Climate Change, Pandemic, and Sustainability

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Ten threats to global health

Infectious disease (pandemic)

The only thing we don't know is when it will hit and how severe it will be

Ten threats to global health
Air pollution and climate change
Noncommunicable diseases
Global influenza pandemic
Fragile and vulnerable settings
Antimicrobial resistance
Ebola and other high-threat pathogens
Weak primary health care
Vaccine hesitancy
Dengue
HIV/AIDS

WHO 2019.

Climate change and pandemic

COVID-19

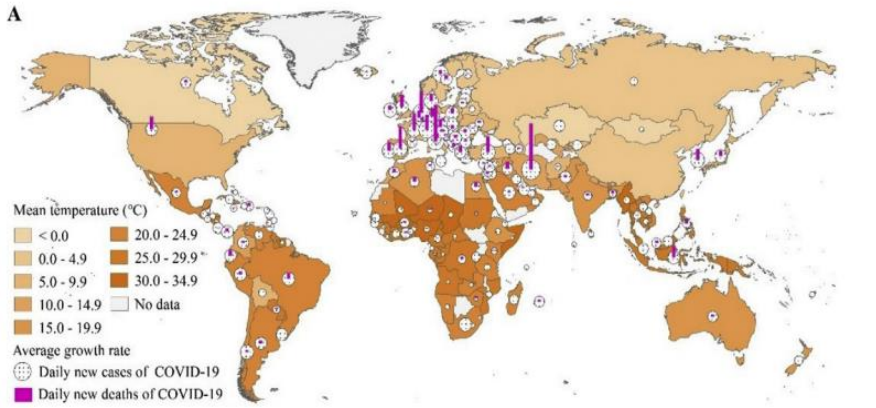
WHO 2023.

- **Effects of temperature and humidity on the daily new cases and new deaths of COVID-19 in 166 countries**

HIGHLIGHTS

- First study to explore the effects of temperature and humidity on the daily new cases and deaths of COVID-19 worldwide.
- We used log-linear GAM to analyze the effects.
- We considered the lag effects and the cumulative effects of weather conditions.
- Temperature and relative humidity were both negatively related to the daily new cases and daily new deaths of COVID-19

GRAPHICAL ABSTRACT



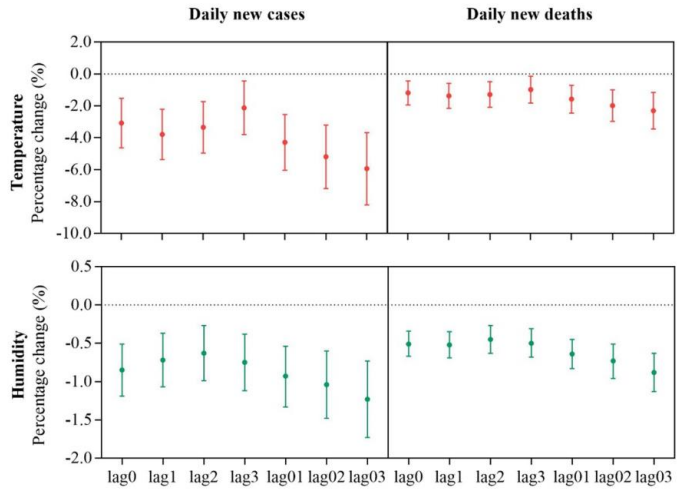


Fig. 2. Effects of temperature and relative humidity on daily new cases and daily new deaths of COVID-19 in different lag structures.

Yu Wu, et al. Science of the Total Environment 2020.

