BI-Factsheets

POPULATION DYNAMICS AND THE CLIMATE CRISIS

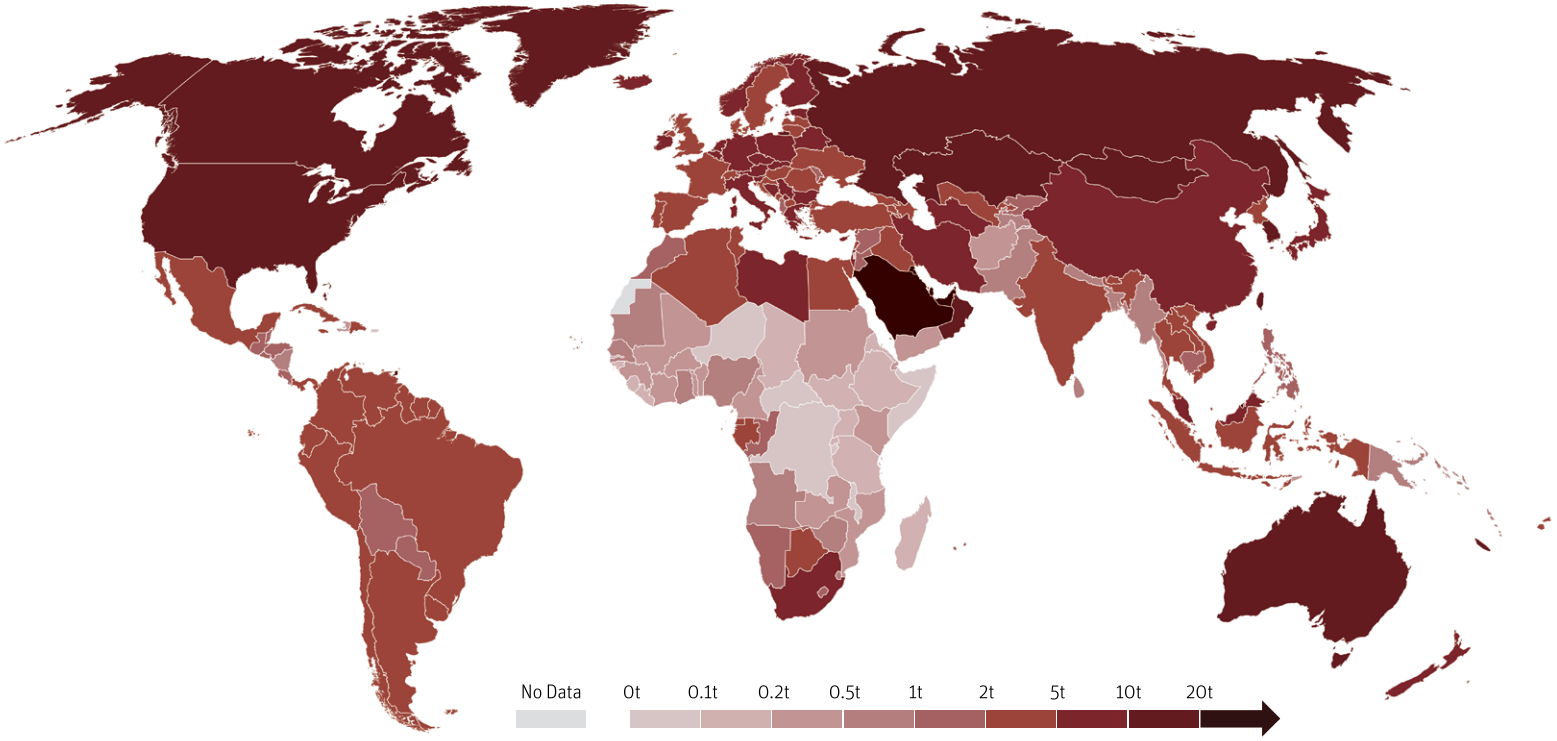
Berlin Institute for Population and Development

