

CLIMATE CHANGE IMPACTS IN AFRICA: THE EFFECTS ON KEY SECTORS IN THE NINE MOST VULNERABLE COUNTRIES

COMPILED BY: MAITE IRIARTE ARRIETA & DR. GRACE MBUNGU

In recent years, the effects of climate change have been felt all over the world: from the floods in Pakistan and Nigeria to the heatwaves in India, the US and Europe. Although the effects may appear to be universal, the implications for life and livelihoods vary greatly between regions. In view of these effects, how are African countries faring? How is climate change impacting people's lives and livelihoods?

According to the Intergovernmental Panel on Climate Change (IPCC) report on climate impacts, adaptation and vulnerabilities, the African continent, despite its status as one of the lowest contributors to greenhouse gas emissions, is already experiencing widespread losses and damages due to human-induced climate change. Indeed, as the African Union points out in its Climate Change and Resilient Development Strategy and Action Plan (2022-2032), the continent is one of the most vulnerable regions to climate change. This vulnerability stems from several factors such as high dependence on rain-fed agriculture, inequitable access to financial resources and weak adaptive capacity, among others.

These risks and vulnerabilities are underscored in the Notre Dame Global Adaptation Initiative (ND-GAIN Index), which shows that 9 out of the 10 countries most vulnerable and least resilient to climate change are located in Africa. The countries include Chad, the Central African Republic, Guinea-Bissau, Eritrea, the Democratic Republic of Congo, Sudan, Niger, Zimbabwe and Liberia. The question, however, is: how do vulnerability and lack of resilience play out in the day-to-day lives of these populations? Which sectors are most affected and in most urgent need of local, national

and global action? This knowledge is at the core of ensuring relevant, effective and sustained climate action. To this purpose, APRI has developed an interactive map that displays the effects of climate change on key sectors with immediate and direct impacts on lives and livelihoods in the 9 countries.

The information contained in the map has been compiled from Nationally Determined Contributions, Biennial Update Reports, National Adaptation Plans, National Communications and climate change or sector-specific reports by international organizations such as the African Development Bank, the World Bank, the United Nations Environment Programme, the International Renewable Energy Agency, the Food and Agriculture Organization of the United Nations and the United Nations Development Programme, among others. The compiled data indicates the state of affairs between 2010 and 2022, unless otherwise indicated on the map. Additional information on the specific data sources for each country is available on the 'Reference' cards in the map.



APRI

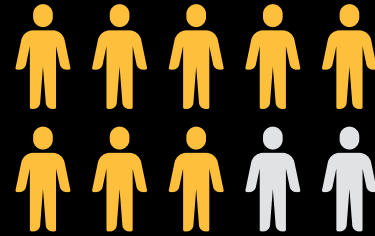
AFRICA POLICY RESEARCH INSTITUTE

CHAD

AGRICULTURE



45% national
GDP



80% population
employed

Climate change impacts



Rising
temperatures



Variability in
precipitation

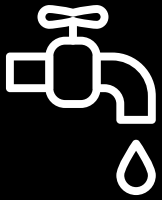
Reduced agricultural season, decrease in agricultural yield

Lower yields of food crops: millet, sorghum and maize

Shrinking production area for cash crops (e.g. cotton)

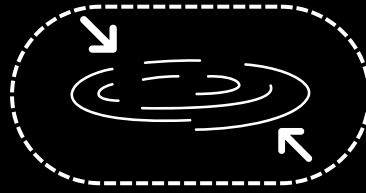
Extension of distribution area of crop pests

WATER



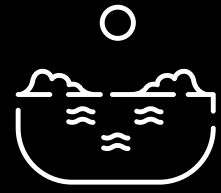
↓ **75%**

in per capita water
availability by 2080



↓ **23,000 km²**

in surface of Lake Chad
(1963-1992)



50 M

people depend
on Lake Chad

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Groundwater pollution

Dried-up wells and boreholes

Reduction in surface water and groundwater table

FORESTRY



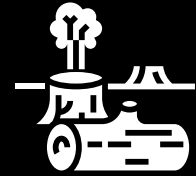
63%

territory is
a desert



↓ 1.5 Mha

in forest cover
(2001-2016)



50%

forestry potential
lost in last 20 years

Climate change impacts



Rising
temperatures



Variability in
precipitation

Increased dieback of woody plants and soil cracking in Sahelian zone

Reduction in number of large trees in Sudanian zone

Disappearance of plant species, especially aquatic ones

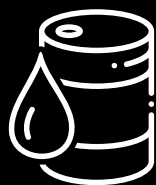
Increased risk of forest and bush fires

ENERGY



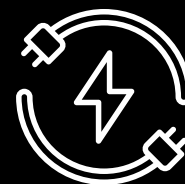
> 90%

energy consumption
from wood and charcoal



92%

total exports
from petroleum



11%

population has
access to electricity

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Damaged transport infrastructure (essential for trade): degraded
roads and bridges

Shortage of biomass for energy production

HEALTH



5.4 M

undernourished
people (2019-2021)



