Children's Climate Risk Index:

Egypt Report

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for every child

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This report was produced by Stefano Visani, in consultation with UNICEF. The contents of this report are the responsibility of its authors and do not necessarily reflect the views of UNICEF.

Table of Contents

Introduction

The effects of climate change and environmental degradation are fast becoming more severe, and their consequences more visible around the world. The awareness of the urgency of a decisive response at all levels is also rising, making climate change and environmental degradation anincreasingly prominent issue in public policy. While the negative effects of climate change impact all people, children, especially those living in poorer communities, are more exposed than adults and have less capacity to respond, ultimately paying the highest price.

In 2021, UNICEF released the Children's Climate Risk Index (CCRI), published in the "The Climate Crisis is a Child Crisis"[1] Report. The CCRI provides the first comprehensive overview of exposure and vulnerability to the impacts of climate change from a child's perspective. The report is a contribution towards an increased understanding of the multifaceted impact climate change has specifically on children and of the actions required to increase children's adaptive capacity and resilience.

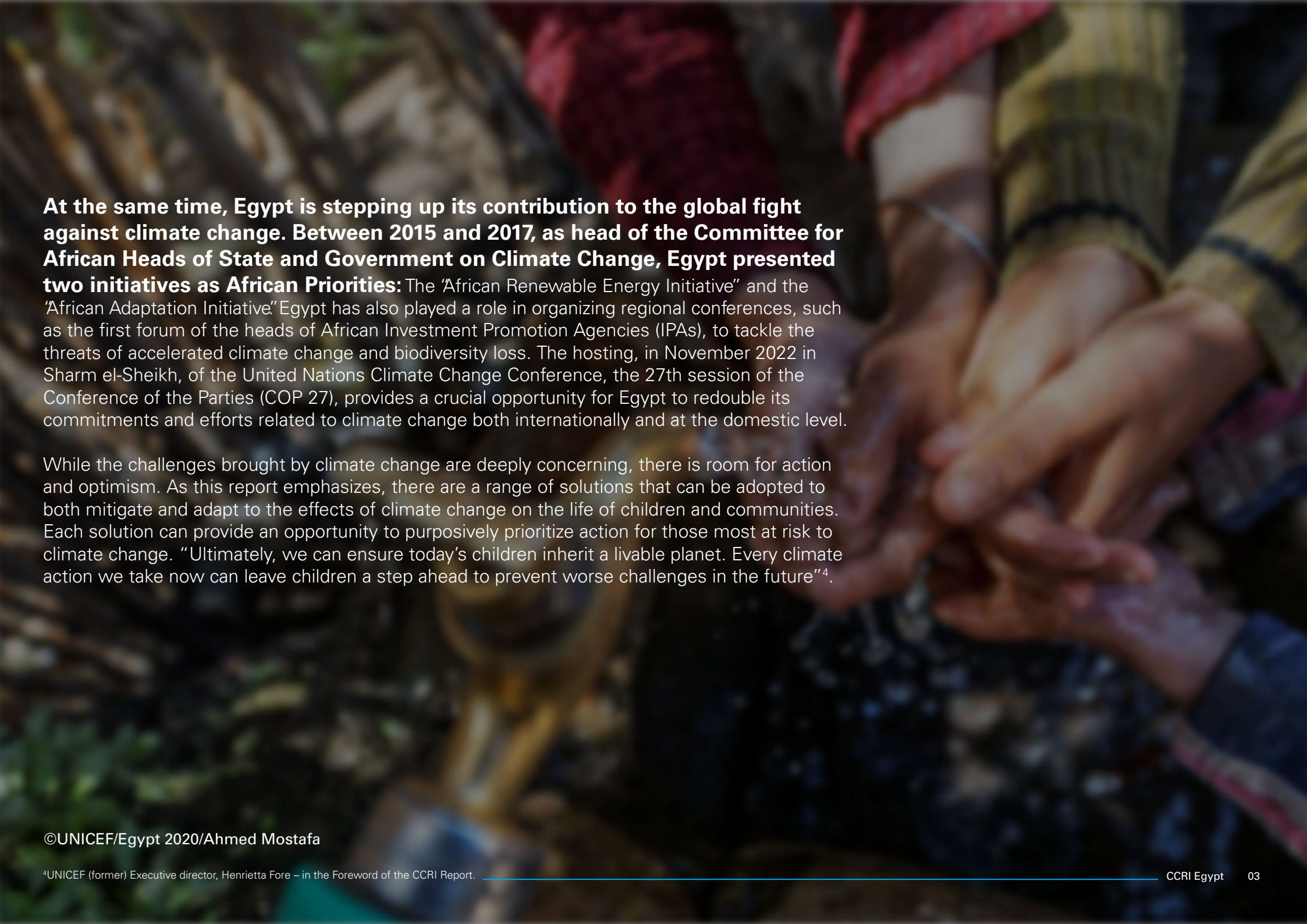
Using the data and methodology of the global UNICEF CCRI as a basis, this report presents an analysis focused specifically on Egypt. The objective of this report is to shed light on how climate change is impacting on the rights of children in Egypt and to explore levels of exposure and vulnerability of children in Egypt to climate change. This report can also be seen as a call for policy and actions that can timely and effectively respond to the challenges that climate change brings to the realization of children's rights in Egypt. Finally, the report can also serve as a contribution to the country's efforts by promoting informed strategic decisions and solutions that protect the children in Egypt from the impacts of climate change.

Egypt is highly vulnerable to climate change, with projected increase in heat waves, dust storms, storms along the Mediterranean coast and extreme weather events[2]. Stronger warming has been documented over the past 30 years, with average temperatures increasing by 0.53 degree Celsius per decade.[3] The country's climate risks are and will impact the younger generations of today.

Crucially, the awareness of the importance of climate change action both domestically and at the global level is fast increasing in Egypt. The country is at a turning point in its commitment and action to tackle the consequences of climate change. The Egypt National Climate Change Strategy (NCCS), which is finalized, represents a milestone in this process, as it is the country's first comprehensive strategy adopted which is consolidating the different aspects of climate change and fostering the integration of climate change dimensions into general planning in all sectors.

In the 2030 Vision and sustainable development strategy, Egypt has also made commitments to integrate climate change in national development policies and to progressively green its budget across sectors.

[1]The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index. New York: United Nations Children's Fund (UNICEF), 2021.
[2]Egypt Third National Communication under the United Nations Framework Convention on Climate Change.
[3]GERICS (2019). Climate Fact Sheet – Egypt. URL: https://www.climate-service-center.de/products_and_publications/fact_sheets/ climate_fact_sheets/index.php.en



At the same time, Egypt is stepping up its contribution to the global fight against climate change. Between 2015 and 2017, as head of the Committee for African Heads of State and Government on Climate Change, Egypt presented two initiatives as African Priorities: The "African Renewable Energy Initiative" and the "African Adaptation Initiative." Egypt has also played a role in organizing regional conferences, such as the first forum of the heads of African Investment Promotion Agencies (IPAs), to tackle the threats of accelerated climate change and biodiversity loss. The hosting, in November 2022 in Sharm el-Sheikh, of the United Nations Climate Change Conference, the 27th session of the Conference of the Parties (COP 27), provides a crucial opportunity for Egypt to redouble its commitments and efforts related to climate change both internationally and at the domestic level.

While the challenges brought by climate change are deeply concerning, there is room for action and optimism. As this report emphasizes, there are a range of solutions that can be adopted to both mitigate and adapt to the effects of climate change on the life of children and communities. Each solution can provide an opportunity to purposively prioritize action for those most at risk to climate change. "Ultimately, we can ensure today's children inherit a livable planet. Every climate action we take now can leave children a step ahead to prevent worse challenges in the future"[4].

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[4]UNICEF (former) Executive director, Henrietta Fore – in the Foreword of the CCRI Report.

1. The Children's Climate Change Index

The Children's Climate Risk Index (CCRI) is a composite index based on a multi-shock model that captures the exposure of children to multiple climate and environmental shocks and stress. The index covers the various sectors related to the well-being of children, focusing on aspects that can contribute to child deprivation in the context of climate-related and environmental shocks and stresses.

The CCRI has distinctive characteristics that make it different from other climate related indexes. **Firstly,** it focuses on child-specific factors of vulnerabilities and capacity such as Water, Sanitation and Hygiene (WASH), education, health, nutrition and social protection. **Secondly,** the CCRI uses updated hydrological and coastal flood risk data from the World Resource Institute, which allows us to measure exposure to shocks and stresses with a higher resolution. **Thirdly,** the CCRI goes beyond climate-related hazards and climate change by also including broader environmental shocks and stresses that have a direct impact on children's wellbeing, such as air pollution.

Adopting the Intergovernmental Panel on Climate Change (IPCC) risk framework (IPCC 2014), the CCRI considers risk as being composed of the key domains of hazards, exposure to identified hazards and vulnerability, where vulnerability has the components of both sensitivity (immediate impact of hazard) and adaptive capacity (ability to respond in the longer term). **The indicators that compose the index reflect these categorizations and, more specifically, reflect them in relation to children's risk related to climate change.**

- Children are more vulnerable to climate and environmental shocks than adults for several reasons: They are physically more vulnerable, and less able to withstand and survive shocks such as floods, droughts, severe weather and heatwaves.

- They are physiologically more vulnerable. Toxic substances, such as lead and other forms of pollution, affect children more than adults, even at lower doses of exposure[5].

- They are more at risk of death compared with adults from diseases that are likely to beexacerbated by climate change, such as Malaria and Dengue.

- They have their whole life ahead of them – any deprivation as a result of climate and environmental degradation at a young age can result in a lifetime of lost opportunity.


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[5]UNICEF Toxic Truth report here: https://www.unicef.org/reports/toxic-truth-childrens-exposure-to-lead-pollution-2020

Not all children are equally vulnerable to climate and environmental related shocks and stresses. Some children who for various reasons are the most vulnerable, will bear the greatest burden. For example, while climate change will impact agricultural systems globally – the effects will be most acute where the main source of income relies on the natural environment, where families spend the majority of their incomes on food, and where the nutritional status of children is insufficient to withstand changes in the price and quality of food. Similarly, while climate change will affect the health of children all around the world – the effects will be most acute where disease vectors become more prevalent and widespread, and where the health systems are not capable to adequately protect children from the shocks[6].

The CCRI is specifically sensitive to the experience of children, thus providing insight that can inform policy decisions toward protecting children from the impact of climate change and environmental degradation. Decision makers at all levels are in fact tasked with the duty of defining policies and programmes that are specifically tailored to the heightened vulnerability of children and provide adequate response to mitigate it. To this end, it is important to have a sound understanding of the type and scale of hazard, shock or stress that children are likely to face. Equally important, policies and programmes need to take into consideration the extent to which children in a certain community have access to climate resilient basic social services that can reduce their vulnerability to climate-related shocks and stresses. These considerations are at the basis of the way the CCRI is built. In fact, the Index is calculated based on a set of indicators across two pillars, namely:

- Pillar 1 that measures the exposure of children to climate and environmental hazards, shocks and stresses.
- Pillar 2 that captures child vulnerability to climate and environmental shocks and stresses.

The first pillar reflects the likelihood that the child population of a country is exposed to climate and environmental shocks or stresses. It includes **eight components** aggregated with a geometric average.

The second pillar deals with the vulnerability of children to the negative effects of climate and environmental induced shocks and stresses. This pillar focuses on the underlying factors that make children, their families and communities prone to the adverse impacts of these shocks and stresses. The pillar comprises of **four** components that measure different aspects of child vulnerability and the capacity and readiness of communities and systems to deliver services that are essential for the well-being of children. Figure 1 provides a list, by pillar, of the components that compose the two pillars of the CCRI.

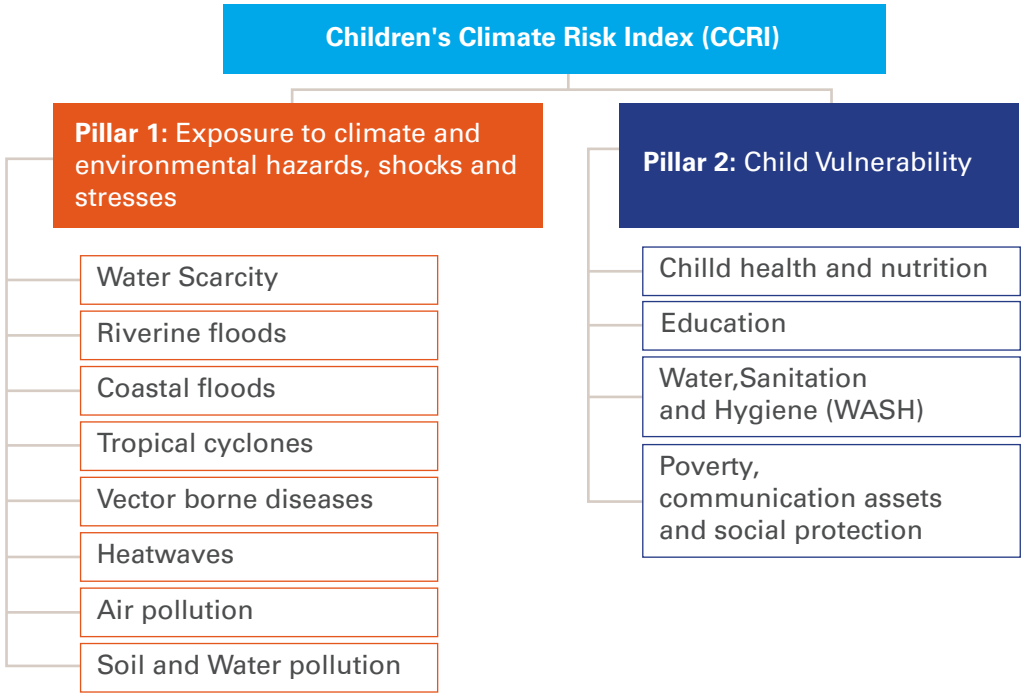
Each of these **twelve components** are calculated using a number of indicators whose data are combined to determine a CCRI score for each individual component.

[6]The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index. New York: United Nations Children's Fund (UNICEF), 2021.

Across the two pillars, the CCRI uses 57 indicators together to measure children's overall risk related to climate change[7].

Figure 1:

CCRI index pillars and relative component



All results presented by the CCRI model are indices. Each country has a score between 0 and 10 on the final CCRI and on each of the two pillars and on all the dimensions that compose the two pillars. A higher score corresponds to a higher risk level or a worse situation; a score of 0 indicates that the model does not record any specific risk on the pillar or component that is presents a 0 score.

[7]For a more detailed review of the CCRI methodology please refer to: . The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index. New York: United Nations Children's Fund (UNICEF), 2021. See in particular the annexed methodological note.

To facilitate the analysis of the results for the overall index, the two pillars and the different components that compose it, countries are categorized into five classes of risks according to the scales presented in Table 1.

Table 1:

CCRI calls limits at the level of the climate change risk index and pillars

Risk Index and Pillars	Class	Min	Max
Children's Climate and Environment Risk Index (CCRI)	extremely high	7.1	10.1
	high	5.5	7.0
	medium-high	3.8	5.4
	low-medium	2.1	3.7
	low	0.0	2.0
Pillar 1: Exposure to climate and environmental shocks	extremely high	7.1	10.1
	high	5.5	7.0
	medium-high	3.8	5.4
	low-medium	2.1	3.7
	low	0.0	2.0
Pillar 2: Child Vulnerability	extremely high	7.1	10.1
	high	5.5	7.0
	medium-high	3.8	5.4
	low-medium	2.1	3.7
	low	0.0	2.0

2. Children's exposure to climate and environmental hazards, shocks and stresses in Egypt

This section of the report focuses on the **first pillar** of the CCRI, the one dealing with the climate and environmental related risks factors to which children are exposed. For each of the eight risk factors (also called 'components') that are part of pillar 1.

This section of the report outlines how children who are exposed are uniquely vulnerable to the effects of the risk factors.

Furthermore, it outlines the situation in Egypt and looks at Egypt index score in each factor, also comparing it to the scores of the other countries of the Middle East and North Africa (MENA) region.