Africa is currently the world region experiencing the strongest population growth. With 1.5 billion people living on the continent today, the population is estimated to reach 3.8 billion by 2100.[1] At the same time, the continent is disproportionately affected by the climate crisis.[2] Among other impacts, extreme weather events resulting from climate change are putting people's health and livelihoods at risk. Both demographic and climatic changes influence all sectors of development cooperation. Similarly, interactions between population dynamics and the climate crisis are evident in many areas, including health, urban development and resource consumption. This fact sheet puts a spatial focus on cities as centres for climate action and highlights possibilities for climate resilient urban development. Health is another focus topic that should be treated as a priority in projects and programme planning.

Climate Change as a Result of Population Growth?

Historically, high- and middle-income countries have produced the largest share of greenhouse gas emissions. They account for 85 percent of global emissions, whereas low-income countries are responsible for only 15 percent of emissions.[3] And while countries in the Global North are responsible for the climate crisis with their excessive consumption and resource use, countries in the Global South are most impacted by its consequences. Extreme weather events, droughts and floods threaten the livelihoods of millions of people and adversely affect their health, nutrition, education and work.[4,5,6]

Just as greenhouse gas emissions are unequally distributed, population trends differ across world regions. While the population in some regions of the Global North is already shrinking, many African countries are still experiencing rapid population growth. Between 2024 and 2050, Africa's population is expected to increase by close to one billion people, even as population growth is continually slowing down due to falling fertility rates.[7] As a result, the resource and energy needs on the continent will continue to grow—and the challenges to meet these demands will increase for the foreseeable future.[8] In this respect, the size and composition of a population do influence emissions and resource consumption, but so do strategies to reduce the latter. In addition, sociodemographic characteristics such as age, place of residence and gender offer insight into the vulnerability of different population groups and which adaptation measures are most appropriate.[9] A large population does not automatically create



High-income countries have the highest per capita CO_2 emissions

There are significant differences in the geographical distribution of per capita CO_2 emissions. The countries with the highest values are those that produce oil and especially those with small populations, such as Qatar, the United Arab Emirates and Kuwait. Countries with large populations that also have some of the highest per capita emissions include the United States, Australia and Canada. In these countries, the average per capita emissions are about fourteen times higher than the African average.[10]

Per capita CO_2 emissions, in tons, 2023
(Data Sources: Global Carbon Budget (2024); Population based on various sources (2024) – with major processing by Our World in Data[11])

high levels of greenhouse gas emissions, as illustrated by the global distribution of per capita emissions (see graphic).[12] More important than the size of a population is the energy consumption per person as well as how economic development and growth are designed.[13]

The Impacts of Climate Change on Health

Scientists have long warned that the climate crisis has serious consequences for human health and poses new challenges for health systems, not least due to rising global temperatures. Heat records were broken around the globe in 2022 and 2023.[14,15] Extreme heat stress can lead to serious health complications, especially for children, pregnant and elderly people, and in the worst case scenario can be deadly.[16,17,18,19] The number of older people is growing in many African countries, which translates into an increasing number of people whose health is most threatened by high temperatures.[20] The globally rising average temperature will also lead to a greater spread of diseases such as malaria and dengue, putting more people at risk.[21] In addition, higher temperatures impact food security. For example, more frequent heat waves and droughts in 2021 resulted in 127 million more people being affected by moderate to severe food insecurity than between 1981 and 2010.[22] A higher frequency of heavy rains and flooding is another symptom of climate change. In April and May 2024, hundreds of thousands of people in Eastern Africa had to flee their homes after weeks of heavy rainfall. People experiencing forced displacement not only have a higher risk of contracting infectious diseases, they also often lack access to basic medical care, menstrual products and psychosocial support.[23]

