

“Population growth in these areas will increase the vulnerability of coastal ecosystems to sea level rise.”

#### Rising sea levels

During the twentieth century, global sea levels rose by roughly seven inches. Climate change models predict that the rise in sea levels will increase this century. In assessments of flood risks that may arise by 2080 across a range of climate change projections, three of the five regions shown to be at risk of flooding in coastal and deltaic areas of the world are located in Africa: North Africa, West Africa and southern Africa.

Population growth in coastal areas will increase the vulnerability of coastal ecosystems to sea level rise. 40% of the population of West Africa live in coastal cities. It is expected that an entire stretch of West Africa, between Accra and the Niger Delta, will become a continuous megacity by 2020. As sea levels rise, increased salinity in groundwater could affect access to drinking water and agricultural inputs. Flooding and the destruction of infrastructure and food-producing areas is a likely result of sea level rise. In the Gulf of Guinea, rising sea levels would be likely to breach the low-level barriers that limit coastal lagoons. Lagoonal fisheries and aquaculture will be impacted in a number of countries. Coastal agriculture could be at risk of inundation and soil salination.


In the SANA reports, a total of 14 of the 15 sea-bordering countries describe sea level rise as a

risk, but the exact magnitude of the problem is largely unknown. In Mauritius, a mean rise of 2.1mm per year has been measured from 1997 to 2007. Congo reports flooding in bays, estuaries and lagoons, but lacks actual data on sea level rise, as do many other countries.

#### Volcanic eruption

Eruption can cause injury, fatality and social disruption. The explosion and contact with volcanic mass are a direct health hazard, while hot ash, gases and acid rain have more indirect health consequences.

There are several volcanoes in the African region, predominantly in Kenya, but they can also be found in other countries such as Cameroon or Congo. Eruptions are mentioned as a risk by seven countries, but three of them say the risk is very low. Cameroon notes that geologists expect Mount Cameroon to erupt again between 2015 and 2020. In 1992, eruption on the western side of Mount Cameroon lasted for six months, killed 100 persons and destroyed crops, railway infrastructure and human dwellings. The Rift Valley area of Kenya is an active volcanic zone and records an average of 1 000 volcanic activities a year. The Democratic Republic of the Congo (RDC) reports a historic eruption of the Nyamuragira volcano in 1977, when 600 people lost their lives.



PART 2  
SECTION 1  
MAJOR RISKS  
OCCURRING  
NATURALLY

### Earthquakes

Earthquakes have direct and indirect health impacts. High levels of injury can occur as the result of falling debris or dust inhalation, including trauma and asphyxiation. Destruction of shelter and infrastructure can have secondary health consequences. Compound hazards for health include fire, landslides and tsunamis.

Earthquakes are not seen as a high risk by African countries. Only Madagascar reports earthquakes as a high risk and identifies 21 epicentres of earthquake activity. A significant earthquake occurred in the Ol Doinyo Lengai area (Tanzania) in 2007, measuring 5.2 on the Richter scale, causing destruction of human settlements.

### Salinity

Salinity is a measure of the salt content of soil or water. High concentrations of salt pose hazards for the environment as well as affecting agriculture and infrastructure and therefore the wider economy. High levels of salinity in water and soil may cause native vegetation to become unhealthy or die and lead to a decline in biodiversity through dominance of salt-resistant species, potentially altering entire ecosystems. Reduced ground cover also makes soil more prone to erosion, which can pollute water with increased sediment, making it unsuitable for both human and animal consumption and threatening high value ecosystems and the plant and animal species they support.

In the SANA reports, salinity is noted as a risk by 11 of 22 countries. Direct effects are noted in Gabon, where people in coastal areas have to consume salt water, leading to health risks such as cardiovascular diseases and digestive disorders.

### Other risks

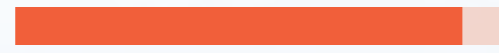
Several other risks are noted in the SANA reports. Heat is reported as a risk in two countries. Extreme weather and natural disasters are seen as a risk in eight countries. These include cyclones, storms and locust invasions. Six countries report landslides as a risk, while land degradation is mentioned by six countries. In one country, Cameroon, gas release is reported as a serious risk, as Lake Nyos in Cameroon is at risk of toxic gas emissions (CO<sub>2</sub>).