2.1. Extreme temperature

The past six years have been the hottest on record for our planet, with 2020 setting a new record. Extreme temperatures tend to affect children more than adults, as children adjust more slowly to changes in temperature and are more vulnerable to heat-related health risks. Infants and children are more likely to suffer from heatstroke because they are unable or lack agency to regulate their body temperature and control their surrounding environment.

Exposure to abnormal or prolonged heat and humidity without relief or adequate fluids can cause various types of heat-related illnesses. Children and adolescents with chronic health conditions, such as respiratory conditions, may be even more susceptible to heat-related illnesses. Conditions like heart disease, mental illness and poor circulation are risk factors for heat-related illnesses. Other risk factors that can make children vulnerable include whether they have access to adequate shelter, clothing and water[8]. It is therefore critical to provide communities with resources and knowledge needed to protect themselves and children from the effects of extreme heat[9].

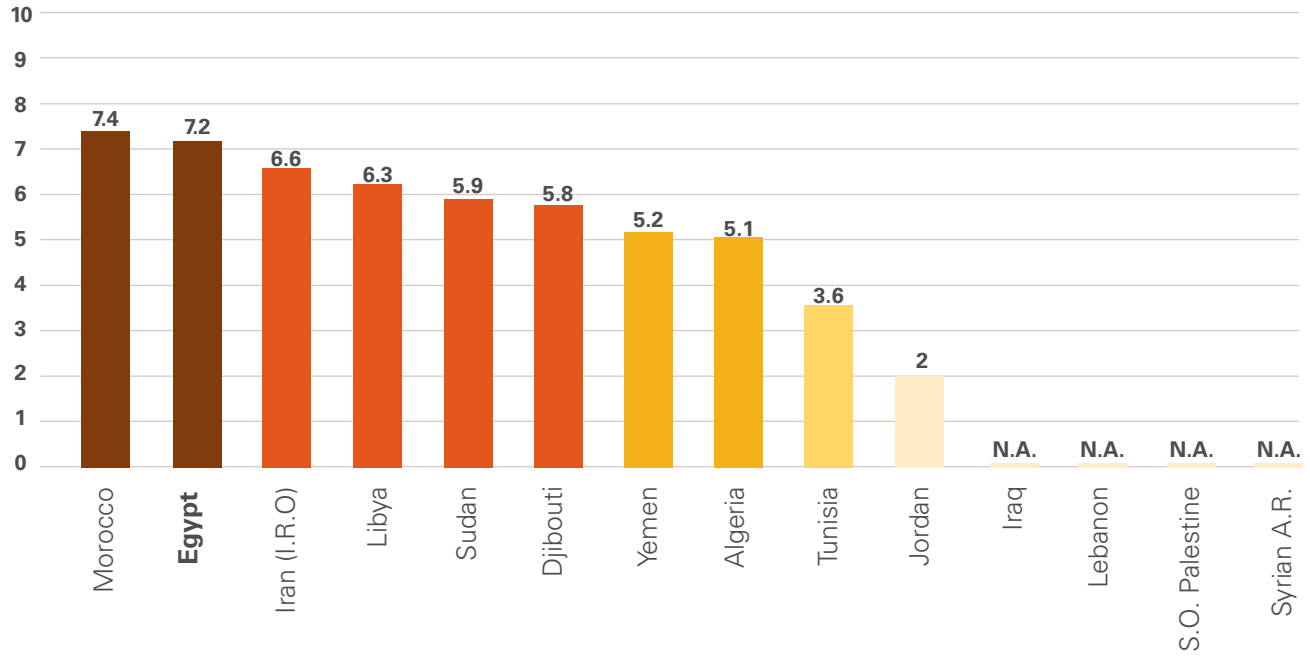
[8]The Climate Crisis is a Child Rights Crisis. UNICEF, 2021.
[9]CCRI dataset (2020). This heatwave indicator shows the estimated number of children under 18 living in areas where the average yearly number of heatwaves was above six per year between 2000 and 2020

An estimated 5.3 million children are exposed to heatwaves in Egypt.[10] According to recent analysis[11], by the year 2080, Egypt is expected to experience an increase in annual mean temperature between 1.8°C and 5.2°C, with maximum temperatures expected to increase by 2.1°C to 5.7°C over the same period. The severity and frequency of heat waves will also increase significantly, and their duration is expected to last between 9 and 77 days longer than currently recorded. Egypt's hyper-arid areas are forecasted to experience a more rapid increase in temperature and heatwaves[12].

In the coming years the number of children exposed will increase due to the forecasted increase in temperature and heatwaves and the population growth in the country. In addition to the significant impact, these changes will have on human health, particularly on children, heatwaves will also negatively affect animal health, agriculture, water resources, and ecosystems thus producing additional damage to families and communities' livelihood.

With an index score of 7.2 (on the 0 to 10 scale), Egypt vulnerability to heatwaves falls in the 'extremely high' class. Figure 2 shows that Egypt's vulnerability to heatwaves is the second highest in the region, after Morocco that posts a slightly higher score (7.4).

Figure 2:
CCRI index – Exposure to heatwave in MENA counties



[10]CCRI dataset (2020).
[11]GERICS (2019). Climate Fact Sheet – Egypt
[12]USAID (2018). Climate Risk Profile – Egypt. Fact Sheet. URL: https://www.climatelinks.org/sites/default/files/asset/document/2018_USAID-ATLAS-Project_Climate-Risk-Profile-Egypt.pdf

2.2. Water scarcity

Water scarcity refers to the lack of available water resources to meet the demands of a population. It can result from different factors, including low rates of recharge, prolonged misuse, poor management, overextraction of groundwater and contamination of freshwater supplies. Rising temperatures can contribute to water scarcity through increased evaporation from land and water. At the same time, higher temperatures also lead to higher demand for water. Water scarcity and droughts can have multiple devastating effects on poor families and communities, including through crop failure, livestock death and income drops, leading to food insecurity as well as increase in food prices. Water scarcity can also increase the incidence of a range of diseases.

A reduction in the availability of fresh water for drinking and hygiene places children at an increased exposure to diseases such as cholera, typhoid, acute respiratory infections and measles. Waterborne infections can also cause diarrhoea – which in itself is one of the biggest killers of children globally. A decrease in water volume can also lead to an increase in the concentration of biological and chemical contaminants, which can harm children[13].

Water is an extremely scarce resource in Egypt, due to the country's high evaporation rate and the near absence of permanent surface water over significant portions of the country[14]. Egypt also has low precipitation levels as data from the past three decades shows that the average precipitation has been decreasing and it is forecasted to continue to decline[15]. Reduced precipitation combined with increased temperatures are expected to increase evaporation, deteriorate water balance and worsen drought conditions.

With the Nile River's sources located outside Egypt, the country is highly vulnerable to changing climatic conditions and shocks both within and outside its borders.

Evidence on the effect of climate change on the level of water in the Nile River is still inconclusive.

However, some studies indicate that increased evaporation due to rising temperatures could decrease water availability in the Nile River by up to 70 percent, while other studies suggest the projected increases of rainfall in the Ethiopian highlands and Blue Nile River Basin could increase flow by 15 to 25 percent[16]. Given uncertainties in future flow, there is need to prepare for potential changes in both flood and drought incidence in Egypt.

A further crucial element impacting on water availability in Egypt is the rapid increase in the country's population, which is expected to be home to 112 million people by 2025[17], accelerating water demands.

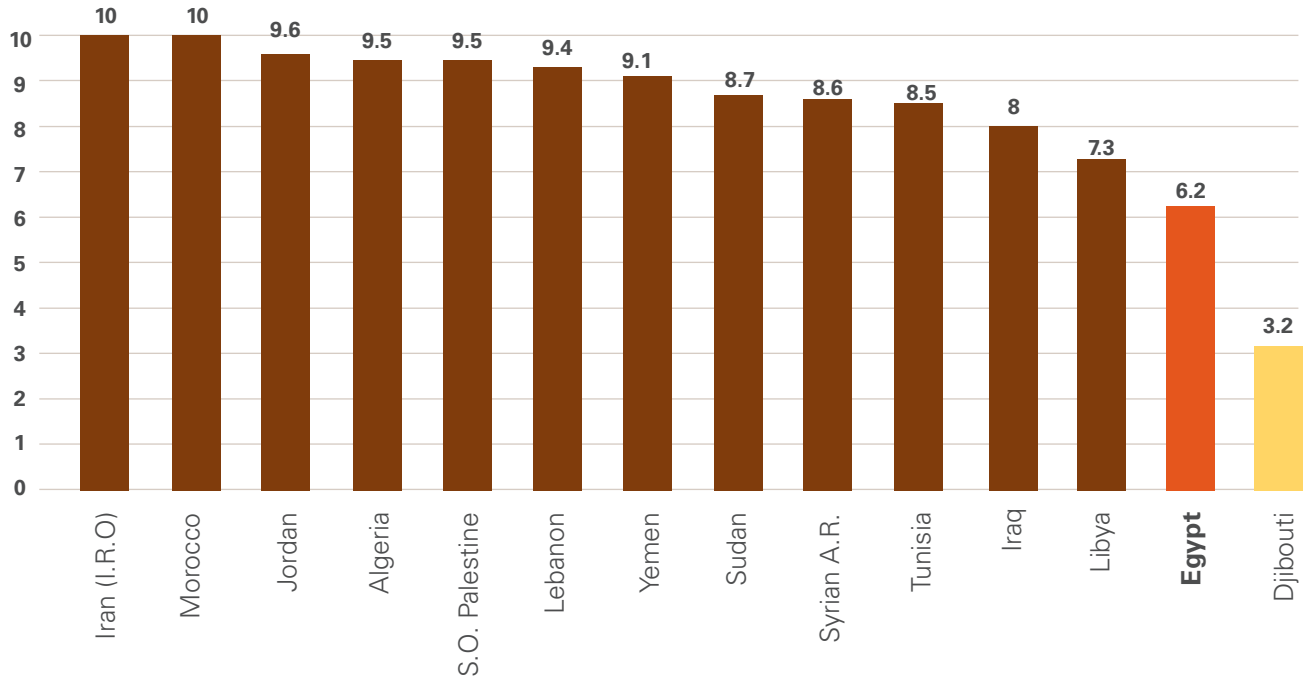
All these factors combined resulted in the decline in Egypt's annual per capita share of water starting from the late 1980, to 772 cubic meters in 2019, which sit significantly below the international standards at 1,000 cubic meters[18]. Demographic dynamics will continue to play a crucial role in the coming years, as population is growing not only in Egypt, but also in other countries along the Nile River, which are expected to host around a billion people by 2050[19].

[13]CCRI report pages 31-32.
[14]World Bank. Climate change knowledge portal, Egypt, Current climate page.
[15]GERICS (2019). Climate Fact Sheet – Egypt.
[16]USAID (2018). Climate Risk Profile – Egypt. Fact Sheet.
[17]United Nations population projections.
[18]Knoema World data atlas, Egypt
[19]Own calculation based on United Nations population projections.

These factors are likely to increase the risk of conflict related to water scarcity among water uses, which would disproportionately affect the most destitute communities with limited coping strategies and higher risk. Further reduction in water availability can also impact on agricultural, industrial, and domestic water uses, while at the same time impacting the overall hydropower generation capacity of the Aswan dam[20].

When examining regional water scarcity CCRI scores, the MENA region has a very high level of vulnerability to water scarcity. With twelve of the region's countries falling in the 'extremely high' class with scores above 7.2 over 10 in this dimension (Figure 3). With a score of 6.2, **Egypt exposure to water scarcity, while it is in high class, it is lower than the majority of countries in the MENA region.The Nile River and its constant provision** of fresh water is a main determinant of Egypt's relatively lower vulnerability in this dimension compared to other countries in the region. However, as indicated above this scenario is likely to change in the coming years resulting in an increase in children of Egypt's exposure to this risk factor.

Figure 3:
CCRI index - Exposure to water scarcity in MENA countries



[20]USAID (2018). Climate Risk Profile – Egypt. Fact Sheet.

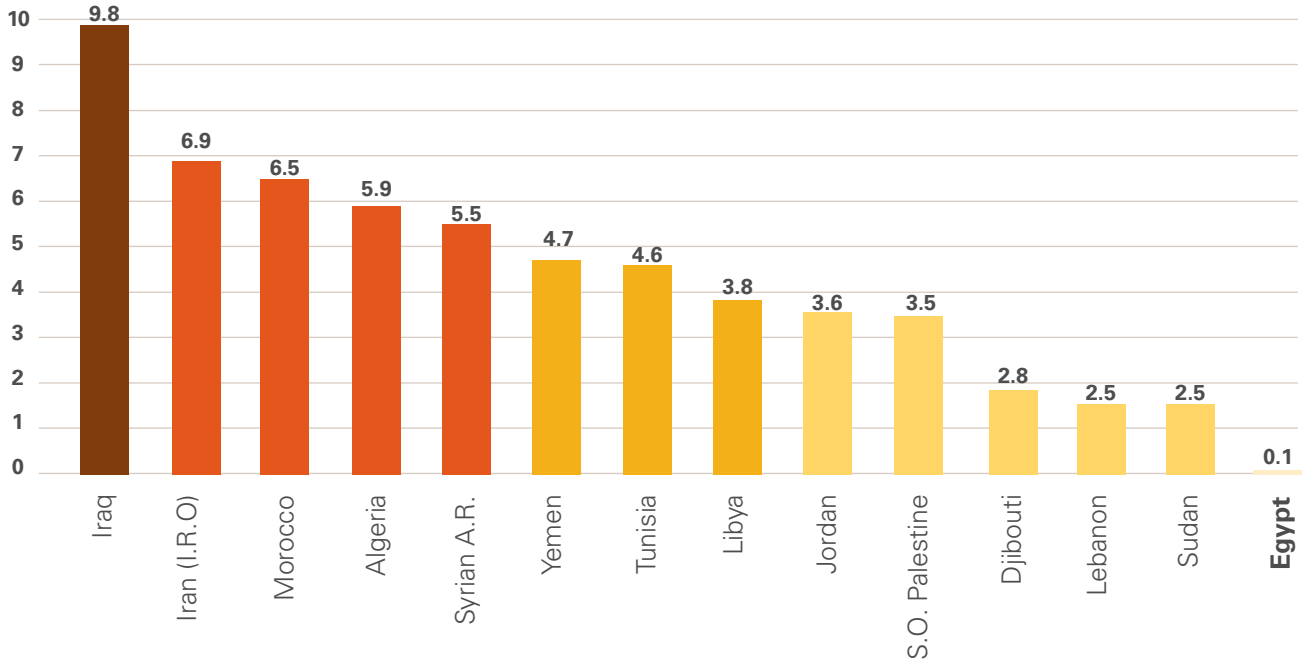
2.3. Riverine flooding

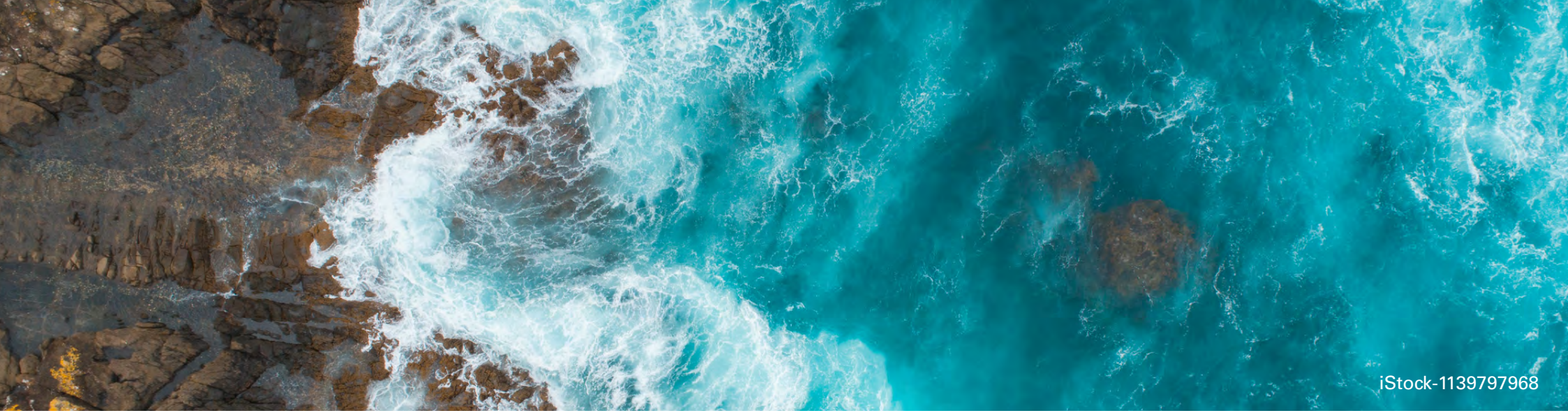
The vast majority of the Egyptian population lives in close proximity to the Nile River and it is thus potentially exposed to floods. However, the annual flooding cycle in Egypt ends at Lake Nasser where Aswan High Dam, completed in 1970, controls the flow of the river, while using the water's power to generate electricity. The presence of the dam has substantially reduced the risk of riverine flooding in the country.