The climate crisis hits people affected by discrimination and social injustice particularly hard.[24] Therefore it is critical to consider the needs of marginalised groups, including women and people affected by multiple and intersecting forms of discrimination, when designing interventions. Overall, women and girls are more severely impacted by the climate crisis because of prevailing social and gender norms. Because they often work in agriculture, cook outdoors and are responsible for fetching water for their household, they are particularly exposed to higher temperatures.[25]

Sexual and reproductive health and rights (SRHR) are central to sustainable development in the context of the climate crisis—at an individual and societal level. Women and girls must have reliable access to medical care and modern contraceptive methods to lead self-determined lives, including and especially in times of crisis. The climate crisis impacts SRHR in numerous ways. For example, at a practical level, impassable roads due to flooding can make it difficult to access health services such as HIV testing or treatment. Extreme weather events also lead to an increase in humanitarian crises and forced displacement. In such situations, women and girls are more likely to experience sexual and gender-based violence. Moreover, women often lose access to medical care in the context of displacement, which can cause an increase in maternal mortality and complications during childbirth.[26] Pregnant women who are exposed to extreme heat are also more likely to experience complications before, during and after birth. Foetal development problems during pregnancy also increase with extreme heat stress.[27] Climate adaptation programmes must therefore pay special attention to SRHR.

GOOD PRACTICE

Securing Health Care Services After Natural Disasters

In **Malawi**, climate catastrophes regularly cause severe damage to essential infrastructure. When cyclones or flooding destroy bridges and roads, health clinics in remote regions become cut off from the rest of the country.[28] The organisation **VillageReach** aims to sustainably strengthen and make primary health care more resilient in the hardest-to-reach communities in Africa. With the **Drones for Health** project in Malawi—implemented in partnership with the national health ministry and co-financed by **USAID**—VillageReach can ensure a sustainable supply of vital medical products reaches even the most remote villages.[29,30] Drones deliver vaccines, medications and contraceptives to community health centres that are difficult if not impossible to reach by road. On the return flights, the drones carry lab samples that can only be analysed in larger hospitals.[31]

Adaptation, Mitigation and Resilience

Decision makers face particular challenges in addressing the twin demands of meeting the needs of a growing population while simultaneously making cities, health and energy systems more sustainable. This is where the concept of climate resilience comes into play. The concepts of climate resilience, adaptation to climate change and the mitigation of its consequences often go hand in hand.

Climate change adaptation refers to measures with which societies adapt to existing or anticipated impacts of climate change, such as the construction of dikes to protect against flooding. By contrast, **climate change mitigation** measures aim to reduce greenhouse gas emissions to slow down climate change. One such measure is the expansion of renewable energies.

Climate resilience, in turn, encompasses more than just adaptation or mitigation and refers to the ability of societies and systems to cope with climate disasters, and to be able to adapt and continue to function even under stress.[32,33]

Growing Cities, Rising Energy Needs

Alongside Asia, Africa has the fastest growing urban population on the planet.[34] Already, almost 700 million people live in Africa's cities and urbanisation will continue to increase in the coming decades. According to United Nations (UN) projections, by 2050 the urban population on the continent will increase by an additional 800 million people.[35]

Factors contributing to this rapid urbanisation include climate-related displacement and migration. A growing number of people are moving to nearby cities and suburbs due to natural disasters and extreme weather. Water shortages and food insecurity in rural regions are also contributing to this trend.[36, 37, 38]

The UN has designated cities as critical partners in efforts to achieve global climate goals.[39] Cities produce about 60 percent of greenhouse gas emissions, and energy consumption is particularly high in urban areas.[40] Because urban infrastructures are very vulnerable to changing climates, people who live in cities are increasingly feeling the impacts of the climate crisis.[41] For example, many African cities are already affected by extreme heat. In the capital cities of Eritrea (Asmara) and Nigeria (Abuja), temperatures reach over 35° Celsius on 69 and 76 days per year, respectively, and in Bamako (Mali), on 165 days of the year.[42] With ongoing global warming over the course of this century, the number of annual days with extreme heat will continue to increase in African cities.[43,44] At the same time, many cities—especially in Western and Southern Africa—are on the coast and are therefore threatened by the predicted rise in sea levels.[45] In 2022, floods were already one of the most frequent natural disasters in Africa.[46]

