

POPULATION DYNAMICS, CLIMATE CHANGE, AND SUSTAINABLE DEVELOPMENT IN AFRICA

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<http://populationaction.org/topics/climate-change/>

Population Action International advocates for women and families to have access to contraception in order to improve their health, reduce poverty and protect their environment.

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EXECUTIVE SUMMARY

A region's population dynamics, including the size, distribution and composition of its population, influence its prospects for sustainable development. Virtually all development policies in Sub-Saharan Africa (SSA) cite the region's rapid population growth, urbanization, and age structure as major challenges. These pressures hurt efforts to reduce poverty, ensure food security, preserve the environment, and improve education, employment, and health.

SSA's population is growing more rapidly than other regions of the world. Rapid population growth and climate change are speeding up the region's environmental degradation. This makes people more vulnerable to climate change impacts and undermines sustainable development on the continent. Development efforts in several countries in SSA are harmed by a combination of high rates of population growth, high projected declines in agricultural production and low resilience to climate change. We classify such countries as population and climate hotspots. In these hotspots, addressing population challenges will help increase resilience to climate change, and contribute to development goals such as better food and water security.

Despite the strong links between population and climate change, and their role in sustainable development, these issues are not a priority in broader development policies and strategies. Unfortunately, population, climate change and development are often addressed separately at policy and program levels. We conducted assessments in Kenya and Malawi, complemented by in-depth interviews, and found that policymakers recognize the importance of population issues for climate change and development. However, these issues are rarely worked on together in the two countries, limiting the benefits that could result from combining the two.

The reasons for this lack of integration are:

- a) Weak coordination and governance mechanisms for climate change
- b) Lack of climate change policies or fragmented, and often conflicting, policies among various ministries

- c) Weak technical capacity in government agencies to show the benefits of integrating population, climate change and development goals
- d) Weak technical capacity in government agencies to design integrated programs
- e) Lack of funding for developing and implementing integrated programs.

This report calls on governments, donors, and civil society to invest more in population and climate change work, to address the two issues together in policies and programs, and to build the technical capacity to develop programs and research. Ensuring women in SSA who wish to avoid pregnancy have access to family planning can reduce population pressures and reduce vulnerability to climate change impacts. It can also help meet other development goals, including reducing poverty and maternal mortality, and improving education.

Joint investment in family planning and climate change strategies can yield the 'triple win' of the United Nations (U.N.) sustainable development framework. Reducing fertility rates and slowing population growth would help:

1. Reduce poverty by improving and expanding health, schooling and economic opportunities
2. Protect and manage natural resources for economic and social development
3. Reduce inequality and create greater opportunities for all.

INTRODUCTION

The size, composition, and distribution of populations are part of any analysis of sustainable development challenges and opportunities. The role population and climate change play in sustainable development is particularly critical for Africa. It is the only continent where population will continue growing beyond 2100,¹ and also has the least ability to adapt to the consequences of climate change. A large number of Africa's people live in areas susceptible to climate variation and extreme weather. Population growth is occurring most rapidly in Africa, making people more vulnerable to climate change impacts. Africa's population will grow from 1 billion in 2010 to 2.1 billion by 2050, with growth driven by countries in SSA. There, the population will increase from 0.8 billion to 1.9 billion by 2050. Thirty-one of the 51 countries in SSA are projected to at least double their population by 2050.²

Africa's rapid population growth stems from persistent high fertility and declines in overall mortality during the past four decades. High fertility can be largely addressed by making family planning and reproductive health universally accessible to those who want it. Yet only 16 percent of married women in SSA were using modern contraception in 2009, compared to the global average of 56 percent. About 25 percent of women in SSA have an "unmet need" for family planning, meaning they want to avoid pregnancy but lack effective contraception.³ Meeting the need for family planning globally could reduce unintended pregnancies by 76 percent.⁴

Most Least Developed Countries (LDCs) identified that population growth makes people more vulnerable to climate change in their National Adaptation Programme of Action (NAPAs). However, few NAPAs proposed projects that respond to population-related vulnerability and reduce high fertility, such as family planning.⁵

About this Report

This report contributes to understanding the role of population in sustainable development by analyzing population, climate change and sustainable development links in SSA. The report also includes a summary of population, environment and climate change issues facing Malawi and Kenya, based on detailed country assessments for the two countries.