Nevertheless, the increased frequency of intense precipitation events with more frequent extreme rainfall and flash floods is likely to progressively heighten the risk of flooding, including overflowing riverbanks. Flash floods have a quick onset and a destructive effect due to a sudden release of water and debris moving fast. Flash floods can be particularly dangerous for children who can lack sufficient strength to stay on their feet when in contact with fast water currents, even in shallow water strong currents and debris in the water put them at risk of injuries and drowning. Floods can also increase health risks, including by through the contamination of water supplies which can result in increases in water borne diseases.

Egypt exposure to the riverside flood risk is in the 'low' class of the CCRI, with a score of 0.1 (Figure 4) that currently makes Egypt the country with the lowest level of risk in the MENA region.

Figure 4:
CCRI index – Exposure to riverine flooding in MENA Countries

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2.4. Coastal flooding

Coastal areas are particularly exposed to the risk of flooding, as a result of sea level rise or, coastal storms. This risk is heightened by the increasing frequency of severe weather associated with climate change. Higher global temperatures also cause thermal expansion of water, increasing coastal flood risk. In recent decades the rate of sea level rise has been increasing; between 2006 and 2015, sea levels rose on average by 3.6 mm per year globally[21]. **As a result of sea level rise low-lying coastal areas are and will be increasingly exposed to flooding. This in turn will increase coastal erosion, with waves extending further inland and affecting homes, infrastructure, agricultural land and ecosystems.**

With a coastline stretching for 3,500 kilometers, the coastal areas of Egypt are inhabited by some 15 percent of the country's population[22], primarily along the Mediterranean Sea, in Egypt's northern coast.

The shoreline along the Mediterranean Sea has a low elevation, with large areas of the Nile Delta below sea level, leaving it highly vulnerable to sea level rise[23]. In addition to major population centers, such as Alexandria, Rosetta, Damietta, Port Said, Suez, and Hurghada, coastal zones host important industrial, touristic and agricultural activities.

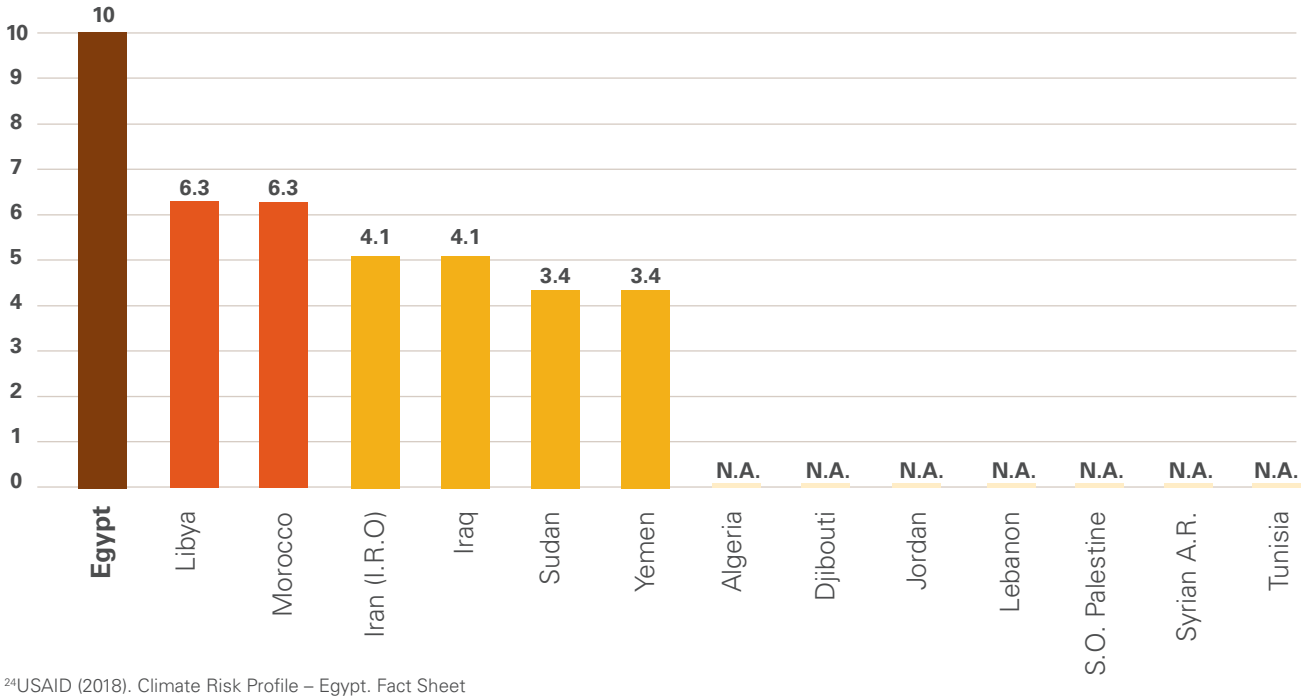
These characteristics make Egypt extremely vulnerable to the risk of coastal flooding. Inundation due to sea level rise and coastal storms threatens lives, property, environmental health, and the structural integrity and functioning of critical infrastructure. The inundation combined with saltwater intrusion pose great risk to **food security** and water security in the Nile Delta, an area that is both densely populated and used for agriculture. **Fisheries** can also be significantly impacted by saltwater intrusion, due to increased salinity of the lakes in and around the Nile Delta that can make these habitats unsuitable for many types of fish.

[21]Oppenheimer, M., B. C. Glavovic, J. Hinkel, R. van de Wal, A. K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R. M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, and Z. Sebesvari (2019),
[22]World Bank. Climate Risk Country Profile, Egypt. 2021.
[23]World Bank, Climate Risk Country Profile, Egypt. 2021.

Tourism, another crucial sector for the country's economy is also highly vulnerable to coastal flooding. As an example, it is estimated that nearly half of the area dedicated to the tourism sector in Alexandria could be underwater with just 0.5 meters rise in the sea-level. Higher than average water warming in the Red Sea is expected could result in coral bleaching[24].

Egypt's risk score in the coastal flood dimension falls in the 'extremely high' class of the CCRI, reaching the maximum value of the index range, 10 out of 10. Figure 5 shows that in this dimension Egypt posts the highest score, by a margin, among all countries in the MENA region. Based on available data, the countries with second highest exposure to this risk are Libya and Morocco that both have a score of 6.3 out of 10.

Figure 5:
CCRI index – Exposure to coastal flooding in MENA counties



[24]USAID (2018). Climate Risk Profile – Egypt. Fact Sheet
[25]CCRI report, page 41.

2.5. Cyclone exposure

Cyclones are rapidly rotating low-pressure storms which form over tropical or subtropical oceans. Cyclones can cause flooding, storm surges and extreme winds. **Egypt's score against this dimension of the index is zero,** similarly to all other countries in the region.

This is due to the lack of record of winds above 100 km per hour in the country. Tropical cyclones in the Mediterranean are rarely strong storms, but on some occasions have been noted to reach the strength of a category one hurricanes. Although they do not pose the threat of destructive winds, these storms can cause loss of life due to the formation of torrential rains and flash floods.

While the relationship between climate change and cyclone frequency is complex, with some projecting a decrease in frequency, there is agreement that warmer ocean temperatures and rising sea levels are likely to increase the frequency of high-intensity cyclones[25]. This might lead to an increase in the frequency and severity of the Mediterranean cyclones in the coming years and decades and thus result in an increase in the exposure to this hazard for Egypt and other countries in the region.

2.6. Disease vector exposure

Changes in temperature, precipitation patterns and humidity have a direct effect on the reproduction and survival of the mosquitoes that transmit vector-borne diseases. Rising temperatures increase bite rates and transmission and are associated with reductions in a mosquito's virus incubation periods, leading to higher mosquito proliferation. The prevalence of infectious disease outbreaks and vector distribution can also increase as a result of flooding. With increasing temperatures and shifting agro-ecological zones, the geographic prevalence of many of these diseases is changing and spreading into higher altitudes[26].

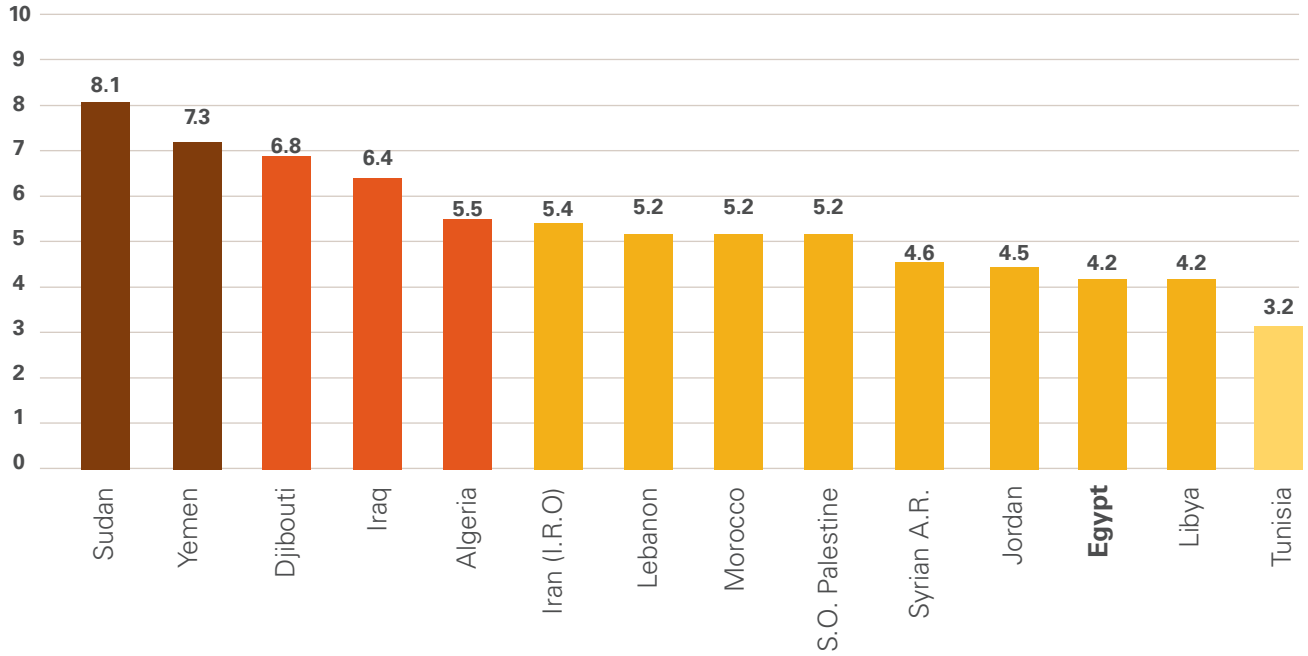
Egypt has made significant progress in decreasing the prevalence of vector- and waterborne diseases. However, high exposure to increase in temperature (as seen in paragraph 2.1), changes in precipitation partners and humidity and other climate related changes threatens to slow that progress.

Vector borne diseases such as malaria, dengue fever and respiratory infections are all highly sensitive to shifts in climatological environments and are expected to worsen across Egypt over the coming years.[27] The increase in intensity and frequency of dust storms and sandstorms can also contribute to an increase in numerous infectious diseases, such as influenza and pneumonia as well as non-infectious diseases, such as asthma and pulmonary fibrosis, and pose significant respiratory health risks to children.

Egypt index score in the vector borne diseases risk is 4.2 out of 10. Egypt's exposure to this hazard, while it falls in the **'medium-high' risk class** of the for the CCRI absolute score, it is relatively low in comparison to the other countries in the MENA region, as shown in Figure 6 below.

Figure 6:

CCRI index – Exposure to disease vector in MENA countries



[26]CCRI report, page 43.
[27]Egyptian Environmental Affairs Agency (2016). Egypt Third National Communication under the United Nations Framework Convention on Climate Change.

2.7. Air pollution

Children's lungs and their immune systems are still developing, making them especially vulnerable to polluted air. Their respiratory airways are smaller than adult airways, so infections are more likely to cause blockages than in adults. Exposure to air pollution during childhood can harm the healthy development of children's lungs, and this can have lifelong implications. Air pollution is linked with asthma, bronchitis and other respiratory infections and diseases, which can be debilitating, force children to miss school, and cause long-lasting damage to their health and well-being. Air pollution might affect cognitive development[28], as inhaled ultrafine particles are so small that they can enter the bloodstream and eventually lead to oxidative stress and neuroinflammation in the brain. Pregnant mothers are particularly at risk – studies have shown an association between high levels of air pollution and fetal loss, pre-term delivery, lower birthweight and infertility.[29]

Available data from the Egyptian Environmental Affairs Agency (EEAA) indicate that the presence of particulate matter is very high in Egypt and well above the World Health Organization (WHO) air quality guidelines for the annual average in ambient concentration. An analysis of the EEAA data[30] looking at PM2.5[31] in Greater Cairo found an annual average concentration over the period 1999-2016 of 84 milligrams per cubic meter (µg/m3) of PM2.5. This value is more than eight times higher than the WHO air quality standard for PM2.5 of 10 µg/m3.

It is estimated that annually in Egypt close to 20,000 people are dying prematurely and over 3 billion days are living with illnesses as a result of air pollution. The estimated cost of these health effects is equivalent to 2.5 percent of Egypt's GDP .[32]

Egypt carbon emissions have increased rapidly, particularly so since the early 2000s. The total country's emission passed from 100 million tons in 2000 to 254 million tons in 2019.[33] Improper waste management, including burning of waste and garbage is also a contributing factor to the pollution problem in Egypt.[34]

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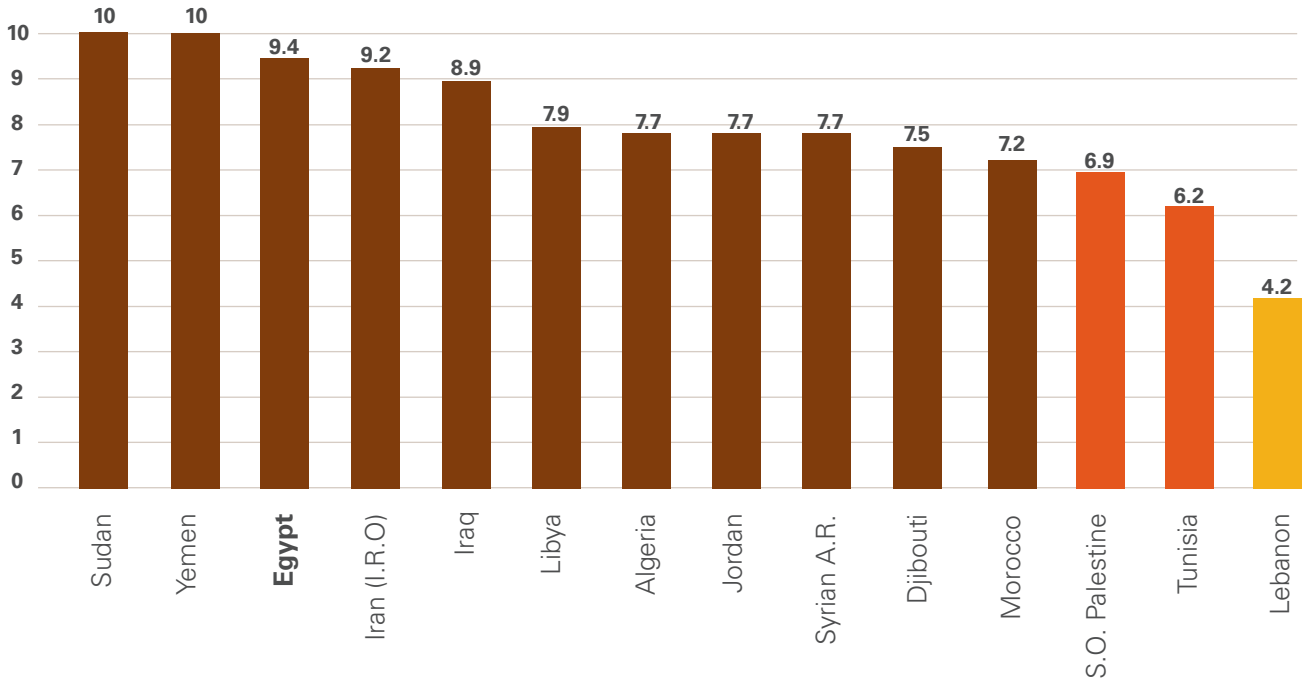
[28]UNICEF Clear the Air for Children: https://www.unicef.org/reports/clean-air-children
[29]CCRI report, page 50
[30]Larsen, Bjorn. 2019. Egypt: Cost of Environmental Degradation: Air and Water Pollution. The World Bank.
[31]'PM 2.5' refers to the particulate matter that is smaller than 2.5 micrometers.
[32]Larsen, Bjorn. 2019. Egypt: Cost of Environmental Degradation: Air and Water Pollution, The World Bank.
[33]International Energy Agency, Country profile, Egypt.
[34]UNEP (2018). "How climate change and population growth threaten Egypt's ancient treasures."

