



Climate Landscape Analysis for Children in Zambia

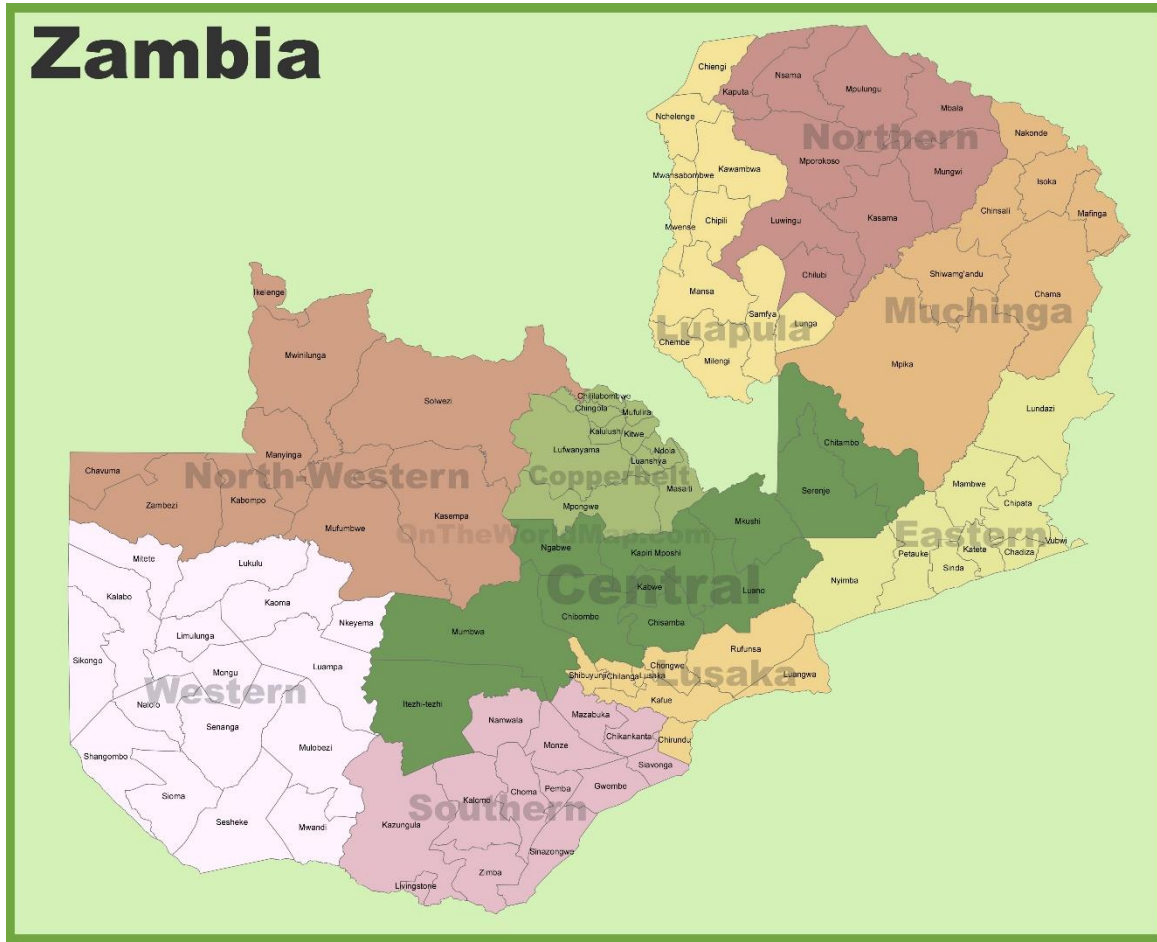
March 2025



UNICEF Zambia

This report was prepared by Mark Henderson (consultant). He is solely responsible for the opinions and conclusions expressed in this report. Warm thanks are extended to everyone who contributed their time and shared their knowledge of the subject matter for this report.

Map of Zambia



Source: <https://ontheworldmap.com/zambia/zambia-districts-map.jpg>

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Abbreviations

AfDB	African Development Bank
AFOLU	agriculture, forestry and other land use
ASGM	artisanal and small-scale gold mining
CCRI	Children's Climate Risk Index
CCRI-DRM	Children's Climate Risk Index-Disaster Risk Model
CDF	Constituency Development Fund
CEED	Climate, Environment, Energy and DRR
CH ₄	methane
CLAC	Climate Landscape Analysis for Children
CO ₂	carbon dioxide
COP	Climate Change Conference
CP	Cooperating partner
DMMU	Disaster Management and Mitigation Unit
DRM	disaster risk management
DRR	disaster risk reduction
ECHO	European Civil Protection and Humanitarian Aid Operations
EE	energy efficiency
EIA	environmental impact assessment
ENSO	El Niño-Southern Oscillation
ESS	environmental and social safeguarding
EU	European Union
FAO	United Nations Food and Agriculture Organization
FCDO	Foreign Commonwealth and Development Office
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	greenhouse gases
GIZ	German Agency for International Cooperation
GRZ	Government of the Republic of Zambia
GWP	Global Water Partnership
HCF	healthcare facility
IOM	International Organization for Migration
ITCZ	Inter-Tropical Convergence Zone
IWRM	integrated water resources management
KfW	German Development Bank
LED	light-emitting diode
MFNP	Ministry of Finance and National Planning
MGEE	Ministry of Green Economy and Environment
MSMEs	micro-, small- and medium-sized enterprises
MoE	Ministry of Education
MW	megawatts
MWDS	Ministry of Water Development and Sanitation

NAP	National Adaptation Plan
N ₂ O	nitrous oxide
NDC	Nationally Determined Contribution
NGO	non-governmental organization
NO ₂	nitrogen dioxide
O ₃	ozone
O&M	operation and maintenance
PM	particulate matter
PM _{2.5}	ultra fine PM
RE	renewable energy
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SIDA	Swedish International Development Cooperation Agency
SO ₂	sulfur dioxide
TEVETA	Technical Education, Vocational, and Entrepreneurship Training Authority
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNSDCF	United Nations Sustainable Development Cooperation Framework
USAID	United States Agency for International Development
WASH	water, sanitation and hygiene
WB	World Bank
WFP	United Nations World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WWF	Worldwide Fund for Nature
ZEMA	Zambia Environmental Management Agency

Executive summary

Children have a right to a clean, healthy and sustainable environment. Children need a clean environment in order to enjoy all of their human rights. Children should have access to clean air and water, safe climates, healthy ecosystems and biodiversity, healthy food and non-polluted environments.

General Comment No. 26, United Nations Committee on the Rights of the Child, CRC/C/GC/26, 22 August 2023

Climate change and environmental degradation have direct and serious impacts on the survival and development of children. The UNICEF Children's Climate Risk Index (CCRI)¹ shows that the risk to children is medium high in Zambia. As climate change accelerates, the impacts on children become more severe, and the imperative for action to mitigate risks and protect children becomes stronger.

In response, and as part of a global UNICEF initiative, UNICEF Zambia commissioned this Climate Landscape Analysis for Children (CLAC) report to review the climate, environment, energy and disaster-risk reduction (CEED) situation in the country and its impacts on children.

Climate stakeholders and policies

The Government of Zambia (GRZ) ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1993, signed the Paris Agreement, and passed the National Policy on Climate Change in 2016. The National Adaptation Plan (NAP) was prepared in 2023 and Zambia submitted its new Nationally Determined Contribution (NDC 3.0) in 2025. GRZ takes a whole-of-government approach to climate mitigation and adaptation under the leadership of the Ministry of Green Economy and Environment. Other ministries with roles in the area of climate and the environment include those responsible for lands and natural resources, local government, agriculture, finance, energy, water resources, health, community development, and others.

Key partners to GRZ in its climate and environment programmes are United Nations agencies, cooperating partners, the World Bank and African Development Bank, climate financing instruments and the European Union.

The CLAC analysis shows that CEED-related policies and strategies in Zambia vary greatly in the degree to which they articulate the rights and needs of children, with some making no mention at all. Similarly, policies and strategies governing social sectors that deliver services for children do not uniformly reflect CEED issues, including resilience to climate change and shock responsiveness.

Climate trends and environmental threats

Rising temperatures will intensify and extend heatwaves and droughts, thus exacerbating land degradation, stressing forests, impacting agriculture and creating water shortages. Annual rainfall will become more variable and the increased intensity of rainfall events will increase the risk of floods.

¹ The Climate Crisis is a Child Rights Crisis, UNICEF, 2021. <https://data.unicef.org/resources/childrens-climate-risk-index-report/>

About half of the economically active population is employed in the agricultural sector.² Most rural smallholder farmers raise rainfed maize. The contribution of agriculture to GDP has been decreasing, mainly due to droughts, with the 2024 drought bringing about crop failures affecting millions and reducing hydropower production, impacting the whole economy.

Zambia is rich in natural resources, water, forests, biodiversity, and minerals. Yet it is experiencing a high rate of deforestation driven by charcoal production, illegal logging, and agricultural and mining expansion.³ Land degradation and biodiversity loss in Zambia has reached unprecedented levels mainly due to human activities in pursuit of economic gains.⁴

The main sources of Zambia's total energy supply are biomass (wood and charcoal), hydropower, imported oil and coal. Access to electricity is 87 per cent in urban areas and 15 per cent in rural areas,⁵ but there is significant growth in the use of solar power and small hydro, while wind and geothermal are unexploited. The main greenhouse gas (GHG) emissions contributor is land and forest degradation. Data on ambient air quality is limited, but indoor pollution from cooking is a concern as it contributes to respiratory illnesses, particularly in women and young children.

Zambia's main hazards are river and urban floods, droughts, wildfires, water scarcity, epidemics (human and animal) and pest infestations.

Impacts on children

Of the global burden of disease attributable to climate change, 88 per cent is borne by children.⁶ Changes in weather patterns can accelerate the spread of vector borne disease causing severe death and disease in infants and young children, increase rates of food- and water-borne disease that provoke excess fluid loss and drive cholera outbreaks. Vital health services are disrupted when floods and storms damage facilities, roads and the electrical grid. Ambient and indoor air pollution are particular risk factors for children under the age of five.

Reduced agricultural productivity limits the availability and affordability of locally produced food, restricting children's access to diverse and nutrient-rich food. Resulting loss of agricultural livelihoods and displacement constrain household food security with direct impacts on child nutrition. Lack of sufficient nourishment for pregnant women and young children will increase the incidence of low birthweight and infant mortality and exacerbate child malnutrition contributing to stunting and wasting.

Poor water, sanitation and hygiene conditions exacerbate poor nutritional status in children, and undernutrition is a major co-factor in child mortality and morbidity. Rising temperatures, rainfall variability and environmental hazards make safe water supplies more scarce, unpredictable or polluted. Water and sanitation coverage is insufficient while water demand by a growing population is increasing.

Extreme weather events exacerbate poor access, retention and learning outcomes in basic education. Degradation of livelihoods and food insecurity reduce families' ability to cover school-related costs, and children often have to supplement the family income, sacrificing their education.

² <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=ZM>

³ Country Forestry Note Zambia, World Bank, 2019

⁴ Policy Brief: Key drivers of biodiversity loss in Zambia, Biodiversity Finance Initiative, UNDP, 2018

⁵ <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ZM>

⁶ Global climate change and children's health: threats and strategies for prevention. PE Sheffield, PJ Landrigan, Environmental health perspectives, 2011. <https://pubmed.ncbi.nlm.nih.gov/20947468/>

Climate-driven humanitarian disasters stretch child protection services for psychosocial support, prevention of gender-based violence, and family reunification. Climate change disproportionately affects the poorest, increasing inequality, prolonging existing poverty traps and creating new ones. Deprivation increases the likelihood of early marriage and sexual exploitation.

Climate change effects and the uncertainty they pose for the future can have psychosocial impacts – including impaired decision-making, anxiety and depression – on adolescents and youth as they make plans for their lives.

Climate change and environmental impacts drive inequality and threaten standards of living, hindering economic growth and putting a strain on public expenditures. Health emergencies and natural disasters result in stretched social protection systems.

Recommendations to UNICEF

UNICEF Zambia has taken strides to incorporate CEED-relevant topics into its country programme and to address issues related to children and climate change and the environment, both through existing sectoral programmes and new initiatives. These include risk reduction efforts during the national drought emergency in 2024, solar power investments at health facilities, implementing climate resilient WASH strategies, and engaging with youth to support their participation in the climate space.

The CLAC report presents a set of recommendations in Section 7 for more comprehensive UNICEF CEED programming in Zambia, building on these initiatives and expanding areas of action. They are informed by the experience of UNICEF globally in CEED, and by the UNICEF Sustainability and Climate Change Action Plan (SCAP) 2023-2030. The recommendations fall into four categories:

1. *Make children a focus of climate and environmental strategies:* Advocate with the government and development partners to put children first in national sustainability plans, budgets and actions towards a green transition.
2. *Empower children as change agents:* Support and empower children and young people to adapt and create a better world.
3. *Protect children from the impacts of climate change, environmental degradation and disasters:* Strengthen the resilience and continuity of social services in the face of climate and environmental impacts, including disasters.
4. *Reduce emissions and pollution:* Reduce emissions and pollution to avoid the worst impacts of climate change and environmental degradation, including within UNICEF programmes.

1 Zambia: Background

Zambia is a landlocked country located on the central plateau of southern Africa. It has an area of 752,612 km² and is bordered by eight countries.⁷ Zambia is connected to the port of Dar-es-Salaam via the Tazara Railway.

The population of Zambia in 2022 was 19.6 million, with a 2010–2022 growth rate of 3.4 per cent.⁸ Forty-two percent of the population live in urban areas, and 42 per cent are aged 0–14,⁹ making Zambia one of the world’s youngest countries by median age. The population is expected to double in the next 25 years, placing pressure on the demand for jobs, health care, education and other social services.

Zambia is rich in freshwater resources, woodlands, wildlife and minerals. Its main tourist attraction, the spectacular Victoria Falls, is located on the Zambezi River at its southern border with Zimbabwe. The majority of rural Zambians are smallholder farmers raising rainfed maize, but there is also a significant commercial farming sector. English is the official language but there are a total of 72 languages spoken; the top ones are Bemba, Nyanja (or Chewa) and Tonga.

Zambia ranks 153 out of 195 countries in the Human Development Index, making it a “medium human development” country.¹⁰ In 2022, the country had the 6th highest poverty incidence and the 6th highest Gini coefficient.¹¹

Zambia is politically stable; there have been nine presidential elections and the country has been governed by four different political parties since its independence in 1964. The next scheduled elections are set for 2026. Its national aspiration, Vision 2030, is to become “a prosperous middle-income nation by 2030”. Zambia is a founding member of the Southern African Development Community.

In 2011, Zambia attained lower-middle income country status but fell from it in 2022. The economy is heavily reliant on its mining sector, particularly copper mining, which accounts for more than 70 per cent of its export earnings but employs less than 2 per cent of the population.¹²

Since COVID-19, Zambia has weathered crises that have included floods, cholera outbreaks and, in 2024, severe drought that interrupted hydropower generation and impacted food security for about 9 million people. During this same period, the government negotiated a major debt restructuring, which is not yet fully completed.

The economy is expected to rebound in 2025–2026, with growth projected to average 6.3 per cent annually.¹³ This assumes new and expanded mining operations, effective implementation of reforms, restoration of debt sustainability, and normalization of rainfall patterns.

⁷ <https://www.zamstats.gov.zm/wp-content/uploads/2024/09/2022-Census-of-Population-and-Housing-Summary-Report-Part-2.pdf>

⁸ <https://www.zamstats.gov.zm/wp-content/uploads/2023/12/2022-Census-of-Population-and-Housing-Preliminary.pdf>

⁹ <https://www.zamstats.gov.zm/wp-content/uploads/2023/12/2022-Census-of-Population-and-Housing-Preliminary.pdf>

¹⁰ <https://hdr.undp.org/content/human-development-report-2023-24>

¹¹ <http://documents.worldbank.org/curated/en/099091624151519669>

¹² <http://documents.worldbank.org/curated/en/099091624151519669>

¹³ <https://www.worldbank.org/en/country/zambia/overview>

2 Climate, environment, energy and DRR in Zambia



2.1 Climate

2.1.1 *Historical trends in temperature and precipitation*

Zambia has a sub-tropical climate with three distinct seasons: a hot and dry season (mid-August to mid-November), a unimodal, rainy season (mid-November to April) and a cool dry season (May to mid-August).¹⁴ Zambia's climate is largely influenced by latitude and elevation. Mean annual air temperatures range from 19°C to 25°C, with lower values in the mountainous areas in the north and northeast and higher values in the rest of the country, the Luangwa River and Zambezi River valleys in particular.¹⁵

Annual precipitation ranges from 620 mm in southwestern Zambia to 1,480 mm in the northeast at higher altitudes.¹⁶ No rain falls between June and August. Rainfall is strongly influenced by the Inter-Tropical Convergence Zone (ITCZ), whose variations can cause large changes in rainfall from one year to the next. The El Niño-Southern Oscillation (ENSO) phenomenon causes further interannual variability and can trigger droughts.¹⁷

¹⁴ <https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-historical>

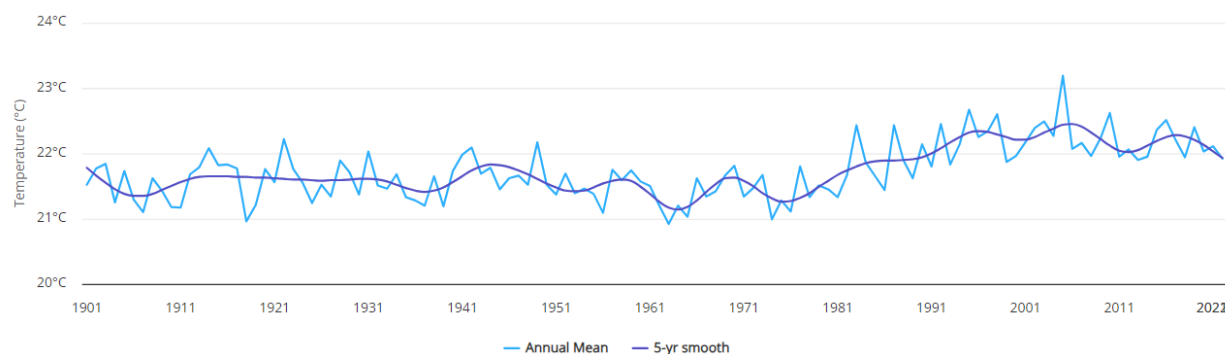
¹⁵ Climate Risk Profile Zambia, GIZ, 2022

¹⁶ Climate Risk Profile Zambia, GIZ, 2022

¹⁷ <https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-historical>

Since the 1960s, there has been an increase in Zambia’s annual mean temperature of about 1.3°C, an average of 0.34°C per decade¹⁸ (Figure 2.1). The frequency of cold days and nights has decreased significantly, and the frequency of hot days and nights has increased.

Figure 2.1. Observed annual mean air temperature in Zambia (1901-2022)



Source: <https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-historical>

Since the 1960s, there has been a decrease in rainfall averages throughout the year by an average of 1.9 mm/month (2.3 per cent) per decade, with the trend more pronounced during the wet season.¹⁹ There has been an increase in the frequency and intensity of extreme weather events such as droughts and floods.

2.1.2 Projected climate changes in Zambia

Temperatures are projected to continue to increase, with mean annual temperatures increasing 1.2°C-3.4°C by 2060 across a range of global warming scenarios (Figure 2.2).²⁰ There will be a substantial increase in the frequency and intensity of hot extremes, as well as a decrease in the number of cold days and nights. The warming will occur more rapidly in western Zambia where the number of very hot days (daily maximum temperature above 35°C) is already high, and in the south.²¹

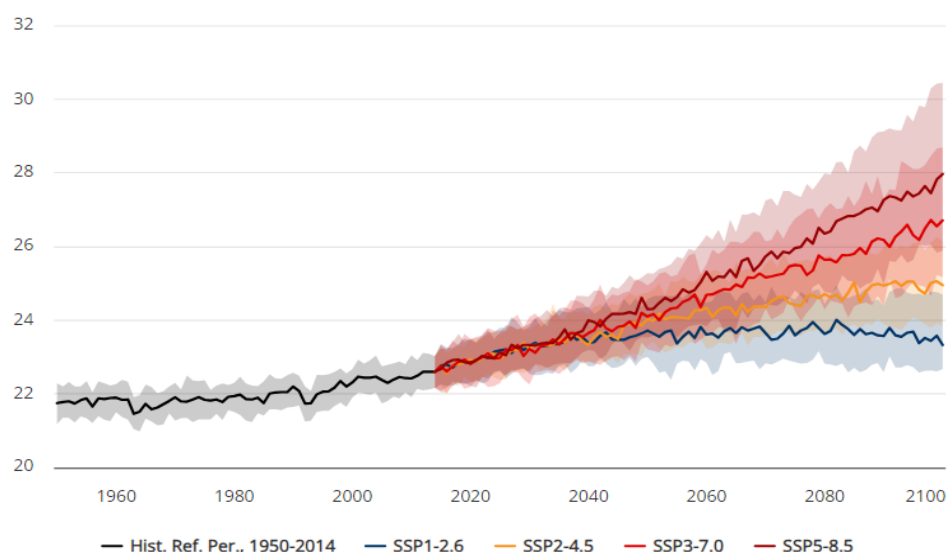
Figure 2.2: Historical and projected average air temperature across multiple global warming scenarios, Zambia

¹⁸ Zambia Climate Change Risk Profile, USAID, 2016

¹⁹ Zambia Climate Change Risk Profile, USAID, 2016

²⁰ Zambia Climate Change Risk Profile, USAID, 2016

²¹ Climate Risk Profile Zambia, GIZ, 2022



Source: <https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-projections>

The projected trend in precipitation is less clear, but there is some evidence for a delay to the start of the rainy season.²² Flood and drought events are likely to be more frequent and intense due to increased year-to-year rainfall variability, increased intensity of heavy rainfall events and increased evapotranspiration resulting from rising temperatures.²³

A recent modelling study provides high resolution projections of the regions of Zambia that may experience future climate extremes.²⁴ The greatest dryness in both the near and far future, as measured by consecutive dry days, may be in Livingstone, Chipata, and Solwezi regions. Projected heavy one-day rainfall events in these same two timeframes may most intensely affect the Copperbelt, Kabwe, Lusaka, Livingstone and Chipata regions (Figure 2.3).