Climate change and infectious diseases

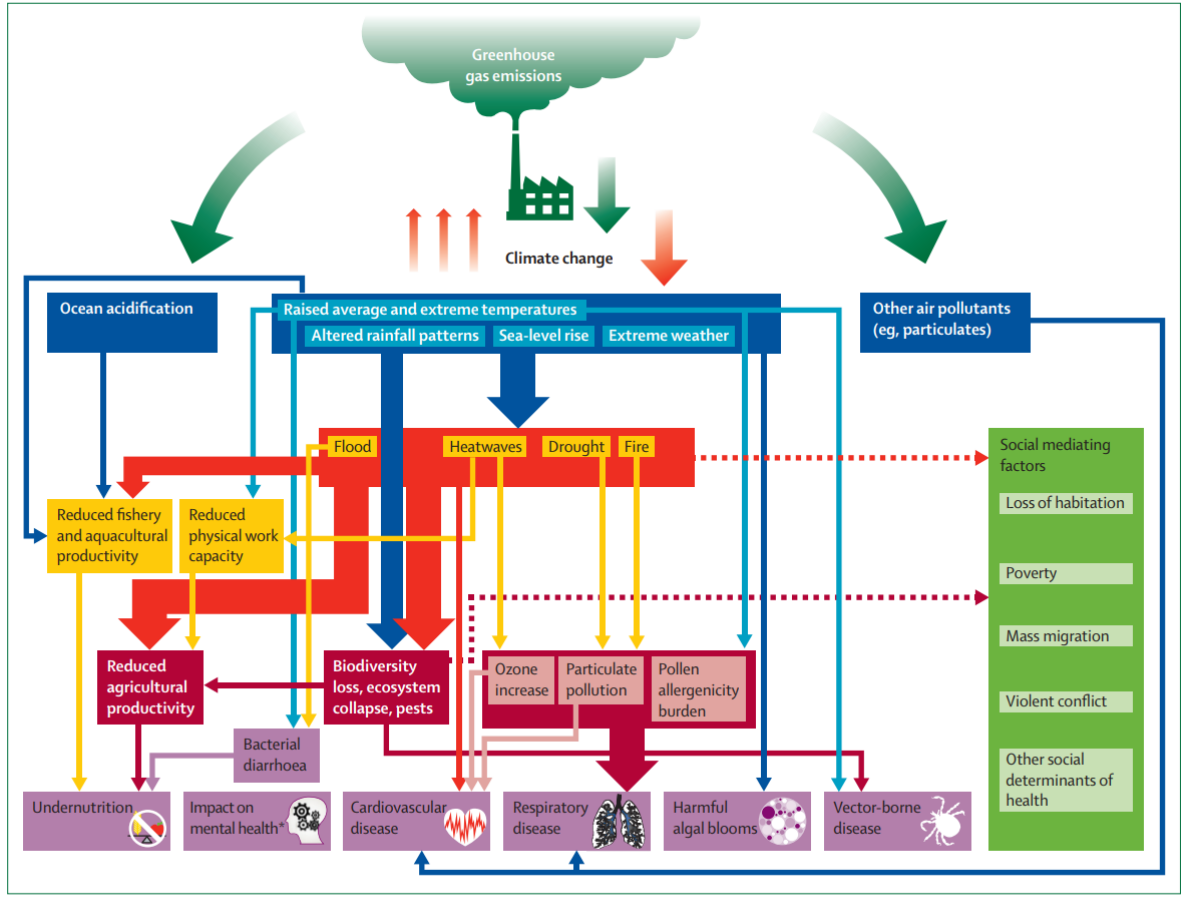


Figure 1: **The health impacts of climate change**
*The mental health effects of climate change are complex and interact with many of the processes shown in the figure. Source: *Lancet* Commission, 2015.[5]

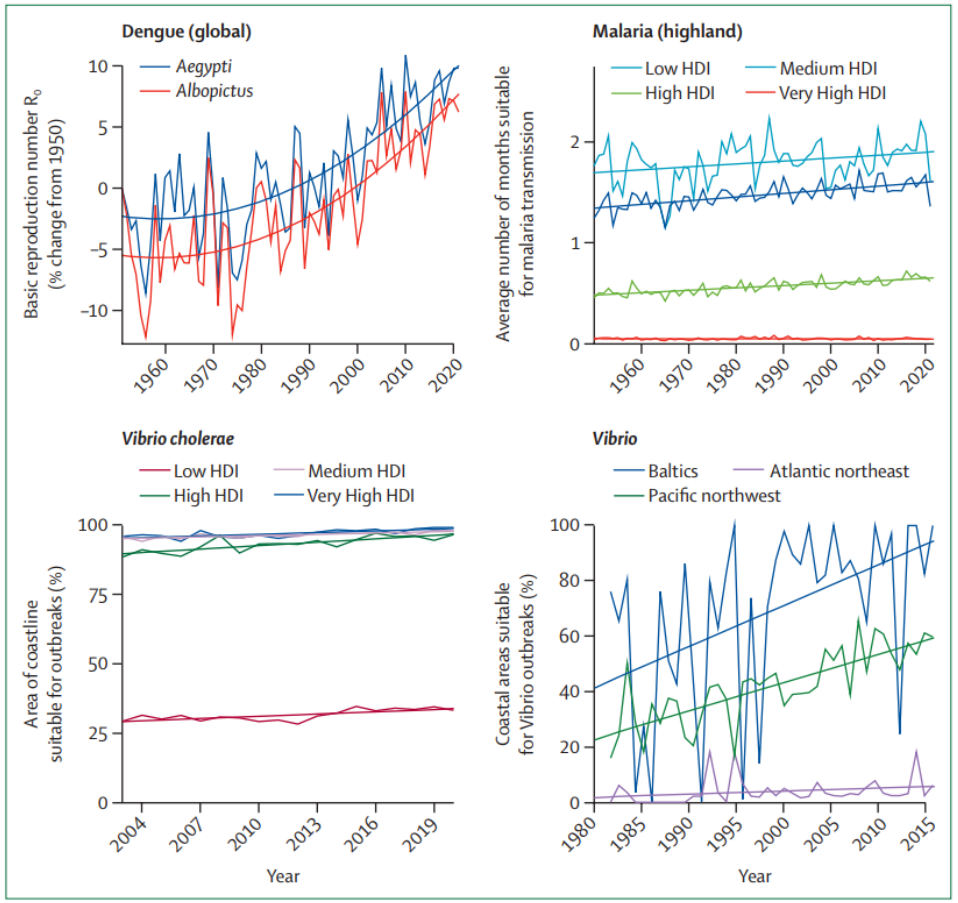


Figure 4: **Change in climate suitability for infectious diseases**
Thin lines show the annual change. Thick lines show the trend since 1951 (for malaria), 1951 (for dengue), 1982 (for *Vibrio* bacteria), and 2003 (for *Vibrio cholerae*). HDI=human development index.

Watts N, et al. Lancet 2017; Romanello M, et al. Lancet 2022.