Egypt's exposure to the air pollution hazard is scored with a 9.4 out of 10 in the CCRI falling in the 'extremely high' classification. When looking at the MENA region at large (Figure 7), it is evident that the whole of MENA has very high exposure to this hazard, with all countries, except Lebanon, falling in the 'high' or in the 'extremely high' category. Egypt's exposure ranks third in the region. Sudan and Yemen, both reaching a score of 10 out of 10 in the index, are the only two countries in the region with exposure higher than Egypt.

Figure 7:
CCRI index – Exposure to Air pollution in MENA countries



2.8. Soil and water pollution

Soil and water pollution are a risk factor for the health and development of children. Lead, a potent neurotoxin, is among the most dangerous pollutants and it is often found in soil and water. Around 1 in 3 children globally have blood lead levels at or above 5 micrograms per decilitre (µg/dL)[35]. Children under five are most vulnerable, due to the critical window of brain development and studies show that exposure levels above 5µg/dL may result in a 3–5 point lower score on intelligence tests[36], that in turn can undermine children's future potential. Pesticides are another common pollutant of soil and water that can affect children's health, cause developmental delays and impact brain and behaviour development. Child exposure can be significantly reduced with the sound management of chemicals.

Exposure to pesticide pollution can be exacerbated by many of the other climate and environmental hazards. During storms and floods, for example, there is potential that pesticides can leach into previously uncontaminated areas and water sources.

[35]CCRI report, page 52.
[36]CCRI report, page 52

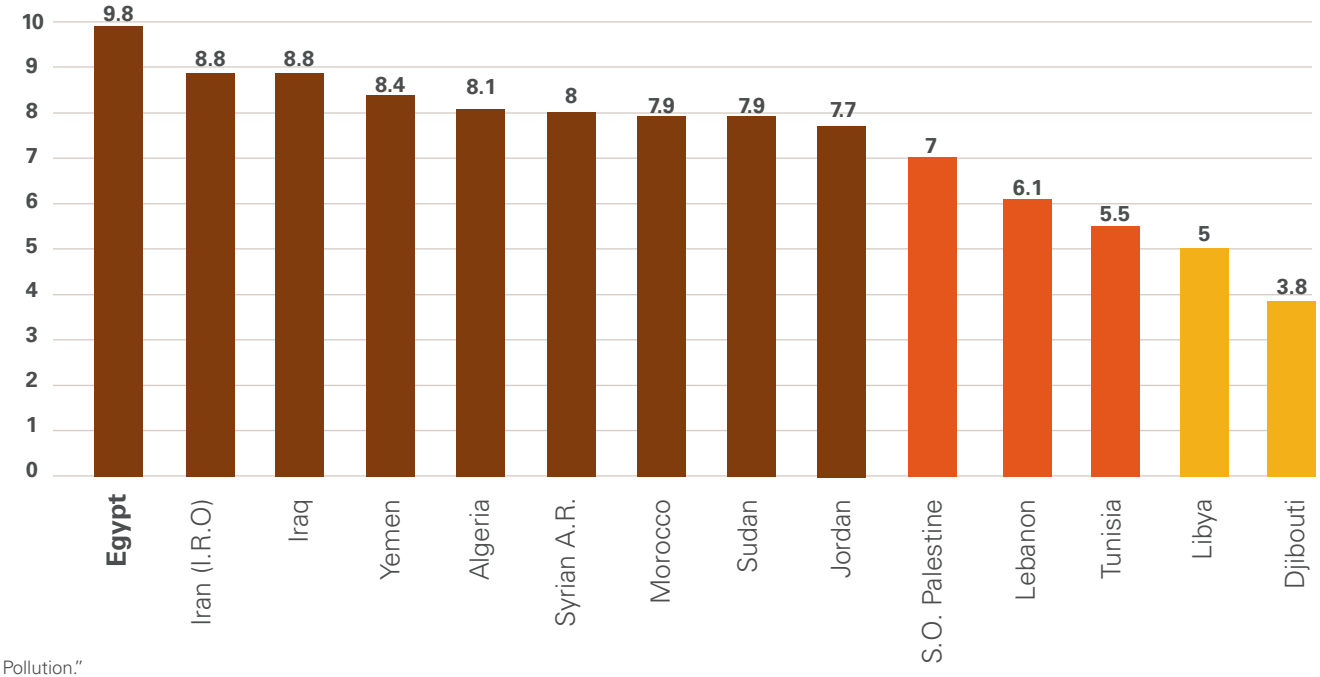
Conversely, pesticide pollution can reduce biodiversity and ecosystem functionality, which subsequently reduces the capacity for resilience and restoration when there are droughts and storms. Pesticide use may increase in many areas as farmers need to adjust to new types of pests associated with changes in climate.

Almost 9 out of 10 (88 percent) children in Egypt are living in areas with high pesticide pollution risks while 60 percent are exposed to lead pollution[37]. The Nile, the main source of water for the country, is polluted by several sources, including industrial wastewater discharge, pesticidal and chemical fertilizer, agricultural water drainage, radioactive discharge, and oil pollution[38]. Water pollution in canals and drains is a major public health risk as wastewater is discharged without treatment threatening particularly low-income and refugee families. A report by the Egyptian Organization for Human Rights titled "Water Pollution: A ticking time bomb threatening the life of the Egyptians"[39] estimates that some 38 million people in Egypt were drinking polluted water[40].

Soil pollution is also a reason of concern in Egypt threating both public health and sustainable agricultural. Soil pollution is caused by the utilization of agrochemicals, the reuse of agricultural drainage water, the recycling of partially treated wastewater and the improper disposing of solid wastes. The country would benefit from the development and implementation of a national plan for preventing soil pollution in the newly reclaimed areas"[41].

With a soil and water pollution index score of 9.8, Egypt is positioned in the 'extremely high risk' class of the index for this environmental hazard. When compared to other countries in the MENA region, (Figure 8), Egypt is the country with the highest exposure against this hazard.

Figure 8:
CCRI index – Exposure to soil and water pollution in MENA countries



[37]CCRI dataset.
[38]Research Institute of Soil, Water and Environment. Year Unknown. Article: "Water Pollution."
[39]The Egyptian Organization for Human Rights. 2009. Report: "Water pollution time bomb threatening the life of the Egyptians."
[40]It should be noted that this estimate refers to the year 2009, and the number might have changed in recent years. It is presented here to provide a scale of the threat since a more recent estimate has not been found.
[41]Elbana, Tamer & Gaber, Hesham & Kishk, Fawzy. (2019). Soil Chemical Pollution and Sustainable Agriculture.

2.9. The threat of overlapping hazards

For a child living in Egypt, the exposure of each of the eight hazards reviewed above can be a serious health concern. However, many children in Egypt are exposed to several overlapping hazards. Overlapping hazards can trigger and reinforce each other producing a compounding negative effect that is larger of the sum of their parts.

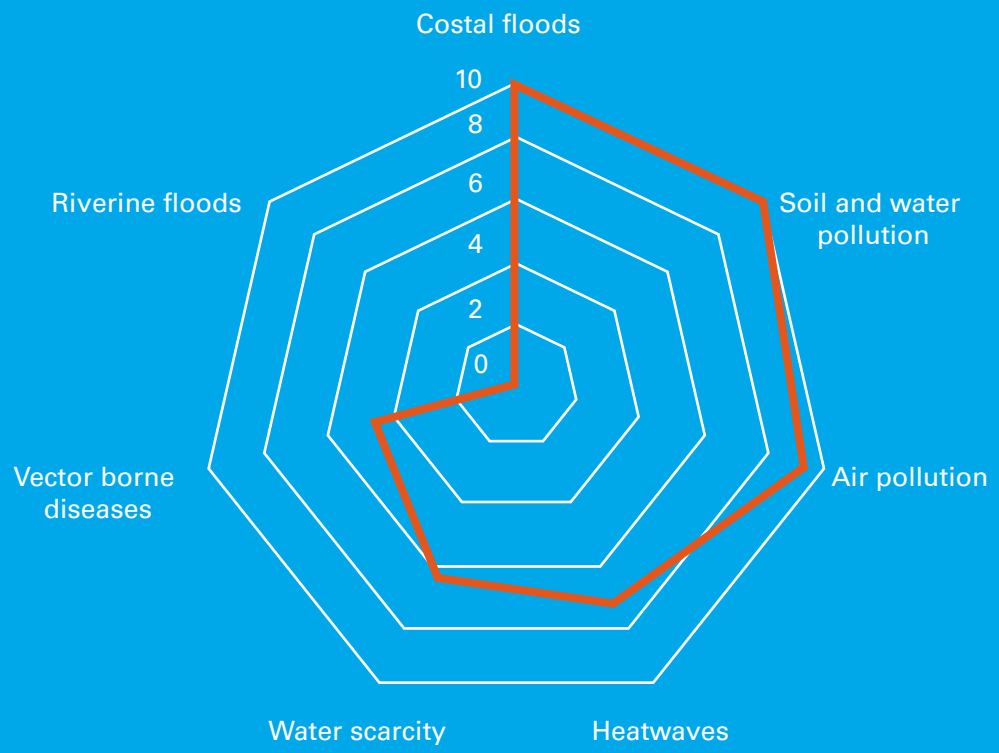
The larger impact of overlapping hazards makes it harder for families and communities to recover from shocks and stresses and build resilience. Overlapping hazards can also exacerbate existing inequalities, as households that are poor have low resilience and hence low capacity to respond to climate related shocks and are hence pushed further into deeper poverty and higher vulnerability.

As shown in Figure 9, **Egypt has an Index score in the 'extremely high' class (i.e., from 7.2 to 10) in four hazards,** namely: coastal floods, soil and water pollution, air pollution and heatwaves. **While the Egypt score falls in the 'high' class** (i.e., from 5.5 to 7) in one further hazard (water scarcity). **One risk falls into the 'medium-high class** (vector borne diseases). Only the remaining two (riverine and cyclone) have a **negligible exposure score**.

Furthermore, as we have seen in this section of the Report, all of these risks are forecasted to worsen over the coming years, due to the effects of accelerated climate change.

In summary, Egypt posts high index scores in multiple risk factors pointing at an overall very high level of risk for children. These risks, that are forecasted to increase, are multiple and often overlapping, thus further heightening the climate risk faced by children in Egypt.

Figure 9:
Children's exposure to climate and environmental hazards: Summary score by hazard



3. Children's vulnerability to climate and environmental hazards, shocks and stresses in Egypt

This section of the report focuses on the **second pillar** of the CCRI, the one dealing with children's vulnerability to climate and environmental risks in Egypt.

The rationale behind this pillar of the CCRI is that the availability, quality, equity and sustainability of essential services for children, such as water and sanitation, health care, nutrition and education, among others, are crucial elements in determining the vulnerability of children to climate related shocks and stresses. In fact, while all children face challenges associated with climate change and a degrading natural environment, those who have access to better essential services are better equipped to withstand the negative consequences of the shocks and stresses.

As seen earlier (Figure 1, Page 6), this second pillar of the CCRI Index is articulated in four (4) components. For each of them, this section of the report outlines its strategic importance for the wellbeing and resilience of children and then it looks at their status in Egypt.

Finally, Egypt's index score in each of the four components of this pillar is compared to the score posted by the other countries in the MENA region.

3.1 Water, sanitation and hygiene

Inadequate water supply, sanitation, and hygiene can causes diarrhea and other infectious diseases. Poor sanitation and hygiene can also increase the risk of parasite infestation. Poor hand washing practices is a major contributor to diarrhea and respiratory infections in children. In early childhood, frequent diarrheal infections are a key determinant of poor nutritional status. The availability of safe water, sanitation and hygiene (WASH) has a crucial impact in the child's capacity to cope with the shocks and stresses determined or exacerbated by climate change.

For example, when communities with poor sewage and drainage systems are hit by climate-induced flooding, they are more likely to face contamination of local water sources. Moreover, children without access to adequate WASH provisions have a reduced capacity to respond to climate-related diseases. Climate change will impact the spread not only of vector-borne diseases but also water-related ones which are among the biggest causes of child morbidity and mortality, such as diarrhoea. As evident during the COVID-19 pandemic, the practice of effective sanitation and hygiene behaviours such as frequent handwashing with soap are crucial to prevent or limit infectious waterborne disease transmission[42].

In the past decades, Egypt has made significant progress in increasing households' access to safe drinking water and basic sanitation services. According to the latest available data[43], more than 97 percent of residential buildings had piped water sources, this includes both piped water sources within the houses and shared WASH facilities within the community.

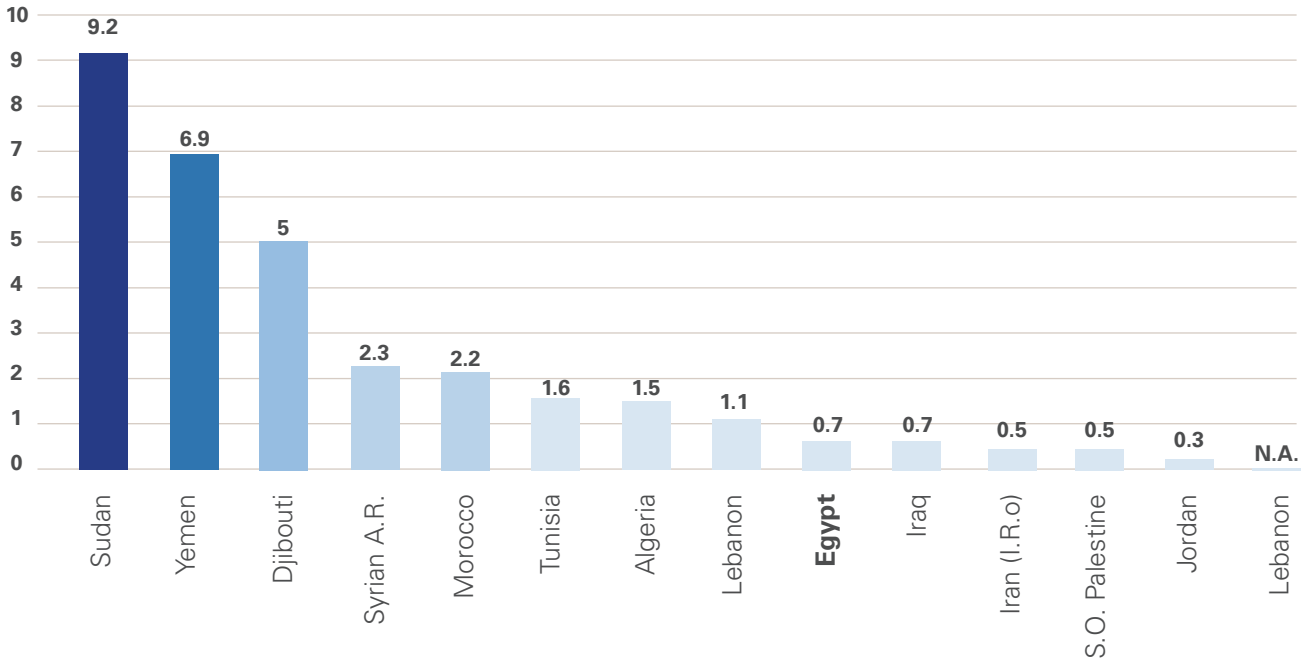
[42]CCRI Report, page 58.
[43]Egypt Demographic and Health Survey 2014.