Figure 2.3. Projected regions of Zambia affected by increased consecutive dry days (CDDs) and single-day heavy rainfall events, in (a) the near future (2025-2054) and (b) the far future (2071-2100)

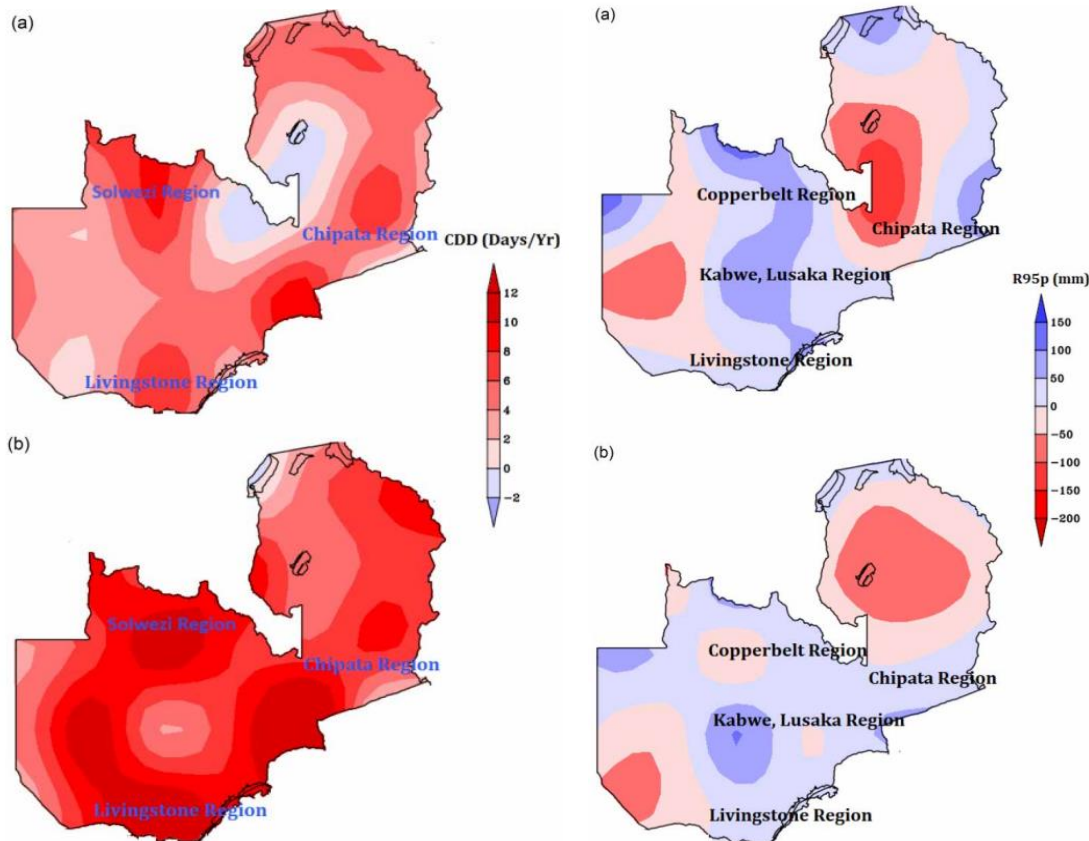
Consecutive dry days

Single-day heavy rainfall events

²² Climate Risk Report for the Southern Africa Region, Met Office, FCDO, 2022

²³ Climate Risk Report for the Southern Africa Region, Met Office, FCDO, 2022

²⁴ Recent and future exposure of water, sanitation, and hygiene systems to climate-related hazards in Zambia, Brigadier Libanda et al., Journal of Water and Climate Change, 2024



Source: Recent and future exposure of water, sanitation, and hygiene systems to climate-related hazards in Zambia, Brigadier Libanda et al., Journal of Water and Climate Change, 2024

Graphics illustrating Zambia’s historical and projected climate trends can be generated on the World Bank Climate Change Knowledge Portal.²⁵ Variables include Shared Socioeconomic Pathways (SSP), which provide models of future climates based on emissions, mitigation efforts and rates of technological development. According to the SSPs scenarios, the world climate might evolve in five different ways:

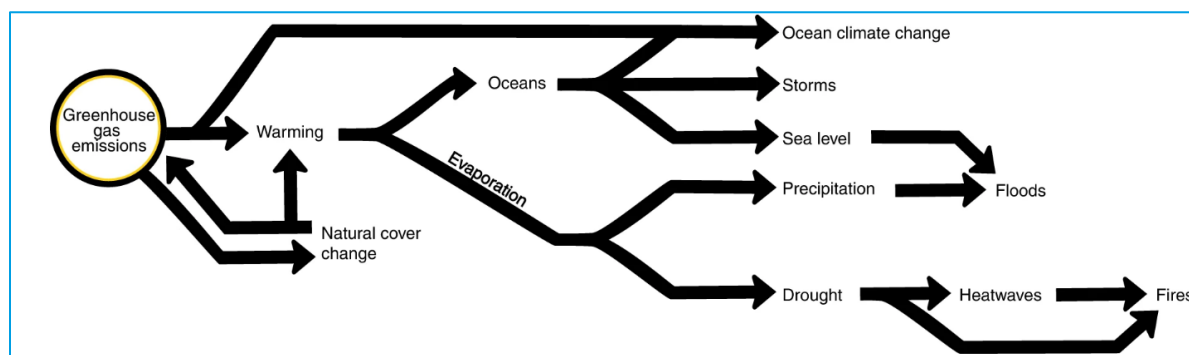
- SSP1 – sustainability focused growth and equality
- SSP2 – trends broadly follow historical patterns
- SSP3 – fragmented world economy and limited collaboration
- SSP4 – world of ever-increasing inequality
- SSP5 – rapid and unconstrained growth in energy use.

2.1.3 Key effects of climate change

Greenhouse gases (GHGs) regulate the balance between incoming solar radiation and outgoing infrared radiation, and more GHGs in the atmosphere drive warming. Warming accelerates soil-moisture evaporation, leading to drought, heatwaves and wildfires. Increased evaporation strengthens precipitation, which causes floods. Warming of the oceans enhances evaporation and wind speeds, intensifying storms and worsening floods. Land cover changes release GHGs but also directly modify temperature. Figure 2.4 presents climate change in a nutshell.

²⁵ <https://climateknowledgeportal.worldbank.org/country/zambia>

Figure 2.4: Climate hazards of the Earth's system affected by GHG emissions



Source: <https://www.nature.com/articles/s41558-022-01426-1>

Zambia's economy, based on agriculture, mining, manufacturing, and services, is vulnerable to the impacts of climate change. The sustainability of rich freshwater resources is threatened by increased droughts and floods. Higher temperatures and more intensive drought can cut hydropower production and cause crop harvest loss. Table 2.1 summarizes the main climate stressors and the risks they pose in key sectors.

Table 2.1: Summary of sector impacts and vulnerabilities in Zambia

Sectors	Stressors	Risks
Agriculture	Increased temperatures	Less predictable growing season, reduced productivity and crop failure, especially of rainfed agriculture
	Increased rainfall variability	Increased pests, weeds and pathogens affecting crops
	Increased evapotranspiration	Loss of arable land due to increased waterlogging, desertification and soil erosion
	Droughts	Livestock increased exposure to new pests and diseases; reduced water and feed; increased heat stress and elevated livestock mortality
Water resources	Increased temperature	Higher demand for water supply from agriculture, industry, population and tourism
	Increased intensity of rainfall	Over-exploited aquifers due to increased evapotranspiration, reduced aquifer recharge, and increased groundwater withdrawals
	Increased drought	Flooding leading to pollution, siltation and sedimentation of water bodies
		Reduced river flows impact aquatic ecosystems and fisheries; warmer waters conducive to algae growth
Energy and infrastructure	Drought and reduced rainfall	Reduced hydropower generation capacity
	Increased frequency of intense rainfall events	Forests at risk from reduced regenerative capacity and wildfires
		Flood damage to vital infrastructure (e.g., homes, water and sanitation systems, bridges, healthcare facilities)
Human health	Increased temperatures	Increased mortality from heat stroke and exacerbation of pre-existing conditions
	Increased rainfall variability	Spread and growth of vector-borne diseases (e.g., malaria)

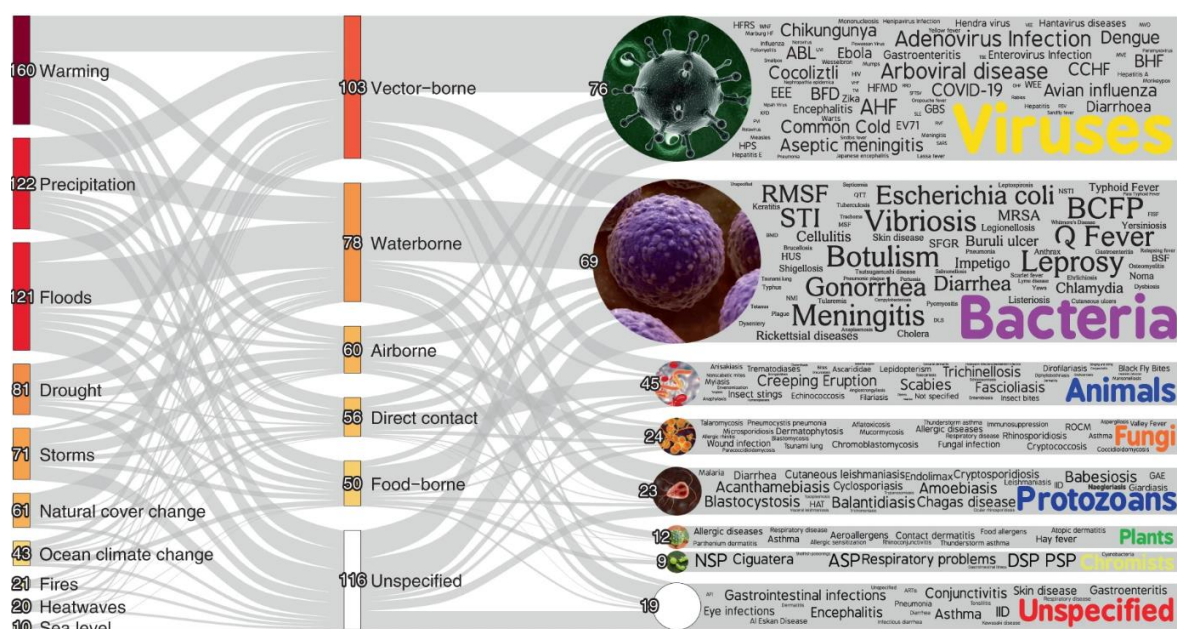
Sectors	Stressors	Risks
	More frequent, longer and intense heat waves	Reduced water quality and availability affecting health and sanitation conditions; increased outbreaks of diarrhoeal diseases
	Floods	Food insecurity leading to increased malnutrition and undernutrition
		Displacement, injuries, and death from floods and storms; reduced access to medical services

Adapted from: Zambia Climate Change Risk Profile, USAID, 2016

Human health is impacted through the direct effects of extreme events such as heatwaves, floods and storms, indirect influences on the transmission of infectious diseases, and the availability of food and fresh water.

A review of 375 infectious diseases affecting humans revealed that 58 per cent have been aggravated by climate hazards, while 16 per cent were at times diminished.²⁶ The study identified over 1,000 pathways by which climatic hazards lead to pathogenic diseases. While numerous biological, ecological, environmental and social factors contribute to the successful emergence of a human pathogenic disease, it primarily depends on contact between a pathogen and a person, and the extent to which a person's resistance is diminished, or the pathogen is strengthened, by a climatic hazard. Figure 2.5 illustrates the relationship between climate hazards, transmission types and disease.

Figure 2.5: Pathogenic diseases aggravated by climate change



Source: <https://www.nature.com/articles/s41558-022-01426-1>

COVID-19 is a dramatic example of pathogens that become a threat to human health. Up to 75 per cent of emerging infectious diseases come from wildlife.²⁷ The ongoing exploitation of natural resources and

²⁶ <https://www.nature.com/articles/s41558-022-01426-1>

²⁷ Risk factors for human disease emergence, LH Taylor, SM Latham, ME Woolhouse, 2001

human encroachment on natural habitats due to climate change-related migration will continue to expose humans to more unknown pathogens, novel viruses, and potentially devastating pandemics.

The UNICEF Children’s Climate Risk Index²⁸ (CCRI) ranks Zambia 45th out of 163 countries where children are most at risk to exposure to climate and environment shocks, such as heatwaves and floods, as well as their vulnerability to those shocks based on the quality of and access to water and sanitation, education and health services. Although the risk of exposure for Zambian children to climate shocks is determined to be of ‘medium’ severity, their vulnerability is ‘high’, yielding a composite CCRI severity score for Zambia that is ‘medium high’, reflecting generally poor essential services. (See Section 5, Impact of CEED situation on UNICEF outcome areas.)

2.2 Environment

The economies of low-income countries are heavily reliant on nature, making them highly vulnerable to climate change. About 79 per cent of Zambians in rural areas live below the poverty line²⁹ and depend greatly on biodiversity and ecosystem services for their livelihoods, primarily in forestry, fisheries, wildlife and water. Despite the importance of biodiversity to its future survival and prosperity, loss of biodiversity in Zambia has reached unprecedented levels mainly due to human activities in pursuit of economic gains.³⁰

2.2.1 Agriculture, forests and land degradation

Agriculture

Over half (58 per cent) of Zambia’s total land area is potentially suitable for agriculture, yet only 14 per cent of this is under cultivation, producing a broad range of crops (maize, groundnuts, cotton, sorghum, mixed beans), livestock and fish.³¹ Most farmers are small-scale subsistence and cash crop farmers, raising rainfed crops on land parcels of only 1.5 ha. Large-scale commercial farmers employ irrigation systems and raise cash crops such as sugar cane, soybeans, tobacco and cotton.

Agriculture’s contribution to GDP decreased from 9.3 per cent in 2012 to 3.3 per cent in 2022, mainly due to droughts.³² About half of the economically active population is employed in the agricultural sector.³³ Women provide approximately 70% of agricultural labour.³⁴ Approximately 40 per cent of rural households rely solely on subsistence farming.³⁵

Changes in temperature, water availability, and growing season can quickly affect agriculture. Greater rainfall intensity damages crops and causes soil erosion. Dry periods with higher evapotranspiration rates reduce soil moisture and create conditions for wildfires that can harm crops, woodlands and pasture. Shifts in growing season may benefit some crops but cause reduced yields in others.

Drought is a normal, recurring feature of climate, and Zambia has frequently experienced extremely dry periods, recently in 1991–1992, 2015–2016 and 2019–2020. The longest drought was recorded in

²⁸ The Climate Crisis is a Child Rights Crisis, UNICEF, 2021

²⁹ Highlights of the 2022 Poverty Assessment in Zambia, Zambia Statistics Agency, 2023

³⁰ Policy Brief: Key drivers of biodiversity loss in Zambia, Biodiversity Finance Initiative, 2018

³¹ Second National Agricultural Policy, GRZ, 2016

³² <https://www.afdb.org/en/countries-southern-africa-republic-zambia/zambia-economic-outlook>

³³ <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=ZM>

³⁴ Climate smart agriculture in Zambia, World Bank, 2017

³⁵ <https://www.g-fras.org/en/world-wide-extension-study/africa/eastern-africa/zambia.html>

Eastern Province for 107 months from 1969–1977.³⁶ A national emergency was declared in February 2024 for the latest severe drought, which has impacted 84 of 116 districts. The drought has hit hydropower generation, resulting in widespread grid blackouts. Water and power interruptions affect mining, manufacturing, water utilities and public health. Drought typologies are defined by their impacts (Box 2.1).

Box 2.1 Definitions of different types of drought

Types of drought

Meteorological drought – Precipitation departs from the long-term normal.

Agricultural drought – There is insufficient soil moisture to meet the needs of a particular crop at a particular time, which typically occurs after a meteorological drought but before a hydrological one.

Hydrological drought – Surface water and groundwater supplies are deficient.

Socio-economic drought – Human activities are adversely affected by reduced precipitation and water availability.

Source: Food and Agriculture Organization (FAO)

Figure 2.6 is a graphic illustration of the inter-relation of drought impacts across multiple sectors. While drought cannot be averted, better forecasting, drought-resistant crops, soil conservation and water-efficient irrigation are recommended drought management strategies for agriculture. Zambia's plentiful water resources coupled with climate-smart irrigation offer options for greater food security.

Forests

Zambia's natural forests and woodlands are a critical component of its rich biodiversity. In 2015, the forest sector contributed US\$1.1 billion to the economy and provided livelihoods for about 21 per cent of the labor force.³⁷ About 60 per cent of Zambia's land area is forested, and 68 per cent is miombo woodland. Forests provide wood for construction, fuelwood and charcoal, and products such as fruits, honey, game and medicinal plants. Ecosystem services include erosion control, pollination, water regulation and purification, and carbon storage. Forests are also critical to the ecotourism and safari sector.

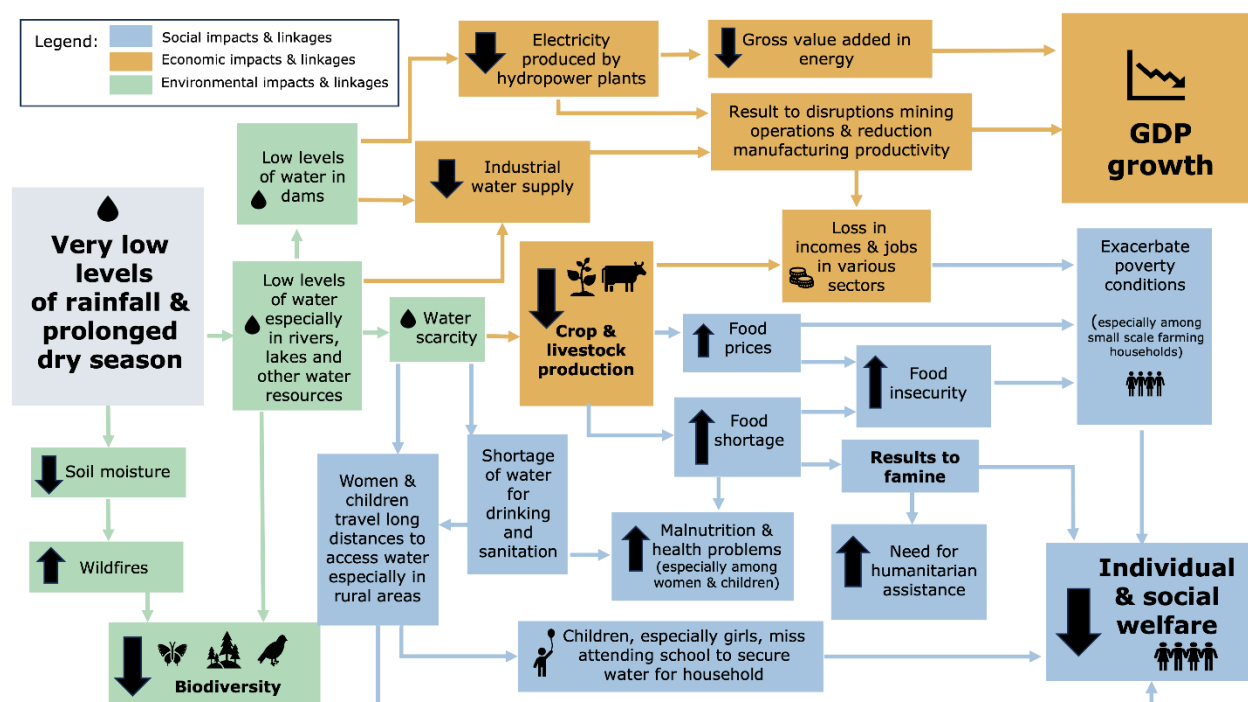
A large network of national protected areas – game management areas, national parks and forest reserves – offers opportunities for protecting and conserving biodiversity. However, Zambia's forests experience a high rate of deforestation, estimated at 250,000–300,000 ha or about 0.5 per cent of total forest cover lost each year, driven by charcoal production, illegal logging, agricultural expansion by smallholder and commercial farmers, and mining.³⁸ Forests contribute 80 per cent of Zambia's energy

Figure 2.6. Drought impact pathways

³⁶ <https://www.fao.org/in-action/drought-portal/preparedness/vulnerability-and-impact-assessment/national-case-studies/zambia/en>

³⁷ Country Forestry Note Zambia, World Bank, 2019

³⁸ Country Forestry Note Zambia, World Bank, 2019



Source: <https://www.fao.org/in-action/drought-portal/preparedness/vulnerability-and-impact-assessment/national-case-studies/zambia/en>

needs (home cooking and heating). Sustainable forest management is hampered by weak governance with little control over the charcoal business.