206 malaria cases out of
1,000 population at risk



↑ 3X

in heat-related
mortality by 2080

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Higher morbidity and mortality from tropical and water-related diseases

Increase in number of meningitis cases and advance of its seasonal onset

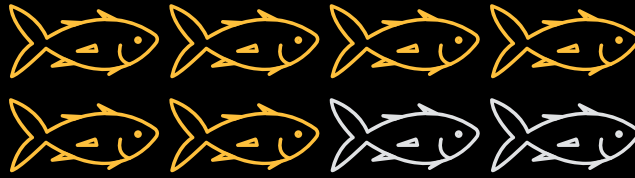
Increase in risk of malnutrition and food insecurity

FISHERIES



3%

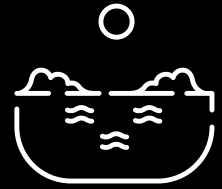
GDP from
fisheries



108 suitable for exploitation

out of

136 freshwater species



35%

production from
Lake Chad

Climate change impacts



Rising
temperatures



Variability in
precipitation

Loss of spawning areas in floodplains and marshes of Lake Chad

Salinization of surface waters + loss of oxygen saturation: most fish
species endangered and many lost

Production shortage and reduction in economic gains for fishers



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- **FAO (2022). World Food and Agriculture – Statistical Yearbook 2022. Rome.**
- **German Federal Ministry for Economic Cooperation and Development (BMZ), Potsdam Institute for Climate Impact Research (PIK), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and KfW Development Bank, (2021). Climate Risk Profile: Chad.**
- **International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division (UNSD), World Bank and World Health Organization (WHO), (2022). Access to electricity (% of population): Chad. World Bank Global Electrification Database from "Tracking SDG 7: The Energy Progress Report".**

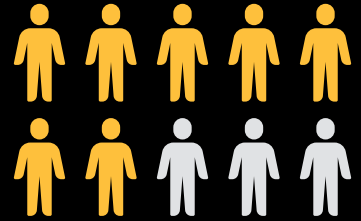
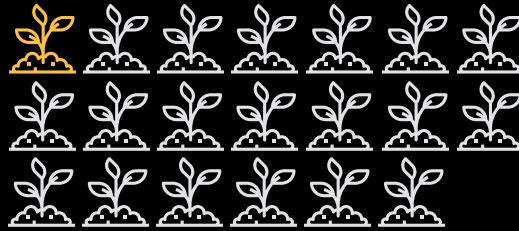


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- **Republic of Chad and United Nations Development Programme (2022). First National Climate Change Adaptation Plan of Chad.**
- **République du Tchad (2012). La Seconde Communication Nationale du Tchad sur les Changements Climatiques.**
- **République du Tchad (2020). Troisième Communication Nationale du Tchad sur les Changements Climatiques.**
- **World Health Organization (2022). World Health Statistics 2022: monitoring health for the SDGs, sustainable development goals. Geneva. Licence: CC BY-NC-SA 3.0 IGO.**

**CENTRAL AFRICAN
REPUBLIC**

AGRICULTURE



50% national
GDP

7,000 km² cultivated
15 Mha suitable land

72% population
employed

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Altered pest and pathogen existence

Inability to store perishable products

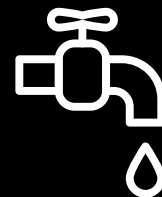
Increased erosion and waterlogging in agricultural areas

WATER



↓5%

in access to drinking
water (2015-2020)



63%

population lacks
access to safe water

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Loss in surface water and strain on pumping mechanisms

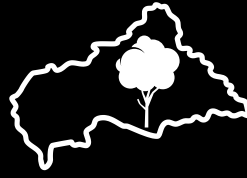
Altered groundwater recharge and poor water quality

FORESTRY



10%

forests used as
energy resources



45%

territory covered
by forest



40-50%

of exports from
commercial forestry

Climate change impacts



Rising
temperatures



Variability in
precipitation

Shrinkage of protected habitats

Endangered species at risk of conflict with human settlements

Extinction of heat-sensitive species

Reduced means of livelihood for people in rural areas

ENERGY



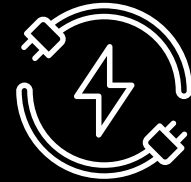
88%

electricity generated
from hydropower



90%

energy sourced
through wood



15%

population has
access to electricity

Climate change impacts



Variability in
precipitation



Floods

Disrupted river flows, hindered power generation

Damaged infrastructure, higher investment costs

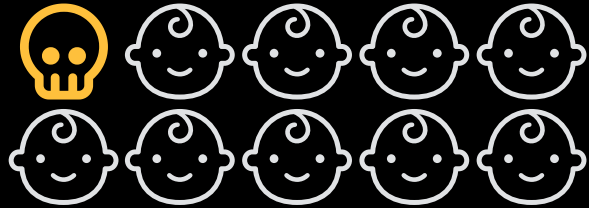
Impaired access to energy for households and productive uses