The evidence in this report should guide African governments in setting priorities and making investments in sustainable development plans. This report is aimed at helping policymakers, donors, and civil society understand the importance of incorporating population, family planning and reproductive health in policies and programs to address climate change and further sustainable development in Africa

Unless otherwise specified, population projections are based on the United Nations Population Division's medium variant assumption.⁶

Study Methods

The analysis uses both quantitative and qualitative research methods to examine links between population dynamics and climate change for sustainable development. It identifies opportunities for addressing these issues together. The quantitative analysis examines the impact of population growth on resources, such as agricultural productivity and water, that are also threatened by climate change. The analysis also looks at the relationship between demographic trends, vulnerability and reproductive health

in SSA and identifies population and climate hotspots. Population and climate change hotspots are countries with rapid population growth, low resilience to climate change, high projected decline in food production, water scarcity, and high unmet need for family planning.

The quantitative analysis is complemented by a desk review of policies and strategies in SSA. We conducted interviews with stakeholders in Kenya and Malawi to see if policies address both population and climate change together. Annex I provides a more detailed explanation of the research methods and analysis.

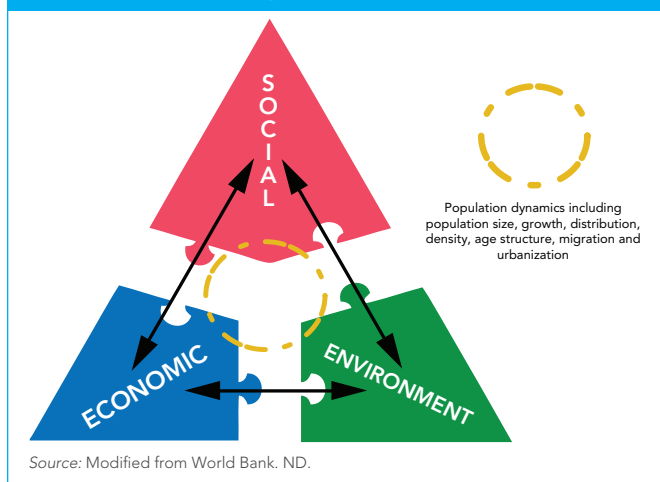
BACKGROUND

The 1987 Brundtland Commission's report, *Our Common Future*, defines sustainable development as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."⁷ Using this definition, the U.N. built a sustainable development framework with three pillars: economic, environmental, and social. Population falls under the social pillar in this framework. However, population size, growth, distribution, density, and age structure, as well as migration and urbanization, matter for all three pillars. The intergenerational focus of sustainable development reinforces the centrality of population to the U.N. framework (Figure 1).

A country's population growth rate affects its prospects for economic growth and poverty reduction. A rapidly increasing population may create greater demands on an economy and constrain economic growth. When women choose to have fewer children, it reduces the number of dependents in a household and provides opportunities for increasing productivity, savings and future economic growth. Children are often healthier and more likely to attend school. Additionally, women themselves are healthier and better able to earn and income and participate in their communities. Slowing population growth also reduces pressure on the environment and natural resources.⁸

These links were emphasized in the International Conference on Population and Development (ICPD) Programme of Action, adopted in Cairo, Egypt in 1994⁹ and the Rio Declaration on Environment and Development, which was agreed upon at the United Nations Conference on Environment and Development in 1992. Agenda 21 discusses reproductive health programs, including family planning, as approaches that promote changes in demographic trends and sustainability.¹⁰ The links were reaffirmed at the United Nations Conference on Sustainable Development, Rio +20, held in Rio de Janeiro, Brazil, in 2012.¹¹

Figure 1: Population Dynamics within the U.N. Sustainable Development Framework



Key Population Dynamics in Sub-Saharan Africa

SSA is one of the poorest regions in the world and is undergoing a demographic transformation. It is home to around 900 million people, a number that is projected to grow to 1.2 billion by 2025, and to almost 2 billion by 2100.

The region's population is growing at a rate of more than 2 percent – the fastest in the world. Of the 2.4 billion people who will likely be added to the world by 2050, about half will be born in SSA (Figure 2).

Thirty-one of the region's 51 countries are projected to at least double their population by 2050.

SSA's high population growth rate is driven by high fertility. Although the growth rate has slowed, fertility rates remain at an average of five children per woman (compared with a world average of 2.5). Few countries average a total fertility rate below four.¹²

High-fertility countries often have youthful age structures. The median age in SSA is around 18 years, but in countries like Niger, it can be as low as 15. The population ages 15 years and below grew by 150 percent in the region between 1970 and 2005. In Niger, it increased by 200 percent.