Land degradation

Land degradation resulting from agriculture, forestry and other land use (AFOLU),³⁹ whether from climate factors or direct human practices, impacts the biological productivity, ecological integrity and socio-economic value of the land resource. In Zambia, the primary drivers of AFOLU are agricultural expansion and fuelwood extraction, exacerbated by high levels of rural poverty.⁴⁰

Land degradation contributes to climate change through release of carbon dioxide (CO₂). Subsistence farmers respond to lower rainfall years and crop losses by expanding areas under cultivation, thus accelerating land degradation and damage to natural ecosystems.⁴¹ AFOLU can also impact land surface albedo (the fraction of light that a surface reflects), thus increasing the reflection of radiation or increasing heat absorption capacity. Over-grazing by livestock reduces ground cover and promotes soil erosion.

Zambia has a long history of mining due to rich resources of copper and cobalt. The mining sector contributed 13 per cent of Zambia's GDP over the period 2011-2021 and 70 per cent of export earnings.⁴² However, extractive industries have long-term consequences for the landscape and negatively impact the environment. Large-scale open pit mining in the Copperbelt has resulted in more

³⁹ Referred to elsewhere in climate literature as Land use, land use change and forestry (LULUCF).

⁴⁰ Land Degradation Neutrality, UN Convention to Combat Desertification-GRZ, 2019 https://www.unccd.int/sites/default/files/ldn_targets/2019-10/Zambia_LDN_TSP_Country_Report.pdf

⁴¹ The Economic Case for Nature, World Bank, 2021

⁴² Zambia Country Report, International Monetary Fund, 2023

than 10,000 ha covered with mine waste, effectively removing the land from productive uses.⁴³ Copperbelt mining operations fall within the Kafue River catchment area; mining discharges degrade the quality of watercourses and groundwater, which the population relies on for fishing and water supply.

Lead mining has left a legacy of gross contamination of the soil, air and water around Kabwe, Zambia, affecting approximately 200,000 people. Elevated blood lead levels have been found in children, who are particularly vulnerable to the toxic effects on development of the brain and nervous system. Children who play in the soil and young artisanal miners in the area are most at risk. Some remedial measures have been taken but it remains a highly polluted place.⁴⁴

With the expansion of copper mining into North-Western Province in 2005, about 350,000 ha of Protected Forest Areas have been converted to mining concessions.⁴⁵ The exploitation of abundant reserves of coal and uranium in Southern Province and manganese in Luapula Province challenge Zambia's regulatory bodies to ensure that future mining activities comply with national environmental and social safeguards.⁴⁶

Artisanal and small-scale gold mining (ASGM) in Zambia involves an estimated 30,000 miners, including women (18 per cent) and children (5 per cent).⁴⁷ Only 2 per cent of the operations have been formalized under national regulations. The main environmental threat concerns the use of mercury for gold extraction, which is hazardous to human and ecosystem health. In accordance with the Minamata Convention, Zambia has targeted a 25 per cent reduction in the use of mercury for ASGM by 2030.⁴⁸

2.2.2 Water resources

Zambia has abundant water resources. The total renewable quantity of water – the theoretical annual amount available from precipitation and cross-border in-flows – is estimated to be approximately 150 km³, making Zambia a very low water stress nation.⁴⁹ About one-third of this water is present as groundwater and two-thirds are surface waters.⁵⁰ Surface water is unevenly distributed within the country and there are often shortages in the south. High population growth and economic development drive the main competing uses of available water for agriculture, hydropower, municipal supplies, industry and mining.

Zambia has six large perennial river basins (Figure 2.7). The three largest are the Zambezi River, whose watershed spreads over eight countries, followed by the Kafue River, the longest river that lies wholly within Zambia, and the Luangwa River. Reservoirs store water for hydropower and water supplies.

Eight major wetland ecosystems are recognized internationally for their rich biodiversity, which include Bangweulu Wetlands, Kafue Flats, Lukanga Swamps and Busanga Swamps. These wetlands provide livelihoods to millions of Zambians through fishing, hunting and agriculture. The wetlands also serve to regulate water flow, reducing storm damage and flooding, preserving water quality, while storing carbon

⁴³ Environmental Impacts of Mining in Zambia, Geological Survey of Sweden, 2014

⁴⁴ Zambia: 'Green City' Plan Should Focus on Lead Mine Remediation, Human Rights Watch, 2023

⁴⁵ Key drivers of biodiversity loss in Zambia, Biodiversity Finance Initiative, 2018

⁴⁶ Environmental Impacts of Mining in Zambia, Geological Survey of Sweden, 2014

⁴⁷ National Action Plan for Artisanal and Small-scale Gold Mining in Zambia, ZEMA, 2023

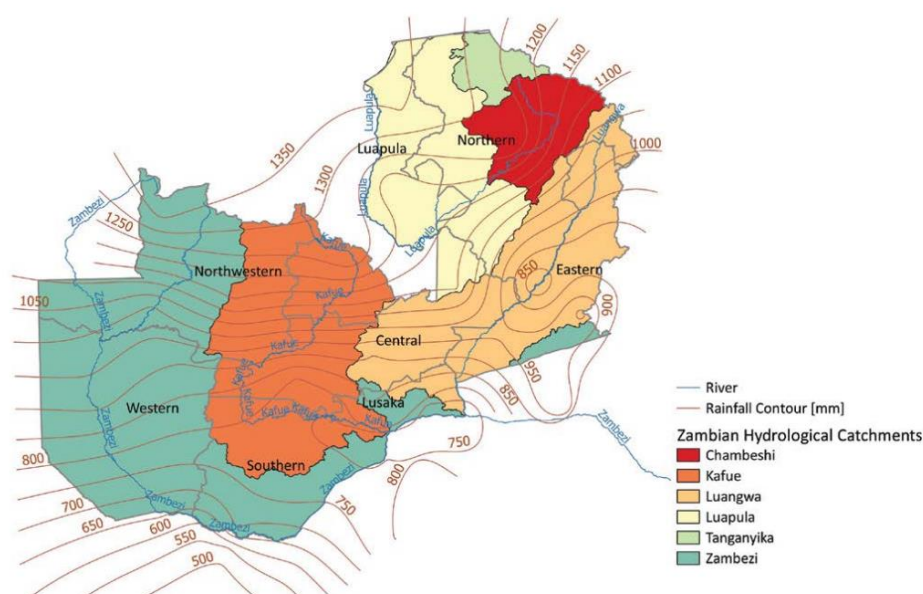
⁴⁸ National Action Plan for Artisanal and Small-scale Gold Mining in Zambia, ZEMA, 2023

⁴⁹ Zambia Water Use, Resources and Precipitation - Worldometer

⁵⁰ National Water Policy Implementation Plan, GRZ, 2024

and stabilizing climatic conditions. Yet, they are under threat from human encroachment, agricultural expansion, deforestation, draining and overgrazing.⁵¹

Figure 2.7. Hydrological catchment basins of Zambia



Source: Zambia Water Investment Programme 2022-2030, GRZ

Groundwater in Zambia is found in a range of aquifers, from highly productive karst (limestone) to low-medium potential alluvial deposits to igneous rocks with limited potential.⁵² Groundwater quality is generally good but is at risk of pollution in dense urban areas, as well as from mining and agricultural runoff. Most of the population relies on groundwater from drilled boreholes for domestic water supply (including water utilities) and for livestock and irrigation. In Lusaka, about 60 per cent of drinking water is groundwater and about 40 per cent comes from the Kafue River, 45 km south.

Nationally, 68 per cent of the population have access to at least basic drinking water sources. In urban areas the figure is 88 per cent while in rural areas it is only 51 per cent.⁵³ Eleven commercial utilities provide water supply services in 87 urban and peri-urban areas serving 7.3 million people.⁵⁴ Of these, 61 per cent have household connections and the rest use public stand posts and kiosks. Non-revenue water from leakage and illegal connections across the 11 commercial utilities averaged 57 per cent in 2023, despite a national benchmark of 25 per cent. Rural water supply is provided through community-managed or self-supply water points.

Sanitation services lag behind water services. Overall, 32 per cent of the population have access to basic sanitation, 20 per cent use shared facilities, 37 per cent use unimproved facilities and 11 per cent practice open defecation.⁵⁵ Households in rural areas and peri-urban areas rely primarily on pit latrines

⁵¹ National Policy on Wetlands 2018-2028, GRZ

⁵² Hydrogeology of Zambia, BGS https://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Zambia

⁵³ Joint Monitoring Programme, WHO-UNICEF, 2024

⁵⁴ Sector Report 2023, Zambia National Water Supply and Sanitation Council (NWASCO)

⁵⁵ <https://www.unicef.org/zambia/water-sanitation-and-hygiene>

or septic tanks, generating the need for pit emptying services. Lusaka's aquifers are particularly vulnerable to environmental pollution. The high concentration of latrines in peri-urban areas cross-contaminates water from shallow wells, contributing to annual outbreaks of cholera.

The Lusaka sewerage system is limited to 30 per cent of the city area and only 14 per cent of households are connected. There are seven wastewater treatment sites but only an estimated four per cent of the city's total wastewater production undergoes treatment and safe disposal in the environment.⁵⁶

2.2.3 Solid waste

Municipal solid waste management is poorly resourced and executed by local authorities. Despite a growing number of disposal sites serving urban areas, waste collection levels are low and most is illegally dumped and burned.⁵⁷ Waste collection services are practically non-existent in rural areas.⁵⁸ Most recycling is done informally after disposal, mainly by waste pickers – adults and children – at the dumpsites. Single-use plastic bags were banned in 2018, but small-scale plastics plants continue to produce them.⁵⁹

In 2013, an estimated 30 tonnes of infectious and non-infectious healthcare waste per day was produced; much of it joined the ordinary municipal waste stream, putting the environment and waste pickers at dumpsites at risk.⁶⁰ Since then, a UNDP-Global Environment Facility (GEF) project has supported the installation of autoclaves at hospitals to sterilize the waste, in place of polluting incinerators.

2.2.4 Air quality

Ambient air quality in Zambia, measured by the annual mean concentration of fine particulate matter (PM_{2.5}), is considered to be moderately unsafe, placing it 33rd out of 134 countries.⁶¹ Sources of fine and large particulate matter (PM) include cement factories, wildfires, burning of waste and exhaust from vehicles. Copper smelters contribute over 98 per cent of Zambia's sulfur dioxide (SO₂) emissions, as well as PM, directly affecting the health of humans, animals and plants.⁶² In 2015, wildfires burnt 25 per cent of the area of Zambia and 67 per cent of Kafue National Park.⁶³ Data on air quality is limited, however, due to the scarcity of monitoring stations.

Indoor air pollution is even more of a contributor to negative health effects since about 78 per cent of households burn wood and charcoal for home cooking.⁶⁴ Indoor smoke increases the risk of respiratory illnesses, mainly in women and young children. The proportion of Zambia's households with primary reliance on clean fuels and technologies (SDG indicator 7.1.2) is 17 per cent in urban areas and only two per cent in rural areas.⁶⁵

⁵⁶ The Development and Use of SFDs for Better Sanitation Investment Planning in Lusaka, GIZ, 2018

⁵⁷ Waste as a resource in Zambia, International Labor Organization, 2017

⁵⁸ Zambia Environmental Outlook Report 4, ZEMA, 2017

⁵⁹ <https://www.lusakatimes.com/2022/03/10/zema-facing-challenges-in-enforcing-the-ban-on-the-use-of-plastic-carrier-bags/>

⁶⁰ <https://undpinzambia.exposure.co/tackling-zambias-medical-waste-problem>

⁶¹ IQAir Zambia Air Quality Index (AQI) and Air Pollution information | IQAir

⁶² Environmental impacts of mining in Zambia, Geological Survey of Sweden, 2014

⁶³ Zambia Environment Outlook Report 4, ZEMA, 2017

⁶⁴ https://climatecompatiblegrowth.com/wp-content/uploads/Alternative-Energy-for-Cooking-in-Zambia_COP27-Policy-Brief.pdf

⁶⁵ <https://data.who.int/indicators/i/D66483C/6A64C9A?m49=894>

2.3 Energy

Zambia's primary energy supply depends on hydropower, biomass (firewood, charcoal), petroleum products, coal, and solar. Energy supply grew 4.5 per cent annually from 2008–2018 due to the growing economy.⁶⁶ Only petroleum is imported, giving Zambia an enviable degree of energy independence. Biomass accounts for 80 per cent of total primary energy supply and is used mainly for household cooking and heating. The high dependence on biomass is due to its ready availability, low electricity access particularly in rural areas, and lack of cleaner alternatives like liquified petroleum gas (LPG), although LPG consumption jumped 32 per cent in 2024 in response to power shortages.⁶⁷ Zambia's proven reserves of coal are estimated at 30 million tonnes, which fuel electricity production, mining and industries.⁶⁸

2.3.1 Electricity

The installed electricity generation capacity in 2024 was 3,871 megawatts (MW), powered primarily by hydropower (82 per cent), but also coal, petroleum and solar photovoltaic (PV).⁶⁹ The two largest consumers of electricity are the mining sector (51 per cent) and domestic use (33 per cent).⁷⁰ National access to electricity is 48 per cent, with urban coverage at 87 per cent and rural coverage at 15 per cent.⁷¹

Zambia's large hydropower electricity reservoirs are fed by the Zambezi and Kafue river basins into five major generation stations: Kafue Gorge, Kafue Gorge Lower, Kariba North Bank, Victoria Falls, and Itezhi-Tezhi. Reliance on hydropower gives Zambia a green edge, but leaves it vulnerable to rainfall variability, more frequent droughts and greater competition for water resources. In 2024, the water level of Lake Kariba, the largest man-made lake in Africa by volume, was the lowest in memory, forcing the cutting of power generation to less than 10 per cent of normal output.⁷²

The state-owned utility ZESCO is responsible for the generation, transmission, distribution and supply of electricity. It also exports to and imports electricity from the southern Africa region. The Rural Electrification Authority (REA) focuses on expanding electricity access in rural areas.

2.3.2 GHG emissions

Most common greenhouse gases

Carbon dioxide (CO₂): Carbon dioxide is introduced into the atmosphere mainly through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions. Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH₄): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

⁶⁶ Zambia Energy Efficiency Strategy, Ministry of Energy, 2022

⁶⁷ Mid-Year Statistical Bulletin, Energy Regulation Board, 2024

⁶⁸ National Energy Policy, Ministry of Energy, 2019

⁶⁹ Mid-Year Statistical Bulletin, Energy Regulation Board, 2024

⁷⁰ National Energy Policy, Ministry of Energy, 2019

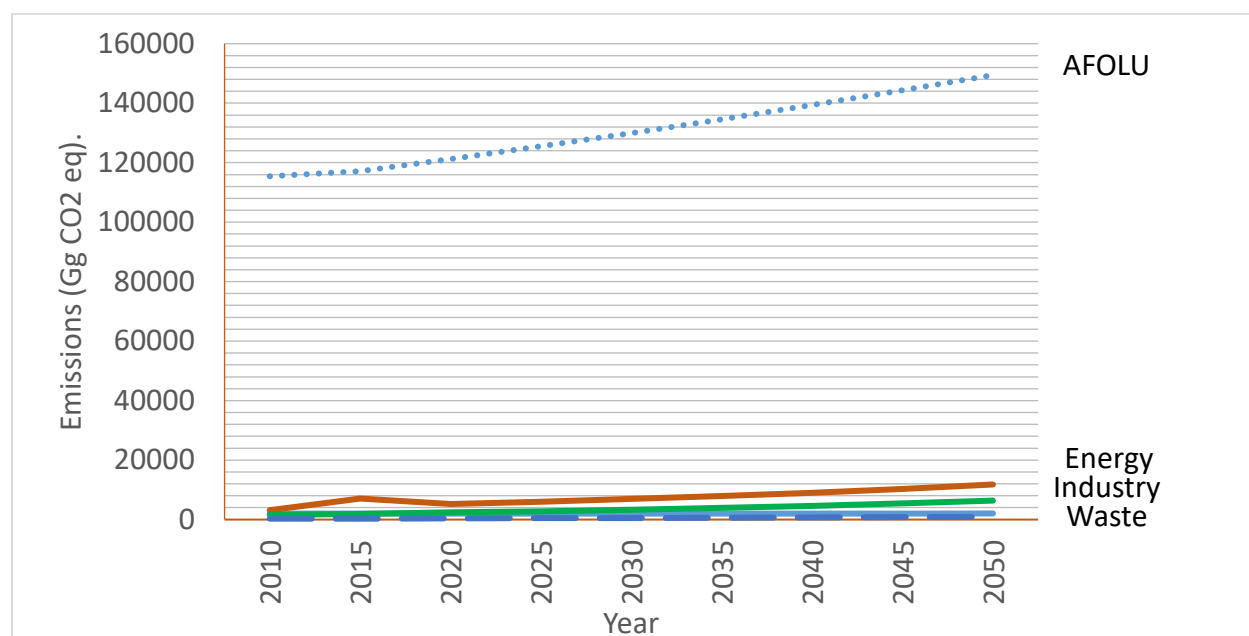
⁷¹ <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ZM>

⁷² Zambians struggle with electricity shortages driven by drought, Africanews, Oct 2024

Nitrous oxide (N₂O): Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

The AFOLU sector (see Section 2.2.1) contributes 93 per cent of Zambia’s GHG emissions, followed by the energy sector at 5 per cent, and industrial processes and waste sectors. The AFOLU sector transitioned from net sink to net source of CO₂ in 2018, when its natural carbon absorption capacity could no longer

Figure 2.8. Projected emissions trends by sector



Source: First Biennial Update Report to UNFCCC, GRZ, 2020

compensate for rapid increases in firewood and charcoal production, timber removal, crops, burning and settlements.⁷³ AFOLU is projected to continue to outstrip other sectors in emissions of CO₂-equivalents to 2050 (Figure 2.8).

2.3.3 Renewable energy and energy efficiency

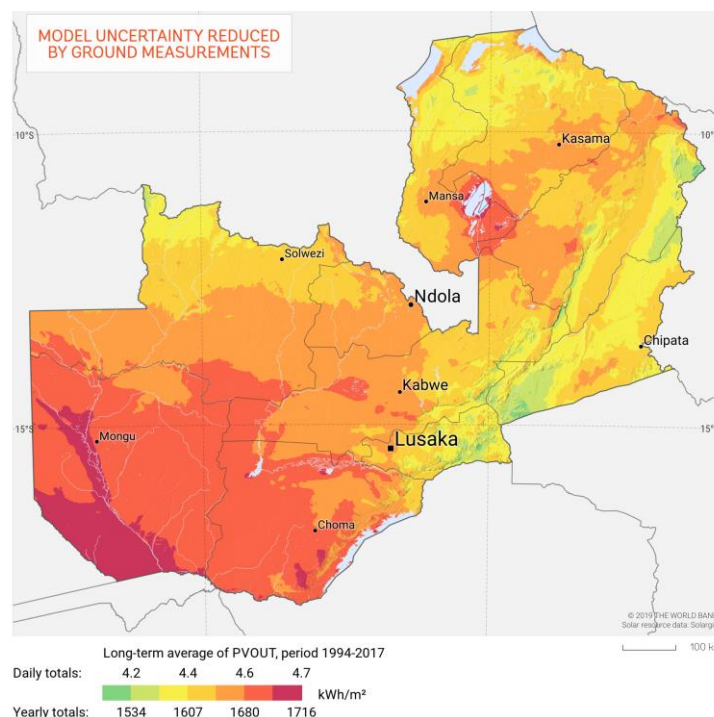
Besides large hydropower, renewable energy (RE) sources in Zambia are solar (PV and thermal) and small hydro. Biomass from forests and woodlands can be considered RE when it is sustainably harvested, which is not the case in Zambia. With 3,000 sunshine hours annually, solar has good potential, particularly in the southwest (Figure 2.9). Recent investments in solar PV have been solar plants at Bangweulu (54 MW), Ngonye (34 MW) and Ilute (25 MW). In 2023, ZESCO announced a United Arab Emirates investment in solar projects worth US\$2 billion.⁷⁴ Growth in the access and affordability of

⁷³ First Biennial Update Report, GRZ, 2020

⁷⁴ <https://www.reuters.com/business/energy/zambia-uae-develop-2-billion-solar-projects-2023-01-17/>

small-scale solar panels offer a way for small businesses and households to mitigate the costs of irregular electricity supply, and for off-grid communities to charge mobile phones and gain lighting.