HEALTH



40%

children under 5
experience stunting



130

deaths
out of

1,000

children under 5

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Increase in epidemics due to transference into new areas

Increase in waterborne diseases and emerging infectious diseases

Further breakdown in food systems, increase in food insecurity

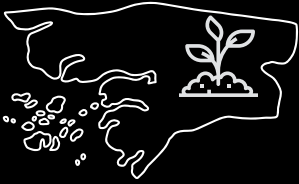


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- **International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division (UNSD), World Bank and World Health Organization (WHO), (2022). Access to electricity (% of population): Central African Republic. World Bank Global Electrification Database from "Tracking SDG 7: The Energy Progress Report".**
- **Oluwasanya, G., Perera, D., Qadir, M., Smakhtin, V., (2022). Water Security in Africa: A Preliminary Assessment, Issue 13. United Nations University Institute for Water, Environment and Health, Hamilton, Canada.**
- **The World Bank Group (2021). Climate Risk Profile: Central African Republic.**
- **UNEP GRID-Geneva (2022). Interactive Country Fiches: Central African Republic.**

GUINEA-BISSAU

AGRICULTURE



58%

territory suitable for
agricultural use



> 80%

population
employed



90%

total export revenue
from cashews

Climate change impacts



Rising
temperatures



Variability in
precipitation



Flooding &
waterlogging



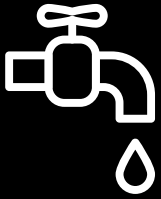
Sea level rise
& salinization

Permanent loss of land (sea encroachment, flooding and soil salinization)

Lower yields in key commodities such as peanuts and rice

Disrupted food supply and reduced incomes

WATER



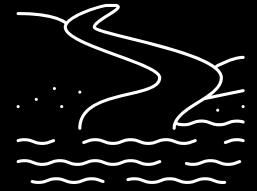
69%

population access
to potable water



11 m³/s

dry season flow in Corubal
River main surface water source



175 km

upriver saltwater
intrusion

Climate change impacts



Rising
temperatures

Decrease in surface waterbodies

Decrease in the water table

Lack of water for pastures, conflicts
between pastoralists and farmers



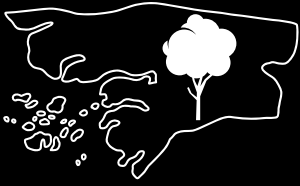
Variability in
precipitation

Deterioration in water quality:
saline infiltration into aquifers
and infestation by waterborne
plants



Sea level rise

FORESTRY



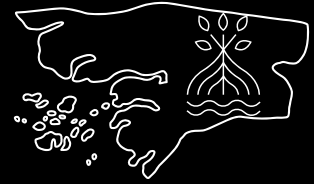
> 70%

territory covered by
forest



3%

global mangrove
territory



↓ 32%

in mangrove forest
cover since 1940

Climate change impacts



Rising
temperatures



Variability in
precipitation



Sea level rise

Higher deforestation rate, higher incidence of forest fires
Increased erosion due to deforestation in mangrove forest
(first-line defense against erosion and flooding)
Altered composition of forest species, extinction

ENERGY



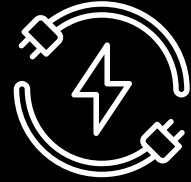
83%

energy supply from
bioenergy (2019)



90%

energy consumption
from biomass resources



33%

population has
access to electricity

Climate change impacts



Rising
temperatures



Variability in
precipitation



Sea level rise

Biomass scarcity and poor reproductive capacity of floristic species

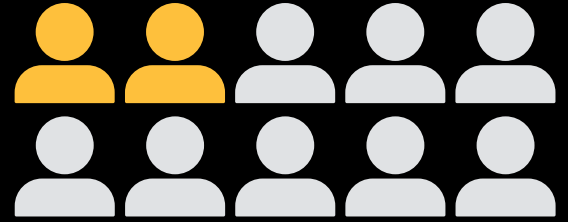


Lower availability of resources for energy generation

HEALTH



89 malaria cases out of
1,000 population at risk



2 undernourished out of
10 people

Climate change impacts



Rising
temperatures

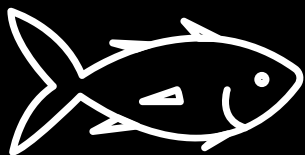


Variability in
precipitation

Changes to habitat range for vector-borne diseases such as
malaria and dengue fever

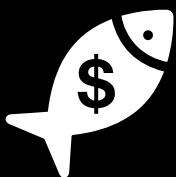
Increase in food insecurity

FISHERIES



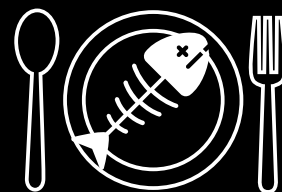
24%

total animal protein
consumption from fish



7%

national GDP
from fisheries



26 kg/year

per capita fish
consumption

Climate change impacts



Rising sea
surface
temperatures



Sea level rise



Extreme
weather events



Variability in
precipitation

Endangered mangrove ecosystems, critical breeding grounds for
replenishing fish stocks of both Senegal and Guinea-Bissau

