the Horn of Africa. Higher temperatures, prolonged droughts, high population growth and increasing migration place a strain on water resources.[27] In recent history, the region has experienced recurrent drought due to global climate change and related environmental shocks, which contribute to poverty, population displacement, biodiversity loss and increased conflict.

The Nile is a key source of fresh water in the region. As such, it has been a recurrent source of social and political tensions between Nile Basin countries, especially with the recent GERD construction, which Egypt sees as a threat to its water security. Djibouti, for example, does not have a permanent source of surface water such as rivers or freshwater lakes. It depends on deep underground water tables, where they exist, fed by rainwater infiltration. The country has been adversely affected by recurring droughts since 2009.[28]

Many herders and rural dwellers have lost their livelihoods, and countless families have seen their incomes dramatically reduced and are forced to seek shelter in urban centres.[29] As a result of climate change, the Horn region is projected to experience significant variations in rainfall and temperatures, and this is likely to exacerbate water insecurity in the region.

As of 2019, about 38.3% of the population in the Horn region had access to piped water, and 19.8% to improved sanitation (Chart 25). The regional average of piped water access is above that of low-income Africa while the region remains below the average for low-income Africa in terms of access to improved sanitation. On the Current Path, access to piped water is projected to be about 73% by 2040, above the projected average of 52% for low-income Africa in the same year.



**Chart 25: Access to safe water source and improved sanitation: Horn of Africa and other groups**



Geography	2019		2030		2040	
	Access to improved sanitation (% of population)	Access to piped water (% of population)	Access to improved sanitation (% of population)	Access to piped water (% of population)	Access to improved sanitation (% of population)	Access to piped water (% of population)
Djibouti	64.3	81.6	71.3	87.3	76.0	89.1
Eritrea	16.5	52.6	25.1	49.8	37.3	54.7
Ethiopia	11.0	37.5	33.0	57.0	90.0	87.0
Somalia	38.2	39.3	54.5	45.0	85.6	60.0
Sudan	38.0	46.0	42.6	45.6	50.0	51.8
South Sudan	11.6	4.3	18.0	7.2	25.4	18.0
Horn of Africa	19.8	38.3	36.3	51.2	76.4	72.7
Low-income Africa	24.3	30.6	35.4	39.2	56.8	52.1
Lower middle-income Africa	52.1	45.7	55.7	49.5	63.1	56.8

Source: Forecast in IFs version 7.63, historical data from WHO/UNICEF JMP global database

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As shown in Chart 25, access to safe water and sanitation is not homogenous across the Horn region. Djibouti has the highest access rates of improved water and sanitation in the region and is above the average for its peers (lower middle-income Africa), due to its tiny population and small size. However, major disparities exist between urban and rural areas in Djibouti. While about 70% of urban residents have access to sanitation facilities, only 16.4% have access to latrines in rural communities.[30]

In Ethiopia, about 33 million people do not have access to an improved source of water while 89 million people remain without access to improved sanitation. In rural Ethiopia, many women and children walk several hours to collect water, often from shallow wells or unprotected ponds that they share with animals.[31]

Nearly 90% of South Sudan's population has no access to improved sanitation, making it the country with the lowest access rates in the region, although slightly better than for Ethiopia. In South Sudan, only 17% of schools have suitable latrines. The chance of contracting waterborne diseases such as diarrhoea, cholera, hepatitis, typhoid or Guinea worm disease in the country is one of the world's highest.[32] Continuing conflicts, instability and bad governance have made access to clean water scarce and often lead to tensions between communities.

Access to safe water and sanitation is also a major problem in Eritrea and Somalia. According to UNICEF, diarrhoeal disease, which is often caused by contaminated water sources, is the leading cause of death for children under the age of five in Eritrea. Around half of Somalia's population does not have access to a basic source of water.

Restricted control of private suppliers of water also leads to high costs, requiring families to retrieve water from remote and dangerous open wells; open defecation is a common occurrence, with 28% of the population defecating outdoors.[33]

Water scarcity is a significant cause of conflict in Somalia's nomadic pastoralist societies. According to a study commissioned by Somalia's Ministry of Planning in partnership with development partners, scarcity of drinking water along with food insecurity contribute significantly to rural conflict, child malnutrition and waterborne disease in the country.[34]

The Jubba and Shabelle rivers are Somalia's main sources of water, and both sources flow from Ethiopia. A national water policy to regulate and manage internal water resources and a Somalia-Ethiopia bilateral agreement on the mutual waters of the two rivers are indispensable to improve water security in Somalia.

As for Sudan, access to improved sources of water and sanitation has experienced some improvement in recent years, although the water and sanitation sector is facing several key constraints. These include weak sector coordination capacities and a lack of resources for investment in the provision of water facilities.[35] About 60% of the population in Sudan is still without access to improved sanitation.

Overall, the Horn of Africa performs poorly in the water and sanitation sector. This increases the prevalence of preventable diseases, including cholera, measles and acute respiratory infections, among others. Also, girls and women are often responsible for water collection, especially in the rural areas, and this limits their time and possibility to go to school and work. In Somalia, for instance, a single trip to fetch water can, on average, take more than an hour.[36]

Several actions are being taken in collaboration with international organisations and NGOs to improve the population's drinking water and sanitation issues. These include UNICEF, the World Bank, EU, US Agency for International Development and Water.org, among others. To date, for example, Water.org has reached more than 256 000 people with access to safe water and sanitation in Ethiopia. And the Djibouti National Water and Sanitation Office has embarked on a major sanitation programme with the financial support of the EU.[37]

In sum, increasing access to basic infrastructure such as electricity, transport and communication as well as safe water and improved sanitation in the Horn region could produce major benefits in terms of people's living conditions. This could help to achieve the SDGs.

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