Figure 2.9. Photovoltaic power potential in Zambia



Source: Solar Resource Atlas – Zambia, World Bank, 2019

Small hydro contributes 1.5 per cent to total installed electricity generation capacity but could play a larger role in rural and off-grid applications.⁷⁵ Other potential energy solutions, which have been assessed to varying degrees but not implemented at-scale are wind, geothermal and waste-to-energy (municipal and agricultural waste).

Zambia aims for energy efficiency (EE) improvements that contribute to SDG 7 (Affordable and clean energy for all) and achieve 100 per cent urban electrification and 50 per cent rural electrification by 2030. Large gains are needed in domestic cooking to reduce the use of biomass with efficient cook stoves and using alternative fuels. Household EE can be further improved by switching incandescent bulbs for LED lights and mandating greater efficiency of home appliances (air conditioners, water heaters, refrigerators).

The transport sector, which consumes about 38 per cent of the petroleum share,⁷⁶ is energy inefficient and substantial EE gains can be achieved by addressing the age, condition and fuel economy of vehicles (cars, trucks), railways and public transport. EE actions include more public transport, incentives for a newer motor vehicle fleet, fuel blending with biofuels and vehicle tuning. Large energy consuming

⁷⁵ National Energy Policy, Ministry of Energy, 2019

⁷⁶ Energy Efficient Strategy, Ministry of Energy, 2022

sectors like mining, industry and water utilities are all candidates for adopting technological and management changes that reduce and diversify energy consumption and drive down GHG emissions.

2.4 Disaster risk reduction (DRR)

The Global Facility for Disaster Reduction and Recovery (GFDRR) has ranked damaging and life-threatening river and urban floods as ‘high risk’ for Zambia, as well as wildfires, which can result in life and property loss in any given year and in every part of the country.⁷⁷ GFDRR classifies extreme heat, water scarcity (incorporating drought) and earthquakes as ‘medium risk’ hazards for Zambia.

The Zambia Disaster Management and Mitigation Unit (DMMU) identifies more hazards: hailstorms, epidemics (human and animal), and pest infestations, such as the armyworm, which has invaded crops on almost an annual basis across all provinces.⁷⁸ The number of people affected by droughts and floods since 2020, compared to the period 1987-2019, has nearly doubled.⁷⁹

Recommended risk reduction measures for Zambia, outlined at a DMMU-UN Disaster Risk Reduction workshop, include:⁸⁰

- Carry out land use planning to identify flood event safe zones for critical infrastructure such as schools and hospitals, and major housing or infrastructure developments.
- Update building codes for the evolving nature of flood risk.
- Adopt flood and drought insurance, such as the Africa Risk Capacity weather-risk insurance.
- Institute emergency and recovery plans for floods and droughts, from national level to ward level, based on risk profiles.
- Build dams for watering livestock where boreholes are depleted.
- Increase the number of reservoirs for hydropower generation.

2.5 Water-energy-food nexus

Water security (SDG 6), energy security (SDG 7), and food security (SDG 2) are inextricably linked. In Zambia, this nexus creates challenges for sustainable environmental and economic development, and it presents opportunities for integrated solutions that reduce trade-offs and achieve cross-sectoral benefits for all (Figure 2.10).

Zambia’s water resources are subject to increasing demands. Water fuels its electricity production. In turn, water supply for growing towns and cities depends upon this electricity for groundwater extraction, water treatment and pumping stations. Sewerage collection and treatment are also energy-consuming processes. Large investments in expanded water and sanitation services that meet future needs and build climate resilience will further increase the sector’s energy demands. Solar PV installations at water and sewage facilities, as well as biogas capture at large wastewater treatment plants, are ways to reduce demands on the grid and gain a degree of self-reliance.

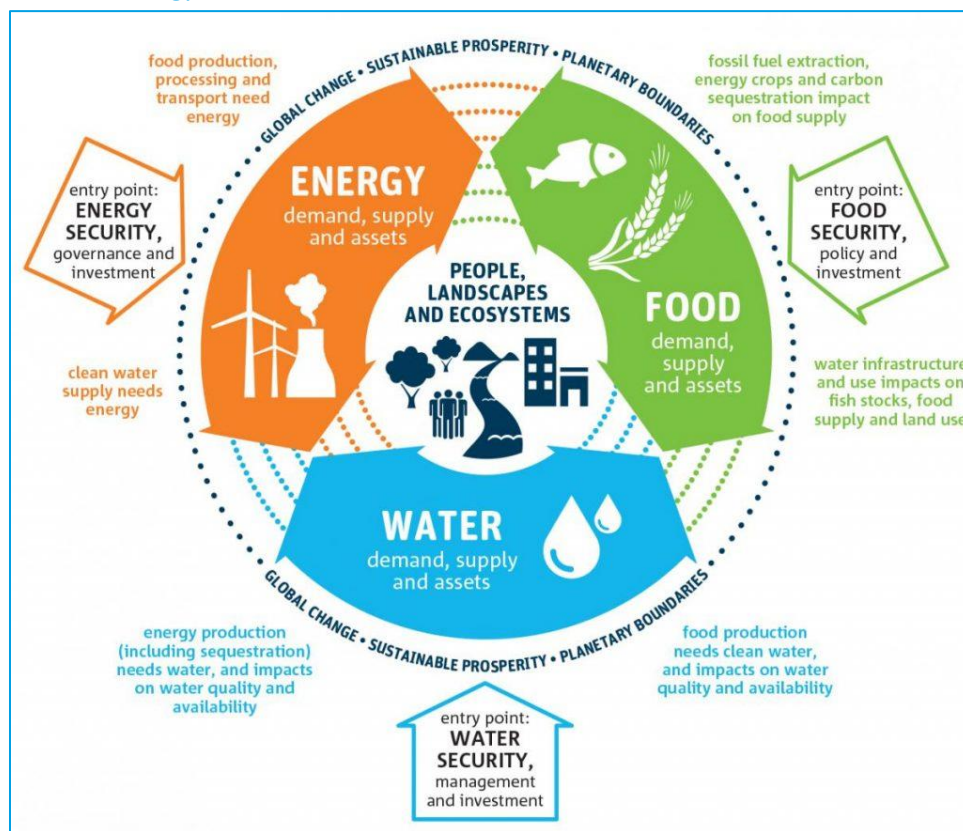
⁷⁷ <https://thinkhazard.org/en/report/270-zambia>

⁷⁸ Zambia National Disaster Risk Management Framework 2017-2030, Office of the Vice-President-DMMU, 2017

⁷⁹ Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT: International Disaster Database, 2024
<https://www.emdat.be/>

⁸⁰ Disaster Risk Profile Zambia, UNDRR, 2019

Figure 2.10: Water – energy – food nexus



Source: Sustainable development: the Water-Energy-Food Nexus, International Water Association, 2018.

Food production and energy are highly water-intensive. Demands from agriculture and hydropower production peak during the dry season. At the same time, water availability for wetlands and watercourses must be ensured across the country. The transfer of bulk water to the dry south is being considered, even with its substantial financial and environmental costs.

Electricity production from hydropower depends on Zambia's rich water resources, and more hydropower generation, both large and small, is planned. But this dependence is vulnerable to rainfall variability and rising temperatures, pointing to the need for increasing the share of non-hydro renewables and scaling up energy efficiency measures. The huge portion of energy from biomass, mostly for home use, threatens the sustainability of forest ecosystems and water resources.

Agriculture is a user of energy, a major consumer of water and a competitor with ecosystems. It can also be a source of feed stock (e.g., cassava, sugar cane) for bioethanol production. Agriculture can degrade groundwater and surface water quality through the application of pesticides and nitrogen (fertilizers, manure). Crop production and food processing are energy consumptive, and they also emit GHGs, contributing to global warming, which in turn affects water availability and crop yields (see Section 2.3). A growing urban middle class and increasing agricultural exports (e.g., maize, sugar cane, tobacco and wheat) accelerate the contribution of farming to land use change and land degradation. Large-scale commercial farmers and smallholders alike will need to increasingly adopt climate-smart crop choices and water and soil conservation techniques.

The water-energy-food (WEF) nexus highlights the value of intersectoral governance, such as that offered by the integrated water resources management (IWRM) approach that aims to reduce costs, increase efficiencies and secure resources. Institutional and policy frameworks need to be well coordinated to accommodate competing demands. Integrated management can help to weigh climate adaptation and resilience options, and determine the feasibility of economic activities that require water. In agriculture, reduced water availability could be a barrier to investments in irrigation systems, which are proposed as an adaptation measure.

Cost-benefit analysis could inform where and when more water-efficient technologies or improvement to water harvesting and storage would be a better option. WEF nexus solutions available to Zambia include solar and wind power; increased water efficiency (e.g., leak reduction, water conservation); water re-use for agriculture, industry, or urban landscapes; improved irrigation efficiency, such as drip irrigation; and nature-based solutions in both rural and urban settings.

2.6 Summary of CEED-related impacts in Zambia

Section 2 is an overview of the climate, environment, energy and DRR situation in Zambia. The historical and projected trends point to the many ways that Zambia's natural environment, economy and children are being challenged and changed. A summary of these impacts is Table 2.3.

Table 2.3. Summary of climate change impacts in Zambia

Areas of impact	Projected changes
Less water availability	- Increased evaporation reduces stored water in reservoirs. - Increased temperatures, higher evapotranspiration and rainfall variability lead to shrinking wetlands and decreased river flows. - Greater stress on aquifers due to increased evapotranspiration, reduced aquifer recharge and increased groundwater withdrawals. - Higher demand for water supply from agriculture, industry, population and tourism.
Increased drought periods	- Precipitation projections are unclear but possible delays to start of rainy season, with an increase in variability and unpredictability in seasonal rainfall. - Greater frequency and duration of drought periods. Reduced river flows impact aquatic ecosystems and fisheries; warmer waters conducive to algae growth. - Strain on rural livelihoods and increased rural to urban migration.
Increased riverine and flash floods	- High intensity rainfall events, including in neighbouring countries, lead to rivers overflowing their banks, extensive flooding of low-lying areas, and damaging crops. - Urban environments at risk of floods, especially marginal low-lying neighbourhoods; city stormwater drainage systems unable to cope, resulting in damaged infrastructure. - High rainfall runoff on degraded lands, eroding fields and flooding communities. - Flooding leads to pollution, siltation and sedimentation of water bodies and reservoirs. - Housing, transport networks, healthcare facilities, and water and sanitation systems suffer damage from urban and river floods.
Loss of agricultural productivity	- Reduction in soil moisture due to higher temperatures, reduced precipitation, and higher evapotranspiration, with rainfed agriculture at immediate risk. - Expanded deforestation, land degradation, or desertification leading to loss of arable land, pasture and water supplies. - Less predictable or shorter growing seasons, increased exposure to new pests and diseases, reduced yields or crop failure, and elevated livestock mortality.

Areas of impact	Projected changes
Higher energy demand	▪ Higher temperatures will increase demand for cooling, with increasing consumption of electricity which is in short supply. ▪ Increased evaporation in water storage reservoirs and reduced river flows will adversely impact national electricity grid power and rural electrification efforts. ▪ As groundwater levels drop, energy costs for water pumping using diesel and electricity rise, and solar powered systems become more expensive as well.
Tourism impacted	▪ Natural beauty and resources that support ecotourism are threatened by deforestation, wildlife poaching and loss of habitat; Victoria Falls less of a draw during long dry periods. ▪ Lakes, wetlands and rivers are under pressure from climate changes and human overexploitation, reducing recreation, water sports and adventure potential. ▪ Forest and woodland ecosystems lose regenerative capacity; they already suffer from fragmentation, wildfires, unsustainable wood extraction and loss of soil fertility.
Increased morbidity and mortality	▪ Increased food insecurity from livelihood losses, agriculture losses and food price hikes, leading to increased malnutrition and undernutrition. ▪ Spread and growth in water- and vector-borne diseases (e.g., malaria). ▪ Child deprivation due to repeated climate shocks that overwhelm coping mechanisms. ▪ Children exposed to high levels of air pollution at greater risk of chronic diseases such as cardiovascular disease later in life. ▪ Heatwaves result in increased mortality from heat stroke and exacerbation of pre-existing health conditions. ▪ Reduced water quality and availability affecting health and sanitation conditions; increased outbreaks of diarrhoeal diseases. ▪ Reduced access to medical services; injuries and death from floods and storms.

3 Engagement and priorities on CEED



3.1 National institutional arrangements

The Council of Ministers, chaired by the Vice President, is the highest decision-making body overseeing climate change governance, as well as disaster management. The Council provides overall policy direction on climate mitigation and adaptation, mainstreams climate activities in national and sector plans and policies, mobilizes resources, and monitors activities.

Since it was created in 2021, the Ministry of Green Economy and Environment (MGEE) has been working to “promote the effective and sustainable use of the environment, while at the same time, facilitating support for adaptation to, and mitigation of the effects of climate change”.⁸¹ This has streamlined government’s function by creating dedicated oversight to combatting climate change.⁸²

Other ministries with key roles in the area of climate and the environment include ministries responsible for agriculture, lands and natural resources, energy, finance, water resources and others, as listed in Table 3.1.

Table 3.1: Ministries and other government bodies involved in CEED issues

Ministry / Government body	Subordinate unit
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⁸¹ https://www.mgee.gov.zm/?page_id=197

⁸² Stocktake on Mitigation and Adaptation Actions Towards Achievement of Nationally Determined Contribution Target, UNDP-MGEE, 2024

Council of Ministers (chaired by Vice President)	Steering Committee of Permanent Secretaries Technical Committee on Climate Change Disaster Management and Mitigation Unit
Ministry of Green Economy and Environment (MGEE)	Green Economy and Climate Change Department (Designated National Authority to Green Climate Fund); Forestry Department; Zambia Meteorological Department; Zambia Environmental Management Agency (ZEMA) (Environmental regulator)
Ministry of Lands and Natural Resources (MLNR)	Climate Change and Natural Resources Management Department (CCNRMD)
Ministry of Local Government and Rural Development (MLGRD)	Department of Local Government Administration (LGA) Department of Rural Development
Ministry of Finance and National Planning (MFNP)	Division of Budget and Economic Affairs Division of National Planning and Monitoring and Evaluation Office of the Accountant General
Ministry of Energy (ME)	Department of Energy Department of Petroleum
Ministry of Transport and Logistics (MTL)	Transportation Department
Ministry of Health (MoH)	National Public Health Institute Department of Environmental Health
Ministry of Agriculture (MA)	Zambia Agricultural Research Institute Natural Resources Development College
Ministry of Fisheries and Livestock (MFL)	Department of Livestock Department of Fisheries
Ministry of Tourism (MT)	Department of Tourism Department of National Parks and Wildlife
Ministry of Water Development and Sanitation (MWDS)	National Water Supply and Sanitation Council (NWASCO) (WSS sector regulator); Water Resources Management Authority (WARMA) (semi-autonomous water resources regulator)
Ministry of Youth, Sport and Arts	Department of Youth Development
Ministry of Community Development and Social Services (MCDSS)	Food Security Pack Programme Zambia Agency for Persons with Disabilities Council of NGOs
Local authorities	Municipalities, provincial councils, district councils, city councils

Generally, Zambia has a well-structured climate change coordination framework, with involvement of high-level government structures including the Council of Ministers chaired by the Vice President and the Technical Committee of Permanent Secretaries, among others.⁸³ Delays and weak capacities are more evident at sub-national levels, where local authorities are important players on CEED, but where mainstreaming of climate change into district and community development plans and approval of funding has taken more time.

⁸³ Zambia: NDC and NAP Country Profile and Assessment, ANAPRI CACCI Report #3, Michigan State University, 2024

District and provincial development coordinating committees, and ward development committees at community level, are engagement partners for field work with front-line stakeholders and facilitate demonstration of innovation at the local level. The National Adaptation Plan (NAP) identifies these sub-national entities for capacity building in knowledge management, coordination and implementation of climate adaptation actions (see Section 3.2 for more information on the NAP).

3.2 National policies and strategies

3.2.1 Climate legislation and policies

Zambia ratified the UNFCCC in 1993 and the Kyoto Protocol in 2007 and then signed the Paris Agreement in 2016. In 2015, the Zambian government confirmed the country's commitment to Agenda 2030 and its Sustainable Development Goals. Zambia has since reported to the UNFCCC on progress against its commitments through three National Communication reports (latest in 2020) and one Biennial Update Report (BUR).

Zambia's *National Policy on Climate Change (NPCC)* was enacted in 2016 to guide a coordinated cross-sectoral response of climate change mitigation and adaptation interventions, while meeting the development goals as outlined in Zambia's Vision 2030. The policy is guided by the principle of "sustainable climate change response" by which all climate change actions should be environmentally sustainable and contribute positively to national economic growth and social development objectives, including poverty alleviation, access to natural resources and basic amenities, gender equality and equity, and infrastructure development.

Zambia's first *Nationally Determined Contribution (NDC)* to the Paris Agreement was submitted in 2016, with a pledge to reduce GHG emissions by 25 per cent by 2030 (base year 2010) or by 47 per cent with substantial international support. Keeping the same emission targets, an updated NDC 2.0 was issued in 2021, with mitigation actions focused on energy and transport sectors, AFOLU, and solid and liquid waste management. A new round of NDC submissions (NDC 3.0) is underway, and Zambia submitted its Provisional NDC 3.0 to UNFCCC in March 2025,⁸⁴ with a final document due for COP 30 in November 2025. The provisional NDC raises Zambia's ambition by covering four more sectors: tourism, green infrastructure, industrial processes, and water security.

In 2023, the *NDC Implementation Framework 2023–2030* was produced under the leadership of MGEE. Building on the 2021 NDC, the Framework translates eight National Development Plan objectives into measures for environmental sustainability, with 11 clustered sectors and 18 outcome areas for both mitigation and adaptation. Key sectors for action are: banking and finance, agriculture, forestry, energy, infrastructure, waste, water, industry, transport, and health, with a total implementation cost of US\$17.2 billion (or US\$2.1 billion annually).

A 2024 review of progress of Zambia's NDC noted that the government has championed bilateral and multilateral ties aimed at fostering reductions in GHG emissions, increasing resilience, and promoting environmental protection and sustainability.⁸⁵ In terms of reaching the overall emission targets, estimated reductions over the 2016–2023 period exceeded both scenarios (without and with substantial

⁸⁴ [Provisional NDC Submission Zambia Revised and Updated NDC 100325](#)

⁸⁵ Stocktake of mitigation and adaptation actions towards achievement of nationally determined contribution target, UNDP-MGEE, 2024

international support). Mitigation, measured as reduction in CO₂ equivalent, was due to sustainability gains in forestry (68 per cent), energy (20 per cent), and agriculture (12 per cent).

The study concluded that greater urgency is warranted to advance Zambia's mitigation and adaptation agenda as its resilience and adaptive capacity remains fragile, as evidenced by the significant impacts on the country's agriculture, energy, and water sectors by the 2023–2024 drought.

The *National Adaptation Plan 2023–2030 (NAP)* for Zambia was submitted in 2023 by MGEE. The formulation process was a multi-sectoral and participatory effort, supported by the Green Climate Fund (GCF) and the Global Water Partnership (GWP). The four main hazards facing Zambia were identified to be droughts, floods, high temperatures and windstorms. For each hazard, vulnerability is analyzed and adaptation measures are outlined across six vulnerability elements (environmental, social, human, financial, physical and institutional). The priority sectors for climate adaptation actions are agriculture, forestry, water, transport, tourism, infrastructure, mining, wildlife and health. The total implementation cost to 2030 was estimated to be US\$34.7 billion.

Other key policy documents and reports have been produced by GRZ that complement the NDC and NAP. Key national development and climate change mitigation and adaptation documents are summarized in Table 3.2.

Table 3.2. Key government policies and reports on national development and climate action

Policy document	Responsible party	Year issued	Time horizon	Summary description
National Green Growth Strategy (NGGS)	Ministry of Green Economy and Environment	2024	2024–2030	Presents development pathways to a low-carbon, efficient, and inclusive economy, aligned with 8NDP and NDC. Situation analysis by sector, cost-benefit analysis, and M&E framework.
Eighth National Development Plan (8NDP)	Ministry of Finance and National Planning	2022	2022–2026	Sets out Zambia's strategic direction, development priorities and implementation strategies for its socio-economic transformation. Incorporates the National Vision 2030 ambition for becoming a prosperous middle-income nation.
Renewable Energy Strategy and Action Plan (RESAP)	Ministry of Energy	2022	2022–2030	Aims to achieve 51 per cent rural electricity access by 2030 through solar PV mini-grids and small hydropower. Plan includes targets for biofuels, biogas, and sustainable charcoal production.
First Biennial Update Report to the UNFCCC (BUR1)	Ministry of Lands and Natural Resources	2020	-	Reports trends in GHG emissions (1994–2016) in energy, industry, agriculture, forestry and waste sectors. Outlines mitigation actions and remaining needs.
Third National Communication to the UNFCCC (TNC)	Ministry of Lands and Natural Resources	2020	-	Reports Zambia's circumstances with regard to updated GHG emissions, policies and programmes for resilience and adaptation, and financial and capacity needs.
Nationally Appropriate Mitigation Actions (NAMA)	GRZ (Multiple entities)	2014	-	NAMA identifies concrete low-carbon projects for donor funding in waste management, tramway network, small hydropower, and sustainable agriculture.