Hypersalinised estuaries, decrease in fish production

Migration and extinction of species



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- **Food and Agriculture Organization of the United Nations (FAO), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and International Center for Tropical Agriculture (CIAT), (2019). Climate-Smart Agriculture in Guinea-Bissau.**
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- **Republic of Guinea-Bissau (2018). Third National Communication: Report to the United Nations Framework Convention on Climate Change.**
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- **Röhrig, F., Bougouma, K., Schiek, B., Ghosh, A., Ramirez-Villegas, J., Achicanoy, H., Esquivel, A., Saavedra, C., Diekjürgen, D., Grosjean, G. (2021). WFP Critical Corporate Initiative: Climate Response Analysis Guinea-Bissau. The Alliance of Bioversity and The International Center for Tropical Agriculture, World Food Programme.**



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- **United Nations Development Programme and Government of Republic of Guinea-Bissau (2019). Strengthening the adaptive capacity and climate resilience of Guinea-Bissau vulnerable coastal communities to climate risks. Project document.**
- **World Health Organization (2022). World Health Statistics 2022: monitoring health for the SDGs, sustainable development goals. Geneva. Licence: CC BY-NC-SA 3.0 IGO.**

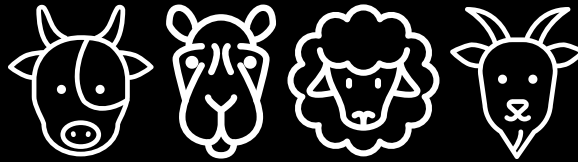
ERITREA

AGRICULTURE



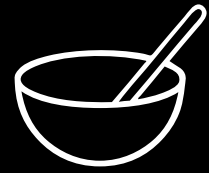
95%

agriculture
rain-fed



20%

agricultural GDP
from livestock



< 25%

food needs met
when rainfall low

Climate change impacts



Rising
temperatures



Variability in
precipitation

Reduced size of land suitable for sorghum
(most important cereal)

Lower productivity of crops and livestock

Loss of biological diversity due to lack of water

Exacerbated pests and diseases

IMPACT OF
UKRAINE WAR

100%

DEPENDENT

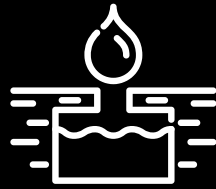
on wheat imports
from Russia and
Ukraine (2021)

WATER



60%

wells are
contaminated



85%

population depends
on groundwater



71%

population access to
safe drinking water

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods



Sea level rise

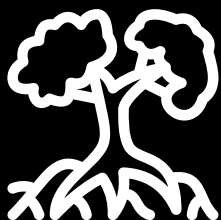
Shortage of water supply and lower water quality

Damaged drainage infrastructure and wastewater treatment facilities

Increased groundwater salinity

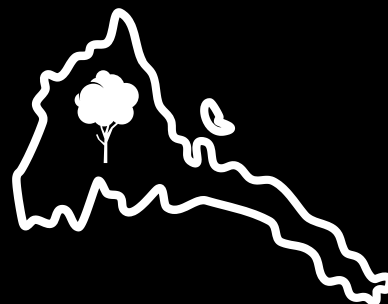
Exacerbated conflict for water between pastoralists and cultivators

FORESTRY



102 km²

total mangrove
forest coverage



< 1%

forest cover
remaining

Climate change impacts



Rising
temperatures



Variability in
precipitation

Submergence and displacement of mangroves in inter-tidal areas

Shortage of biomass for house construction, gum Arabic and wild medicine

Loss of income from forest products

ENERGY



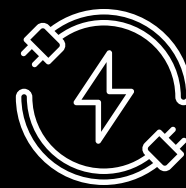
71%

energy supply from
bioenergy (2019)



80%

household energy needs
from biomass resources



52%

population has
access to electricity

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Damages to electric power lines

Shortage of biomass for energy production

HEALTH



50%

children experience
stunting in rural areas



480

maternal mortality ratio
per 100,000 live births

Climate change impacts



Rising
temperatures



Variability in
precipitation



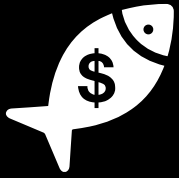
Floods

Changes in prevalence and distribution of malaria

Increase in malnutrition and incidence of vector-borne diseases

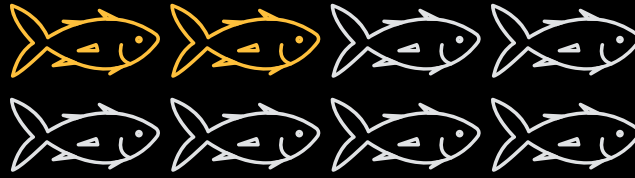
Increase in bacterial reproduction in water sources