Young age structures mean that populations will continue to grow, even after reaching replacement level fertility (about two children per couple). For example, if Nigeria reduced its fertility rate of 5.7 children per woman to 2.1

children by 2020, its 160.3 million population would still grow for many years before stabilizing at around 300 million around the year 2100.¹³

Urbanization

Most of the expected population growth in SSA will be in urban areas. Urbanization has slowed in most developed countries, with about 75 percent of the population living in urban areas. Most African countries, however, are still transitioning from being mainly rural to urban.¹⁴

In 2010, 36 percent of the population in SSA lived in urban areas. Globally that year, 52 percent of the world's population lived in urban areas. However, the total urban population in SSA is expected to increase from 298 million in 2010 to about 1.1 billion in 2050, representing 8 percent and 17 percent of the total world urban population respectively.¹⁵

In developed countries, urbanization is often accompanied by infrastructure development, concentrated delivery of social services to benefit from urban economies of scale, and additional economic opportunities. If properly managed, an increase in urban inhabitants could provide social and employment benefits. Challenges arise when the scale of urban growth outpaces the capacity to adapt and provide services.

Figure 2: Africa's projected population

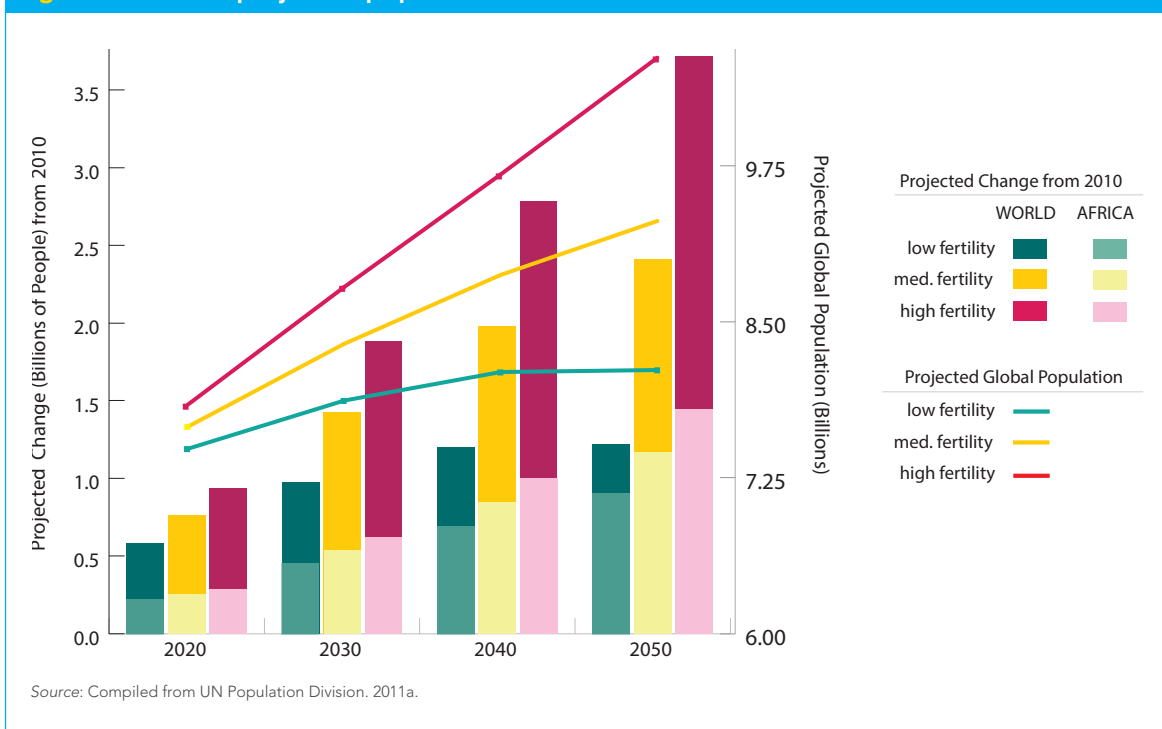
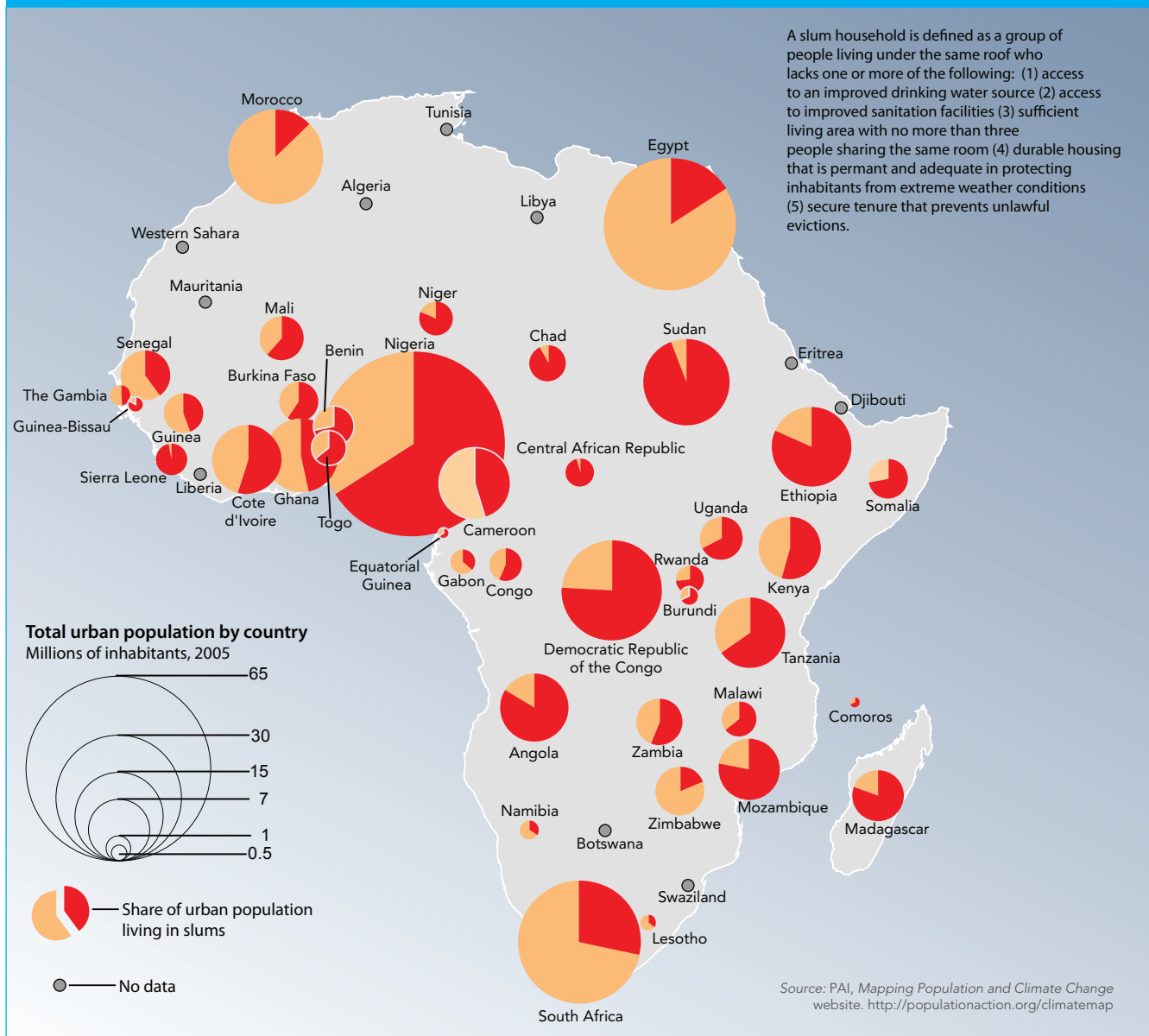