National Disaster Risk Management Framework (NDRM)	Disaster Management and Mitigation Unit	2017	2017–2030	Aligns with Sendai Framework for DRR 2015 by focusing on understanding disaster risk, strengthening DRM governance, investing in DRM resilience, and building capacities for preparedness and recovery.
Climate Change Gender Action Plan (CCGAP)	Ministry of Gender	2016	2016–2020	CCGAP is a tool developed to ensure Zambia’s climate change processes mainstream gender considerations, ensure women and men have access to participate in, and benefit equally from climate change initiatives across many sectors.
Reducing Emissions through Deforestation and Degradation (REDD+)⁸⁶	Ministry of Lands and Natural Resources, Ministry of National Development Planning	2015	-	REDD+ aims to reduce emissions from deforestation through financial incentives to protect carbon stored in forested lands. The strategy targets sustainable forestry by local communities (e.g. charcoal reduction).
Second National Biodiversity Strategy and Action Plan (NBSAP2)	Ministry of Lands, Natural Resources and Environmental Protection	2015	2015–2025	A framework for biodiversity conservation of forests, wildlife, fisheries, and wetlands. Promotes sustainable use of resources and safeguarding ecosystem services upon which the majority of Zambians depend.
Vision 2030: A prosperous middle-income nation by 2030	GRZ	2006	2006–2030	Vision 2030 is a long-term plan for Zambia to become “A prosperous middle-income nation by 2030”. The document sets out broad goals and targets and appeals to all of society to adopt this aspirational socio-economic objective. Vision 2030 is designed to guide all development efforts, and to be operationalized by successive National Development Plans.

3.2.2 Environment, energy and DRR legislation and policies

The *Environmental Management Act 2011* (amended in 2023) is the overarching legal framework governing integrated environmental protection and conservation in the country. It establishes the principles, responsibilities, and rules for use of natural resources, and tasks the Zambia Environmental Management Agency (ZEMA) with enforcing regulations and standards; advising government on the formulation of environmental policies, standards and regulations; administering the Environmental Impact Assessment (EIA) process; licensing for hazardous waste management, emissions and toxic substances; and educating the public on environmental protection.

There is a wide range of legislation and policies concerning the environment and energy. A selection of these instruments is listed below:

- National Water Policy (2024)
- Energy Efficiency Strategy and Action Plan (2022)
- National Water Supply and Sanitation Policy (2020)
- National Energy Policy (2019)
- National Policy on Transport (2019)

⁸⁶ UN-REDD agencies are UNDP, FAO and UNEP.

- Second National Agriculture Policy (2016)
- National Forestry Policy (2015)

GRZ has also signed numerous international multilateral environmental agreements (MEAs) related to the environment, including the following:

- Kigali Amendment to the Montreal Protocol on Ozone Depleting Substances (2019)
- Basel Convention on the Control of Hazardous Wastes (1997, amended in 2019)
- Minamata Convention on Mercury (2013)
- Stockholm Convention on Persistent Organic Pollutants (2004)
- Ramsar Convention on Wetlands (1996)
- Convention on Biological Diversity (1994)
- UN Convention to Combat Desertification (UNCCD) (1994)
- Convention on International Trade on Endangered Species of Wild Flora and Fauna (CITES) (1973, amended in 1983)

Disaster risk management (DRM) is the responsibility of the Disaster Management and Mitigation Unit (DMMU) in the Office of the Vice-President. The *National Disaster Risk Management Framework 2017–2030* (NDRM) aligns with the Sendai Framework for Disaster Risk Reduction 2015–2030 by focusing on understanding Zambia’s disaster risk, strengthening DRM governance, investing in DRM resilience, and building capacities for preparedness and recovery.

DMMU does not implement DRR activities directly but coordinates stakeholders (government, UN, cooperating partners, private sector, civil society) through the National Disaster Management and Coordination Structure.⁸⁷

3.3 Other key stakeholders

3.3.1 United Nations

United Nations agencies in Zambia plan and implement their programmes under the UN Sustainable Development Cooperation Framework (UNSDCF) over the five-year 2023–2027 period.⁸⁸ The UNSDCF is designed to support Zambia’s development trajectory set out in its Vision 2030 and the Eighth National Development Plan. Interventions are organized in four strategic priorities with Planet – sustainable management of Zambia’s natural resources, mitigating climate change, and reducing and managing disaster risks – being most relevant to CEED programming. Strategic priority Planet has several output areas including for laws and policies on the sustainable management of natural resources, access to environmentally friendly basic services, and strengthened resilience to climate-related shocks and natural disasters. UN agencies work within one or multiple strategic priorities and output areas. The engagement and empowerment of youth as agents of change is a theme throughout the UNSDCF. Programmes include youth training and job placement, and in priority Planet the focus is on promoting youth as advocates for climate action and environmental protection.

Table 3.3 presents the UN agencies most involved in priority Planet.

⁸⁷ Zambia Risk-sensitive Budget Review, UN Office for Disaster Risk Reduction, 2020

⁸⁸ United Nations Sustainable Development Cooperation Framework 2023–2027, UN Zambia and GRZ

Table 3.3: UN agencies in Zambia with significant CEED programming

Agency	CEED involvement in Zambia
UN Development Programme (UNDP)	UNDP is the lead agency working on environmental sustainability, renewable energy, and climate change adaptation and mitigation efforts. UNDP is delivery partner for GEF projects totaling US\$75 million on renewable energy minigrids and on strengthening management of Greater Kafue national Park. Other projects include biodiversity finance (BIOFIN), climate resilient agriculture with FAO and WFP through the Green Climate Fund, and access to rural electricity through off-grid renewable energy sources, under the UN's Sustainable Energy for All initiative (SE4ALL).
UN Children's Fund (UNICEF)	UNICEF supports climate resilience and adaptation efforts, particularly focusing on the impacts of climate change on children and youth. Through its Climate Resilient WASH programme, UNICEF prioritizes water supply and sanitation in poor communities and institutions as key adaptation and DRR investments. Youth engagement for climate action is spearheaded by UNICEF's CAPE programme. UNICEF's health, education, nutrition and protection programmes strive to reduce children's climate vulnerability through quality basic services. UNICEF's 2024 emergency response was geared towards combating malnutrition and cholera, ensuring water security and supporting GRZ social safety net programmes.
UN Environment Programme (UNEP)	UNEP works to protect Zambia's biodiversity and natural resources, promoting sustainable environmental practices and supporting the country's commitments to global environmental agreements. (It supports Zambia from its regional office.) UNEP's US\$83 million GEF portfolio builds community resilience through ecosystem conservation, supports electric mobility, and seeks reduced mercury use in artisanal gold mining.
UN Industrial Development Organization (UNIDO)	UNIDO promotes sustainable industrial development, focusing on energy efficiency, renewable energy, and environmental management. It is an accredited entity of the Green Climate Fund (GCF) with a US\$12 million project for renewable energy powered minigrids.
Food and Agriculture Organization (FAO)	FAO works on sustainable agriculture, forestry, and fisheries to improve food security, home nutrition and sustainable natural resources management. FAO is a SUN II partner of WFP, WHO and UNICEF. FAO's technical cooperation in Zambia enables agricultural services to combat crop diseases, promote efficient agricultural water use, and empower youth 'agripreneurs'. FAO's two GEF projects support climate resilient ecosystem restoration and land management, and adaptation in communities reliant on forests and agriculture, with a combined budget of US\$148 million.
World Food Programme (WFP)	WFP is the world's largest provider of humanitarian food assistance. In Zambia, its programmes include integrated nutrition support, smallholder farmer support, social protection, disaster risk management and food assistance to vulnerable populations. In response to drought, WFP ramped up assistance through cash-based transfers, commodity vouchers and in-kind food distributions, as well as distributing drought-tolerant crop packs to farmers. WFP provides technical assistance to GRZ to strengthen capacities and systems for climate risk financing and insurance reaching over 1 million smallholder farmers.
International Organization for Migration (IOM)	IOM's priority is to support migrants and migration-affected communities in Zambia, long a country of origin, transit and destination of migrants, so that migration contributes to Zambia's sustainable development. Because climate change is a primary driver of displacement, IOM invests in DRR and local adaptation strategies, including energy, water, and waste management.

Agency	CEED involvement in Zambia
World Health Organization (WHO)	WHO supports MoH to improve health equity and achieve universal health coverage by supporting health system strengthening, as well as health emergency preparedness and response for disasters, outbreaks and pandemics. Its involvement in environmental health issues includes: air quality and pollution control; water, sanitation and hygiene; proper waste management and disposal; and community engagement and health surveillance systems. WHO addresses the health impacts of climate shocks, whether floods or changing vector-borne disease patterns.
World Meteorological Organization (WMO)	WMO provides meteorological and hydrological support in Zambia, working closely with the Zambia Meteorological Department on weather forecasting, climate information, and early warnings that help communities prepare for extreme weather events and natural disasters.
UN Human Settlements Programme (UN-Habitat)	UN-Habitat's priorities in Zambia, working especially with local authorities, focus on improving urban development and sustainability through poverty reduction, slum upgrading, land management, basic services and housing. It supports land tenure security in informal and customary settlements, and in DRR supports implementing flood control measures in urban environments.
UN Educational, Scientific and Cultural Organization (UNESCO)	UNESCO's priorities in Zambia are in education, including curriculum development with MoE, education for health and well-being with MoH, training for job creation and socio-economic transformation, and scientific and technologic advancement. In 2022, the Kafue Flats Biosphere Reserve became part of the UNESCO World Biosphere network, joining other Zambian reserves.

3.3.2 Development partners

The development partners in Zambia that provide significant financial and technical assistance in the area of CEED are presented in Table 3.4.

Table 3.4: Involvement of key development partner agencies in Zambia

Agency	CEED involvement in Zambia
European Union (EU) / European Civil Protection and Humanitarian Aid Operations (ECHO)	EU is the largest provider of development assistance in Zambia with support to realize its national development objectives, and preserve peace and stability. Climate, environment and energy are focal areas. For the 2021-2027 programme, approximately US\$220 million is earmarked for green partnerships for sustainable growth. Other climate-related initiatives are the Green Nexus programme and the EU-Zambia Forestry Partnership (forest governance and improved value chains). ECHO is an important source of funding for Zambia's numerous emergencies and disasters, including for UNICEF's response to cholera, drought and malnutrition.
German development bank (KfW)/ German Agency for International Cooperation (GIZ)	KfW is actively involved with the Ministry of Energy through the Global Energy Transfer Feed-in Tariff (Get FiT) which aims to construct 200 MW of renewable energy capacity split between solar PV and small hydro, as well as enabling a transparent regulatory framework for private sector participation. Other areas of investment are agriculture, education and healthcare. GIZ has three priority areas in Zambia: water (drinking water supply, wastewater disposal, water efficiency) and renewable energy, good governance, and agriculture and food security. GIZ partners with UNICEF on the NEWZA water sector programme.

Agency	CEED involvement in Zambia
United Kingdom/Foreign Commonwealth and Development Office (FCDO)	UK's development objectives in Zambia are to reduce poverty (strengthened health, education, nutrition, and social protection), to promote green and resilient economic development, and to support governance and democracy. UK supports the responsible mining of metals critical to the global clean energy transition, and seeks to improve environmental and social standards. Significant funding is channeled to WB, AfDB and the Green Climate Fund (GCF).
US Agency for International Development (USAID)	USAID's programme in Zambia has been significant, totaling about US\$500-600 million annually, in the areas of HIV and AIDS, health and education, water and sanitation, trade and business, and regional peace and stability. From early 2025, support has been largely suspended.
Swedish International Development Cooperation Agency (SIDA)	Among SIDA's priorities in Zambia is the promotion of climate and environmentally sustainable development, including carbon credit transactions. SIDA has been investing in rural electricity services for lighting with a goal of reaching 5 million people. Support is also channeled through SNV in climate-smart agriculture and biogas production.
Swiss Agency for Development and Cooperation (SDC)	SDC priorities in Zambia include vocational training and matching youth with companies in agri-food and renewable energy. DRR support aims at rural resilience through improved resource management, drought insurance and microcredit. To deliver social assistance to vulnerable populations, SDC contributes to UNICEF and WB cash transfer programming to respond to climate-related and other shocks.
Irish Aid	Irish Aid supports gender equality, education, and social protection. It also supports climate adaptation by helping small farmers to increase the supply chain value of their crops from production to processing and marketing.

3.3.3 International financial institutions

The World Bank and the African Development Bank are the two key international financial institutions in Zambia that provide significant financial and policy assistance in the area of CEED (Table 3.5).

Table 3.5: Involvement of key international financial institutions in Zambia

Agency	CEED involvement in Zambia
World Bank (WB)	WB is investing US\$22.5 billion over five years (2021–2025) to support renewable energy adoption, climate-smart agriculture, and green infrastructure. WB manages four GEF projects including sustainable management of ecosystems in Miombo ecoregions of Zambia (US\$97.5 million); Eastern Province jurisdictional sustainable landscape program (US\$24 million) to reduce deforestation and land degradation; and Zambia integrated forest land project (US\$63 million) for forest conservation, climate-smart agriculture, fuel-efficient cookstoves and sustainable charcoal production.
African Development Bank (AfDB)	AfDB's priorities are to boost private sector development and agricultural value chain development for job creation for women and youth. In 2024, AfDB had a portfolio of 23 projects, heavily tilted towards infrastructure, worth about US\$900 million. Transport is the leading sector, followed by water and sanitation, agriculture and energy. AfDB manages two GEF projects focusing on livestock management and Lake Tanganyika basin natural resources and livelihoods (US\$56.7 million).

3.3.4 Cooperating Partners Group

GRZ set out its development cooperation principles and responsibilities in 2023.⁸⁹ With regard to bilateral and multilateral cooperating partners (CPs), GRZ aims to strengthen collaboration, manage grants and loans to benefit national programmes, and ensure that CP assistance is aligned with Zambia's priorities and needs.

The CP Group coordinates partners' support with 17 thematic sub-groups, including Environment and Climate Change, chaired by members on a rotating basis. It aims to create a coordinated, effective, and sustainable approach to tackling climate change and environmental degradation in the country. Recent briefings included an update on the lead mining contamination situation in Kabwe and a 2025 Kitwe copper mining acid pollution spill, threatening people and wildlife along the Kafue River.

3.3.5 Private sector

Of all micro-, small- and medium-sized enterprises (MSMEs) in Zambia, 99 per cent are considered micro-sized with under 10 employees, and 96 per cent operate in the informal sector.⁹⁰ MSMEs employ a huge share of the workforce, including the most vulnerable. Raising the competitiveness of these enterprises would help reduce the youth unemployment rate and increase the number of women in employment.

Small Zambian companies are aware of climate and environmental change and its risks to their businesses, citing water scarcity, depletion of production inputs, flood disasters and energy shortages. Meanwhile, others see the emergence of new business opportunities.⁹¹

The World Bank identifies four sectors where greater private sector investment could accelerate economic growth, and which also link directly to Zambia's CEED-related challenges to improve climate resilience.⁹²

- *Agriculture* – Zambia's 1,300 large commercial farms have helped the country transform into a net exporter, contributing to regional food security. Expansion of agribusiness in livestock and crops through irrigation and sustainable farming practices could improve productivity and create jobs in rural areas, as well as increase food security and boost climate resilient agriculture if done without deforestation and encroachment on fragile habitats.
- *Renewable energy* – The private sector has a direct vested interest in contributing to the energy sector; electricity is one of the most frequently reported constraints to businesses in Zambia. Greater investments by independent power producers in grid-connected solar PV and mini-grid systems will help to diversify the energy mix and meet the economy's rising demand.
- *Tourism* – Zambia's tourism sector's contribution to GDP is half that of Botswana's and income generated per international visitor falls short of its neighbors. When done diligently, growth in ecotourism can create jobs while fostering stewardship of natural assets, such as forests and wildlife.
- *Mining* – The mining sector has announced huge investments in copper mine expansion, for which increased energy supply is essential (above). Improved infrastructure access is also

⁸⁹ National Policy on Development Cooperation, Ministry of Finance and National Planning, 2023

⁹⁰ https://www.boz.zm/2022_MSME_Finance_Survey_Report.pdf

⁹¹ Promoting SME competitiveness in Zambia, Ministry of Commerce, Trade and Industry-International Trade Centre, 2021

⁹² Zambia: Country Private Sector Diagnostic Summary, World Bank, 2024

needed, as well as a predictable policies and regulations that enforce more stringent and effective environmental, social, and governance safeguards to avoid environmental damage and reputational risk to investors.

3.3.6 NGOs

Non-governmental organizations (NGOs) incorporate climate and environment programming into their community development and relief efforts. Many of the international and national NGOs noted for their CEED programmes are presented below.

- *Worldwide Fund for Nature* – The Zambia branch of WWF, one of the world’s largest nature conservation organizations, seeks the sustainable management of the environment, natural resources and biodiversity in Zambia. WWF is also a GEF partner and manages two projects (total value US\$49 million) for Lower Kafue and Luangwa ecosystems protection.
- *CARE* – CARE’s focus in Zambia is on long-term community-based development programmes, with priority work empowering women and girls through maternal and child nutrition and social protection.
- *World Vision* – WV operates in 72 districts of all 10 provinces. Priority programme areas are literary, health promotion, livelihoods, child protection, and WASH.
- *WaterAid* – WaterAid dedicates its resources to the WASH sector for governance, water supply, sanitation and hygiene in communities and schools.
- *Save the Children Fund* – SCF’s programme in health and nutrition focuses on reducing under-five child mortality rates. It also works to increase access to quality education and to protect children from all forms of violence. SCF’s contribution to green livelihoods includes beekeeping, mushroom farming and planting beneficial moringa trees.
- *Catholic Relief Services* – The CRS focus in Zambia is on nutrition, agriculture, WASH, HIV/AIDS, health systems strengthening, microsavings, and orphans and vulnerable children.
- *SNV* – Over the decades in Zambia, the Netherlands NGO SNV has supported smallholder farmers to increase their productivity, improve food security and increase incomes. SNV also improves community access to electricity and to improved WASH.
- *Plan International* – Plan’s programmes in Central, Luapula and Eastern Provinces seek to support vulnerable children and reduce poverty in their communities. Plan addresses challenges facing girls, such as child marriage, teenage pregnancy, violence, exclusion and poverty.
- *Zambia Red Cross Society* – ZRCS has over 7,000 volunteers across the country who provide first aid training and humanitarian response to disasters, disease outbreaks, and food and water insecurity.
- *Centre for Environment Justice* - Lusaka-based CEJ prioritizes environmental protection, water security, climate change, sustainable energy and governance, with the overall objective of promoting environmental justice for the most vulnerable Zambians. Its platforms also include youth-oriented empowerment (Environmental Defenders) and school children education (Think Environment Campaign).
- *Wildlife and Environmental Conservation Society of Zambia* – WECZ promotes forest and wildlife conservation, waste management, water and climate resilience, and policy advocacy. Through a partnership with the Ministry of Education, WECZ also supports 1,000 school clubs for conservation education and local community action, the well-known Chongololo and Chipembele Conservations Clubs.

3.3.7 Academia

Zambia has several institutions of higher learning and research that prepare graduates for government services and private sector careers in natural resources management, agriculture and forestry, engineering, and mining. Three of the universities with CEED-related programmes are:

- *University of Zambia* (Lusaka) – UNZA’s Department of Geographical Sciences, Environment and Planning takes an integrated approach to the study of geography, environment, natural resources and spatial planning, including climate change, loss of biodiversity, and deforestation.
- *Mulungushi University* (Kabwe) – The School of Agriculture and Natural Resources includes coursework in food production, environmental studies, hydrology, soil science, and DRR.
- *Copperbelt University* (Kitwe) – The Department of Plant and Environmental Sciences has a focus on forestry, sustainable agriculture, resources management and climate change.

In addition, the Ministry of Agriculture runs the Natural Resources Development College (in association with UNZA), the Zambia Agriculture Research Institute, and six colleges of agriculture around the country. FAO has provided support to address climate change in their curricula, to promote sustainable agricultural practices, and to build resilience.

3.4 Climate financing requirements and on-going financing initiatives

3.4.1 Climate financing requirements

Zambia’s NDC Implementation Framework (2023) calculates the financial requirements to meet the commitments under the Paris Agreement to be US\$2.1 billion annually until 2030, primarily for renewable energy, transport and industry. The NAP (2023) estimate for climate adaptation actions in agriculture, forestry, water, transport, tourism, infrastructure, mining, wildlife, and health is US\$5 billion annually until 2030. These combined requirements amount to US\$50 billion, though some duplication of costs between the two plans is inevitable. Much of this financing would come from climate mechanisms such as the Green Climate Fund (GCF), as well as climate-related bilateral, multilateral, and domestic financing.

The private sector plays a role in providing climate finance, including corporate social responsibility initiatives. A prominent example of this is the recent creation of the US\$53 million Green Outcomes Fund, a collaboration between Zambia National Commercial Bank, Kukula Capital, and the World Wide Fund for Nature-Zambia.⁹³

Zambia has significantly increased its national budget allocation for climate change-related activities in recent years. However, the country is heavily dependent on donor support, with 95 per cent of its climate expenditures being funds channeled from international partners.⁹⁴ Weather-indexed insurance instruments are already being used, while other options being pursued by GRZ are: issuance of green bonds, developing a pipeline of potential green bond projects, and developing regulations for the carbon market and carbon trading.