FISHERIES



3%

national GDP
from fisheries

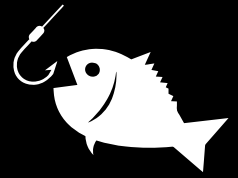


250

fish species out of

1,000

commercially important



15%

fishery potential
achieved

Climate change impacts



Rising sea
surface
temperatures



Sea level rise
& salinization

Toxic algal blooms (such as red tide) in the Red Sea: chronic and lethal
impacts for shellfish population

Increase in coral bleaching and mortality: threatened coral reef ecosystem



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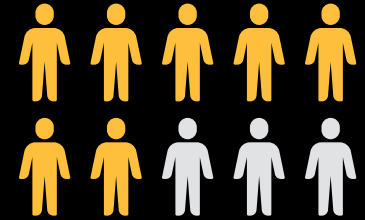


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- **Ministry of Land, Water and Environment of Eritrea (2021). Third National Communication Under The United Nations Framework Convention on Climate Change (UNFCCC).**
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**DEMOCRATIC
REPUBLIC OF CONGO**

AGRICULTURE



40% national
GDP

10 Mha cultivated
80 Mha arable

70% population
employed

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Reduced yields and damaged crops

Lower quality of staple crops and eroded fertile soils

Loss of livestock

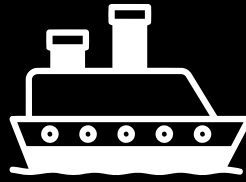
Lower access to markets

WATER



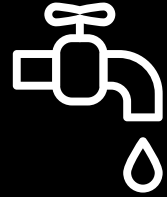
62%

Congo Basin
in the DRC



12,000 km

network
navigable water



54%

population lack
access to safe water

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Significant drought severity, lower infiltration and recharge rates

Pressure on water resources and strain on pumping mechanisms

Lower water quality and availability

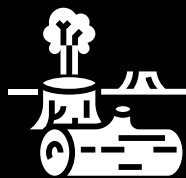
Increased risk of flooding in rivers, disrupted transportation

FORESTRY



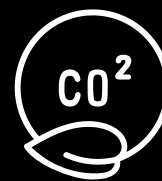
59%

territory is
tropical rainforest



2nd highest

deforestation in the
world (2020)



8%

global forest carbon
stored in DRC

Climate change impacts



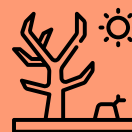
Rising
temperatures

- Altered composition of forest species
- Biodiversity loss
- Shift/loss of habitats in protected areas (Virunga)
- Endangered species and wildlife at risk, increased contact with humans



Variability in
precipitation

DEFORESTATION IN CONGO BASIN



potential drying
over the basin



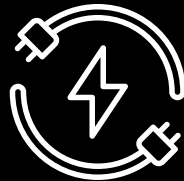
changes in rainfall
over Sahel,
Ethiopian
highlands and
Guinean coast

ENERGY



98%

generated power
from hydropower



19%

electrification
access rate



95%

energy needs from
biomass sources

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Damaged infrastructure, roads and communication networks

Disrupted river flows, lower hydro-power generation

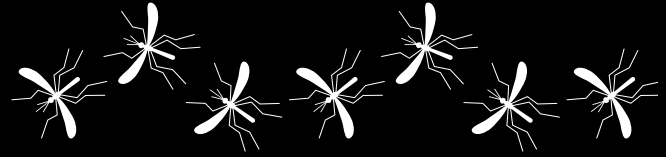
Increasing demand for cooling

HEALTH



3X

malaria cases in malaria-prone areas by 2050



65,000-80,000

additional people will be at risk from endemic malaria

Climate change impacts



Rising temperatures



Variability in precipitation



Floods

Damaged sanitation infrastructure

Increase in waterborne and diarrheal diseases and heat-related deaths

Lower agricultural production, increased food insecurity

Displaced communities



REFERENCES

The World Bank Group (2021). Climate Risk Profile: Congo, Democratic Republic.

SUDAN

AGRICULTURE



90%

agriculture
rain-fed



80%

arable land remains
uncultivated



70%

population
employed

Climate change impacts



Rising
temperatures



Variability in
precipitation

Intensification of desertification of arable areas

Shift southward of humid agro climatic zones

Vast arable lands increasingly unsuitable

Decline in crop yield

DESERTIFICATION

Shift of the boundary
between semi-desert
and desert since

1930s

≈ 50-200 km
southwards

WATER



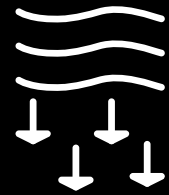
73%

annual fresh water
from the Nile



> 80%

water dependency
on its neighbours



↓ 20-30%

in water flow of the
Nile in 40 years

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods



Sea level rise

Reduced groundwater recharge, salinization of coastal aquifers

Limited access to safe drinking water, water crisis

40% decrease in water storage from 2030 onwards

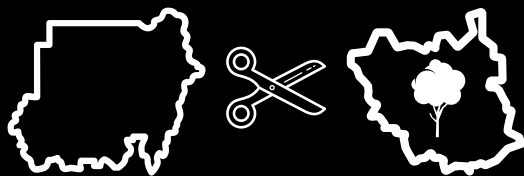
Acidification of water resources due to air pollution