Climate change and infectious diseases

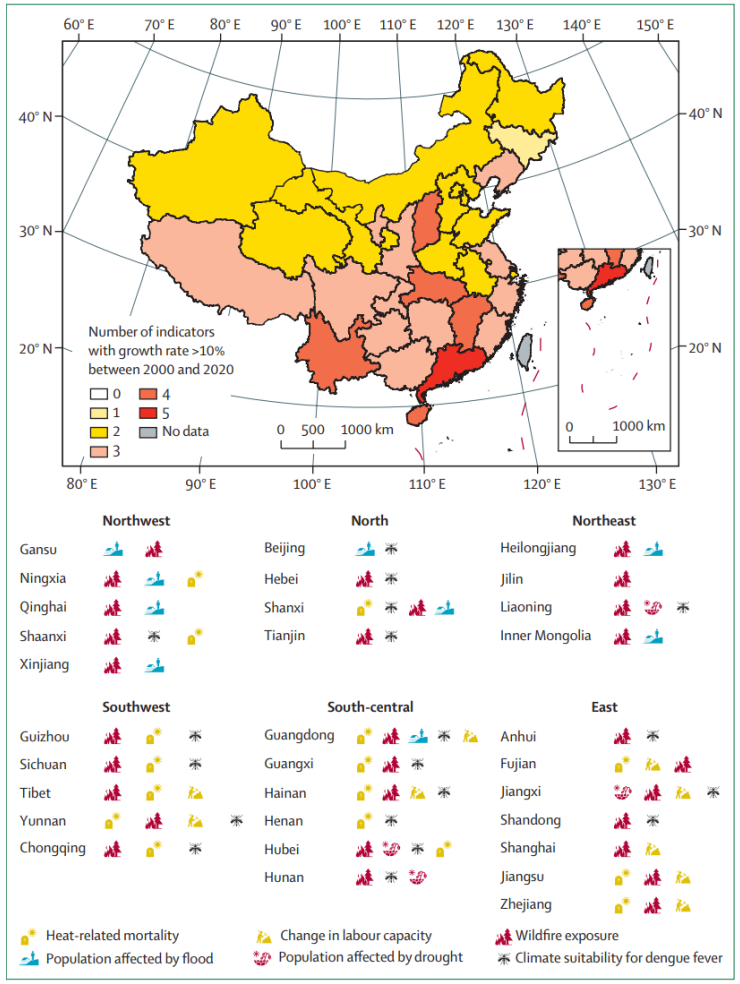


Figure 2: **The key rising health exposures from climate change in each province in China (2000–20)**
Each province is coloured according to the number of indicators with growth of larger than 10% between 2000 and 2020, and the icons represent indicators that have changed by more than 10% for each province. Within each province, the indicators with a growth rate higher than 10% were ranked in order with the indicator with the greatest change range being listed first.

Panel 2: **COVID-19 and the climate-health challenges in China**

The outbreak of COVID-19 has been a reminder of the importance of the health and safety of the people and the country. China's economy had its first contraction in decades, contracting by 6·8% year-on-year in the first quarter of 2020. Urban unemployment also rose to an unprecedented 6·2% of the total working-age population in February, 2020, far higher than past levels of 4·8–5·3%.[33] Furthermore, China set up a special fund of US$2·96 billion[33,34] (equivalent to 30% of the national fiscal expense in foreign affairs in 2019) to help treat COVID-19 patients in designated admission facilities.

From the pandemic, China has learned to attach more importance to the early prevention of diseases. This lesson has been reflected in the establishment of the National Bureau of Disease Control and Prevention (NBDCP) in April, 2021,[8] which is a vice ministerial-level bureau directly administered by the National Health Commission.

The five major responsibilities of the NBDCP are: to formulate policies on prevention and control of infectious diseases and on public health supervision; to guide the construction of a disease prevention and control system; to plan and guide the construction of an epidemic monitoring and early warning system; to guide the construction of a scientific research system on disease control; and to supervise public health and infectious disease control. However, within the NBDCP mandate, there is no direct reference to the health impacts of climate change, signifying a worrying absence of attention to the top global risk identified.[35,36] In April, 2021, President Xi Jinping clearly named climate change and the COVID-19 pandemic as two major challenges faced by the world and advocated that countries should work together to formulate a collective response.[10]

The impacts of COVID-19 have been devastating and, as of Oct 4, 2021, COVID-19 has killed about 4·8 million people worldwide.[37] Although the COVID-19 pandemic represents an acute health crisis, the health impacts of climate change will continue to worsen in the coming years and decades without additional action. Taking a very conservative estimate, climate change has been already linked to an additional 150 000 deaths since 2000, a number that will rise to 250 000 in 2030.[38] The health burden from climate change would increase rapidly if climate change is not addressed in a timely and adequate manner.[4,5,24] The COVID-19 pandemic and climate change have a lot in common, with interlinkages in the root causes and the response measures.[1,39–41] The health impacts from the pandemic are immediate and radical, and they require a rapid and integrated response; however, it is also important to jointly fight climate change, which is a broader, longer-term, and more complex challenge that society faces. Preventing the health risks of climate change should become a key responsibility of the new NBDCP. Underestimating the health risks from climate change will be something that our health and economy cannot afford to do.

Panel 3: **Estimated economic losses of extreme rainfall and the COVID-19 epidemic in Zhengzhou in 2021**

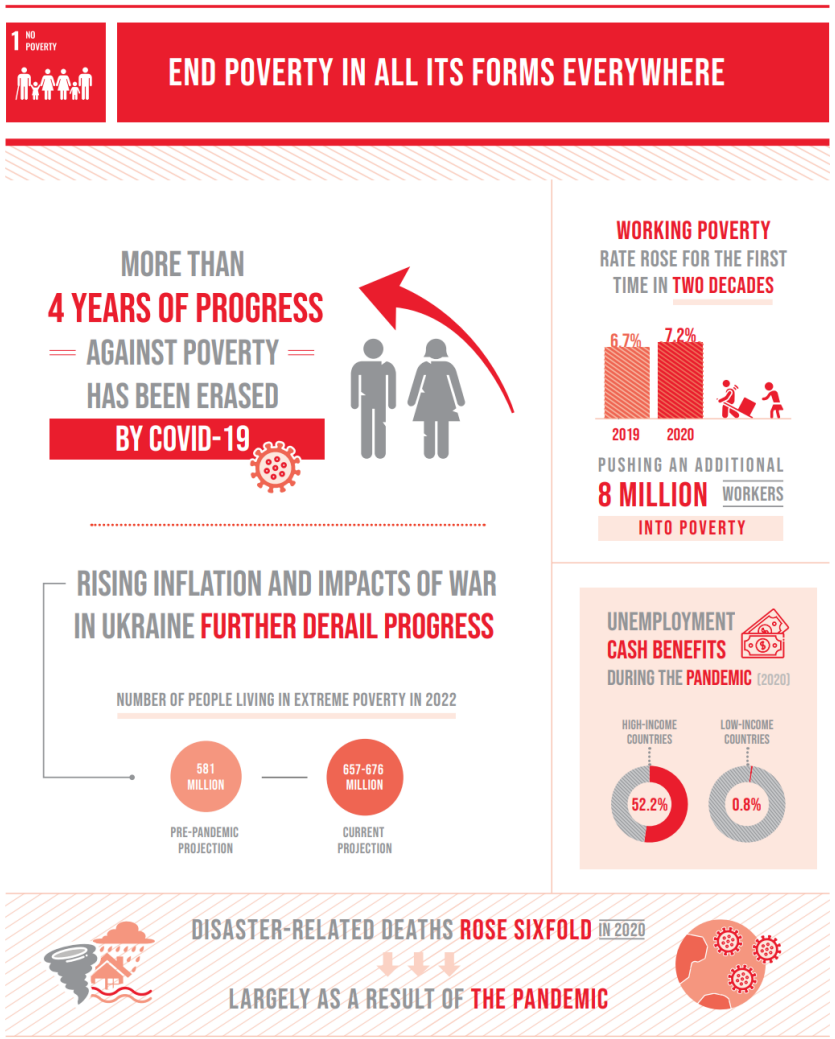
From July 17 to July 23, 2021, Henan province (central China) was hit by unprecedented levels of heavy rainfalls and floods, and its capital city Zhengzhou had extensive casualties and property damage.[71] The event was listed as the deadliest natural disaster in 2021 in China.[72] The situation was further worsened in Zhengzhou by a local coronavirus epidemic a week later,[73] which affected the progress of the post-flood recovery and compounded climate risks.