The cost to Zambia of inaction is high; over the next decade, climate variability could cost it US\$4.3 billion in lost GDP—reducing annual growth by 0.9 percent.⁹⁵

⁹³ Zambia: Financing a Green Future, World Bank, 2024

⁹⁴ From Climate Risk to Resilience: Unpacking the Economic Impacts of Climate Change in Zambia, African Climate Foundation, 2023

⁹⁵ Country Partnership Framework for Zambia 2025-2029, World Bank Group, 2024

3.4.2 On-going financing initiatives

Two key funding instruments for climate and environment are the UNFCCC financing mechanisms, the GEF and the Green Climate Fund (GCF). The GEF has been an important contributor in Zambia, with 16 projects approved or ongoing with a total value of US\$665 million of which US\$102.5 million are GEF grants and the balance is co-financing from other parties. The projects fall into the categories of climate change, biodiversity, land degradation, and chemicals and waste (Table 3.6).

GEF initiatives are managed by approved delivery partners. In Zambia these partners are UNDP, UNEP, FAO, WWF, AfDB, and the World Bank. The MGEE is the primary government implementer. The World Bank has the largest portfolio, managing four projects with a total budget of US\$253.4 million, 38 per cent of the total GEF project value.

Table 3.6. Approved and ongoing GEF projects⁹⁶

Title	Focal Areas	Type	Agency	GEF Grant (US\$)	Total US\$ (incl. co-financing)
Climate-resilient ecosystem restoration and sustainable land management in the Central and Southern Provinces of Zambia (GEF ID 11212)	Climate Change Adaptation Biodiversity Land Degradation	Full-size project	FAO	11,810,092	105,509,649
Climate change adaptation in forest and agricultural mosaic landscapes (GEF ID 10186)	Climate Change Adaptation	Full-size project	FAO	8,932,420	41,953,420
Ecosystem conservation and community livelihood enhancement in North-Western Zambia (GEF ID 10192)	Biodiversity Land Degradation	Full-sized project	UNEP	5,338,585	25,718,585
Sustainable management of ecosystems in Miombo ecoregions of Zambia (GEF ID 11396)	Biodiversity Climate Change Land Degradation	Full-size project	WB	10,375,112	97,575,112
Securing the species, habitat, health and livelihoods of the Lower Kafue ecosystem (GEF ID 11154)	Biodiversity Land Degradation	Full-size project	WWF	5,966,208	24,306,671
Eastern Province jurisdictional sustainable landscape program (GEF ID 11101)	Land Degradation	Medium-size project	WB	2,000,000	24,000,000
Supporting the shift to electric mobility in Zambia (GEF ID 11082)	Climate Change	Medium-size project	UNEP	2,000,000	10,571,104
Zambia national child project under the GEF Africa minigrids program (GEF ID 10841)	Climate Change	Medium-size project	UNDP	1,363,947	14,913,947
Global opportunities for long-term development of artisanal and small-scale gold mining (ASGM) in Zambia (GEF ID 10837)	Chemicals and Waste	Full-size project	UNEP	2,703,750	25,356,864

⁹⁶ https://www.thegef.org/projects-operations/database?f%5B0%5D=project_country_national%3A176

Title	Focal Areas	Type	Agency	GEF Grant (US\$)	Total US\$ (incl. co-financing)
Securing Luangwa's water resources for shared socioeconomic and environmental benefits through integrated catchment management (GEF ID 10412)	Biodiversity Land Degradation	Full-size project	WWF	2,889,155	24,738,355
Africa environmental health and pollution management project (GEF ID 9852)	Chemicals and Waste	Full-size project	WB	8,256,881	68,556,881
Zambia integrated forest land project (GEF ID 9213)	Biodiversity Climate Change Land Degradation	Full-size project	WB	8,050,458	63,250,458
Building resilience of local communities through introduction of ecosystem-based adaptation (GEF ID 8034)	Climate Change	Full-size project	UNEP	6,185,000	21,574,400
Zambia Lake Tanganyika Basin sustainable development project (GEF ID 8021)	Biodiversity Climate Change Land Degradation	Full-size project	AfDB	7,334,247	29,824,247
Climate resilient stock management project (GEF ID 5394)	Climate Change	Full-size project	AfDB	6,210,000	26,918,000
Strengthening management effectiveness and generating multiple environmental benefits in Greater Kafue National Park (GEF ID 4639)	Biodiversity Climate Change Land Degradation	Full-size project	UNDP	13,148,864	60,085,641
Totals (16 projects)				102,564,719	664,853,334

The GCF focal point institution in Zambia is MGEE. GCF projects, classified as Readiness Projects and Implementation Projects, are oriented towards mitigation or adaptation actions. Zambia is implementing two country-specific projects:⁹⁷

- *Zambia Renewable Energy Financing Framework (GCF FP080)*, managed by AfDB, seeks to catalyze private investment in renewable energy sector to boost electricity generation, diversify the country's energy mix, and boost rural electrification with a total funding of US\$154 million.
- *The Strengthening Climate Resilience of Agricultural Livelihoods in Agro-ecological Regions I & II in Zambia (SCRALA) (GCF FP072)*, an adaptation project managed by UNDP, invests in areas such as weather information generation, improved water access for agricultural use, and farmer training in post-harvest loss management and is funded at US\$137.3 million.

Zambia benefits from another seven multi-country GCF projects addressing mitigation and adaptation challenges in agriculture, forestry, and renewable energy, as well as nine readiness projects worth US\$4.54. In 2024, UNICEF gained accredited status with GCF and is now approved to prepare and submit projects for GCF funding.

⁹⁷ <https://data.greenclimate.fund/public/data/countries>

4 Child-inclusive CEED policies and strategies



4.1 The UNICEF position on climate policies and plans

Climate change and environmental degradation undermine the rights of every child, and the most vulnerable and disadvantaged children are most at risk. As the impacts of climate change worsen, UNICEF advocates for – and supports the development of – national climate plans that are child-sensitive and gender-responsive. Global UNICEF reviews show that climate plans in many countries fail to address child vulnerabilities, or even to mention children.⁹⁸ To raise the standard, UNICEF calls for climate policies that meet these principles:

- *Ambitious and urgent* – Ambitious mitigation and adaptation measures that protect the rights and best interests of the child from harm caused by climate change.
- *Rights-based* – Explicit and meaningful references to children and youth, considering them as rights-holders and important stakeholders.
- *Holistic and multi-sectoral* – Specific sector interventions that address children’s specific risks and vulnerabilities.
- *Inclusive* – Systematic consultation and meaningful participation of all children, including children of different ages, gender and social backgrounds, that will inform every step of the climate policymaking process at all levels.

⁹⁸ An Environment Fit for Children: UNICEF’s Approach to Climate Change, UNICEF, 2019; UNICEF Sustainability and Climate Change Action Plan 2023-2030, UNICEF, 2023; NDC and child sensitivity study data portal, UNICEF, 2024.

The Committee on the Rights of the Child report for Zambia (2021) echoes these priorities, and also highlights the adverse effects of climate change and environmental degradation on children.⁹⁹ The report notes the negative effects of deforestation, land degradation, and mining on environmental health, but also mentions the progress being made on lead contamination clean-up, WASH in schools, and inclusion of climate change in the school curriculum.

In this section Zambia's key climate and environment policies and strategies were reviewed to determine the extent to which these documents consider the needs, vulnerabilities and capacities of children and youth. Similarly, Zambia's child-relevant sector strategies for the delivery of social services were also reviewed to gauge if climate and environment considerations were factored into sector plans. Scorecards summarize the results (see Table 4.1 and Table 4.2).

4.2 Do CEED policies and strategies address children's needs?

National climate policies, strategies and reports that guide the CEED agenda in Zambia are designed to contribute to global commitments and benefit the country as a whole. They vary in the extent to which they mention children and youth or include them in planned actions. This is not uncommon; the policy frameworks in many other countries have similar gaps. Foundational instruments such as Zambia's environmental management act, DRM framework, and national energy plan make no mention of children. Some other core instruments, including UNFCCC-related reports, have only a couple isolated references to children. The NAP has some mentions of the vulnerability of children and youth engagement in the formulation process.

Zambia's 2021 NDC 2.0 falls short as assessed in the UNICEF NDC and child sensitivity portal.¹⁰⁰ The UNICEF analysis of the NDC found it lacking in the criteria of rights-based, holistic and multisectoral, and inclusive of children and young people.

Table 4.1: Scorecard of national policies and strategies: child-inclusive?

Document	Child Focus?	Observation
Policies, strategies and plans		
National Adaptation Plan (NAP), 2023	Some	Children vulnerable to stunting, food insecurity and emergencies; youth recognized as marginalized social group, rural target group, and participants in NAP formulation.
Nationally Determined Contribution (NDC 2.0), 2021	Minimal	Refers to National Youth Policy and National CC Learning Strategy. No mentions of children or youth in vulnerable situations.
Provisional Nationally Determined Contribution (NDC 3.0), 2025	Some	Youth participation acknowledged in national NDC stock take in all 10 provinces. Child-sensitive indicators for adaptation (Annex 2) include: water security for all, climate resilient agriculture, resilient health sector, and resilient infrastructure for ensuring basic services.
National Policy on Climate Change (NPCC), 2016	Minimal	Women and children identified as most vulnerable to health impacts; intention to improve participation of children in climate change programmes.

⁹⁹ <https://docs.un.org/en/CRC/C/ZMB/CO/5-7>

¹⁰⁰ NDC and child sensitivity study data portal, UNICEF, 2024 <https://ndcsforeverychild.unicef.org/post/c3889d0f-f1a2-44ca-96eb-f79ed0f72167>

National Energy Policy (NEP), 2019	None	
Environmental Management Act of 2011 (and 2023 amendment)	None	
Climate Change Gender Action Plan (CCGAP), 2017	Some	Child vulnerabilities identified across sectors (e.g., unsafe water, indoor air pollution, toxic heavy metals, malnutrition, etc.). Children and youth linked to actions to improve gender equity.
National Disaster Risk Management Framework (NDRM), 2017	None	

Related reports

First Biennial Update Report (BUR) to the UNFCCC, 2020	None	
Third National Communication of Zambia on Climate Change to UNFCCC, 2020	None	

4.3 Do child relevant sector strategies incorporate CEED issues?

The sector strategic plans that most closely relate to UNICEF Zambia's main programmes were reviewed. Most make mention of climate change and environmental degradation as challenges to improved services but do not include substantive analysis of the issue, and some do not mention it at all (Table 4.2). The National Health Strategic Plan includes climate and environment impacts on the health sector and plans for improving resilience, and its related Health National Adaptation Plan lays out a more comprehensive health sector climate response.

Table 4.2: Scorecard of sector strategies: CEED-inclusive?

Document	CEED Focus?	Observation
Education Strategic Plan 2022–2026	Some	Identified climate impacts on education sector limited to storm damage to school roofs and reduced student access during floods. Resolves to invest in climate resilient infrastructure, and include nature conservation in education. DRR in schools is missing, as well as any inclusion of electrification.
National Health Strategic Plan 2022–2026	Significant	Includes impacts of climate on health services and adaptation measures. Prioritizes disease outbreaks that create health emergencies. Environmental health services (water safety, food hygiene, waste management, WASH/IPC) are a priority. Only single reference to renewable energy at health facilities.
Health National Adaptation Plan, 2017	Significant	Strong strategy for mitigating health risks associated with climate change, a detailed methodology, situation analysis, vulnerability assessment and adaptation measures specific to the health sector. Aims for adaptation and DRR; and strengthened sector capacities at all levels.

National Adolescent Health Strategic Plan 2022–2026	Minimal	Brief paragraph on climate change and adolescent health, but no mention of environmental health impacts or disaster situations.
National Youth Policy, 2024	Some	The Youth Policy has as one of its objectives: to support youth participation in environmental protection and climate action. It notes gaps in green job skills and high levels of environmental illiteracy.
Water Development and Sanitation Strategic Plan, 2022–2026	Some	Plan to invest in climate resilient infrastructure, resilient projects, water harvesting, climate-smart technologies, but no details. Weak analysis of climate impact on sector, with few references to drought, disasters or emergencies, and no mention of sector energy requirements. Emergency preparedness only in relation to COVID.
Child Safeguarding Policy, 2023	None	
Revised National Social Protection Policy 2024–2028	Some	New NSP policy acknowledges climate change impacts on food security, health, shelter, water resources and forestry, and key role of social protection to easing impacts. Seeks enhanced shock-responsive social protection.
Community Development and Social Services Strategic Plan 2023–2026	Some	Floods/droughts causing crop failures/displacement warrant need for shock-responsive interventions, disaster management, climate-smart crops, and disaster insurance schemes.

4.4 Voices of adolescents and youth

Zambia is fertile ground for adolescents and youth getting organized and making their voices heard for climate and environmental action. Hundreds youth-oriented or youth-led groups can be found across the nation. Some groups have formalized management structures over the years, while others are nascent, but all are on the lookout for grants or assistance from donors, embassies, international NGOs, and churches in order to fuel their campaigns and community action. Lusaka City Council is one source through its youth and climate change programme, another is the Constituency Development Fund (CDF) for community projects. Organizations join forces to create alliances and even regional platforms. In 2024, in the lead up to the Conference of Parties (COP) 29, a youth-led Regional Conference of Youth was held in Lusaka, joined by almost 400 climate advocates, government leaders and civil society representatives.

Groups gain formal status by registering with the Ministry of Community Development and Social Services (MCDSS) and must periodically report back. Venerable organizations such as WWF and WECZ offer support and inspiration to many youth groups. Some of the organizations with which UNICEF has connected include the Zambia Climate Youth Taskforce, Young Emerging Farmers Initiative, Centre for Climate Change Action and Advocacy, Agents for Change Foundation, and Youth Movement on NDC.

5 Impact of CEED situation on UNICEF outcome areas



5.1 Health

Of the global burden of disease attributable to climate change, 88 per cent is borne by children.¹⁰¹ Children's health is highly vulnerable to the most severe effects of climate change including heatwaves, droughts and floods, all of which are increasing in frequency and intensity. And when urgent care for children is required, access to healthcare is a challenge for many rural Zambian families, half of whom live more than five km from a health facility.¹⁰²

Changes in weather patterns are dangerous for children, creating more conducive breeding conditions for mosquitoes, flies, and other insects, spreading or intensifying vector-borne diseases such as malaria, dengue, Rift Valley fever, yellow fever, schistosomiasis and chikungunya. More frequent or more intense heatwaves can severely affect babies and young children, causing hyperthermia, cardiovascular disease, and death. Heat-related mortalities can also be linked to increased rates of food- and water-borne disease that provoke excessive fluid loss, such as diarrhoea. Cholera outbreaks are associated with rain events when water supplies and sanitation facilities are flooded, as well as with dry periods when poor quality water sources are used.

Floods and storms affect vital health services for children, damaging facilities, transport infrastructure and the electrical grid, and disrupting service delivery, supply chains and physical access to care.

¹⁰¹ Global climate change and children's health: threats and strategies for prevention. PE Sheffield, PJ Landrigan, Environmental health perspectives, 2011 <https://pubmed.ncbi.nlm.nih.gov/20947468/>

¹⁰² The Situation Analysis of the Status and Well-being of Children in Zambia, UNICEF, 2021

Children are also vulnerable to severe physical injuries, infections, disability or even death from intense events.

Disruptions to daily life can increase children's stress and can contribute to traumatic experiences, affecting their mental health. Adolescents and young people are at a critical phase of cognitive development that can be affected directly by climate-related events or indirectly by school disruptions, family and financial stress, displacement or food insecurity, which results in impaired decision-making, depression and climate anxiety.¹⁰³ In adults, both men and women tend to experience higher rates of mental health challenges after disasters. Crop failure and loss of livestock due to the 2024 drought has led to significant anxiety and stress among farmers and their families. The uncertainty about the future and the loss of a primary income source is contributing to mental health issues and negative coping such as alcohol consumption.

Climate change can have a detrimental impact on air quality, as changes to temperature, rainfall and wind speed determine the spread or concentration of pollutants. Children are especially vulnerable because their brains, lungs and other organs are still developing. Children are more exposed than adults because they breathe twice as fast, and they interact more with those pollutants that concentrate close to the ground. Ambient air pollution is generated from industry, waste burning, transport emissions, road dust, brake/tire wear, and wildfires.

UNICEF, in partnership with the Health Effects Institute, determined that ambient and indoor air pollution was the second-leading global risk factor for children under five years old after malnutrition.¹⁰⁴ Most deaths are linked to household air pollution due to cooking indoors with unclean fuel. More than 90 per cent of air pollution deaths are attributed to ultrafine particulate matter (PM_{2.5}). In Zambia, due to the widespread use of wood and charcoal for cooking (see Section 2.2.4), children and women are exposed to indoor air pollution. Pregnant women are at risk of giving birth prematurely and having low birthweight babies.

Ground-level ozone (O₃), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂) exacerbate cardiovascular disease and lead to respiratory problems and long-term damage to the central nervous system. PM_{2.5} can cross the blood-brain barrier causing inflammation, damaging brain tissue, and permanently impairing cognitive development.¹⁰⁵ Many types of pollutants are mixed, and there can be considerable interaction between pollutants, so it is difficult to determine the cause and effect of discrete pollutants.

5.2 Nutrition

Extreme climatological trends, exacerbated by climate change, can have powerful consequences on nutritional status. Zambia's food and nutrition security is already precarious; seasonal hunger affects many families and children suffer from stunted growth. Hunger, malnutrition and chronic disease can result from the absence of diverse foods all year round. Low consumption of fresh foods and vegetables is exacerbated by the growing preference for unhealthy foods and sweet beverages, particularly in urban populations.

¹⁰³ Mental Health and Our Changing Climate: Children and Youth Report, American Psychological Association, 2023

¹⁰⁴ <https://www.stateofglobalair.org/resources/report/state-global-air-report-2024>

¹⁰⁵ Clear the air for children (blog), UNICEF, 2016

Low rainfall, loss of soil fertility, biodiversity loss, crop pests and extreme weather events threaten crops and livestock, and the availability and affordability of locally produced food, restricting children's access to diverse and nutrient-rich food like vegetables, fish or meat. Subsistence farming families and low-income families are especially vulnerable to food shortages and price hikes.

Lack of sufficient nourishment for pregnant women and young children increase the incidence of low birthweight and infant mortality and exacerbate child malnutrition. Stunted children who survive will experience greater incidence of disease, more extensive learning disabilities, and reduced physical capabilities. For Zambia's under-five children, the stunting rate (too short for their age) is 32 per cent and the prevalence of wasting (too thin for their height) is 3 per cent.¹⁰⁶ By contrast, 4 per cent are overweight (too heavy for their height).

Poor water, sanitation and hygiene conditions only exacerbate poor nutritional status in children. Micronutrient deficiencies among children, pregnant women and lactating mothers is widespread in Zambia, perpetuating the intergenerational cycle of malnutrition. Anemia affects 28 per cent of children under age five and 21 per cent of women of reproductive age.¹⁰⁷ Under-nutrition is a major co-factor in young child mortality and morbidity.

After a major climate shock, household food insecurity can continue on a long-term basis. The effects of the 2024 drought have extended into 2025 with delayed onset of rains or rainfall deficits in places. The Integrated Food Security Phase Classification for the October 2024-March 2025 period projected that 5.8 million Zambians would continue to face acute food insecurity.¹⁰⁸

5.3 WASH

Climate change manifests itself through changes in the water cycle – melting ice, evaporation, atmospheric moisture, and droughts. Demand for water is growing as rising temperatures, rainfall variability and environmental hazards are making it more scarce, unpredictable or polluted. Large rainfall events lead to more runoff of sediments, nutrients, pathogens, and toxic substances (especially in urban areas), increasing the pollutant load in waterways, reducing water quality for water supplies, fisheries or recreation. Sediments are deposited in reservoirs, reducing their storage capacity.

Longer dry seasons and drought periods will increase water demand for hydropower, industrial use, domestic water supply and irrigation, and water shortages can result in increased costs. Increased evapotranspiration will reduce water flows and soil moisture. Groundwater, the source of most agriculture and domestic water supply in Zambia, is buffered from short dry spells but reduced recharge and uncontrolled withdrawals raise the spectre of depleted groundwater reserves.

Zambia has made steady progress in increasing access to WASH services. From 2000 to 2022, the proportion of population without safe water sources has dropped from 30 per cent to 19 per cent,¹⁰⁹ but the provision of effective and equitable services remains a challenge. Sector reforms promise to improve financial sustainability and affordability to cover operational costs, expand and improve services, and

¹⁰⁶ Zambia Demographic and Health Survey: Key indicators report, Zambia Statistics Agency, 2024

¹⁰⁷ <https://www.unicef.org/zambia/nutrition>

¹⁰⁸ https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Zambia_Acute_Food_Insecurity_Jul2024_Mar2025_Report.pdf

¹⁰⁹ [Data Warehouse - UNICEF DATA](#)

strengthen the legal and regulatory framework. The expected outcome will be higher drinking water standards and better water quality monitoring, more reliable water services, and the improved collection, treatment and safe disposal of municipal sewage. In all this, the sector must factor in changes in climate, environment, and energy at the same time.