FORESTRY



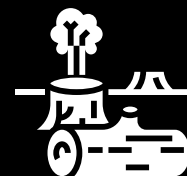
36%

territory is forests
and rangeland areas



68%

forest and woodland
areas lost in secession



2.4%

annual
deforestation rate

Climate change impacts



Rising
temperatures



Variability in
precipitation



Extreme
storms

Increase in forest fires

Prevalence of pests and invasive species, plant and tree diseases

Gum Arabic belt (key livelihood source for forest-based
communities): shift southward and limited productivity

ENERGY



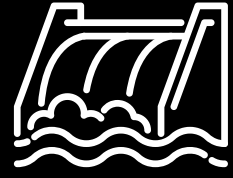
66%

households use
wood for cooking



> 70%

oil revenue lost
to South Sudan



65%

electricity from
hydropower

Climate change impacts



Rising
temperatures



Variability in
precipitation



Storms and
floods



Sea level rise

Shorter lifespan of roadways and increase in cost of maintenance

Reduced water availability for hydropower generation

Port Sudan (major trading port): damaged infrastructure

HEALTH



38%

children under 5
experience stunting



73.4

malaria cases per
1,000 population at risk

Climate change impacts



Rising
temperatures



Variability in
precipitation



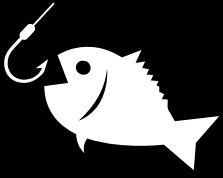
Floods

Changes in prevalence of malaria and meningitis

Increase in malnutrition and stunting

Increase in incidence of water-borne diseases

FISHERIES



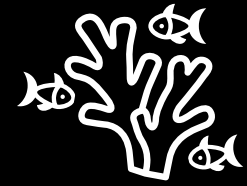
55%

inland fisheries
lost after secession



\$5.3 M

imports of fish
products (2017)



60%

total production
is coral reef fish

Climate change impacts



Rising sea
surface
temperatures



Sea level rise
& salinization

Loss of habitat and breeding grounds: mangroves and coral reefs

Decrease in fish populations and biodiversity due to reduced river flow
and drying of wetlands



REFERENCES (I)

- **African Development Bank Group (2018). National Climate Change Profile: Sudan.**
- **African Development Bank Group (2021). Gender Responsive Climate Resilient Solutions in Africa.**
- **FAO (2022). Fishery and Aquaculture Country Profiles. Sudan, 2019. Country Profile Fact Sheets. Fisheries and Aquaculture Division [online]. Rome. Updated Mar 27, 2020.**
- **Oluwasanya, G., Perera, D., Qadir, M., Smakhtin, V., (2022). Water Security in Africa: A Preliminary Assessment, Issue 13. United Nations University Institute for Water, Environment and Health, Hamilton, Canada.**

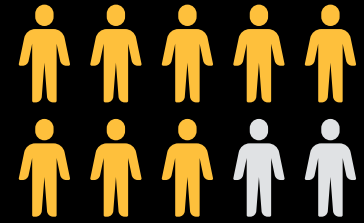
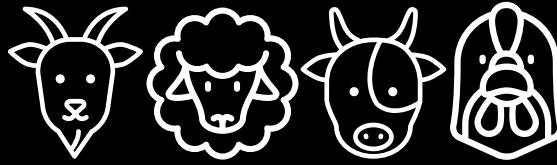


REFERENCES (II)

- Republic of Sudan (2015). First Nationally Determined Contribution.
- UNICEF (2022). The situation of children in Sudan: country factsheet.
- United Nations Environment Programme (UNEP) and Higher Council for Environment and Natural Resources in Sudan (2020). Sudan First State of Environment and Outlook Report 2020.
- World Health Organization (2022). World Health Statistics 2022: monitoring health for the SDGs, sustainable development goals. Geneva. Licence: CC BY-NC-SA 3.0 IGO.

NIGER

AGRICULTURE



39% national
GDP

> 15M
cattle, one of the largest
populations in Sahel region

80% population
employed

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

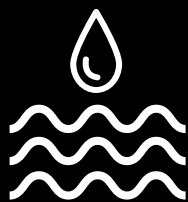
Reduction in duration of agricultural season

Exacerbation of crop pests (e.g. millet head miner moth) and diseases

Reduction/loss of agricultural production and stunted plant growth

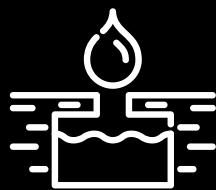
Loss of livestock

WATER



96%

surface water from
Niger River and affluents



> 90%

drinking water
from groundwater



50%

territory in physiological
catchment of Niger River

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Lower flow of Niger River at Niamey

Reduction of groundwater recharge

Increased risk of silting

Lower water quality

FORESTRY



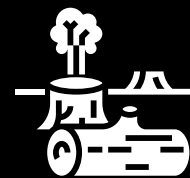
74%

territory covered
by Sahara desert



↓ 200,000 ha

in forest cover
every year



> 50%

main forest cover
lost (1990-2010)