However, considerable geographical inequalities persist in access to piped water, with only 60 percent of low-income families in the frontier governorates having access to piped water sources[44]. Interruptions to the water supply services occur for several hours a week, especially in rural areas of both Upper and Lower Egypt. Uninterrupted, safe water supply is critical for improving nutritional outcomes by avoiding gastrointestinal infections. Inadequate WASH is estimated to cause between 4,400 to 9,200 deaths in Egypt in 2017[45].

Progress in increasing households' access to basic sanitation services have also been substantial. However, while almost all households in Egypt have access to sanitation facilities, these facilities are not always adequate. In 2014[46], just 55 percent of households had access to a piped sewage system. Recent modeling[47] based on 2014 data, reveals that just 19 percent of households had access to septic tanks, and 23 percent were disposing wastewater through pit latrines. Geographic and rural/urban inequalities in access to improved sanitation are wide, with a difference of 14 percent points (Urban 98.8% vs Rural 84.8%), with poorest access in rural areas of Lower Egypt (79.6%)[48]

Egypt's CCRI score against this component of the index is 0.7, placing the country in the 'low' severity class. As shown in Figure 10 below, in the MENA region there are several other countries falling in the same severity class, namely: Tunisia, Algeria, Lebanon, Iraq, Iran, State of Palestine and Jordan. On the other hand of the spectrum, Sudan is the country in the region with the highest vulnerability in relation to this component with a CCRI score of 9.2 out of 10.

Figure 10:
CCRI index – vulnerability due to inadequate WASH in MENA countries



[44]Ministry of Health and Population et al. (2015a). Key informant Interview.
[45]Cost of Environmental Degradation: Air and Water Pollution, the World Bank, 2019.
[46]Egypt Demographic and Health survey – EDHS 2014.
[47]Herbst et al (2020). Modelled estimate using EDHS, ICF International, Rockville, MA.
[48]Egypt Demographic and Health Survey 2014.

3.2 Health and nutrition

When a climate related shock hits a community or a household that has no access, or limited access, to quality health and nutrition services, it can lead to worse health and nutrition outcomes. This can occur through multiple mechanisms. For example, through a higher risk of disease, such as malaria and dengue; or a lack of emergency medical supplies that makes the health response inadequate to the challenges brought about by the climate induced shocks. To compound the problem, health infrastructure and systems that are already weak and struggle to provide adequate health-care services, experience even greater strains on resources due to the increase demand of health services caused by the effects of climate change.

In addition, children with poor health and nutritional status are significantly more vulnerable to environmental changes and stresses. For example, children who suffer from acute malnutrition (wasting) or children with preexisting immunodeficiency disorders like HIV, are more vulnerable to infections and vector-borne diseases such as malaria and dengue, whose frequency can be highly affected by climate change.[49]

Based on the latest Egyptian Family Health Survey (EFHS) 2021 results, the under-five mortality rate has reached 28 deaths per 1,000 live births with an increase in the Infant Mortality Rate (IMR) from 22 deaths per 1,000 births in 2014 to 25 deaths in 2021.[50]

Quality of public health care in Egypt is constrained by the shortage of qualified staff and essential supplies and lack of updated and enforced clinical guidelines. The Government has developed quality accreditation standards for Primary Health Care (PHC) and hospitals based on international guidelines, however full adoption is yet to be achieved.

Although more than half of the population has a health insurance through the Government's Health Insurance Organization, fewer than a quarter of households use this insurance, due in large part to concerns about the quality of care in public facilities. Moreover, vulnerable groups, including informal sector workers, the poor, and dependents, are not covered. As a result, almost half of patients seek care in private clinics and hospitals, where they incur higher out-of-pocket costs[51].

In line with the commitment reaffirmed in the Strategic Vision for Health in Egypt's Vision 2030,[52] Egypt is progressively strengthening its healthcare policies and action. Work is ongoing to progressively expand access to the health insurance system and aims to cover additional 30 percent of the population by 2030. Maintaining these efforts will be crucial to tackle some of the persisting challenges affecting the system thus limiting the accessibility and affordability of healthcare. The Government commitment to address these remaining challenges translated in increased budget allocations in the state budget 2020/21 with the state now able to match the Constitutional mandate of 3 percent of GDP spent on public health[53].

[49]CCRI Report, page 61
[50]CAPMAS. (2022). Egyptian Family Health Survey: Key Findings 2021
[51]Country partnership framework, Egypt. World Bank, Report No.: 94554-EG, 2015
[52]Egypt's Vision 2030. Ministry of Planning and Economic Development (n.d.).
[53]UNICEF Situation Analysis (SitAn) of children and adolescents in Egypt, Final draft, 2021

The COVID-19 pandemic has posed significant challenges to Egypt's health system. A recent study indicates that the COVID-19 crisis may have led to some immediate reversal of gains in population health outcomes, especially among some vulnerable segments of the population.[54] As part of its efforts to response to this challenge, in 2019/2020 the investment plan of the Ministry of Health and Population (MoHP) included an additional EGP 350 million to improve the capacity of hospitals to respond to the health crisis.

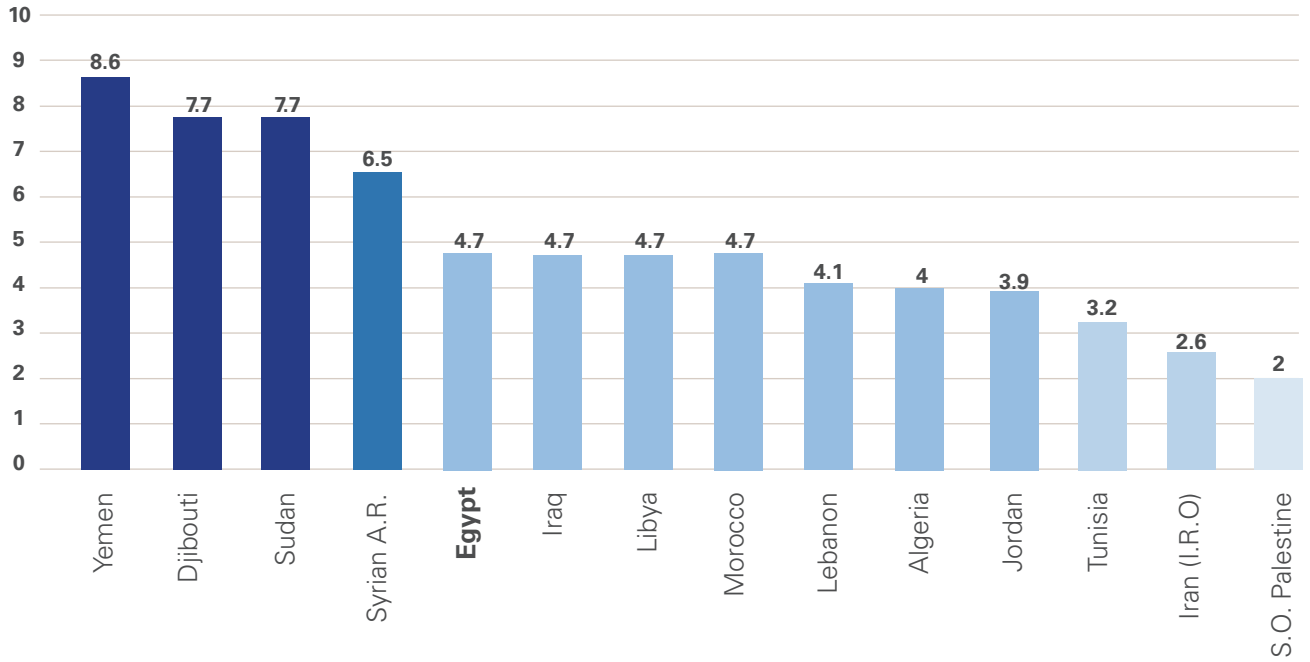
A triple burden of malnutrition constrains human development in Egypt. The nutrition context is improving, for the Under-Five children, 12.8% suffering from stunting in 2021 compared to 21.4% in 2014. For wasting and overweight, a reduction occurred from 8.4% and 14.9% in 2014 to 3% and 11.5% respectively.

A remaining challenge for anemia that increased to 43% in 2021 from 27.2% in 2014.[55]

Egypt's CCRI score against the source of vulnerability due to inadequate health and nutrition, is 4.7 falling into the 'medium-high' severity class. Figure 11 presents a comparison of the country in the MENA region against this vulnerability. Four countries have a markedly higher level of vulnerability than Egypt (Yemen, Djibouti, Sudan and Syria), with Yemen posting the highest of all scores (8.6). With a score 4.7, Egypt score is the 5th highest in the region out of 14 countries. Iraq, Libya and Morocco post an index score equal to that of Egypt (4.7). Finally, Lebanon, Algeria, Jordan, Tunisia, Iran and State of Palestine post lower index scores, indicating a lower level of vulnerability.

Figure 11:

CCRI index – vulnerability due to inadequate health and nutrition in MENA countries



[54]UN in Egypt (2020) Leaving No One Behind in the time of Covid-19, Annex II in United Nations Egypt (2020).
[55]CAPMAS. (2022). Egyptian Family Health Survey: Key Findings 2021

3.3 Education

There is a strong correlation between a child's level of education and its resilience to climate and environmental shocks and stresses. Education enhances a child's adaptive capacity, thus reducing their vulnerability to climate change. Educated children, families and communities are often more empowered and able to adapt their preparedness, response and recovery from shocks. Children living in families with lower level of education are more likely to drop out of school to support the family to cope with the effect of the shocks and are also more likely to be displaced[56].

With over 21 million students enrolled (excluding tertiary education), the Egyptian education system is by a margin the largest in the MENA region. Egypt is investing in an ambitious education reform programme (Education 2.0) to capitalize on the important progress made in the last years and tackle the remaining challenges. Net enrolment rates are approaching universal access with 100 percent in primary, 81 percent in lower-secondary[57].

With virtually no gender gaps in enrolment, socio-economic and geographical disparities remain among the key determinants of the access to education in Egypt. The number of children dropping out of basic education (primary and preparatory) is over 200,000 per year, mostly from poor families and in remote areas. There are high real costs associated with education in Egypt. This includes fees for private schools and private tutorials often offered by the teachers that are part of the public education system.[58] Private tutoring accounts for a rising share of expenditures in households with school-going children.[59]

The quality of education remains a challenge contributing to low completion rates. According to the 2019 global Trends in International Mathematics and Science Study (TIMSS)- that tracks learner competencies in in Grade 4 and Grade 8 level Mathematics and Science report using standardized benchmarks – average student scores remain low over time. In 2019, Egypt ranked 34th out of the 39 countries in Mathematics with an average score of 413, while it ranked 37th out of the 39 countries in science, with an average score of 389, thus falling below the low achievement benchmark[60].

Overall, only 27 percent and 24 percent of participating students scored the intermediate international benchmark score (475) in Mathematics and Science, respectively. Girls fared better than boys on both subjects.

Pre-primary education remains an area where large gains can be made in terms of enrolment rates and quality of education. The Gross Enrolment Ratio (GER) for public kindergarten[61] is 21 percent and has remained fairly stable over the past seven years. When considering also private and Azhari kindergartens, GER reached just 30 percent in 2021[62]. Standards need to be set and abide by for hiring teachers and staff involved with the educational process. Also, quality training and accreditation system for teacher and other staff should be put in place, as well as, in service training.

The Technical and Vocation Education Training (TVET) in Egypt struggles in supplying the economy with an adequately skilled labour force. The informal sector is a large-scale employer that is more tolerant to poorer skillset, however it generally offers lesser quality jobs with low salaries and greater job instability.

[56]CCRI report, page 64.
[57]Ministry of Education and Technical Education & IDSC (2022)
[58]Assaad & Krafft (2015) Is free basic education in Egypt a reality or a mith?.
[59]El-Baradei (2013), cited in Assaad & Krafft (2015).
[60]UNICEF SitAn, final draft 2021.
[61]Schools managed and supervised by MOETE.
[62]UNICEF Education Programme rationale, draft 2022 (based on EMIS data).

Also, there is a mismatch between the needs of the labour market and the profile and skills sets of the TVET graduates[63].

In Egypt, only 17 percent of children with disabilities enrolled in schools, leaving at least 1 million children and adolescents with disabilities in the age group 5-17 out of school.[64] In 2018, the national assembly approved a new law on the provision of education for children with disability. This is a positive step forward towards a more inclusive school system. The full operationalization of the law will require additional data and knowledge on children with disabilities in Egypt. Also, operational procedures for implementation must be developed, including on teacher training, the provision of special learning materials and improvements to the physical accessibility of classrooms.

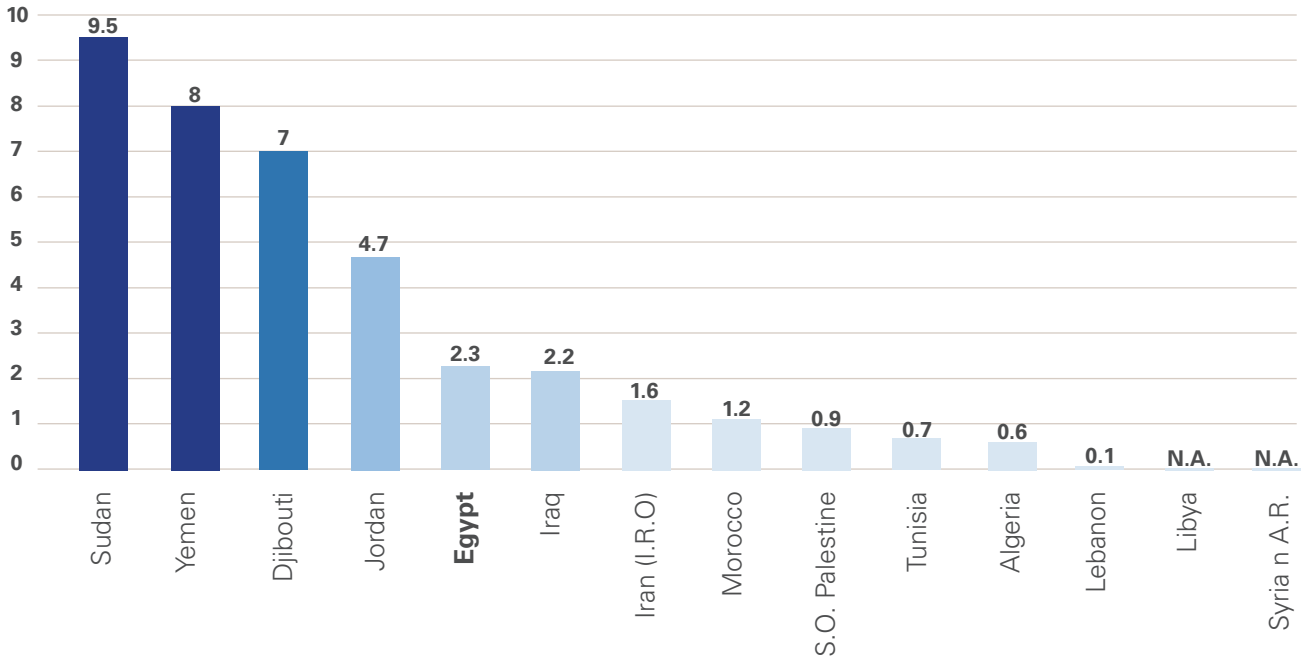
The COVID-19 pandemic has led to further learning losses, owing to the digital divide that is exacerbating inequalities in education. COVID-19-related school closures have affected Egypt's 25.3 million students[65].