- Extreme rainstorm (July 20, 2021)
- The first case of COVID-19 reported (July 30, 2021)
- Recovery of subways hit by floods suspended (Aug 5, 2021)
- COVID-19 control measures lifted (Aug 28, 2021)

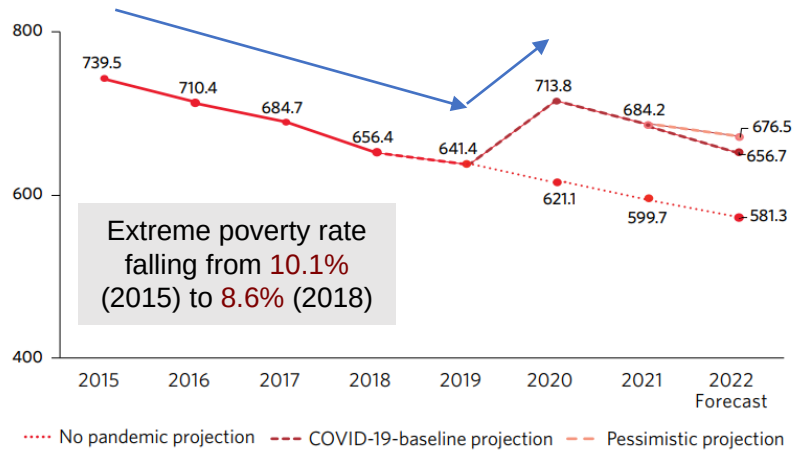
Using similar methods as indicator 4.1.4, the total economic losses of these events were estimated to be US$19·6 billion, equivalent to 0·12% of China's gross domestic product in 2021,[74] excluding health costs. Although the flood-induced direct damage only occurred in Zhengzhou, the indirect losses occurred across other regions due to supply chain disruptions (appendix p 107). Although almost a third (29%) of direct losses happened in Zhengzhou's real estate industry, the indirect losses were bigger in Zhengzhou's non-metallic mineral product (13%), food and tobacco (10%), and transportation services (10%). In regions outside Zhengzhou, the agriculture, mining, petroleum and coking, chemical products, accommodation and restaurants, and financial services were the most heavily affected sectors by these events. Among them, the agriculture in Henan (except Zhengzhou) had the greatest indirect loss, at $0·4 billion. This case study shows how devastating an extreme climate event can be, both to lives and economies, and how the confluence of different risks, such as the collision between an epidemic and extreme weather, can further aggravate socioeconomic consequences. The huge economic costs of these events show the value of risk assessment, planning, and the implementation of early and adequate adaptation and mitigation actions towards climate change.

Cai WJ, et al. Lancet Public Health 2021; Cai WJ, et al. Lancet Public Health 2022.

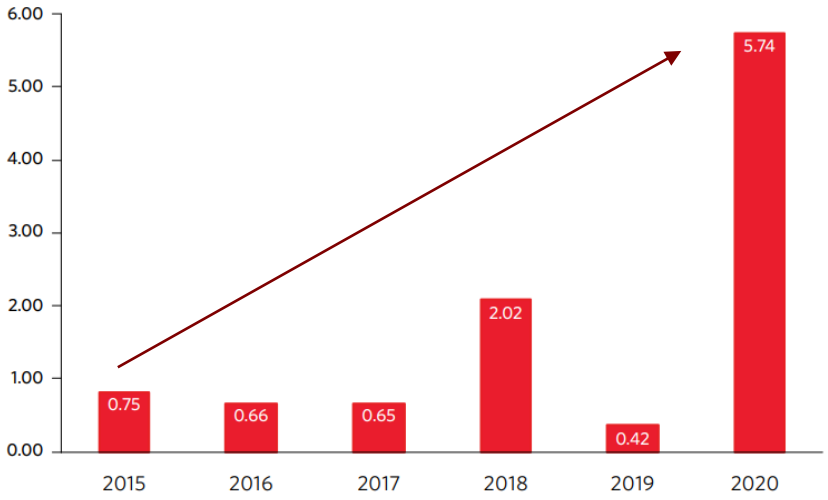
Impact of COVID-19 pandemic on SDGs



Number of people living on less than $1.90 a day, 2015–2018, 2019–2022 projection before and after COVID-19 (millions)