Reliable energy supplies are essential for water and sanitation pumping stations and treatment plants. Water utilities in Zambia have experienced increased electricity expenditures, driving up their recurrent costs. Sustainable energy solutions are being addressed by the EU-financed Nexus Energy and Water Programme for Zambia, which is investing in renewable energy production, energy efficiency, and digital systems for operational efficiency.

Severe weather events can endanger water and sanitation infrastructures, particularly those that are poorly located or under-designed, interrupting WASH services. Heavy rains put drainage systems under stress, highlighting the costs of underinvesting in climate-proofed urban infrastructure. Low-lying wastewater systems and on-site sanitation are especially at risk of flood damage and overflow, resulting in contamination of the environment with raw sewage and increasing the risks of cholera or diarrhoeal disease outbreaks. Cholera outbreaks are a yearly occurrence in Zambia and Lusaka is usually the epicentre due to its congested slums with inadequate water supply and sanitation services.

Critical sector resources are diverted to repeated responses to public health emergencies or disasters. While WASH institutions must prioritize the provision of life-saving measures, they still need to continue long-term building of institutional and community capacities for durable WASH solutions. These solutions need to include nature-based measures such as watershed protection, aquifer recharge, water and soil conservation, wetland conservation, and natural drainage restoration.

Evolving environmental threats or changing disease prevalence will require adaptations to hygiene promotion messaging and more robust civic education on good water conservation at home, school or work to overcome water supply shortages. Disaster-resilient education should focus on children's safety at school and at home.

5.4 Education

The effects of climate change can disrupt learning, hinder access to education (particularly for girls), and weaken the education system as a whole. Climate and environmental threats exacerbate poor access, poor retention and poor learning outcomes in basic education that reflect patterns of poverty, geographical disparities, gender inequities, disability, and displacement.

Increasingly frequent storms and floods can rip off roofs, damage school equipment and disrupt education services, leading to absenteeism, possibly for extended periods. Emergency learning spaces may be needed to substitute for affected schools or in cases of forced displacement. Health emergencies such as cholera outbreaks can also interrupt the school calendar, impacting learning.

Schools in hotter environments may have inadequate ventilation or cooling, making the classrooms uncomfortable, leading to lower learning outcomes. Adaptation strategies include climate-proof school construction, providing cool drinking water or shifting school hours to avoid the hottest periods.

Climate shocks and environmental degradation highlight the importance of providing disaster preparedness education in schools, to reduce children's vulnerability. Preparedness drills, school risk

maps, and contingency plans are all ways to reduce students' exposure to hazards. School facilities may also need to be adapted to serve as community shelters in emergencies. School rehabilitation costs after natural disasters can drain budgets and divert resources from teaching and maintaining a protective school environment.

To “ensure inclusive and quality education for all and promote lifelong learning”, all schools should have basic, functioning WASH services.¹¹⁰ Yet in Zambia, 21 per cent of schools still lack access to basic water facilities, and 17 per cent lack basic sanitation.¹¹¹ School-age children are susceptible to diarrhoeal diseases, severe infectious diseases, and soil-transmitted helminths, which persist under conditions of water scarcity, poor sanitation, and poor hygiene at school and at home.

Droughts or environmental stress can lead to the degradation of livelihoods and food insecurity, particularly in poverty-prone rural areas. Family budgets that have been stretched to accommodate increasing costs of food and shelter may not be able to cover school-related costs. Children often have to supplement the family income, sacrificing their education.

Social and cultural beliefs related to child marriage, girls' education and domestic work pose a threat to young girls in accessing and completing the primary school cycle in Zambia. An estimated 29 per cent of young women aged 20–24 years were first married or in union when they were children, before 18 years of age.¹¹² Girls with only primary education were four times more likely to marry before age 15 compared to girls with secondary education.¹¹³ Child marriages and early pregnancies are associated with poor health outcomes for young people.

A reliable power supply contributes to a school's resilience, yet in 2020, 55 per cent of schools had no electricity, representing a higher proportion of primary schools (61 per cent) than secondary schools (19 per cent).¹¹⁴ Thirty-one per cent of all schools had grid service, while the others with power were connected to generators, solar PV or small hydro.

The threats of and exposure to climate impacts and environmental degradation offer real-life opportunities for the education sector to address the risks associated with climate change, building appropriate science and problem-solving skills, as well as knowledge of environmental sustainability. Children and adolescents will need to be properly equipped with life skills and vocational training to thrive and realize their socio-economic potential, possibly in green employment.

5.5 Adolescents and youth

Climate change and environmental degradation undermine health, nutrition, education and protection systems, key factors in the well-being of youth and adolescents. Opportunities can become limited as climate shocks create socio-economic hardships. Social instability can leave youth and adolescents exposed to violence or mental or physical abuse at home, communities and schools.

¹¹⁰ 2030 Agenda for Sustainable Development: Goal 4, United Nations, 2020

¹¹¹ <https://www.unicef.org/zambia/water-sanitation-and-hygiene>

¹¹² Zambia Country Profile Child Marriage, UNFPA-UNICEF, 2021

¹¹³ Zambia National Adolescent Health Strategic Plan 2022-2026, MOH

¹¹⁴ Education Statistics Bulletin, Ministry of Education, 2020

Psychosocial impacts can result from direct climate change effects but also from the growing awareness of climate change and the uncertainties it casts over a secure future. Young people are expressing negative emotions such as fear, sadness, helplessness and anger at the prospect of climate change, which can contribute to increased risk of diminished long-term social and cognitive development.¹¹⁵

Youth engagement and environmental activism in Zambia are evidenced by the hundreds of local groups that organize awareness sessions and become involved in environmental activities. Despite the risk of climate anxiety, a heightened sense of urgency for youth participation and empowerment can be seen as a positive force and an important catalyst for change.

Adolescents and youth will need to be properly equipped with basic education, life skills and vocational training to thrive and realize their socio-economic potential. Disadvantaged youth, especially marginalized girls with special needs and disabilities, receive fewer learning and life skills opportunities to help them compete in the marketplace. The Zambian education system has continued to record high dropout rates among adolescent girls in secondary school due to pregnancy, early marriage and economic hardship.¹¹⁶

The unemployment rate for young people aged 15-24 is 10 per cent.¹¹⁷ Unemployed or out-of-school youth are the target of Zambia's Technical Education, Vocational, and Entrepreneurship Training Authority (TEVETA) under the Ministry of Technology and Science. TEVETA's mission is to equip individuals with skills aligned with the labour market. Its Entrepreneurship Incubation Centres offer opportunities for students and youth to create viable businesses.

5.6 Child protection and child labour

Climate change and environmental degradation contribute to poverty, conflict, violence, and exploitation, putting children at risk. Climate-driven humanitarian disasters, whether disease outbreaks, natural disasters, or extreme weather events, result in stretched social protection services that struggle to respond. Child protection interventions such as psychosocial support, prevention of gender-based violence, and family reunification will become ever more critical, and the capacities of child protection services must be strengthened to meet the growing challenges, which include unpredictable flows of unaccompanied or separated migrant and refugee children.

Rainfed agriculture is vulnerable to erratic precipitation and increasing temperatures, with risks of water stress, longer droughts, fires, and crop pestilence. The 2024 drought resulted in high levels of stress, anxiety and emotional distress due to food insecurity, financial hardship and family breakdowns. Stress can lead to increased domestic conflicts, resulting in separation, gender based violence and emotional neglect.

Disproportionately affecting the poorest, climate change increases inequality, prolonging existing poverty traps and creating new ones, leading to more deprivation and marginalization of vulnerable groups, and this in a country with a poverty rate of 60 per cent.¹¹⁸ Poor families can be forced out of their homes or communities in search of income opportunities.

¹¹⁵ Climate Change and Children: An issue of intergenerational justice, Ann Sanson and Susie Burke, 2019

¹¹⁶ Zambia National Adolescent Health Strategic Plan 2022-2026, Ministry of Health, 2022

¹¹⁷ <https://data.worldbank.org/indicator/SL.UEM.1524.ZS?locations=ZM>

¹¹⁸ <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=ZM>

Child labour and exploitation can increase, and children may take menial or hazardous jobs like scavenging at dumpsites. In Zambia, the majority of these children work at agricultural chores – tobacco and cotton crops or herding livestock. Eight per cent of children aged 5–14 years old work without going to school.¹¹⁹ Children also engage in artisanal mining, one of the worst forms of child labour.

During the 2024 drought children, particularly boys, were forced into casual labour. Girls experienced greater likelihood of child marriage, sexual exploitation and teenage pregnancy, and leaving school permanently. Girls living near borders and transit corridors are particularly vulnerable to sexual exploitation. In cities, child workers and street children are subject to risks such as physical injuries or exposure to toxic substances, waste, particulates, smoke, and traffic pollutants, all of which can lead to respiratory problems or long-term damage to the central nervous system.

5.7 Social policy

Climate change and environmental impacts drive inequality and threaten standards of living, hindering economic growth and putting a strain on public expenditures. Investments in social sectors and strengthened social protection mechanisms, such as health insurance, pensions, and cash transfers, are ways to mitigate society's exposure to climate shocks. Projected requirements and strategies for social assistance and disaster relief programmes need to proactively consider the impacts on the population, especially the most vulnerable in the poorest communities. Women and young people are more likely to be out of the workforce, unemployed, or in precarious and low-skilled employment. People with disabilities, already with marginalized access to education, health, and housing, are especially at risk.

The challenges of gearing up the national social cash transfer programme to respond to recent emergency shocks were highlighted by experiences during the COVID-19 pandemic and the 2023–2024 drought. Gaps were noted in achieving desired coverage levels, implementation capacity of service providers, interministerial coordination and real-time monitoring.¹²⁰ Nevertheless, an evaluation of emergency cash transfer programmes for earlier crises (2019–2021) found that the operations proved effective in terms of household resilience through the diversification of income, sustained child education and higher access to health services.¹²¹

During the 2024 crisis, the Zambian government issued a supplementary budget of approximately US\$1.45 billion, partially financed through debt, to support the drought response. This realigned budget resulted in increased funding to the social cash transfer programme, water supply management, school feeding and livestock disease control. Emergency infusions to the cash transfer programme allowed it to reach 2.2 million families with support, proving the effectiveness of the shock responsive social protection system.

The most vulnerable to the adverse impacts of climate change are people living in ecologically fragile areas and hazard-prone locations. The rural poor in Zambia depend on its biodiversity and ecosystem services for their livelihoods. In urban areas, the poor often live on marginal lands, subject to flooding or industrial harm. Low-income households are particularly disadvantaged and exposed to land-use change, pollution (water, air, land), chaotic urbanization, and inefficient transport systems.

¹¹⁹ https://www.dol.gov/sites/dolgov/files/ILAB/child_labor_reports/tda2023/Zambia.pdf

¹²⁰ Revised National Social Protection Policy 2024–2028, GRZ

¹²¹ Zambia's Emergency Cash Transfer Programmes: a process evaluation, UNICEF, 2022

Climate impacts accentuate gender inequality. They affect women disproportionately, especially in the areas where women play a central role—food security, subsistence agriculture, home energy, and childcare. Resilience at home is hampered by barriers to decision-making power, financial resources, and information that increase women’s vulnerability. Girls and young women in Zambia feel they lack control over decisions made for them, such as relocating with the family in search of pastures or shelter from floods, or even the forced marriages.¹²²

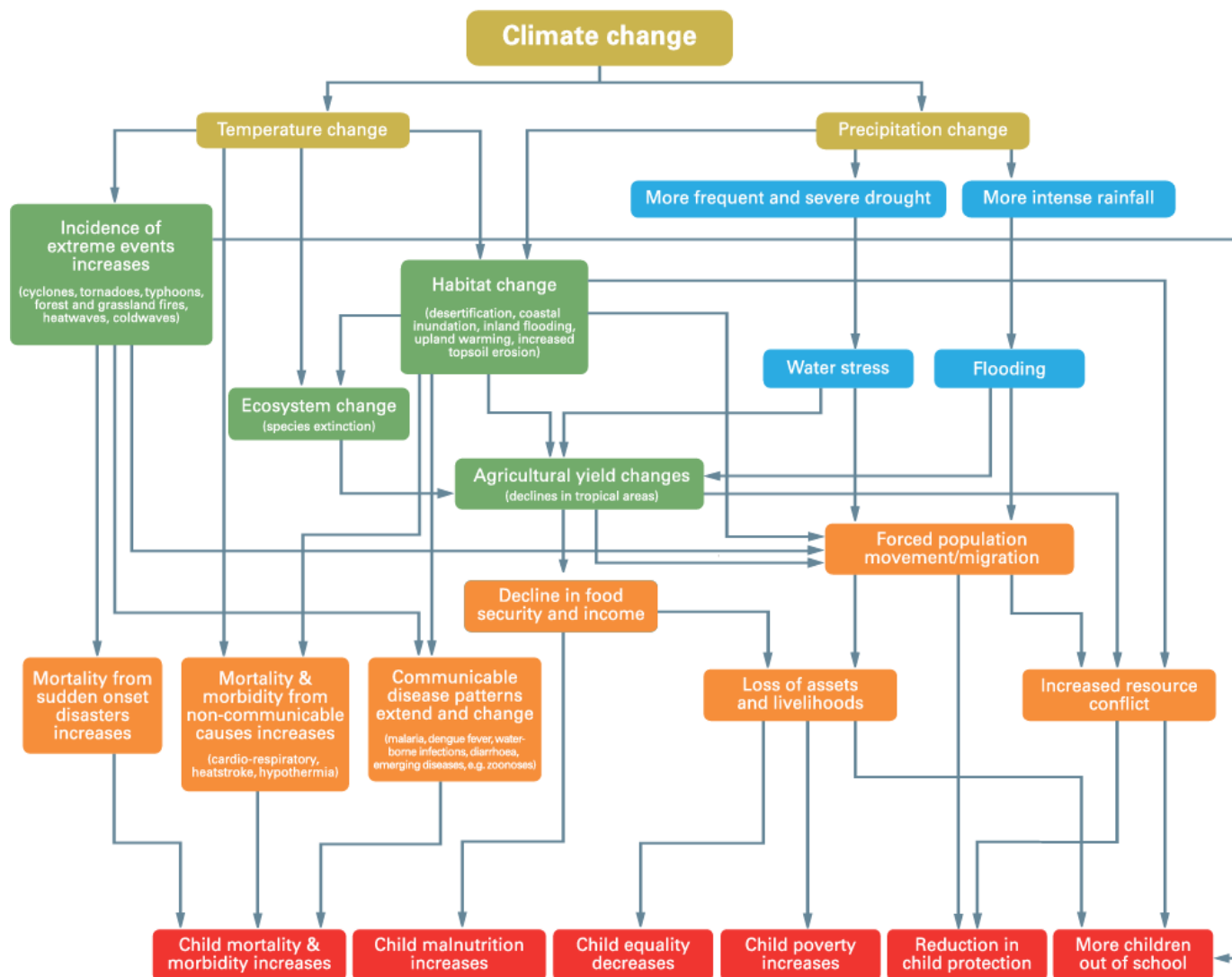
Energy poverty (lack of access to affordable, reliable energy) disproportionately affects women in terms of sustaining livelihoods and overcoming household poverty, both of which directly impact the health and well-being of children. While Zambia’s energy policies prioritize gender equality within the energy landscape, the reality remains that only a small percentage of households use clean fuels for lighting and cooking, which have the potential to save time by women and girls and improve their health and safety.

5.8 Illustration: how climate change affects children¹²³



¹²² Adolescent Girls in the Climate Crisis: Voices from Zambia and Zimbabwe, Plan International, 2021

¹²³ Our climate, our children, our responsibility, UNICEF UK, 2008



5. UNICEF programming on climate, environment, energy and DRR



6.1 Guidance and resources on CEED programming

UNICEF's growing collection of programme guidance reflects organizational commitments to healthy environments for children and builds on UNICEF experience in CEED programming. These resources will be useful as UNICEF Zambia considers how to adjust its programming for children to address the climate crisis. Global policy and strategy documents also provide guidance for alignment with the overall UNICEF CEED agenda.

The foundational 2019 report, [An Environment Fit for Children, UNICEF's Approach to Climate Change](#), outlines strategic directions for UNICEF external advocacy, programmatic interventions, and internal greening efforts. The more recent [UNICEF Sustainability and Climate Change Action Plan \(SCAP\) 2023–2030](#) lays out a template for CEED programming in countries. The Action Plan's three objectives are to:

- Protect the lives, health and well-being of children and the resilience of their communities by adapting essential social services to a changing climate, more frequent disasters and a degrading environment.
- Empower every child through their life course with the developmental opportunities, education and skills to be a champion for the environment.

- Reduce the emissions and environmental footprint within UNICEF, support its global network of partners to do the same, and advocate for the fulfilment of ambitious international sustainability and climate change agreements.

On the Agora learning platform, open to partners and the general public, UNICEF offers two courses on climate change: [Introductory e-Course on Climate Change](#) and the more detailed [Integrating Climate Change in UNICEF Programming](#).

UNICEF guidance materials on operationalizing CEED both for general and sector-specific programming include:

- [Healthy Environments for Healthy Children: Global Programme Framework](#), 2021
- [Protecting Children from Heat Stress: A technical note](#), 2023
- [Building the Climate Rationale for Water Sanitation and Hygiene interventions](#), 2023
- [Agenda for Child Nutrition and Climate Action](#), 2023
- [Child Nutrition and the Climate Crisis: UNICEF Framework for Action](#), 2025
- [Climate, energy, environment and DRR in UNICEF's 2022–2025 Strategic Plan](#), 2022
- [UNICEF Toolkit for young climate activists](#), 2023
- [Strengthening shock responsive social protection systems](#), 2019
- [Guidance on Risk Informed Programming \(GRIP\)](#), 2018

UNICEF staff have access to growing internal set of resources on the UNICEF SharePoint site. This includes extensive guidance on the SCAP, including a menu of options for country office initiatives and a toolkit for integrating sustainability and climate action into programming. The site includes sector-focused sections such as a sub-site on shock-responsive social protection, and other sector-specific materials. It has links to UNICEF's monthly bulletin on CEED programming, the CEED community of practice site, and a growing set of links to external resources that are applicable to UNICEF programming.

UNICEF issues a number of advocacy reports focused on children and climate. A central part of this effort is the [Children's Climate Risk Index \(CCRI\)](#), released in 2021, which assesses risks worldwide and a set of updates and related materials including [The climate-changed child: A Children's Climate Risk Index supplement](#), the [Children's Climate Risk Index-Disaster Risk Model \(CCRI-DRM\)](#) subnational risk assessment tool, and regional and national iterations of the CCRI. Other examples are:

- [Children displaced in a changing climate: Preparing for a future already underway](#), 2023
- [A Livable Planet for Every Child – UNICEF's Strategy-at-a-Glance for Climate, Environment, Energy and Disaster Risk Reduction 2022–2030](#)
- [Making Climate and Environment Policies for and with Children and Young People](#), 2021
- [Actions for a Livable Planet for Every Child: Advocacy brief](#), 2022
- [Every country protected, every child resilient: UNICEF DRR in Action](#), 2022.

6.2 UNICEF CEED programmes in Zambia

UNICEF Zambia's country programme document (2023–2027) identified climate-related shocks as an important factor in developing its new programme, but references to the effects of environmental degradation on children in Zambia are almost completely absent. Most climate references can be found in the WASH programme, which has been charged with leading on CEED-related issues in the office, reflecting UNICEF's global WASH-CEED twinning.

However, UNICEF Zambia has taken strides to incorporate CEED-sensitive topics into its country programme and to address issues related to children and climate change and the environment, both through existing sectoral programmes and new initiatives. These examples include:

- Throughout 2024, UNICEF contributed vital risk reduction efforts to the national response to the El Niño-induced drought that left millions of Zambians relying on relief assistance. Led by its nutrition, health and protection teams, UNICEF treated acute malnutrition in children under five, provided immunization services, and supported community risk-assessments, as well as critical WASH services.
- The UNICEF health programme has invested in HCF solar PV power just for vaccine cold chains for years. Starting in 2025, the Health Facility Solar Electrification pilot, with a multi-country Gavi grant, will reach 200 HCFs with sufficient power for essential medical equipment, storage of vaccines and medicines that require cold chain, connectivity and digital devices, basic lighting, and a safe environment for health workers to deliver quality health services. HFSE is a learning project for Zambia under the auspices of MoH and with the participation of MLGRD, MFNP, ME and MGEE.
- The Climate Resilient WASH programme led discussions with sector institutions for the analysis of climate risks in Zambia, using the services of the Stockholm International Water Institute. In 2025, the exercise will develop a climate rationale report to guide the sector, as well as to help position WASH more prominently into national climate policy documents.
- To green the UN common premises and ensure reliable power, solar PV was fortunately installed prior to the drought that made hydropower electricity blackouts commonplace. The installation of back-up storage batteries is the next step.
- UNICEF played an active role in ensuring youth participation in the stocktake leading up to Zambia's submission of its NDC 3.0 in February 2025. Youth workshops for climate advocates were organized to assist MGEE hear young people's concerns and receive inputs into the new climate commitments.