[63]Population Council, 2018.
[64]UNICEF Education Programme rationale, draft 2022 (based on EMIS data).
[65]UNICEF Egypt, 2020.

Having to opt for remote learning options during school closures, children were not able to utilize available content on various platforms due to connectivity problems or lack of ICT devices or simply because their parents could not afford regular payments of internet bundles.

Egypt CCRI score against the vulnerability due to inadequate education and learning, is 2.3 placing the country in the 'low-medium' severity class. Figure 12 presents a comparison of the countries in the MENA region against this vulnerability. Egypt score is the 5th in the region, substantially lower than Sudan (9.5), Yemen (8), Djibouti (7) and Jordan (4,7).

Figure 12:
CCRI index – vulnerability due to inadequate education and learning in MENA countries



3.4 Poverty, communication assets and social protection

Families living in poverty and their children are more vulnerable to environmental shocks and stresses, as they have the least resources and capacities to adapt.
In addition, the majority of poor families base their livelihood on agriculture, a sector that is particularly vulnerable to environmental shocks giving these people a heightened risk of being pushed even deeper into poverty.

Also, in time of shocks or crisis, poorer communities are often less resilient to shocks and may resort to coping strategies that have negative long-term consequences, such as selling their livelihood assets such as land, livestock or farming tools.

Against this backdrop, social protection mechanisms can protect children and their families from poverty vulnerability and social exclusion, making them less vulnerable to the impacts of climate change. Cash transfers can help vulnerable children in several ways, including reducing monetary poverty, increasing the amount that can be spent on food, helping families pay school fees and strengthening the quality of homes following destruction or displacement.

In times of crisis, when a shock hits, for instance a natural disaster, the availability of social protection measures reaching the poor communities affected is crucial to ensure that children and their families have access to the resources they need to meet their basic needs and cope with the consequences of the crisis, without further depleting their assets. To this end, the shock-responsiveness of the social protection system is a crucial feature that can allow rapid scale up of intervention to reach families and communities when they are hit by climate and environmental hazards.

About 30 percent (31 million) of people in Egypt, including 14 million children, are estimated to be living below the national monetary poverty line[66]. The incidence of poverty in Egypt has been rising in the last two decades, especially in urban areas, and is a major obstacle to the realization of children's rights.

In recent years, the Government of Egypt has taken several steps to tackle widespread poverty, including expanding social protection interventions.

The main national non-contributory social protection interventions are the universal health Insurance, currently implemented in 6 governorates, and the cash transfer programme "Takaful" and "Karama" (TKP) implemented by the Ministry of Social Solidarity (MoSS) in all Governorates. The TKP is funded with domestic resources and receives technical and financial support by the World Bank, UNICEF and other UN agencies. Over the past few years, TKP has increased its coverage to more than 3.8 million families in May 2021[67]. A TKP impact evaluation demonstrated the positive impacts of the programme on the beneficiary families[68]. Despite its recent expansion, large segments of the population are still not reached by the social protection programmes, that are hence not achieving their full potential of reducing poverty and vulnerability.

The TKP has established linkages with other social services critical to children, such as housing and water connections; however, linkages to other key areas, such as child protection and behavioral change dimensions to address demand issues or behavioral bottlenecks (knowledge, attitudes, norms, practices) remain inadequate.

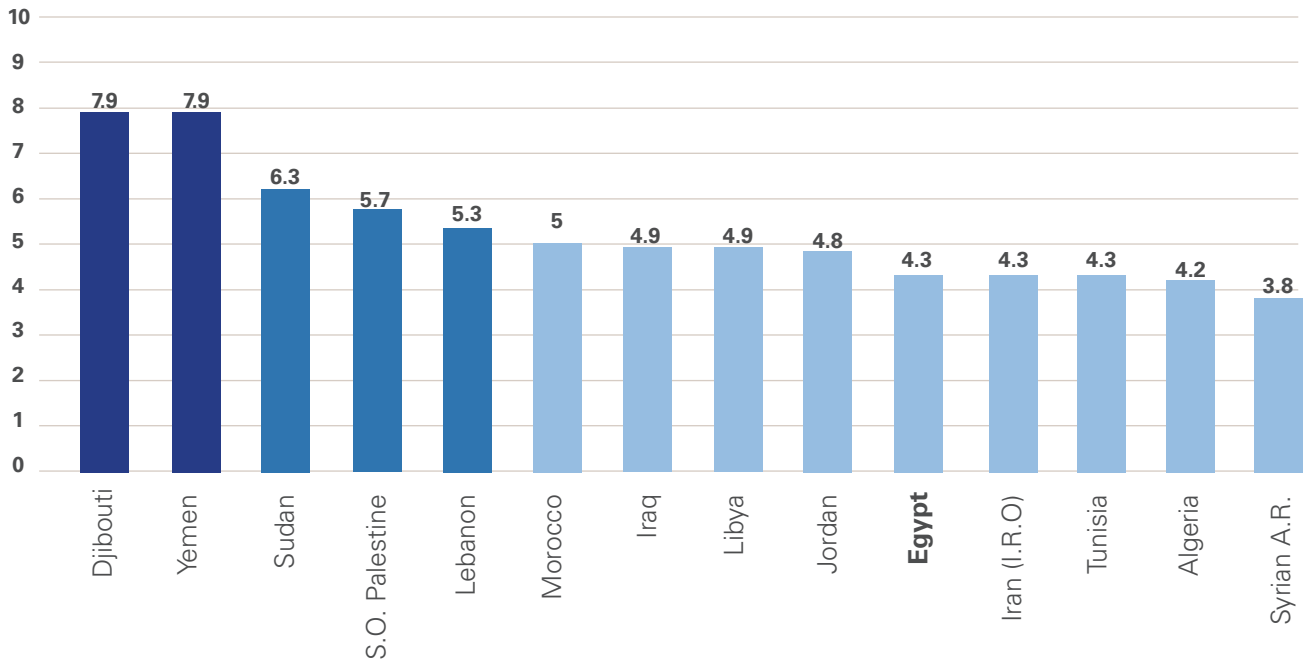
[66]Central Agency for Public Mobilization and Statistics (CAPMAS) Egypt, Household income expenditure and consumption survey 2019/2020.
[67]MPED & UNDP Egypt Human Development Report 2021.
[68]https://www.ifpri.org/publication/impact-evaluation-study-egypts-takaful-and-karama-cash-transfer-program-part-1

During the COVID-19 crisis, the coverage of the programme was expanded to an additional 400,000 families. Such scaling up, while substantial, was able to cover only a fraction of those in need due to the crisis. This is a testimony to the need to strengthen the shock responsiveness of the TKP programme.

The overall coordination, strategic planning, and resources allocation for the social protection interventions occur in the Social Justice Inter-ministerial committee, led by the Prime Minister, with the participation of relevant ministries. Further strengthening of the coordination among these institutions would be beneficial to reach a more effective implementation and guide an organic and sustainable expansion of social protection services in Egypt.

Egypt's vulnerability to poverty and inadequacy of social protection is ranked by the CCRI as medium with a score 4.3. Figure 13 compares the score against this vulnerability in the different countries in the MENA region. Djibouti (7.9) and Yemen (7.9) are the countries with the highest level of vulnerability due to weak social protection. Egypt score is the 10th out of 14 countries in the region, similar to the scores of Tunisia and Iran.

Figure 13:
CCRI index – vulnerability due to poverty and inadequate social protection in MENA countries



4. Egypt in the Children Climate Risk Index (CCRI)

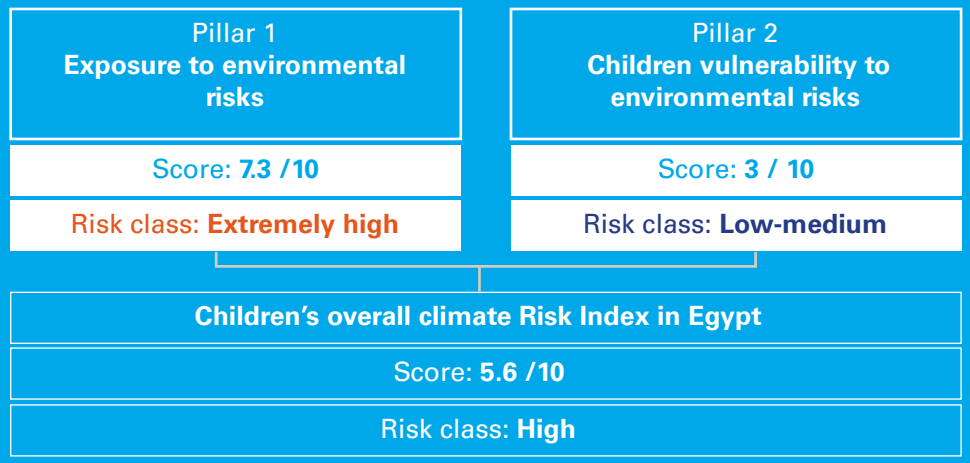
This section of the report summarizes the CCRI scores for the different components presented in section 2 (exposure to environmental risks) and in section 3 (child vulnerability to environmental risks) to reflect on Egypt's overall CCRI score and country ranking. Paragraph 4.2 of this section presents a comparison of Egypt's scores in the two pillars and as a whole, with the scores of other countries in the MENA region.

4.1 Egypt overall score against the CCRI

In the **first pillar** (exposure to climate and environmental shocks), **Egypt has an overall score of 7.3 out of 10 which, according to the CCRI places children in Egypt in the 'extremely high' risk** classification of exposure to climate and environmental hazards. This indicates that the exposure of children in Egypt to climate and environmental related risks and hazard is a matter of serious concern and that it requires urgent actions in the form of adaptation and increasing the resiliency of key services for children.

In the **second pillar** (vulnerability) **Egypt scores 3 out of 10 which according to the CCRI class limit classification falls into the 'low-medium' class.** This indicates that children score relatively well against the indicators included in pillar 2 (see section 3 of this report) resulting in an overall degree of enhanced resilience to climate and environmental hazard, shocks and stress. Nonetheless, the overall degree resilience to climate and environmental hazard is likely to be unequal across the country, due to the disparities in access and quality of services.

Figure 14:
Egypt score in the Child Climate Risk Index (CCRI)



4.2 Comparison of the CCRI scores among countries in the MENA region

This section presents a comparison of the countries in the MENA region based on their aggregate scores in the two pillars of the CCRI (Figure 15 and 16) and in the overall consolidated Child climate Risk Index (Figure 17).

As shown in Figure 15, and as indicated earlier, with a **CCRI score of 7.3, Egypt, jointly with Iran, posts the highest score in the region** in **Pillar 1 of the CCRI** (i.e., exposure to climate shocks). Egypt and Iran are the only two countries falling in the 'extremely high' risk class. Iraq, Morocco, Yemen and Sudan, all with scores between 6.9 and 7.0, fall just short of the extremely high-risk class and remain in the high-risk class. All other countries post scores between 3.8 and 5.4 falling in the medium-risk class of pillar 1 of the CCRI.

Figure 15:

CCRI pillar 1 – Children's exposure to climate and environmental shocks in MENA countries

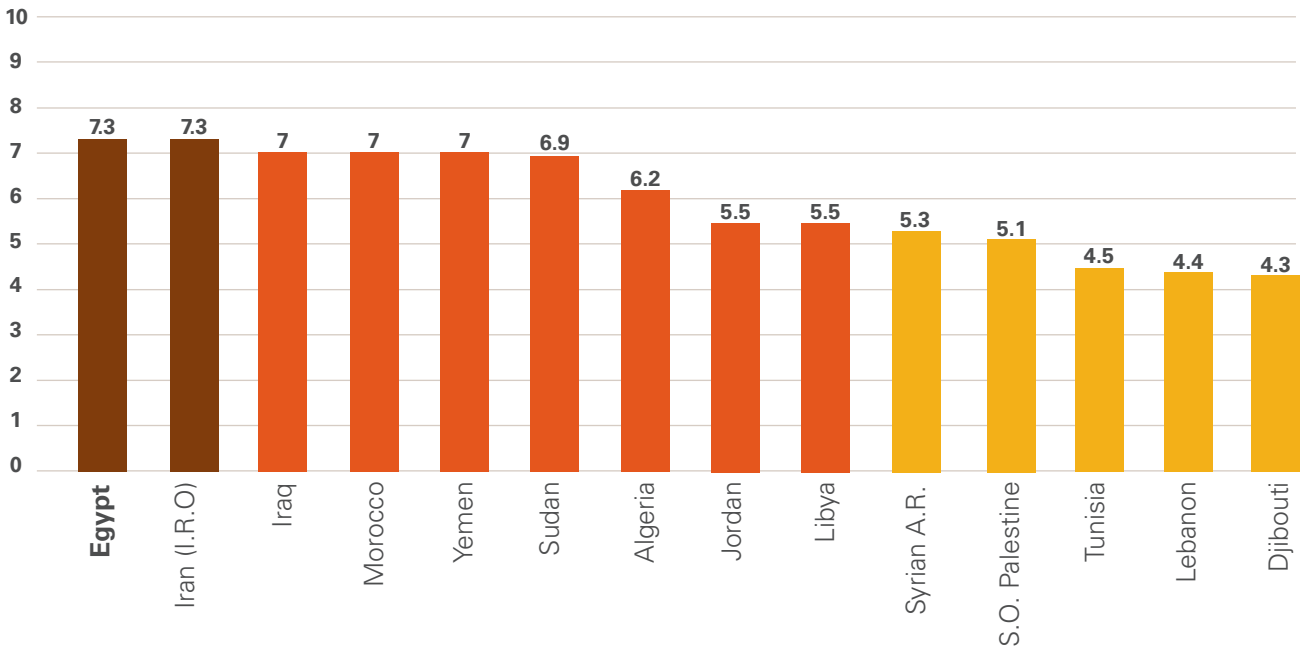



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Figure 16 presents the scores of the MENA countries against **pillar 2 of the CCRI**. With a score of 3 out of 10, **Egypt performance in this pillar is much stronger than in pillar 1. This indicates that the availability and quality of essential services for children, such as water, sanitation, health care, nutrition and education, among others, is generally higher than the regional average.** This in turn decreases the vulnerability of children in Egypt as children with adequate access to basic services are not only less vulnerable, but are likely to be more resilient and adaptive in their response to climate change. In virtue of this score Egypt falls in the low-medium risk class for pillar 2 of the CCRI. Looking at the performance of the other countries in the region, most of them fall in the same class as Egypt (i.e., score between 2.1 and 3.7). In four countries in the region however the vulnerability is much higher positioning them in higher risk classes, namely Syria (medium-high), Djibouti (high) and Sudan and Yemen (extremely high).