**“Direct effects of salinity are noted in Gabon, where people in coastal areas have to consume salt water, leading to health risks such as cardiovascular diseases and digestive disorders.”**

PART 2  
SECTION 1  
MAJOR RISKS  
OCCURRING  
NATURALLY



SOIL EROSION



is a risk in  
**20/22**  
countries



In many parts of Africa, wind and water erosion is a problem, as well as coastal erosion. The problems are floods, landslides, gully and sheet erosion.



**15%**  
of the land is  
prone to  
water erosion



**22%**  
of the land is  
prone to wind  
erosion

Health risks are malnutrition through loss of food production, increased spread of waterborne diseases, and destruction of human habitats through floods and landslides.

SUMMARY: in pictures

**Congo** reports that soil erosion is, "one of the most worrying in the last **20** years of Congo's environmental problems".

FLOOD



is a risk in  
**19/22**  
countries



Flooding leads to health risks, such as outbreaks of communicable diseases that are either waterborne or vector borne. Other risks include malnourishment through loss of food production and limited access to health facilities through destruction of infrastructure, as well as drowning mortality.

**Mali** reports that flooding is a disaster the authorities have to face every year, with each event affecting **10 000 to 45 000** people.

**The Republic of Bénin** reported disastrous floods in **2010** when **46** people died and many more lost their homes.

DROUGHT



is a risk in  
**13/22**  
countries

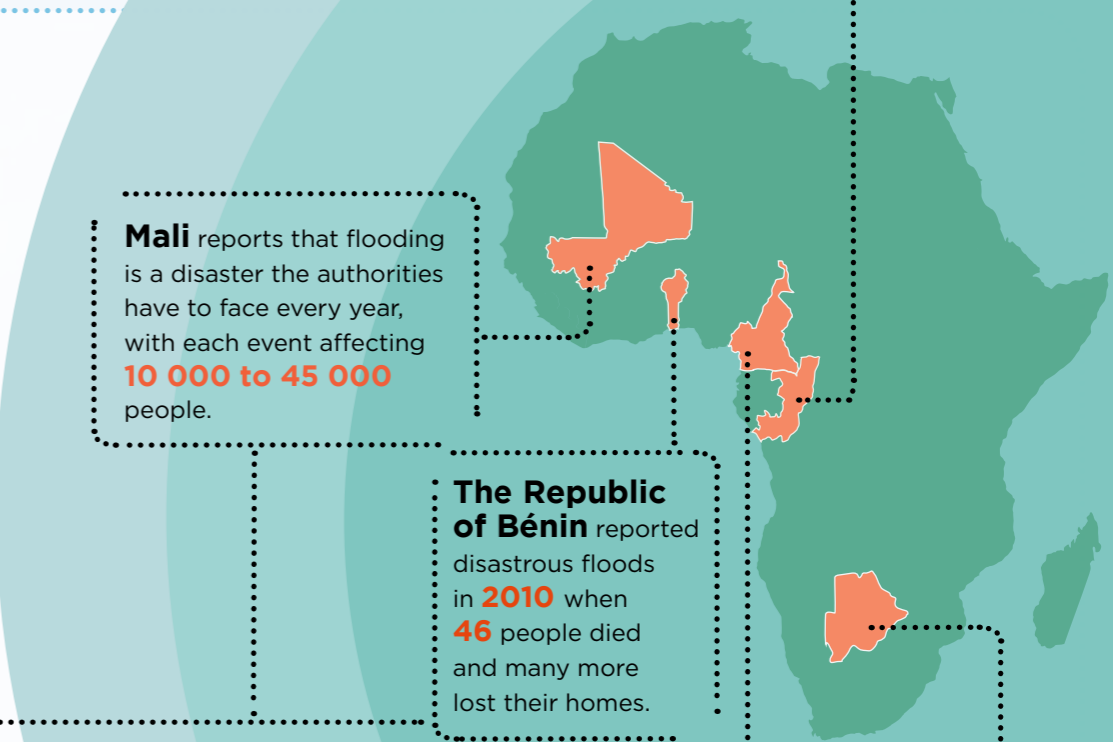


Since 1900, more than **11 million people** have died as a consequence of drought, and more than 2 billion have been affected by drought - more people than are affected by any other physical hazard.