Climate change impacts



Rising
temperatures



Variability in
precipitation

Loss of forest species

Lower productivity of the forest potential

Decrease in natural regeneration

DRIVERS OF FOREST REGRESSION



Demographic
pressure



Wind & water
erosion



Loss of
livelihoods

ENERGY



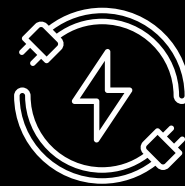
> 90%

households use
wood for cooking



> 75%

national electricity
needs from imports



13%

population has
access to electricity

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Shortage of biomass for energy production

Degraded infrastructure in road transportation (key for Niger):

cracks in roads, bridges and protective structures

Higher maintenance and replacement costs for infrastructure

HEALTH



46%

children <5 suffer
from stunting



324

malaria cases

1,000 out of
people at risk



56%

population suffers
from food insecurity

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Increase in exposure to vector-borne diseases (e.g. malaria, dengue fever)

≈ 77% increase in meningitis cases by 2050

≈ 10% increase in measles cases by 2050

Increase in food insecurity



REFERENCES (I)

- **FAO (2022). World Food and Agriculture – Statistical Yearbook 2022. Rome.**
- **German Federal Ministry for Economic Cooperation and Development (BMZ), Potsdam Institute for Climate Impact Research (PIK), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and KfW Development Bank, (2020). Climate Risk Profile: Niger.**
- **Green Climate Fund (2019). Concept Note: Project to Support Sustainable Forest Management and the Strengthening of the Role of Forests in Combating Climate Change in Niger (GDFCC-Niger).**
- **LeMarois, I., Jaquet, S., Schiek, B., Ghosh, A., Achicanoy, A., Esquivel, A., Saavedra, C., Ramirez-Villegas, J., Grosjean, G. (2021). PAM Initiative Interne Primordiale: Analyse de la Réponse pour l'Adaptation Climatique Niger. L'Alliance de Bioversity International et le Centre International de l'Agriculture Tropicale; Programme Alimentaire Mondial.**



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- **République du Niger (2016). Troisième Communication Nationale à la Conférence des Parties de la Convention Cadre des Nations Unies sur les Changements Climatiques.**
- **Röhrig, F., Gloy, N., von Loeben, S., Arumugam, P., Aschenbrenner, P. Baek, H., Ibrahim Fodi, B., Chemura, A., Habtema-riam, L., Kaufmann, J., Koch, H., Liersch, S., Lüttringhaus, S., Murken, L., Noleppa, S., Ostberg, S., Carlsburg, M., Schau-berger, B., Shukla, R., Tomalka, J., Wesch, S., Wortmann, M. & Gornott, C., (2022). Climate Risk Analysis for Identifying and Weighing Adaptation Strategies for the Agricultural Sector in Niger. Potsdam Institute for Climate Impact Research (PIK), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and German Federal Ministry for Economic Cooperation and Development (BMZ).**
- **World Health Organization (2022). World Health Statistics 2022: monitoring health for the SDGs, sustainable development goals. Geneva. Licence: CC BY-NC-SA 3.0 IGO.**

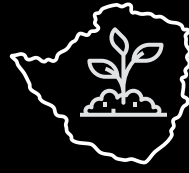
ZIMBABWE

AGRICULTURE



80%

production
is rain-fed



42%

total
land area



67%

total
employment

Climate change impacts



Rising
temperatures



Variability in
precipitation

Suitable production areas will shrink

Decreased agricultural yields

Lower livestock production



MAIZE

Staple food

One of the most
climate-vulnerable

Decrease in production

Total replacement
costs

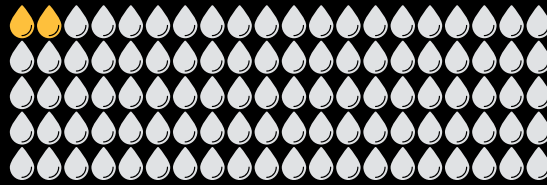
\$88M/year

WATER



90%

from surface
water resources



149 dams

account for



80%

allocated water
to storage

+8,000 dams total

Climate change impacts



Rising
temperatures



Variability in
precipitation

Limited runoff, lower groundwater recharge

Higher costs for water treatment and wastewater management

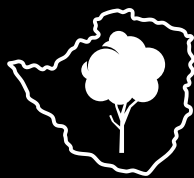
Increased demand, diminished water availability

FORESTRY



4.1%

of total GDP from
forest rents (2016)



↓ 6.5 Mha

in forest cover
(1990-2010)



> 1 Mha

lost due to
wildfires per year

Climate change impacts



Rising
temperatures



Variability in
precipitation

More frequent and intense wildfires

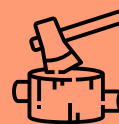
Modified species composition of ecosystems