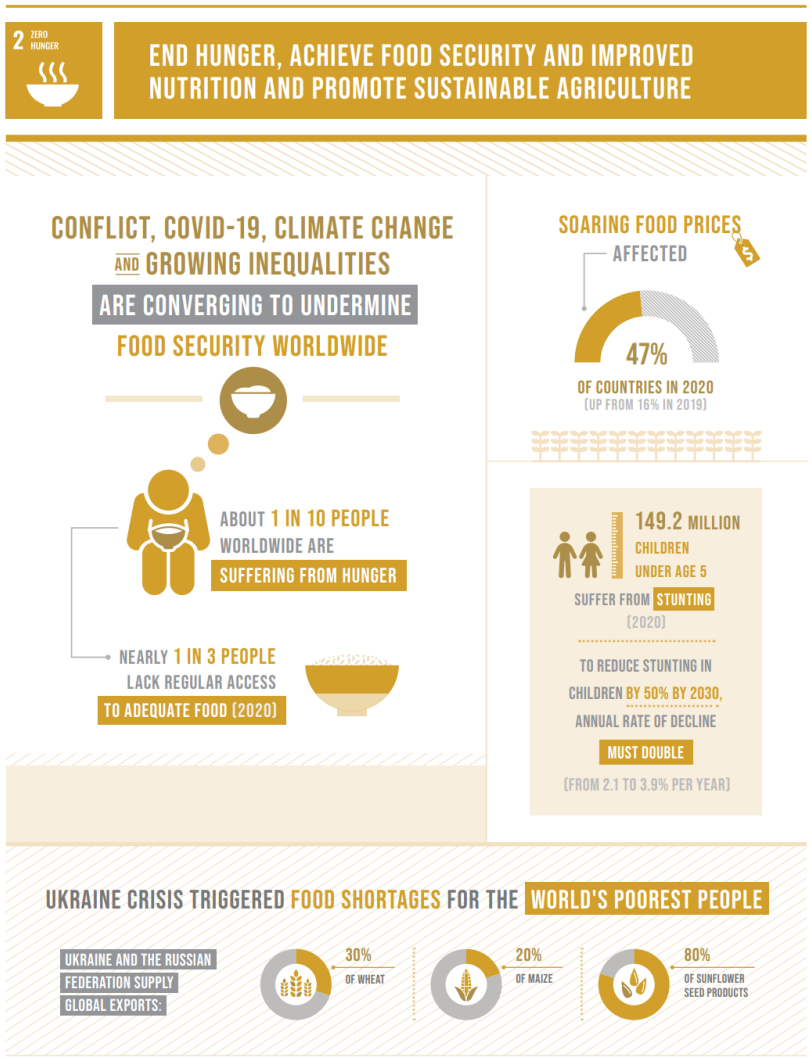
Disaster-related mortality (rate per 100,000 population), 2015–2020

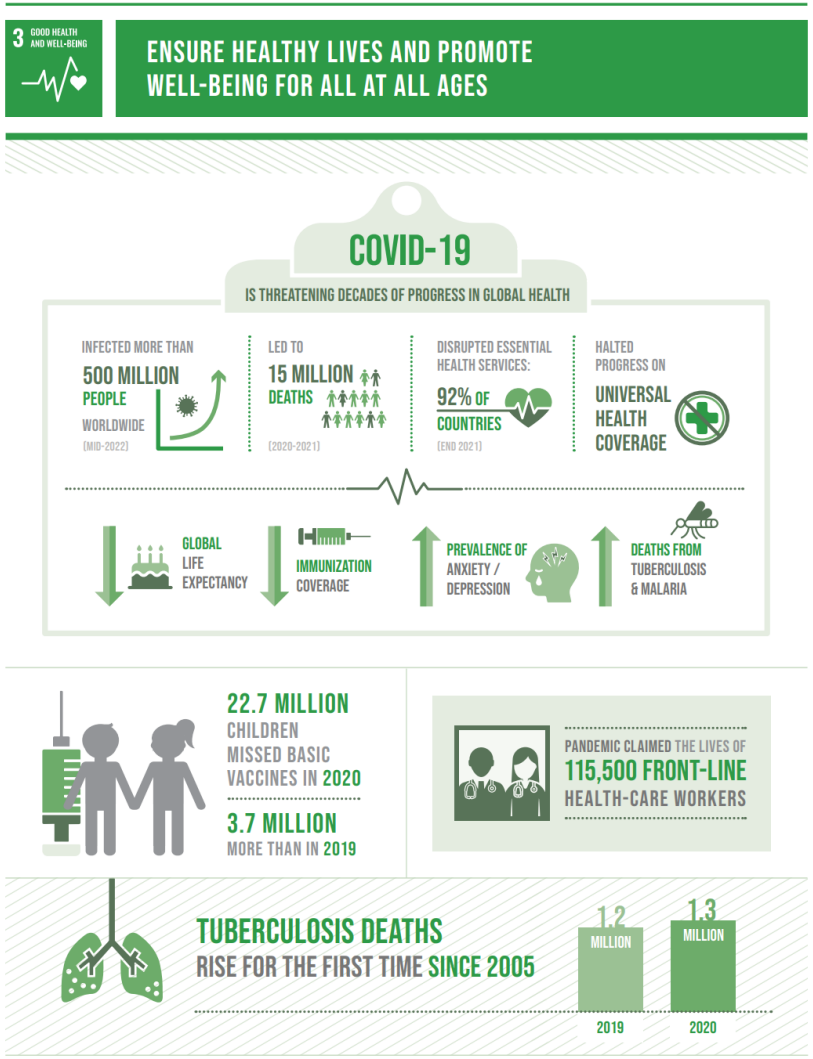


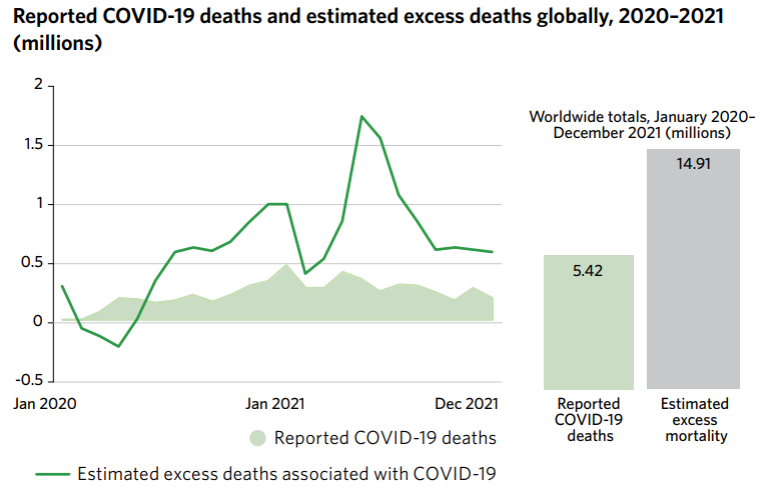
- Nowcasts suggest that the global poverty rate increased sharply from 2019 to 2020, from 8.3 per cent to 9.2 per cent, the first rise in extreme poverty since 1998 and the largest since 1990.
- Disaster-related deaths rose sixfold in 2020, largely as a result of the pandemic.
- As countries were coping with the economic fallout of the pandemic, 33 countries reported $16.5 billion in direct economic losses in 2020, due to other disasters.
- Of this amount, 41% ($6.8 billion) was in the agriculture sector and 38% ($6.2 billion) related to losses resulting from damaged or destroyed critical infrastructure.