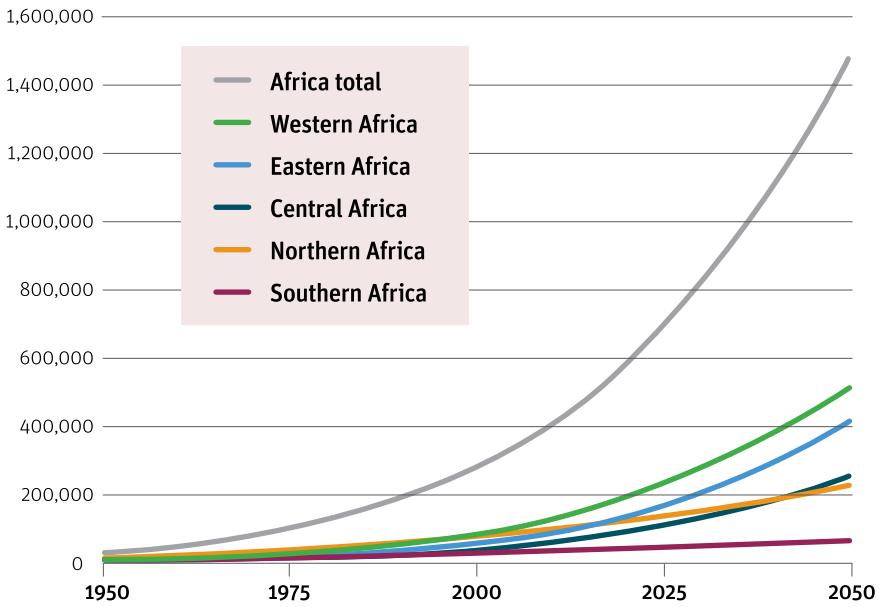
On the other side of the Indian Ocean, the consequences of rapid urbanisation, climate change and flooding are already apparent: Jakarta, the capital of Indonesia, is one of the fastest sinking cities in the world. The government has therefore begun a complete relocation of the city and its population, building the new capital Nusantara over 1,000 kilometres away on the island of Borneo.[47]

As cities continue to grow, it becomes ever more important to make them climate resilient and sustainable. Key sectors for sustainable urban development include construction, energy, transportation, water, sanitation and waste management. In cities, too, women and girls are disproportionately impacted by the effects of climate change. Thus, it is especially relevant for sustainable urban development to be gender-sensitive and -responsive.[48] For too long, gender perspectives and equality were not adequately considered within sustainable urban development goals.[49,50] Over the last decade, gender-sensitive and intersectional approaches have received more attention within climate adaptation strategies. But whether these approaches will be effectively implemented remains to be seen.[51]

Urbanisation Is Advancing in All Regions of Africa

Cities are growing worldwide. Compared to North America and Europe, a relatively large proportion of Africans still live in rural areas. But this will change: By 2050, an estimated 58 percent of Africa's population will live in cities. Globally, more than two-thirds of the world population are projected to inhabit cities in 2050.[59]

Estimated and projected population of urban areas, in billions, 1950-2050 *(Data Source: UN DESA[60])*



GOOD PRACTICE

Passive Cooling to Beat Extreme Heat: Experiences from India

Since 2015 the government of **India** considers heatwaves natural disasters. Today, the country is considered a pioneer in climate change adaptation, especially regarding extreme heat. More than half a billion people live in India's growing cities.[52] Here, residents are already facing the dangerous consequences of heatwaves and extreme heat—from severe health problems to death. This is especially true for people affected by poverty living in informal settlements, for whom purchasing an air conditioner is usually unaffordable.[53,54] This is one of the reasons many Indian cities focus on passive cooling mechanisms. This includes so-called **cool roofs**, which can help reduce indoor temperatures by two to five degrees Celsius. The simplest version involves painting roofs white. This can cause sunlight to reflect into the atmosphere instead of being absorbed by the roof.[55,56] Cool roofs are a globally applicable solution and particularly recommended for cooling in cities.[57,58]