Smaller extension of forest ecosystems

DRIVERS OF DEFORESTATION



Expansion of
agricultural land



Overharvesting
of fuel wood



Encroachment of
human and
industrial
settlements

ENERGY



59%

from hydropower
Lake Kariba



39%

from coal power plants: Hwange,
Munyati, Harare & Bulawayo



68%

households use
wood for cooking

Climate change impacts



Rising
temperatures



Variability in
precipitation



Extreme
weather events

Reduced river runoff

Limited hydropower generation

Damaged energy infrastructures

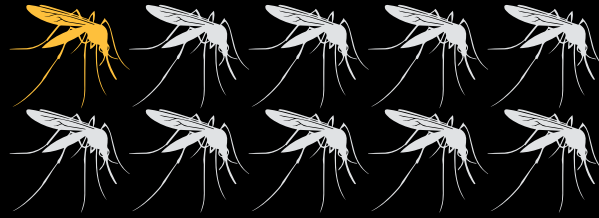
Higher demand for cooling

HEALTH



462

maternal mortality
ratio/100K live births



98 malaria cases out of

1,000 population at risk



29%

children under 5
are stunted

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Increase in food insecurity and stunting

Increase in vector-borne diseases: malaria, dengue and yellow fever

Increase in water-borne diseases: diarrhoea and typhoid fever

Altered geographic distribution of malaria



REFERENCES (I)

- **Hanson, D. (2017). Climate change and health. In Government of Zimbabwe and United Nations Development Programme, Zimbabwe Human Development Report 2017.**
- **Hunter, R., Crespo, O., Coldrey, K., Cronin, K., New, M. (2020). Research Highlights – Climate Change and Future Crop Suitability in Zimbabwe. University of Cape Town, South Africa, undertaken in support of Adaptation for Smallholder Agriculture Programme (ASAP) Phase 2. International Fund for Agricultural Development (IFAD), Rome.**
- **The World Bank Group (2021). Climate Risk Profile: Zimbabwe.**



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- **Zimbabwe National Statistics Agency (ZIMSTAT), (2017). Inter-Censal Demographic Survey.**
- **Zimbabwe National Statistics Agency (ZIMSTAT) and UNICEF (2019). Zimbabwe Multiple Indicator Cluster Survey 2019, Survey Findings Report. Harare, Zimbabwe: ZIMSTAT and UNICEF.**
- **World Health Organization (2022). World Health Statistics 2022: monitoring health for the SDGs, sustainable development goals. Geneva. Licence: CC BY-NC-SA 3.0 IGO.**

LIBERIA

AGRICULTURE



40%

food crops lost per year,
pests and lack of storage



80%

is subsistence
farming, rain-fed



85%

cultivated land is rice,
cassava and vegetables

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

Exacerbated pests and diseases

Cacao and coffee (major exports) under pressure

Depleted nutrient-rich topsoil and reduction in arable land area

Damaged rubber production

WATER



70%

population has access to improved water sources



↓ ≈ 0.7-25%

in runoff in the St. Paul River Basin by the 2020s

Climate change impacts



Rising temperatures



Variability in precipitation



Floods

Lower water levels, degraded water quality due to contamination

Damaged water infrastructure

Overwhelmed water treatment plants

Higher costs for water purification to supply potable water

ENERGY



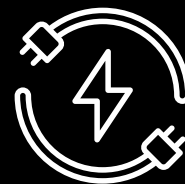
86%

energy supply from
bioenergy (2019)



95%

population relies on
biomass for energy needs



28%

population has
access to electricity

Climate change impacts



Rising
temperatures



Floods



Sea level rise

Damaged infrastructure in power stations and transmissions

Limited access to biomass fuel sources

Altered timing and size of peak electricity demands for cooling needs

Lower water availability for hydropower generation

HEALTH



73%

food needs are
imported



2 food insecure out of
10 households



1

cause of death for
children < 5 is malaria

Climate change impacts



Rising
temperatures



Variability in
precipitation



Floods

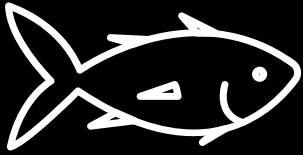
Increase in incidence of vector and waterborne diseases

Lower yields of subsistence crops (rice and maize)

Higher food insecurity due to weak infrastructure

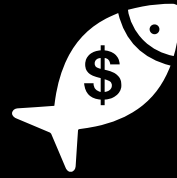
Expansion of the dengue fever from neighbouring Côte d'Ivoire

FISHERIES



65%

animal protein needs of the
country come from fish



3.2%

of GDP from fisheries

Climate change impacts



Rising sea
surface
temperatures



Sea level rise



Extreme
weather events



Variability in
precipitation

Endangered mangrove ecosystems, critical breeding grounds for fish

Reduced biodiversity and fish stocks due to death, diminished
reproductive cycles and migration to cooler waters



REFERENCES

- **Environmental Protection Agency (2021). Liberia National Adaptation Plan 2020-2030.**
- **International Renewable Energy Agency (2022). Energy Profile: Liberia.**
- **The World Bank Group (2021). Climate Risk Profile: Liberia.**



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