UN. The Sustainable Development Goals Report 2022.

Impact of COVID-19 pandemic on SDGs







- About two thirds of the additional deaths were linked to disruptions in the provision of malaria services during the pandemic.
- Disruptions associated with the pandemic globally caused a noticeable rise in the number of TB deaths, from 1.2 million in 2019 to 1.3 million in 2020 (excluding TB deaths in people with HIV). This is the first year-on-year increase in TB deaths since 2005, and it took the world back to the 2017 level.

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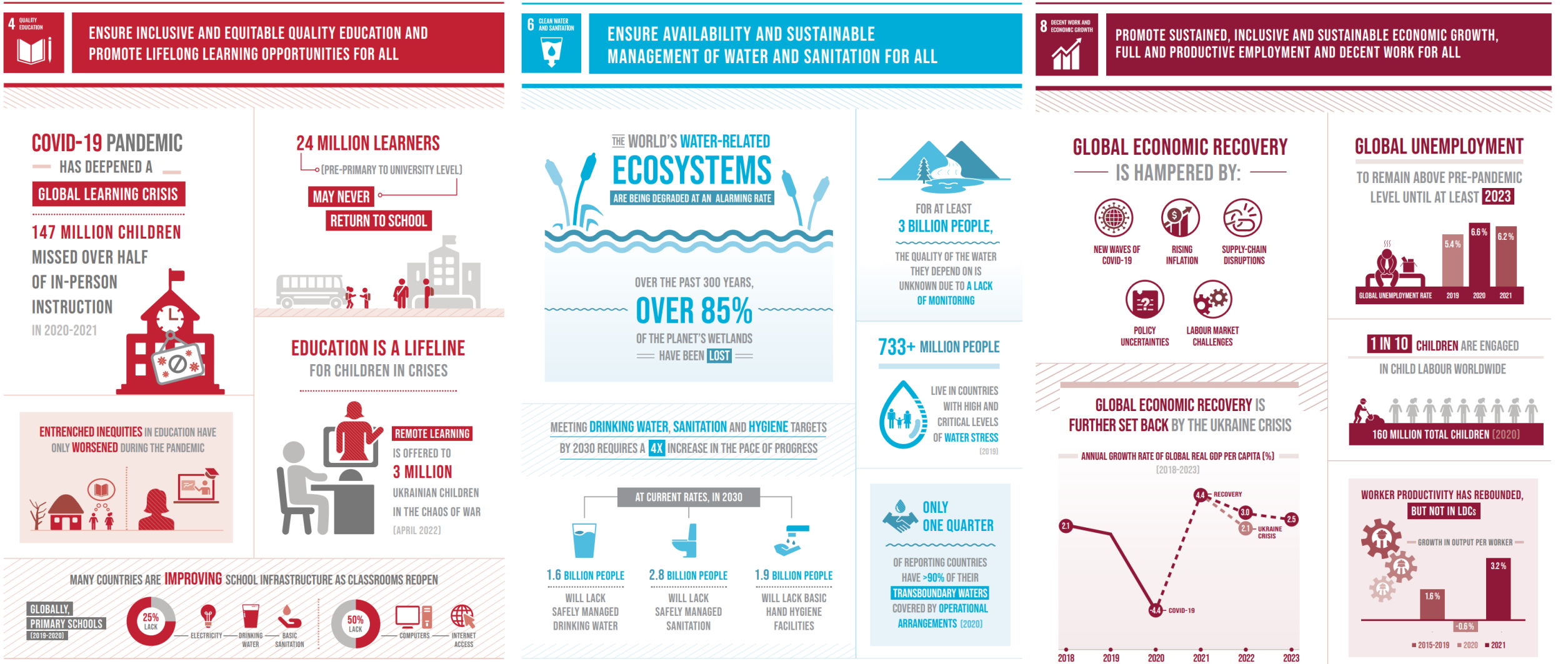
Impact of COVID-19 pandemic on SDGs



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Impact of COVID-19 pandemic on SDGs

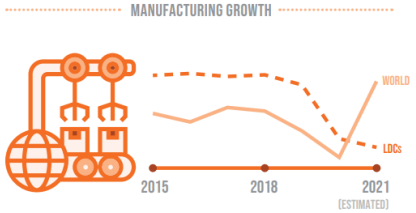
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

GLOBAL MANUFACTURING

HAS REBOUNDED FROM THE PANDEMIC

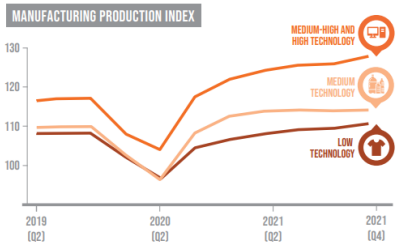
BUT LDCs ARE LEFT BEHIND



HIGHER-TECHNOLOGY INDUSTRIES

ARE FAR MORE RESILIENT IN CRISES

THAN THEIR LOWER-TECH COUNTERPARTS



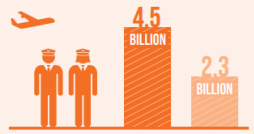
SMALL-SCALE INDUSTRIES

LACK ACCESS TO FINANCIAL SUPPORT FOR RECOVERY

ONLY 1 IN 3 SMALL MANUFACTURERS ARE BENEFITING FROM A LOAN OR LINE OF CREDIT (2020-2021)