Securing Basic Services in Informal Settlements

Urban planning that does not involve all stakeholders and does not take spatial and institutional inequalities into account limits economic growth and social cohesion. Many cities are already struggling to provide adequate services and infrastructure for their growing populations. This is especially true in slums and informal settlements, which often lack adequate and climate resilient infrastructure, such as paved roads, water and sanitation facilities, and energy supply. The estimated 265 million people living in slums and informal settlements in sub-Saharan Africa today are disproportionately affected by the impacts of climate change and are particularly vulnerable to extreme weather events.[61,62] That informal settlements develop and exist at all is due to a combination of factors. Those often include an absence of urban planning altogether, especially with regard to a city's spatial expansion and effective land-use.[63]

Resilient communities are characterized by access to essential basic services, meaning that apartments and houses are supplied with clean drinking water, electricity and a connection to a functioning sewage system. Absent these structures, residents of informal settlements are forced to resort to unsustainable solutions. For example, if sewage systems are clogged with garbage because there is no solid waste management, this can lead to flooding. To ensure that resilient service structures protect the health and livelihoods of all people, they must be designed to be inclusive, gender-sensitive and meet the needs of marginalised groups. Therefore, climate resilient urban design should begin by considering the needs of the most vulnerable populations: those living in informal settlements.[64]

GOOD PRACTICE

Climate Resilience Through Hybrid Infrastructure in Kenya's Largest Informal Settlement

One example of how sustainable urban planning in informal settlements can be approached is the **Kibera Public Space Project**, which was started by the non-profit organization **Konkuey Design Initiative (KDI)** in 2006. Kibera is the largest informal settlement in **Kenya**, located just outside of the Nairobi's city centre. About 250,000 people live here in cramped quarters without waste management or sanitation services. Unemployment and crime are common, and the area routinely faces severe flooding.[65,66] The Kibera Public Space Project advocates for well-designed hybrid infrastructure*, such as drainage systems that reduce the risk of flooding. In addition, the project is building community buildings, spaces for small businesses and recreation, and water, sanitation and hygiene (WASH) facilities. Residents were involved from the beginning, thereby strengthening community engagement and creating environmental awareness.[67,68]

Hybrid infrastructure, *also referred to as green infrastructure, is a term used in sustainable urban planning. It combines man-made, so-called* ***grey infrastructure*** *with natural elements to achieve various environmental goals. This includes the management of water, so-called* ***blue infrastructure*** *(e.g., water bodies), improving air quality and promoting biodiversity. So-called* ***green infrastructure*** *includes, for example, parks and urban green spaces. Examples of hybrid infrastructure include rainwater gutters, rain gardens and green roofs.*[69,70]

A Paradigm Shift for Climate Justice

The people and communities who bear the least responsibility for creating the climate crisis are those who are now most affected by its impacts. This is a direct consequence of global power dynamics and structural inequality.[71] Colonialism and racism, too, are historically closely intertwined with climate change.[72] The concept of climate justice explicitly recognises these historical inequalities. Companies and societies in the Global North have built much of their wealth through the consumption of finite resources and in the process produced large amounts of greenhouse gas emissions. Therefore, they have a responsibility to support the communities and countries that are now suffering the consequences of the climate crisis.[73] Yet to date, climate action measures are insufficiently financed.[74] Marginalised and vulnerable communities continue to have little say in international climate negotiations or their voices are ignored.[75] Climate justice therefore requires a paradigm shift in global climate policy. It demands that climate action centres justice and human rights, as well as an equitable distribution of climate financing and responsibility.[76]

GOOD PRACTICE

African Activists for Climate Justice: Developing Sustainable Solutions Jointly and Locally