Droughts can lead to lack of food, contamination of water supplies and reduced access to safe water. In Kenya, drought led to the incidence of cholera increasing exponentially in 2009.

Droughts are linked to desertification. In **Cameroon**, for example, a drying trend is observed that accelerates desertification. In Northern Cameroon, the desert is advancing at an alarming rate. It is even noted that communities sometimes have to compete with animals for water sources.

In **Botswana**, rural droughts often lead to the government implementing drought-relief programmes to ensure residents have the economic means to survive.



# PART 2

## SECTION 1

### MAJOR RISKS OCCURRING NATURALLY



#### RISING SEA LEVEL

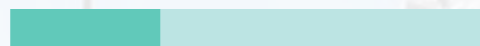


is a risk in  
**14/22**  
countries



Sea level rising is a consequence of climate change and will continue during the 21st century. Related health challenges listed in SANA reports are linked to flooding, salt intrusion and the destruction of breeding areas of marine life.

#### VOLCANIC ERUPTION

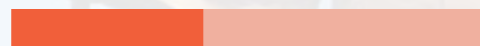


is a risk in  
**7/22**  
countries



Eruptions can cause injury, fatality and social disruption. There is a range of direct and indirect impacts, ranging from those caused by explosion and contact with volcanic mass to those caused by hot ash, gases and acid rain. They are mentioned as a risk by seven countries – with three of them saying the risk is very low.

#### EARTHQUAKES



is a risk in  
**9/22**  
countries



Earthquakes have direct and indirect health impacts. They can cause high levels of injury or mortality resulting from trauma, asphyxia and dust inhalation (acute respiratory distress). Compound hazards for health include fire, landslides and tsunami.

#### SALINITY



is a risk in  
**11/22**  
countries



Salinity is a measure of the content of salts in soil or water. Salts are highly soluble in surface and groundwater and can be transported with water movement. Excessive amounts of dissolved salt in water can affect agriculture, drinking water supplies and ecosystem health.

#### OTHER RISKS



**2/22** Heat



**8/22**

Extreme weather and natural disasters  
For example: cyclones, storms, locust invasions