PASSENGER AIRLINE INDUSTRY

IS STILL STRUGGLING TO RECOUP CATASTROPHIC LOSSES



2.3 BILLION PASSENGERS IN 2021, COMPARED WITH 4.5 BILLION IN 2019

1 IN 3 MANUFACTURING JOBS

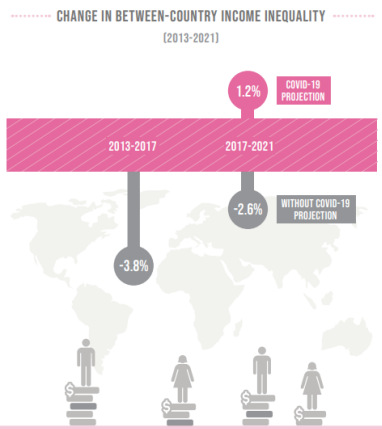
ARE NEGATIVELY IMPACTED BY THE CRISIS

10 REDUCED INEQUALITIES

REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

PANDEMIC

HAS CAUSED THE FIRST RISE IN BETWEEN-COUNTRY INCOME INEQUALITY IN A GENERATION



5,895 MIGRANTS

LOST THEIR LIVES IN 2021

THE DEADLIEST YEAR SINCE 2017 FOR MIGRANTS

1 IN 5

PEOPLE HAVE EXPERIENCED DISCRIMINATION

ON AT LEAST ONE OF THE GROUNDS PROHIBITED UNDER INTERNATIONAL HUMAN RIGHTS LAW

GLOBAL REFUGEE FIGURE HITS RECORD HIGH

WAR IN UKRAINE PUSHES THE WORLD TOTAL EVEN HIGHER

NUMBER OF REFUGEES OUTSIDE THEIR COUNTRY OF ORIGIN INCREASED BY 44% BETWEEN 2015 AND 2021

11 SUSTAINABLE CITIES AND COMMUNITIES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

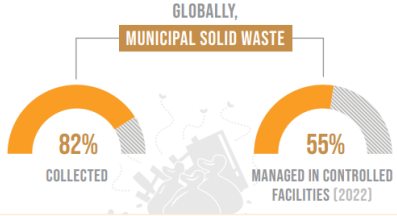
NUMBER OF COUNTRIES WITH LOCAL DISASTER RISK REDUCTION STRATEGIES NEARLY DOUBLED BETWEEN 2015 AND 2021 (51 TO 98 COUNTRIES)