African Activists for Climate Justice (AACJ) is a pan-African initiative that advocates for climate justice in Africa. They aim to strengthen awareness for climate justice in local communities, and to make an effective and lasting contribution to climate protection and adaptation. In these efforts, AACJ wants to elevate the voices of women, youth, older people as well indigenous communities. The initiative is supported by the **Dutch Ministry of Foreign Affairs**.[77,78]

Currently, the initiative is active in eight countries, where it supports **Locally Led Climate Actions**, which focus on issues such as sustainable agriculture and solid waste management in cities. Some local projects also focus on advocacy and movement building. In **Somalia**, for example, AACJ promotes partnerships between governments, civil society organizations (CSOs) and communities to develop sustainable solutions. In one successful intervention two CSOs were trained in advocacy and strategy development, which enables them to more effectively influence and work with government ministries at the national level. Meanwhile, in **Senegal** AACJ has prioritised movement building: mapping existing women's and youth CSOs working on climate change and organising capacity building workshops for activists with the goal of building a strong ecofeminist movement in the country.[79]

Recommendations

The climate crisis and population dynamics influence each other in various ways. For one, climate change endangers the health and food security of millions—if not billions—of people. Children and pregnant people are particularly at risk from extreme climatic conditions like droughts and excessive heat. Therefore, one possible consequence of the climate crisis could be a rise in child and maternal mortality.

Second, population growth per se does not automatically lead to high greenhouse gas emissions or accelerate climate change. Nevertheless, a growing number of people does have an increased need for energy and resources. Whether this results in a significant increase in emissions and destruction of natural resources depends on whether economic growth and food systems are designed in a sustainable manner.

Third, the climate crisis causes migration as environments become uninhabitable due to floods, droughts or rising temperatures. Many people migrate to cities, which gives urban planning a new purpose. Cities must become not only sustainable but also climate resilient in order to meet the needs of a growing urban population in the context of climate change.

To effectively address the interactions between climate change and population dynamics, development cooperation organisations should…

- … place a greater **focus on the development, structure and distribution of the population in each partner country**—and proactively respond to changes—while designing, implementing and evaluating climate adaptation measures.
- … **integrate sexual and reproductive health and rights as an essential component of gender equality in efforts to address the climate crisis**, in particular to strengthen young women's self-determination and increase their resilience.
- … **take into account the needs of particularly vulnerable populations**, including migrants, refugees and people with disabilities **in climate adaption strategies**. In addition, the inclusion and participation of marginalised groups should be more strongly promoted in funding decisions and at all project levels.
- … help cities respond swiftly and sustainably to increasing urban growth. This also means that development cooperation programmes should **support climate resilient urban development**. This creates opportunities to counter the social, ecological and economic impacts of the climate crisis as urbanisation progresses, for example by setting up essential infrastructure systems in informal settlements.
- … incorporate the **improvement and expansion of infrastructures and basic services**, as well as the development of a circular economy as central aspects of sustainable urban development programmes.
- … promote the **development and expansion of climate resilient health systems**, for example by using innovative technologies such as drones in natural disasters and other crises.
- … pursue **energy efficient, environmentally friendly and climate resilient** approaches in the context of **economic development and growth**.
- … **consult and work with local actors and experts before developing funding priorities and interventions**, to identify the greatest needs and the most promising solutions based on local perspectives.

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Imprint

First published February 2025

Published by
Berlin Institute for Population and Development
Schillerstraße 59
10627 Berlin
Germany
Tel.: +49 30 22 32 48 45
Fax: +49 30 22 32 48 46
Email: info@berlin-institut.org
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Design: Christina Ohmann
Layout and Graphics: John Mancarella

This publication was funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Sector Initiative Population Dynamics, Sexual and Reproductive Health and Rights. The Berlin Institute for Population and Development is responsible for the content of this fact sheet.

Berlin Institute for Population and Development

Funded by

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