The recommendations in Section 7 for strengthening current programme activities and exploring new strategies take into account these examples as a foundation on which to base new programming.

7. Recommendations for UNICEF



The set of recommendations in this section are intended to help guide UNICEF Zambia’s advocacy and programming efforts in the area of climate, the environment, energy and DRR. They are aligned with UNICEF’s major global climate and environmental sustainability strategies, including the Sustainability and Climate Change Action Plan 2023–2030.¹²⁴ The recommendations fall into four categories:

1. Make children a focus of climate and environmental strategies.
2. Empower children as change agents.
3. Protect children from the impacts of climate change, environmental degradation and disasters.
4. Reduce emissions and pollution.

7.1 Make children a focus of climate and environmental strategies

Advocate with the government and development partners to put children first in national sustainability plans, budgets and actions towards a green transition.

7.1.1 Make children visible in new or updated climate and environment policies and strategies in Zambia.

¹²⁴ An Environment Fit for Children: UNICEF’s Approach to Climate Change, UNICEF, 2019, and the UNICEF Sustainability and Climate Change Action Plan 2023-2030, UNICEF, 2023.

Only some of the existing climate policy documents mention children, let alone highlight their unique needs and rights in the face of climate threats. Just as UNICEF teamed up with UN agencies and MGEE to contribute children's voices to the consultations for provisional NDC 3.0, other similar opportunities will arise to advocate for the inclusion of child and youth perspectives.

UNICEF guidance, "Are climate policies child-sensitive?" (Section 4), sets out principles to be applied when climate policies are developed or revised. UNICEF must pursue synergies and linkages with new or ongoing projects and programmes in the climate and environment policy space. Dialogue with other UN agencies, and especially UNDP, is essential. Globally, UNICEF has gained accredited status with GCF and is now approved to prepare and submit projects for GCF funding, a significant opportunity to put child-oriented objectives at the centre of climate-related programming initiatives.

Responsible: Deputy Representative

7.1.2 Ensure that new child-relevant sector strategies and plans account for climate impacts and contribute to national mitigation, adaptation and environmental protection goals.

Similar to child visibility in climate and environment policies, UNICEF has an important role in ensuring that child-relevant national sector strategies (e.g., health, education, WASH) reflect climate and environment hazards and lay out measures to adapt to them. Opportunities for updating sector strategies can be expected in the next year, as many strategies expire in 2026.

UNICEF should develop a robust relationship with MGEE, which is the focal point for Zambia's climate and environment agenda. MGEE is the national designated authority for UNFCCC and for GCF, but it is a relatively new ministry with substantial needs for support and capacity building. It also houses the Forestry Department, crucial for controlling deforestation, and ZEMA, Zambia's principal environmental regulator.

Similarly, decentralized administrations (e.g., provinces, districts) have limited CEED expertise, although they are relied upon to carry out much of Zambia's climate and environment agenda with local communities. UNICEF could find critical training or support linkages between its ongoing programmes around the country and skills development opportunities to help fill this gap.

Responsible: All programme sections

7.1.3 Explore opportunities to work with the private sector to identify how their products, services and supply chains can be harnessed to promote environmental sustainability and protect nature.

Just as it joined the regional agreement with Airtel Networks to accelerate the rollout of digital learning by connecting schools to the internet, UNICEF Zambia should identify businesses that have the potential to enrich children's lives while reducing negative impacts on water, soil and air. For example, the agriculture and food industry makes production and marketing decisions that determine the options families have for their daily meals. In addition, agribusiness supply chains affect rural livelihoods, and have implications for child rights and child labour laws.

The food industry is at the nexus of climate and tackling child's malnutrition as it addresses nutrient-rich foods; diet diversity; prevention of micronutrients deficiency; local production, transformation and retail of food by MSMEs; affordable food supplements; regulation of unhealthy "junk" foods; and youth engagement with healthy food choices. UNICEF, with its UN partners, should use alliances like the

Zambia SUN Business Network to develop common approaches with the private sector that promote an accessible and affordable variety of healthy nutrition options.

Regarding private sector partnerships, conversations are already underway between CAPE and Nutrition sections and Emerging Cooking Solutions (SupaMoto)¹²⁵ for an innovative approach that simultaneously helps address two of Zambia's greatest health and environmental threats: indoor air pollution and deforestation. (See videos.)

Responsible: Deputy Representative – Operations, CAPE, Nutrition, Health, SBC

7.2 Empower children as agents of change

Support and empower children and young people to adapt and create a better world.

7.2.1 Team up with youth-led organizations on CEED issues, fostering youth participation and engagement for a safe and protective environment.

Zambia has hundreds of groups eager to make their voices heard, not just in communities but also in decision-making forums on climate, environment and energy pathways. CAPE has spearheaded consultations with youth participants for the new NDC 3.0, and these new relationships offer entry points to broader support. UNICEF may wish to prioritize established organizations, platforms and alliances to maximize breadth and traction, and will need to systematically assess strengths and capacities, geographical presence and modalities of engagement. Extra care will be required to design consistent messaging across many youth groups nationwide, as well as coordinating with the many development partners that also engage with youth in the climate space.

Priority quality of life issues, such as the management of solid waste and plastics, are fertile areas for youth involvement, requiring behaviour change and actions starting at the most local levels, including at home, in schools and at community level. Other topics amenable to youth participation are water conservation awareness campaigns, or pressing for parks and green spaces for recreation, especially by those living in slums and peri-urban areas that have seen them disappear. Youth organizations rally around hands-on greening efforts that include tree nurseries and tree planting, through school clubs or directly in the community.

All programmes have a responsibility to engage children, adolescents and youth into their activities. As an example, the NEWZA project links literate youth from the community to water point communities to boost record keeping and functionality.

Responsible: CAPE, all programme sections

7.2.2 Use existing UNICEF tools and resources to help young climate and environment advocates effectively reach their audiences.

UNICEF has developed a range of resources to engage young people in climate and environment action and increase the reach and visibility on social media channels of climate champions with child-relevant messages during campaigns, event days and youth forums. These include comprehensive resource kits to help young people become informed and effective climate champions: the UNICEF and UNDP *Young*

¹²⁵ https://www.youtube.com/watch?v=8LU8_Wfc7hQ ; <https://vimeo.com/774614718>

Climate Activists Toolkit from the MENA region,¹²⁶ a similar toolkit from the LACRO region,¹²⁷ and a new global toolkit developed by U-Report and Voices for Youth.¹²⁸

There are two other global UNICEF resources that can be drawn upon by the Zambia team. The Green Rising initiative, developed with Generation Unlimited and a global consortium of public, private, and youth partners, provides resources on climate volunteerism, advocacy, and green skills.¹²⁹ The Leading Minds on Climate programme provides fellowships for young climate leaders aged 15–25, and a set of papers on climate activism developed with fellowship holders.¹³⁰ (See Section 6.2 for additional guidance materials.)

These resources, along with partnerships with UN agencies and NGOs that are involved in these efforts, can also be useful to prepare youth delegations from Zambia for participation in regional and global climate events.

Responsible: CAPE, all programme sections

7.2.3 Explore the possibilities and advantages of investing in technical and vocational education and training (TVET).

Zambia's TEVETA¹³¹ under the Ministry of Technology and Science receives support from UNESCO and GIZ, among others. UNICEF could also contribute through this national programme for training and placement, combining youth preparation for the workplace with the green economy. Green career opportunities help businesses advance their corporate social responsibility while contributing to a sustainable Zambia in such areas as solar PV installation and services, sustainable forestry, water conservation, wildlife management, water utilities and climate-smart agriculture.¹³²

CAPE has commissioned a study on the adolescents and youth landscape in Zambia, which aims to identify opportunities for youth in education, training and entrepreneurship. This study is a timely opportunity to explore existing skills-building programmes and possible linkages with UNICEF. Based on this, UNICEF can develop a strategy that promotes climate and environmental action, while creating pathways to green jobs. However, the adolescents and youth study TOR do not mention TEVETA or green jobs as subjects to be included in the assessment, which could be changed.

Responsible: CAPE

¹²⁶ The Young Climate Activists Toolkit, UNICEF MENA, 2022 <https://www.unicef.org/mena/reports/young-climate-activists-toolkit>

¹²⁷ Toolkit for young climate activists, UNICEF LACRO, 2020 <https://www.unicef.org/lac/en/toolkit-young-climate-activists>

¹²⁸ Tools for young climate activists, UNICEF and Voices of Youth, 2023 <https://www.voicesofyouth.org/climate-toolkit>

¹²⁹ Green Rising, Generation Unlimited, 2024 <https://www.generationunlimited.org/green-rising>

¹³⁰ Leading Minds on Climate Action, UNICEF, 2024 <https://www.unicef.org/innocenti/reports/leading-minds-2024-climate-action>

¹³¹ Technical Education, Vocational, and Entrepreneurship Training Authority

¹³² ILO definition for green jobs: Improve energy and raw materials efficiency, eliminate GHG emissions, eliminate waste and pollution, protect and restore ecosystems and human health, support adaptation to the effects of climate change.

7.3 Protect children from the impacts of climate change, environmental degradation and disasters

Strengthen the resilience and continuity of social services in the face of climate and environmental impacts, including disasters.

7.3.1 Anticipate climate and environmental degradation impacts on children and identify ways that programmes can incorporate effective adaptation strategies that bolster social services.

The UNICEF CCRI report revealed the extent to which child vulnerability to climate change and environmental degradation increases when basic services are poor or non-existent. UNICEF's programmes are the core of its contribution to a better Zambia for children, based on systems strengthening, intersectoral collaboration and sustainable results. Programme sections understand the constraints and opportunities of charting successful interventions, and now they must also weave in practical ways to reduce child vulnerability to climate and environment stresses, starting with DRR measures to prevent, reduce and prepare for disaster risk in their sectors and at community level. UNICEF-HQ programme guidance (see Section 6.1) needs to be interpreted and adapted to the local context. There is an abundance of ideas and field results that can be gleaned from government agencies and development partners in Zambia.

The ongoing exercise by WASH to prepare a climate rationale for the water sector suggests the possibility that all programme sections draft their own climate rationale, or CEED theory of change. For WASH, four key elements constitute the climate rationale: climate science basis; impacts on the delivery of services; prioritization of technical and non-technical adaptation solutions; and linkages with national climate priorities. A common understanding of the climate risks and recommended responses to improve resilience for each outcome area will give staff greater confidence in the climate space and also standardize how UNICEF articulates its CEED position in future fundraising proposals.

Responsible: Deputy Representative, all programme sections

7.3.2 Strengthen the WASH in Institutions component.

WASH in Schools, a hallmark of UNICEF integrated interventions for decades, has expanded to address gaps in WASH, IPC, and medical waste disposal in HCFs, tested through the COVID-19 experience. More intentional planning, coordination and implementation is required of WASH, Health and Education together as co-partners, if the poor conditions in Zambia's schools and HCFs are to be improved. WASH in Institutions requires a strong cross-sectoral interface with the multiple government ministries and institutions it draws upon. This makes it a challenging endeavor. WHO-UNICEF guidance materials, such as WASHFIT, to plan and monitor incremental improvements in HCFs are already in use.

Responsible: WASH, Health, Education, Deputy Representative

7.3.3 Continue rolling out Climate resilient WASH while maintaining a focus on sustainability of WASH services and freshwater resources.

The core tenet of ensuring sustainable WASH operation and maintenance (O&M), even in resource-poor communities, must remain at the forefront of UNICEF's investments. Providing sufficient water for multiple-use services, such as vegetable gardening or small livestock watering, adds extra incentive to rural communities to safeguard and maintain their water systems for income-generation purposes.

Tackling water security is also an immense challenge. UNICEF involvement in hydrogeological modelling and aquifer protection, not traditionally a focus, will become increasingly necessary given Zambia's heavy reliance on groundwater resources for all sectors. For protecting water resources, WASH has an

arsenal of water interventions to match conditions on the ground, which should be deployed in concert with watershed conservation and resilient agriculture programmes implemented by others.¹³³ The National Rainwater Harvesting Strategy (2024) confirms the MWDS awareness of the importance of water conservation and management measures at local level, which it acknowledges it is poorly equipped to implement. This opens the door for UNICEF to provide technical capacity building support, drawing upon its wealth of relevant experiences across Africa.

Amid these water strategies, UNICEF is still depended upon in Zambia to lead on sanitation and hygiene priorities to increase access to household and institutional sanitation facilities, drive down open defecation and promote handwashing with soap.

Responsible: WASH

7.3.4 Invest in new ideas and resources for Climate resilient Education.

Clean-safe-green schools and education systems are central to the adaptations needed for protecting and educating children, while empowering them to be agents of change and stewards of a green community. The EU-funded Human Development project is an opportunity to have climate-smart design features that will keep children secure from floods and storms and include elements that are often only added to schools incrementally – water, sanitation, energy, and accommodations for students with disabilities.

The global UNESCO Greening Education Partnership has four action areas: greening schools, greening curriculum, greening teacher training and greening communities. MoE is a partner, and UNICEF should continue its dialogue for combined efforts and collaboration. UNICEF is best placed to support student action in schools (see Recommendation 7.2).

Climate resilient education also means ensuring continuity of education in case of emergency school closures. For this, UNICEF has a key role in harnessing digital education through learning platforms, digital content and stakeholder training to use tools effectively. Enabling factors are access to devices, power to schools and internet connectivity.

Other climate resilient features that UNICEF should advocate for with education sector partners are:

- Risk-reduction education and school preparedness (drills, school risk maps, contingency plans) can prepare students to reduce their exposure to hazards.
- Improved WASH facilities and water supply so children can practice good sanitation practices and hand hygiene at school.
- School and community greening efforts with onsite tree nurseries, coupled with student outreach, as a tangible way for students to translate their environmental education into action.
- Incorporation of climate change and environmental topics into the school curriculum (currently underway). Nutrition education is another subject that warrants emphasis, which coupled with school clubs can instill life skills and improved diets.

Responsible: Education, Child Protection, Nutrition

7.3.5 Continue to bring children's priorities and budget issues to the fore, advocating for investments in basic social services and social protection systems.

¹³³ 3Rs (retention, recharge, reuse), managed aquifer recharge, sub-surface dams, multiple-use services, multi-community systems, rainwater harvesting, aquifer assessments.

Zambia has a long history of social cash transfer programmes to reduce extreme household poverty and has deployed them for shock-responsive social protection in the face of hardship caused by large-scale shock including drought. The Social Policy section should continue its close collaboration with MCDSS, MFNP, World Bank, DMMU and others to build on recent lessons to make the social cash transfer programmes more robust, better financed and more extensive. The national social protection programmes, including crop insurance, have proven to be effective protections against the effects of climate change on the poorest Zambians, but need further investment for anticipatory action, shock response and resilience building, as well as climate smart financing. Social Policy should continue its work to enhance the transparency and effectiveness of the Constituency Development Fund, with its potential to strategically fund critical community and child-sensitive needs.

Social Policy section, with CAPE, should also identify potential financing opportunities for child-sensitive climate mitigation and adaptation, in order to secure more sustainable financing that benefits children and their families.

Responsible: Social Policy, CAPE

7.3.6 Strengthen national and sub-national planning for climate-sensitive development plans and institutional capacity for cross-sectoral coordination.

UNICEF should continue to work closely with national and local authorities to strengthen climate-resilient development plans and build institutional capacity for effective cross-sectoral coordination. This includes supporting local authorities to revise integrated development plans to align with Zambia's climate commitments. A key element of this support would be to develop a framework to monitor, track, and tag climate-related expenditures in both national and sub-national budgets. Engagement of children and youth in this process will boost their voices and interests for climate action.

Further, UNICEF should develop and promote a standardized framework to integrate climate resilience into budget tracking for key social sectors. This will ensure that the budgeting process adequately reflects climate adaptation needs, enabling targeted interventions to protect vulnerable populations, especially children, from the adverse impacts of climate change.

Responsible: Social Policy

7.3.7 Expand investments and options for off-grid communities, building on the significant progress made on HCF solar power solar upgrades and solar water pumping.

Less than half of Zambia's schools have electricity, and only 40 per cent of HCFs are connected to the grid. UNICEF should explore how its investments in solar in HCFs, WASH systems, schools and youth centres could be expanded and its expertise consolidated into an in-house solar hub. While the private sector would continue to be contracted for hardware and installations, there could be gains in efficiency with UNICEF support. Coordinated solar investments in off-grid communities could target all the child-services institutions found there. A UNICEF solar hub could also offer technical services for partners.

The installation of solar panels and infrastructure are not risk-free; they attract theft and vandalism, which needs to be addressed in a sustained way. Partnerships with private sector solar contractors could incorporate apprenticeships and employment for youth (see Section 7.1.3). Any scale-up of solar investments would benefit from advice and expertise from UNDP and World Bank energy group.

Responsible: Supply, Health, WASH, Education, Child Protection

7.4 Reduce emissions and pollution

Reduce emissions and pollution to avoid the worst impacts of climate change and environmental degradation, including within UNICEF programmes.

7.4.1 Research and advocacy on child exposure to ambient and indoor air pollution.

Data on air pollution levels in urban areas (high-traffic zones, burning dump sites, industrial zones) are lacking, creating an opportunity for filling the evidence gap on risk where children are most exposed. The findings could become a basis for multi-stakeholder engagement on the theme of “clean air for healthy children”. The aim would be to build awareness and catalyze action on clean air solutions.

Globally, air pollution is the second-leading risk factor for children under five years old after malnutrition. Most deaths are linked to household air pollution due to cooking indoors with unclean fuel, as in Zambia. Collection of local air quality data using inexpensive, real-time devices at child-centric locations (homes, schools, playgrounds, HCFs) by citizen and youth participants would increase local environmental awareness and action. UNDP and ZEMA are eager to have UNICEF join them in taking action in Zambia.

Responsible: Health, Child Protection, Nutrition

7.4.2 Promote energy efficient cooking alternatives.

Reducing the consumption of charcoal is a national priority, as well as tackling particulate pollution indoors. UNICEF should urgently pursue the possibilities of a partnership with Emerging Cooking Solutions (see Section 7.1.3).

Responsible: Operations, CAPE, Nutrition, SBC

7.4.3 Continue office greening initiatives to ensure best eco-efficiency practices.

UNICEF has carried out a range of office and operations greening initiatives in Zambia. These include the installation of solar power with electricity use reductions, reductions in the use plastics in the office and at UNICEF-hosted events and switching to more fuel-efficient vehicles. The UNICEF office has an established ‘green team’ to develop ideas and carry them forward.

Opportunities to take further measures might include paper recycling, digital footprint reductions and office equipment recycling. The common premises solar power system needs storage batteries for increased continuity of service.

Responsible: Operations, Green team

7.4.4 Collaborate with implementing partners to green their programmes and reduce their carbon footprints.

Based on its own best practice, UNICEF should find supportive ways to collaborate with implementing partners for greening their operations and ensuring sustainability in joint activities. Programme partnerships should be screened to determine risks and impacts on the environment or health and safety of people, guided by UNICEF’s Environmental and Social Safeguards. Equally, UNICEF should be open to good ideas and efficiencies emanating from its partners.

Responsible: Operations, Green team

7.4.5 Ensure that national health guidelines on medical waste management are adequate or are being applied consistently at HCFs.

Healthy environmental conditions at urban and rural venues alike are endangered by poor handling or disposal of sharps, infectious waste, pharmaceutical waste, and single-use polyvinyl chloride products.

Waste is also generated by non-functioning medical devices and cold chain equipment, for which there should be proper decommissioning and disposal protocols. UNICEF should ensure that this component of environmental safety is carried out in all the HCF locations it supports.

Responsible: Health, WASH

6 Conclusion

At UNICEF, we firmly believe that the global climate crisis is, at its heart, a child rights crisis. Across the globe, climate change is impacting children's health and development, their safety, and their access to essential services.

UNICEF Executive Director Catherine Russell, at the UNICEF Executive Board Special Focus Session on Climate Change and Children, 5 September 2024

Children and youth are the future stewards of a healthy environment. Functioning ecosystems and biodiversity buffer the planet from the worst effects of climate change. Investments in children can produce tangible benefits for nature and make communities resilient.

Zambia is already affected by climate change and environmental degradation. Impacts on the physical environment, water resources, air quality, energy production and other areas are widespread and increasing in severity. The unprecedented drought of 2024 made it clear to all how the climate is changing and that it affects everybody.

But children are affected the most. They are more likely to feel adverse health effects from water scarcity, poor nutrition and pollution. They are more likely to be harmed during a severe weather event or other humanitarian emergency exacerbated by climate change. And they are increasingly reliant on quality child services in education, nutrition, health, WASH, protection and social protection to reduce their vulnerability.

UNICEF is well placed to contribute to efforts by government and other stakeholders in Zambia to mitigate climate change impacts on children and to adapt to a changing environment. It has a history of supporting social sectors in the country and is backstopped by UNICEF's growing set of institutional resources for action on climate change. It also has significant experience supporting young people to take action and be their own advocates. Through programming adjustments and new initiatives, UNICEF can help deliver solutions to the climate crisis in Zambia centred on the needs and rights of children.