Figure 16:

CCRI pillar 2 – Children vulnerability to climate and environmental shocks in MENA countries

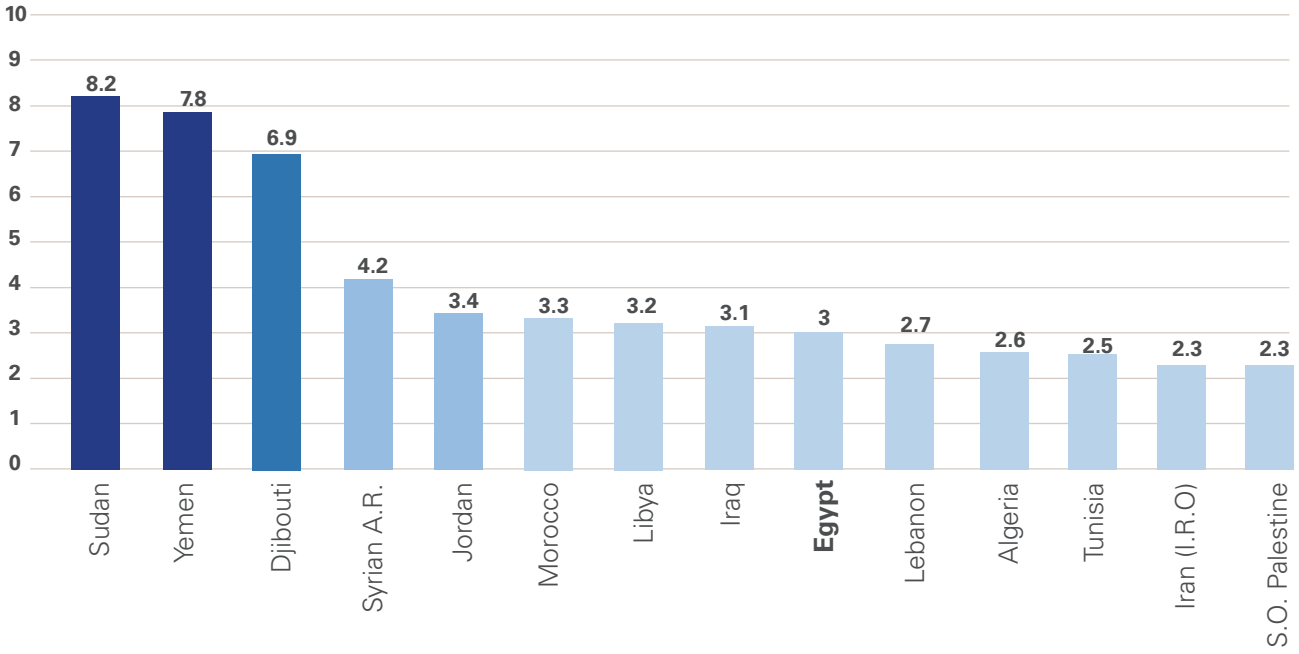

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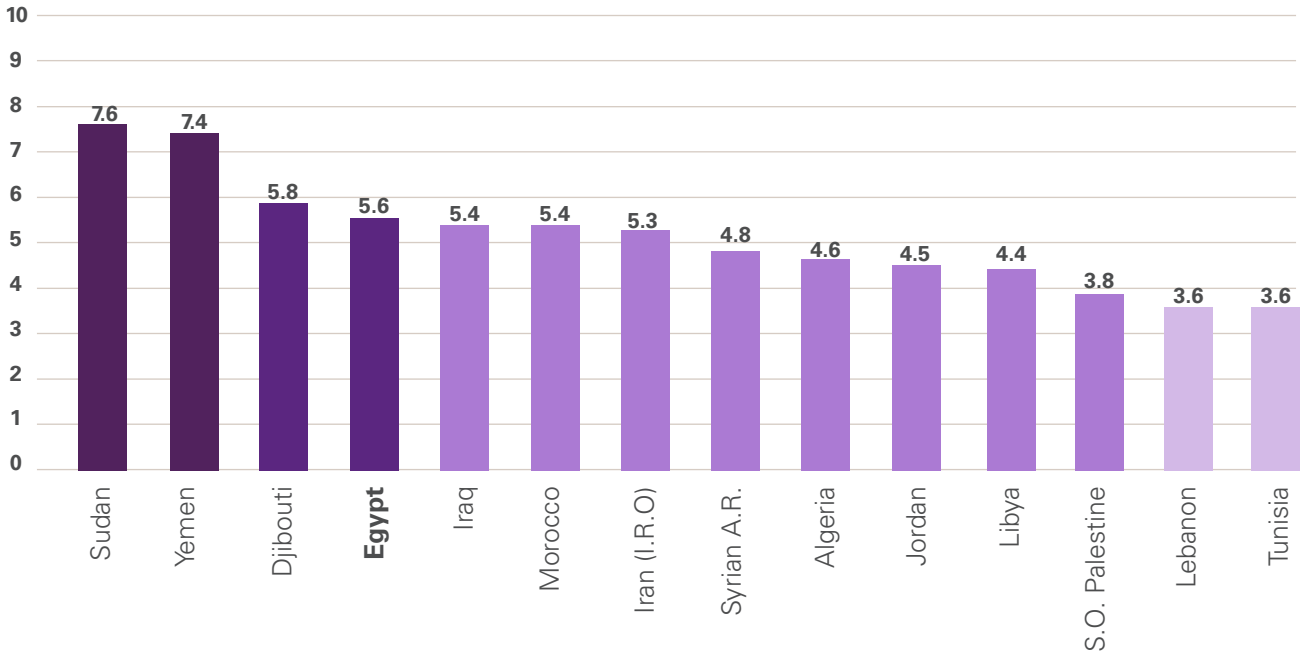
Figure 17 presents the final score of MENA countries against the aggregate CCRI (i.e., pillar 1 + pillar 2). As such this figure summarizes all the different dimensions that have been presented in the earlier part of this report. Sudan, Yemen are the only two countries in the region with an overall score above 7.1 that places them in the extremely high-risk class of the CCRI. **With an overall score of 5.6, Egypt falls in high risk**, as does Djibouti. All other countries in the region fall in the medium high, except for Lebanon and Tunisia that with a score of 3.6 fall in the low-medium class of CCRI.

Figure 17:
Children Climate and Environmental Risk Index (CCRI) in MENA countries



5. UNICEF Egypt contribution to the national response

Within the framework of the long-standing cooperation between UNICEF and the Government of Egypt, UNICEF Egypt is stepping up its efforts in support to national efforts related to climate and environmental action. Jointly with other national and international partners, UNICEF supports the Government in designing and implementing policies and programmes that decrease the exposure of children to climate change and at the same time increase their resilience thus, reducing their vulnerability to climate and environmental related shocks and stresses.

5.1 UNICEF direct engagement in climate change

This year for the first time, UNICEF Egypt is developing a joint annual work plan that specifically focuses on climate action. This work plan has received technical validation from the Ministry of Environment and it is in the process of being formalized prior to implementation.

UNICEF engagement in climate action is structured around **three programmatic priorities, namely evidence generation, skills development and youth engagement:**

Evidence generation initiatives include: i) a 'Climate landscape analysis for children in Egypt' (CLAC) based on secondary analysis, currently being conducted in partnership with the Ministry of Environment. The CLAC report will examine the baseline situation of climate, energy and environment-related issues affecting children in Egypt, provide an overview of existing policies and programmes, and include recommendations on how the UNICEF Egypt country office can further incorporate and strengthen work on climate, energy and environment-related issues in its country programme.; ii) the 'Participatory action research with young people on climate change' (Y-PAR) in partnership with the Ministry of Environment and UNICEF MENA regional office; iii) the "Phone survey on young people perception of climate change', conducted in partnership with the UN Resident Coordinator.

The studies and surveys, jointly with the present report, aim at expanding the knowledge base in Egypt of children's climate risks and inform the development of programmes, policies and action on climate change. Knowledge will also increasingly be used for evidence-based advocacy and as a tool to increase knowledge and awareness of the public at large, particularly young people.

UNICEF action on **skills development** includes the engagement in the framework of the global initiative Generation Unlimited[69], through the Youth Global Challenge focusing on climate change. In addition, UNICEF is providing technical support to MoPED on climate change curricula.

[69] Generation Unlimited is a leading global Public-Private-Youth launched by the UN Secretary-General at the 2018 UN General Assembly.

The third area of action is around **youth engagement**, with a focus on young people. This includes ongoing efforts jointly with MoPED to strengthen the use of RapidPro to engage with young people on climate change and the SDGs.

Engagement of young volunteers on climate change awareness raising and community dialogue. The Shabab Balad van that travels around the country to collect children and young people's voices that will be captured in a short film to be presented at national level and possibly at the upcoming COP 27. The UNICEF digital platforms launched online engagement on climate change, including live Q&A with young experts on climate change.

Live discussions with Greenish on social media tackling topics related to climate change bringing together in interactive session the young influencers and climate change experts.

5.2. UNICEF engagement to decrease children's vulnerability to environmental risks

In addition to an increased focused on climate action, UNICEF will continue its engagement in supporting national efforts to increase availability, access and use of basic services to increase the resilience of children and reduce their vulnerability to climate and environmental related shocks and stresses. This section summarizes **UNICEF engagement in the four dimensions included in pillar 2 of the CCRI, namely: WASH, health and nutrition, education and social protection.**

Safe and equitable water sanitation and hygiene (WASH)

Through its WASH programme, UNICEF supports national efforts aimed at ensuring that children and adolescents use safe and equitable WASH services and live in a safe environment.

UNICEF engagement in this area, builds on the successful cooperation with the Government of Egypt. The main areas of support include strengthening government and district climate resilient water supply systems, through support to revolving funding scheme and strengthening user voice and participation in provision of services. In addition, UNICEF supports rehabilitation of water supply and sanitation and promotion of hygiene in primary health care facilities and schools, including promotion of handwashing with soap and menstrual hygiene management.

The empowerment of girls and boys works to equip them with the knowledge and skills to adopt and promote safe WASH practices and demand accountability from service providers. Finally, UNICEF advocates and supports national efforts to ensure that sanitation and water supply receive adequate financial resources in the state budget.

Health and nutrition

UNICEF support to the Government objectives related to health and nutrition by delivering integrated, prevention-focused interventions to promote the survival and development of children and adolescents, ensure they benefit from services, practices and an enabling environment that supports good health, and have access to safe and nutritious food.

Jointly with partners, UNICEF supports the Ministry of Health and Population to reform the primary health-care system to deliver a package of climate resilient services that addresses the well-being of children and families holistically. UNICEF aims at strengthening the system by increasing access to quality, high-impact maternal and childcare and nutrition interventions, while expanding the scope of service to include child development, adolescent and mental health, support to children with disabilities and environmental health. UNICEF is increasingly relying on national systems, such as the universal health insurance and the Haya Karima programme, as entry points to deliver multisectoral services to the most vulnerable communities. A further area of action is the provision of support to COVID-19 vaccination, infection prevention and control, risk communication and community engagement.

To address the triple burden of malnutrition, UNICEF supports the Government in taking cost-effective, high-impact interventions to scale, including promotion and protection of infant and young child feeding, micronutrient supplementation and school nutrition.

Finally, UNICEF advocates for and supports the Government to generate evidence-based, improved public financing for children. UNICEF will promote positive behaviours, including nurturing care, responsive feeding and health-seeking behaviours. Community engagement is mainstreamed, ensuring that adolescent girls, boys and women are equitably represented in the provision of services and feedback processes.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Education

UNICEF engagement in education contributes to the priorities of the national education reform by addressing barriers hampering the right of children and adolescents to learn and develop skills in safe learning environments. UNICEF provides technical assistance to the Ministry of Education and Technical Education in the roll-out of the education reform for grades 6 to 12; supports the improvement of learning outcomes; and promotes engagement of parents and communities. In addition, UNICEF supports the implementation of evidence-based systems to monitor education participation, prevent dropout and promote re-enrolment and equitable access to digital learning. Deployment of low-tech, digital innovations in underprivileged areas will be prioritized to ensure continuity of quality learning.

The programme will work with the Government to increase the capacity of teachers to support children, adolescents and youth in developing the competencies required for school readiness and for completing 12 years of education. This includes assessing gaps in foundational skills; designing innovative solutions for upskilling of the workforce to run accelerated learning programmes; strengthening pre- and in-service teacher training; improving the quality of digital learning and skills development programmes; and rolling out learning and skills development opportunities that help adolescents and youth develop skills aligned with the fourth industrial revolution, including green skills. Social and behavioural change communication will foster increased demand for inclusive, safe and quality learning.

UNICEF will support the Government in the introduction of policies that enable flexible learning systems in support of national programmes such as Haya Karima and Takaful and Karama, as well as policies to address the risk of harm and violence in learning facilities, including in digital platforms.

Social protection

UNICEF engagement in social protection builds on the work it conducted in the last five years to strengthen the operational level of TKP and it supports government efforts to strengthen the national social protection systems. UNICEF will continue supporting the Ministry of Social Solidarity in the consultative process that will lead to the finalization and implementation of a holistic national social protection that serves as guide for all the non-contributory social protection measures in the country. UNICEF will support Government's efforts to enhance the shock-responsiveness of interventions, also building on the experience from the response to the COVID-19 pandemic. UNICEF will work with the Government and partners to strengthen the linkages between social protection beneficiaries, primarily TKP, with child protection services delivered through social workers and behavioural change initiatives. These interventions are expected to contribute strengthening national social protection thus increasing community resilience through improved livelihoods and increased demand for and access to services.

6. Conclusion

Tackling climate change globally requires that each country and the world as a whole take bold steps towards reducing greenhouse gas emissions. This is extremely urgent, especially as the effects of actions taken today will require many years to have an impact. Meanwhile, countries need to take adaptation actions to reduce the exposure and vulnerability of their population to climate change. These efforts have to be purposively tailored to prioritize the segments of the population that are more vulnerable to climate change.

The global CCRI as well as the Egypt report highlight that while the negative effects of climate change impact all people, children, especially those living in poorer communities, are more exposed than adults and have less capacity to respond, ultimately paying the highest price.

Egypt is highly vulnerable to climate change, with projected increase in heat waves, dust storms, storms along the Mediterranean coast and extreme weather events[70].

Stronger warming has been documented over the past 30 years, with average annual temperatures increasing by 0.53 degree Celsius per decade[71].

In the face of these challenges, the Government of Egypt has reinforced its commitments to tackle climate change and mitigate its consequences, both domestically and internationally. Egypt is playing a more prominent role in international negotiations with the hosting of the COP 27 as a testimony to this renewed commitment. The country has also, over the years, invested in the wellbeing of its citizen especially children, with a focus on the most vulnerable families and the most deprived geographical areas.

Key examples are the national cash transfer scheme Takaful and Karama and the Presidential Initiatives Haya Karima and "National Project for Developing the Egyptian Family", that are contributing to reducing multidimensional poverty and vulnerabilities, with a focus on the quality, equity and sustainability of essential services for children, such as water and sanitation, health care, nutrition and education, which are crucial elements in determining the vulnerability of children to climate related shocks and stresses. While the challenges brought by climate change are deeply concerning, there is room for action and optimism. Thera are a range of solutions that can be adopted to both mitigate and adapt to the effects of climate change on the life of children and communities. Each solution can provide an opportunity to purposively prioritize action for those most at risk to climate change. These actions, if well-conceived and implemented can greatly reduce the level of climate risk for children globally and in Egypt.

Egypt must continue to lead and contribute to the global fight against climate change to avert the worst impacts of the climate crisis, with a focus on the global reduction of greenhouse gas emissions that require to be cut by at least 45% (compared to 2010 levels) by 2030 to keep warming to no more than 1.5 degrees Celsius.

[70]Egypt Third National Communication under the United Nations Framework Convention on Climate Change.
[71]GERICS (2019). Climate Fact Sheet – Egypt. URL: https://www.climate-service-center.de/products_and_publications/fact_sheets/ climate_fact_sheets/index.php.en

Increasing government funding for mitigation and adaptation measures in key services for children is required in the coming years, to protect children, communities and the most vulnerable from the worst impacts of the already changing climate, critical services must be adapted, including water, sanitation and hygiene systems, health and education services. Further efforts will also be needed towards updating the environmental legislations and ensuring adequate application of laws and policies. At the same time, the environmental dimensions and principles of sustainable development will have to continue to be increasingly integrated into sectoral programmes and policies. Egypt can also harness the power of the private sector by involving it in mitigation and adaptation efforts.

Increasing awareness of the Egyptian population on the negative impacts of climate change is also crucial to ensure families and communities have the knowledge to adopt behaviours that mitigate negative effects on them while contributing to protect the environment.
Providing children with climate education and greens skills integrated in the national education curricula, is critical for their adaptation to and preparation for the effects of climate change. Children and young people will face the full devastating consequences of the climate crisis and water insecurity, yet they are the least responsible.

Ensuring the recovery from the COVID-19 pandemic is green, low-carbon and inclusive, so that the capacity of future generations to address and respond to the climate crisis is not compromised.

UNICEF will continue to work jointly with the Government of Egypt in tackling these challenges and protect children from the worst effects of climate changes.