**6/22** Landslides

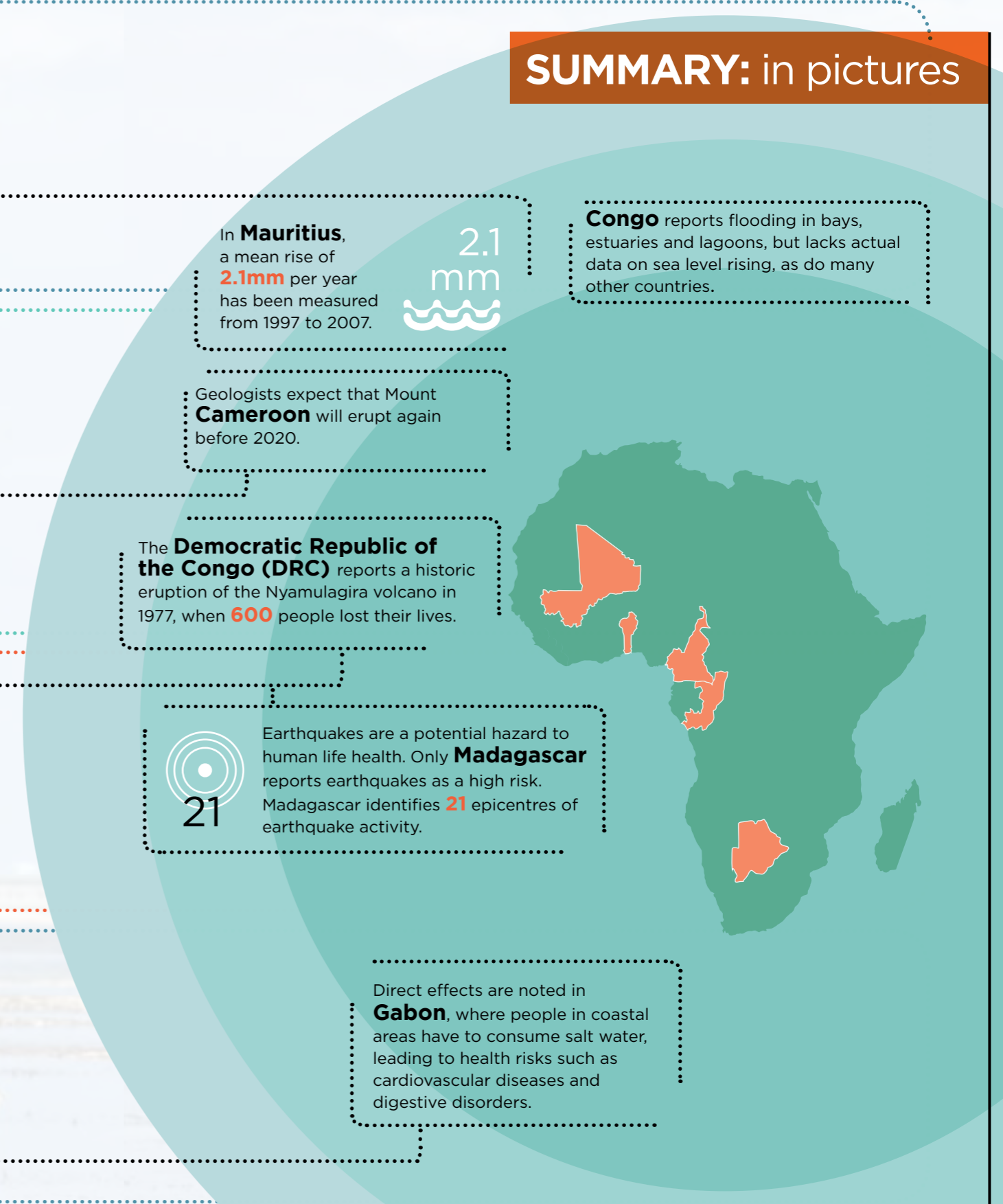


**3/22** Land degradation



**1/22** Gas release  
Lake Nyos in Cameroon is at risk of toxic gas emissions (CO<sub>2</sub>).

## SUMMARY: in pictures



## PART 2

### SECTION 2

# MAJOR RISKS RESULTING FROM HUMAN ACTIVITIES

#### 2.2 MAJOR RISKS RESULTING FROM HUMAN ACTIVITIES

The most commonly reported risk factors resulting from human activity are deforestation, biodiversity loss, disease vectors, drought, marine pollution, unsound management of hazardous and non-hazardous waste, organic drinking water pollution, air pollution and floods, all of which affect both rural and urban settings.

While soil erosion, floods, drought and rising sea levels are classified in this section as major risks occurring naturally, it is very likely that global warming and sea level rising is caused by human activity. Climate change already has a measurable impact on many natural and human systems. Impacts include an increase in floods, droughts and extreme weather events.

**“90% of diarrhoeal diseases are linked to a lack of safe drinking water, environmental pollution and poor sanitation.”**

#### Water pollution

The main health risks related to water pollution are diarrhoeal diseases, parasites and waterborne diseases. In fact, 90% of diarrhoeal diseases are linked to a lack of safe drinking water, environmental pollution and poor sanitation. There are 115 deaths in Africa every hour from diseases linked to poor sanitation, poor hygiene and contaminated water. Typhoid, cholera, dysentery, polio and hepatitis can all be caused by pathogens in water.

In total, 11% of the global population does not have access to clean drinking water. Of these, 43% live in Sub-Saharan Africa. The organic pollution of drinking water is mentioned as a risk in 19 SANA reports; it is one of the main health risks in many countries. Chemical pollution of drinking water and pollution of waste water (organic and chemical) also pose substantial risks to health.

Inadequate waste management is the most commonly reported cause of water pollution; 18 countries report it as a risk. Groundwater is commonly contaminated by pit latrines and soak pits in most peri-urban and informal settlements, leading to potentially high levels of coliform counts in drinking water. This is primarily because untreated waste and waste that remains uncollected or improperly disposed of can be a source of chemical and/or organic contaminants, and can become breeding sites for disease vectors.

Other reported causes are sanitation issues, industry and agricultural run-off. A significant proportion of the urban population has poor access to proper solid waste management and sanitation. In Sierra Leone, for example, only 13% of people have access to improved non-shared sanitation facilities. In Swaziland, most rural communities drink from rivers and streams which are without treatment. In Kenya, only 32 of 174 local government authorities have sewage systems.