LEAVING NO ONE BEHIND

WILL REQUIRE AN INTENSIFIED FOCUS ON

1 BILLION SLUM DWELLERS

AS CITIES GROW, MUNICIPAL SOLID WASTE PROBLEMS MOUNT



IN SUB-SAHARAN AFRICA, LESS THAN 1/3 OF CITY DWELLERS HAVE CONVENIENT ACCESS TO PUBLIC TRANSPORTATION

99%

OF THE WORLD'S URBAN POPULATION BREATHE POLLUTED AIR

ACCORDING TO NEW WORLD HEALTH ORGANIZATION AIR QUALITY GUIDELINES OF $PM_{2.5}$ <5 UG/M^3

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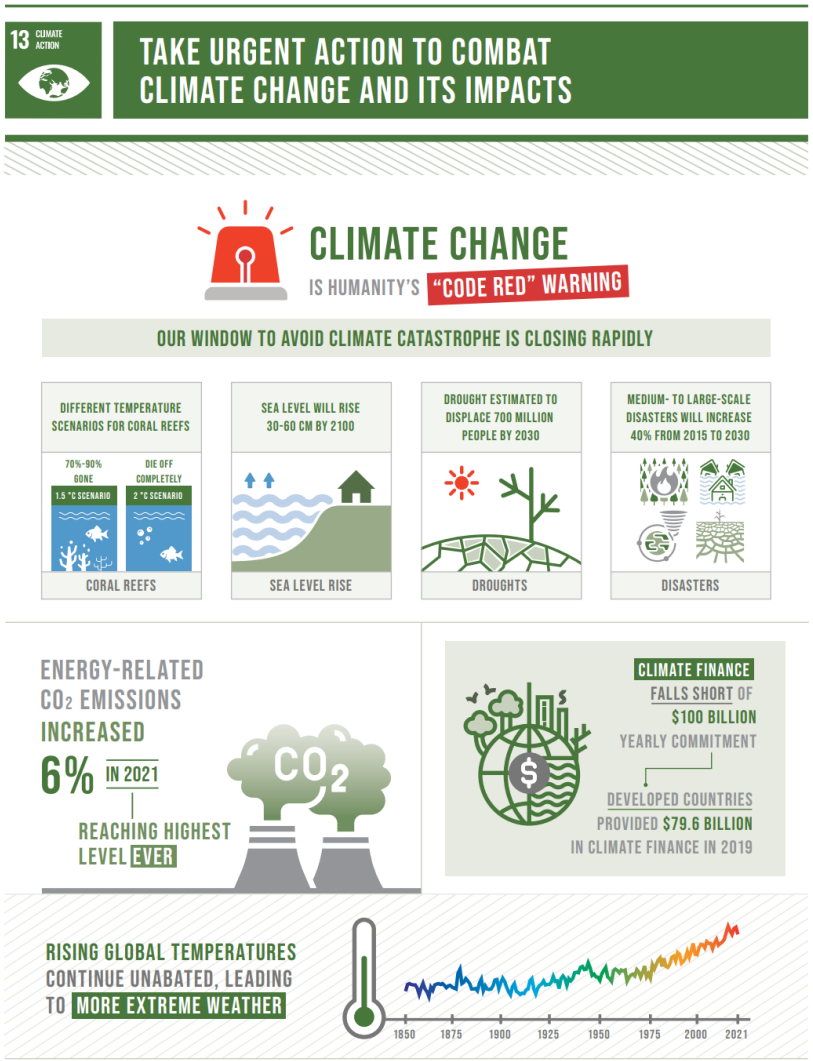
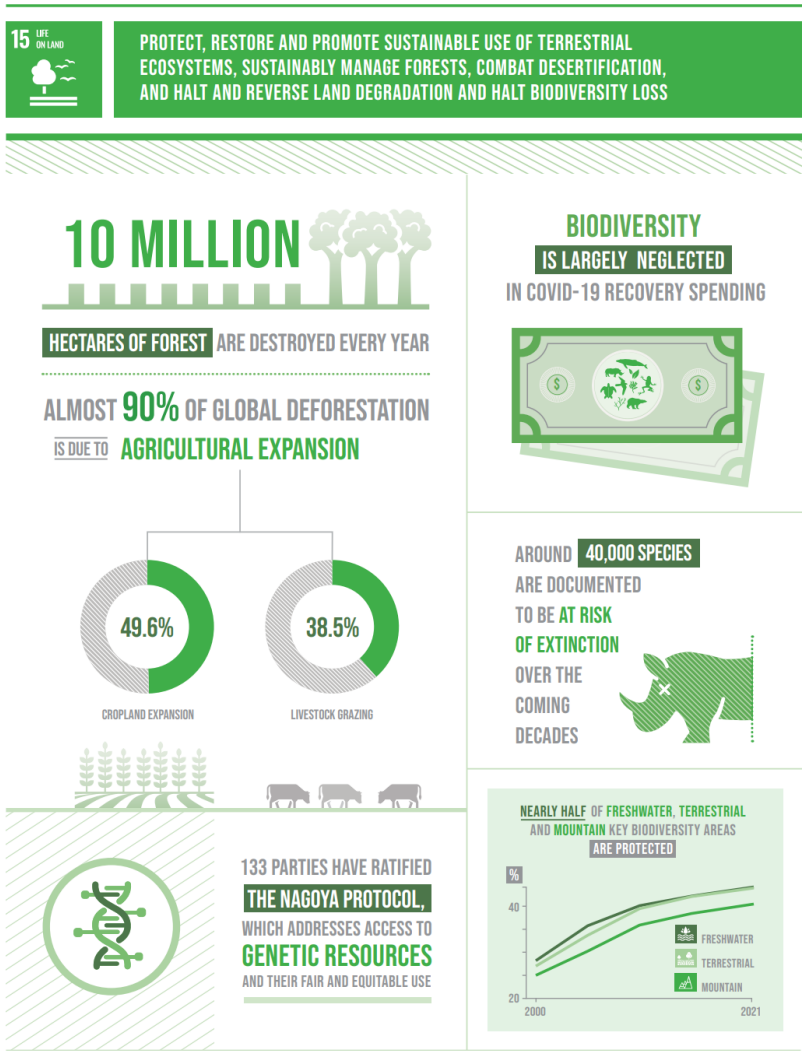
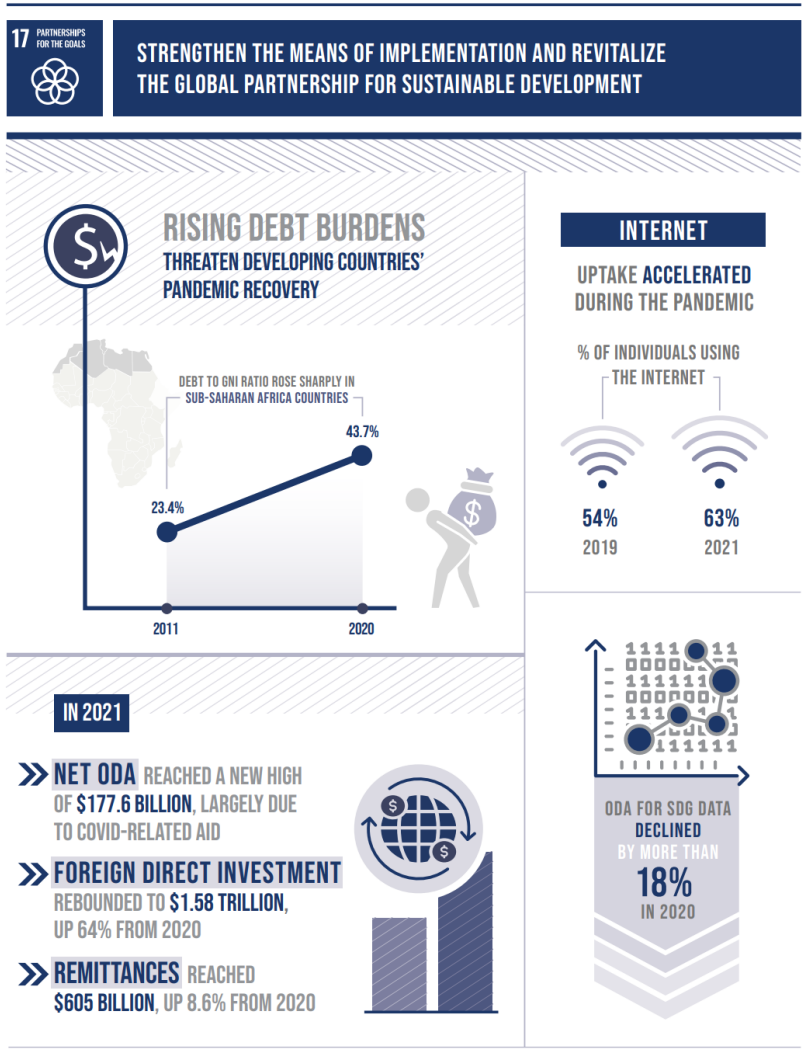
Climate Change and Sustainability







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Climate Change, Pandemic, and Sustainability

- Transition to clean and renewable energy
- Reducing carbon emissions
- Enhancing biodiversity conservation and ecosystem protection

- Establishing a resilient health system
- Strengthening disease surveillance, preparedness, and response
- Raising public awareness and promoting behavioral changes

Enhancing global cooperation

Thanks!

"We must rise higher to rescue the Sustainable Development Goals – and stay true to our promise of a world of peace, dignity and prosperity on a healthy planet."

— *António GUTERRES*
Secretary-General of the United Nations