ANNEXES
Components and indicators of Pillar 1

Table 2: Components and indicators of pillar 1

COMPONENT	INDICATOR	DATA SET	SOURCE
Water scarcity exposure	Children exposed to water scarcity (absolute)	Drought events	UNEP
		Water stress	WRI
		Seasonal variability	WRI
	Children exposed to water scarcity (relative)	Interannual variability	WRI
		Groundwater table decline	WRI
Riverine flood exposure	Children exposed to riverine floods – 50 years (absolute)	Riverine flood hazards, 50 years return period	GAR 2015
	Children exposed to riverine floods – 50 years (relative)		
Coastal flood risk	Children living in areas with coastal flood risk (absolute)	Coastal flood risk (high to very high)	WRI
	Children living in areas with coastal flood risk (relative)		
Tropical cyclone wind exposure	Children exposed to tropical cyclone winds – 100 years (absolute)	Tropical cyclone windspeed, 100 years return period (above 119 km/h and above 178 km/h)	GAR 2015
	Children exposed to tropical cyclone winds – 100 years (relative)		
Exposure to vector borne disease	Children at risk of Malaria (absolute)	Spatial limits of **Plasmodium vivax** malaria transmission (stable and unstable)	The Malaria Atlas Project
	Children at risk of Malaria (relative)	Spatial limits of **Plasmodium falciparum** malaria transmission (stable and unstable)	
	Children exposed to Zika (absolute)	Environmental suitability for Zika	Messina et al.
	Children exposed to Zika (relative)		
	Children at risk of Aedes (absolute)	Probability of occurrence of Aedes	Kraemer et al.
	Children at risk of Aedes (relative)		
	Children exposed to Dengue (absolute)	Environmental suitability for dengue	Messina et al.
	Children exposed to Dengue (relative)		

COMPONENT	INDICATOR	DATA SET	SOURCE*
Heatwaves	Children exposed to heatwaves (absolute)	Annual average number of heatwaves between 2000 and 2020	Berkeley Earth Surface Temperature
	Children exposed to heatwaves (relative)		
Air pollution	Children exposed to outdoor fine particulate matter (absolute)	Exposure to ambient fine particulate matter (PM2.5)	Atmospheric Composition Analysis Group
	Children exposed to outdoor fine particulate matter (relative)		
Soil and water pollution	Children living in areas with pesticide pollution risk (absolute)	Pesticide risk (high to very high)	Tang et al.
	Children living in areas with pesticide pollution risk (relative)		Tang et al.
	Children with blood lead levels (BLL) over 5 µg/dL (absolute)	Number of children (under 20) with blood lead levels (BLL) over 5 µg/dL	IMHE
	Children with blood lead levels (BLL) over 5 µg/dL (relative)	Percentage of total population by age group, both sexes (per 100 total population), 2019 estimate	UN WPP 2019 revision
Common	Total population count, both sexes combined	Gridded population of the world v4.11 (counts), UN Adjusted, 2020 estimate	CIESIN
	Percentage of child population under 18, both sexes combined	Percentage of total population by broad age group, both sexes, 2020 estimate	UN WPP 2019 revision

Figure 18: Pillar 1 - Exposure to climate and environmental shocks and stresses

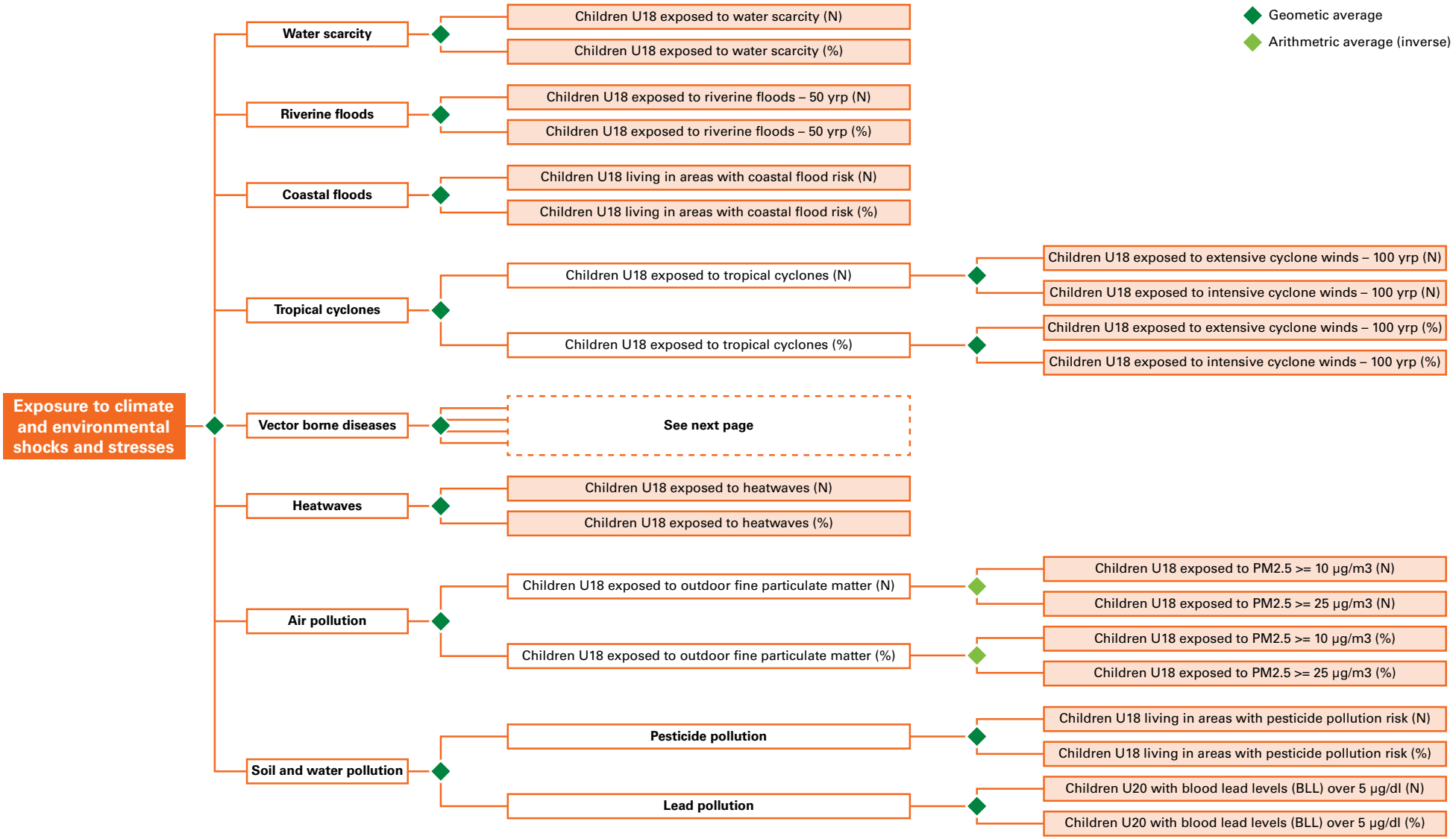
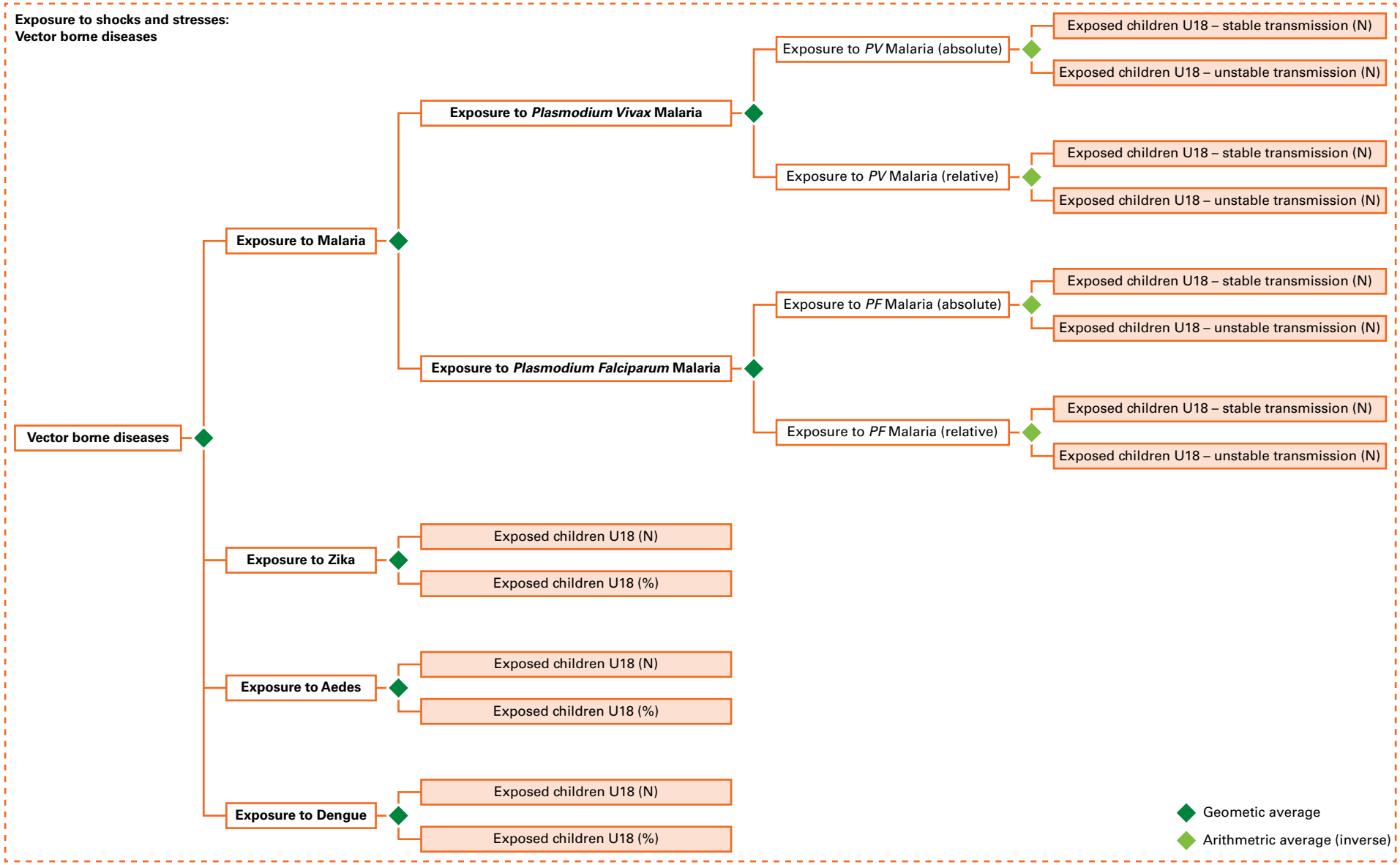


Figure 18: Pillar 1 - Continued



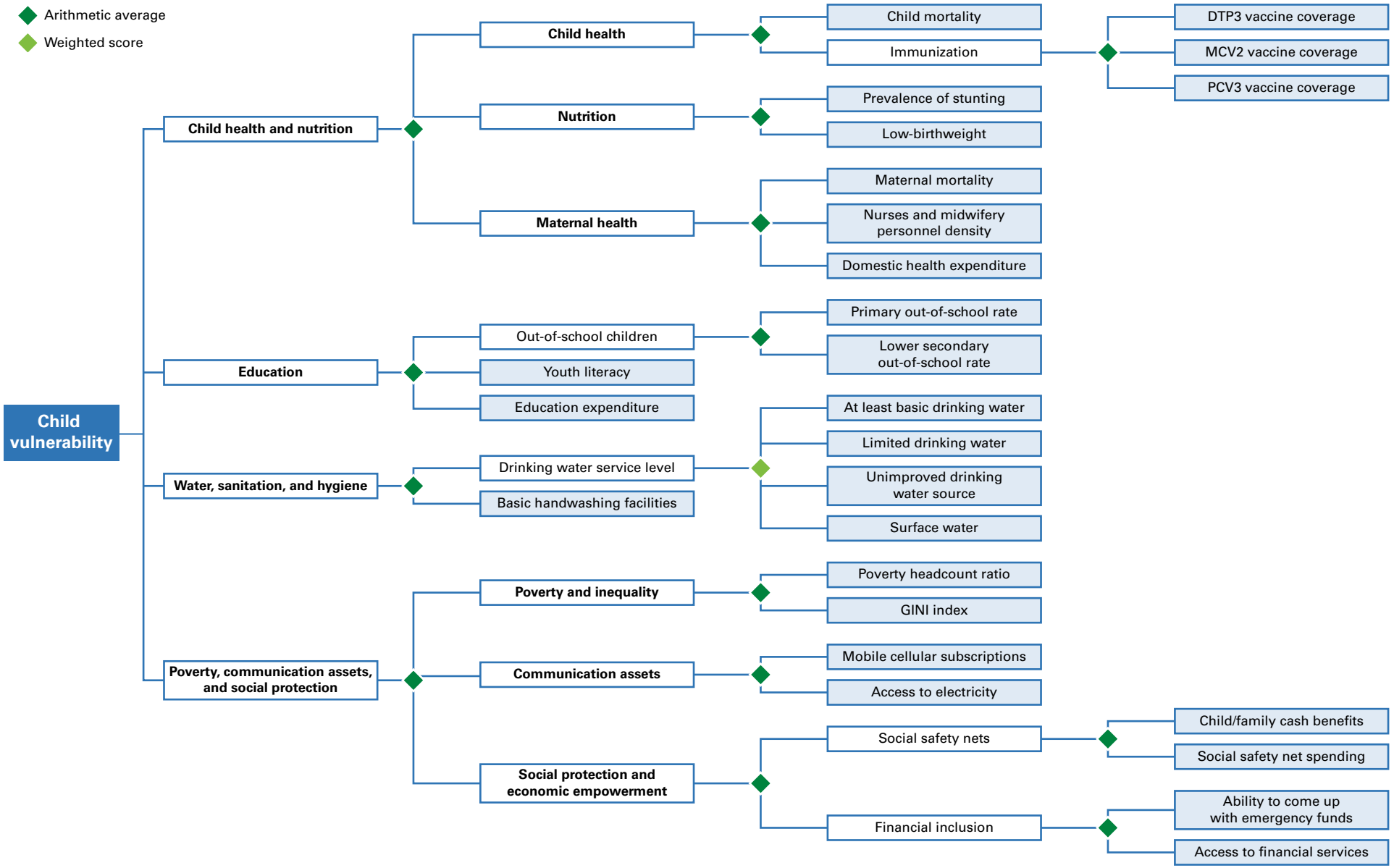
ANNEXES
Components and indicators of Pillar 2

Table 3: Components and indicators of Pillar 2

COMPONENT	SUB-COMPONENT	SUB-COMPONENT	INDICATOR (SHORT NAME)	SOURCE
Child health and nutrition	Child health		Under-five mortality	UN Inter-agency Group for Child Mortality Estimation, through World Bank WDI
		Immunization	DTP3 access	WHO, UNICEF, through SDG
			MCV2 access	WHO, UNICEF, through SDG
			PCV3 access	WHO, UNICEF, through SDG
	Nutrition		Prevalence of stunting	UNICEF, WHO, World Bank: JME
			Low-birthweight babies	UNICEF, WHO, through World Bank WDI
	Maternal health		Maternal mortality	WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division, through World Bank WDI
			Nursing and midwifery personnel density	WHO, through SDG
			Health expenditure	WHO, through World Bank WDI
Education		Out-of-School	Out-of-school rate primary	UNESCO
			Out-of-school rate lower secondary	UNESCO
			Youth literacy rate, population 15–24 years, both sexes	UNESCO
			Education expenditure	UNESCO, through World Bank WDI

COMPONENT	SUB-COMPONENT	SUB-COMPONENT	INDICATOR (SHORT NAME)	SOURCE*
Water, sanitation, and hygiene		Drinking water service level	Improved drinking water source (within 30 minutes)	WHO/UNICEF JMP
			Improved drinking water source (exceeding 30 minutes)	WHO/UNICEF JMP
			Drinking water from an unprotected dug well or unprotected spring	WHO/UNICEF JMP
			Drinking water from other unprotected sources	WHO/UNICEF JMP
			Basic handwashing facilities	WHO/UNICEF JMP, through World Bank WDI
Poverty, communication assets, and Social protection	Poverty and inequality		Poverty headcount ratio	World Bank Global Poverty Working Group
			GINI Index	World Bank Development Research Group
	Communication assets		Mobile cellular subscriptions	ITU, ICT, through World Bank WDI
			Electricity access	World Bank, through SDG
	Social protection and economic empowerment	Social Safety Nets (SSN)	Child cash benefits	ILO, through SDG
			SSN spending	World Bank ASPIRE
		Financial inclusion	Lacking emergency funds	World Bank Findex database
			Access to money services	World Bank Findex database

Figure 19: Pillar 2 - Child vulnerability

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