Figure 3: Urban and slum population in Africa



Urban growth in Africa is happening so quickly that it overwhelms governments' abilities to provide education, health services, housing, drinking water, electricity and waste disposal.¹⁶ Most residents of SSA cities live in overcrowded informal settlements commonly referred to as slums (Figure 3). Slums are characterized by lack of proper housing and basic amenities, social services, livelihood opportunities, and security. In Lagos, the second-largest city in Africa, about 62 percent live in such conditions. Between 1990 and 2010, countries such as Mali, Senegal, Ghana and Benin, have reduced, the proportion of urban slum dwellers by up to 30 percent. In other countries, like Kenya and Namibia, the proportion has remained stagnant.¹⁷

And in another set of countries, urbanization is contributing to a growth of slums and increase in poverty. The proportion of slum dwellers in Mozambique, Malawi and the Central African Republic has increased between 4 percent and 9 percent. Rapid population growth in urban areas is contributing to increased poverty levels in Africa. Between 1990 and 2010, while the proportion of urban residents living in slums in Africa has declined from 70 percent to 62 percent, the actual number of people living in slums has almost doubled from 103 million to 200 million.¹⁸

Climate change compounds the challenges of rapid urbanization in SSA by making the urban population more vulnerable. Rising sea levels due to climate change could threaten coastal settlements with floods and storm surges.¹⁹ Forty percent of West Africa's population currently lives in coastal cities. Africa is expected to have three coastal cities (Cairo²⁰, Lagos and Kinshasa) of at least eight million inhabitants by 2015.²¹

Most of the big cities in SSA are also at risk given their location along a coast. Recent estimates suggest that the number of people at risk of coastal floods in Africa will increase from one million in 1990 to 70 million by 2080.²²

Most of these people will be living in cities. Poor urban residents in non-coastal cities like Nairobi are also facing flooding risks because of heavy rains and the fact that their homes are located along river banks and other fragile areas.²³

The links between climate change and urbanization are recognized by a number of NAPAs submitted by African LDC. The NAPAs state that climate change will impact on cities, especially with increasing population and urban migration. Djibouti's NAPA notes that unfavorable climate conditions have led to migration from rural areas to "new urban areas." Previously nomadic populations are being forced to settle around water points established by the state. Similarly, rapid urbanization in Gambia is "paralleled by clearing of forests and woodlands, expansion of cultivated area, over-fishing of particular species and severe coastal erosion." In Sao Tome and Principe, the NAPA places a priority on relocating populations at risk of food shortages and landslides in three urban areas: Malanza, Santa Catarina, and Sundy.²⁴

IMPLICATIONS OF POPULATION GROWTH AND CLIMATE CHANGE FOR SUSTAINABLE DEVELOPMENT IN SUB-SAHARAN AFRICA

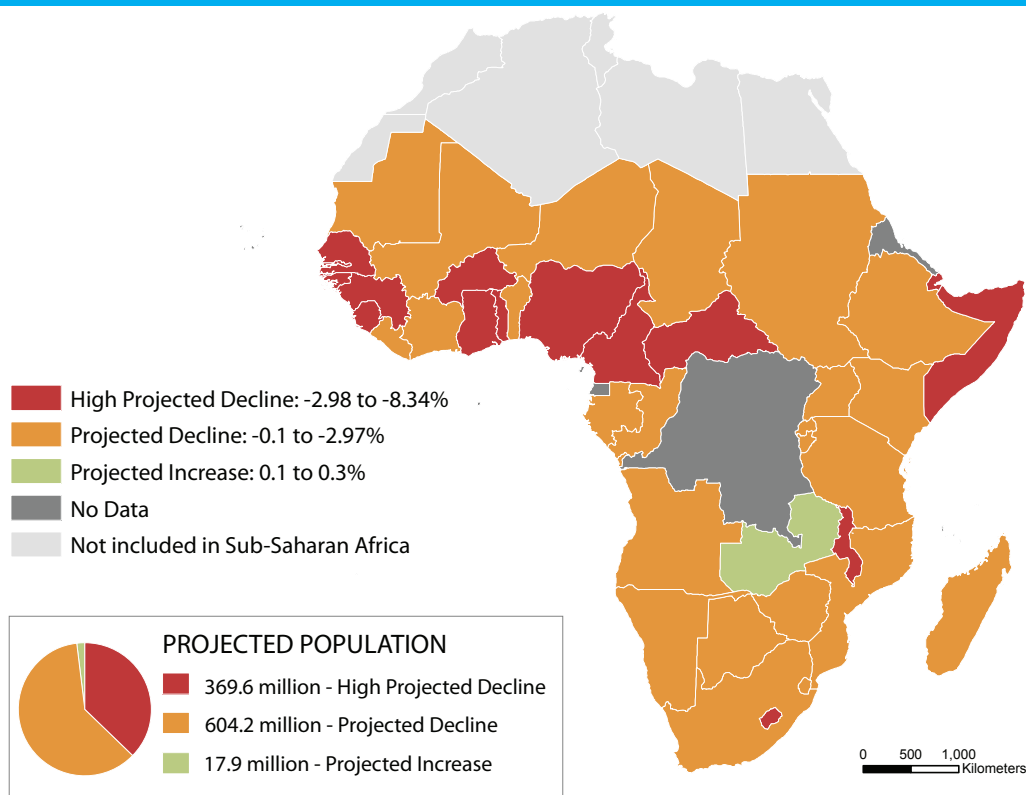
Population growth and food security

Populations in SSA are expected to grow as agricultural production, an important part of food security, declines (Figure 4). Most people in SSA depend on agriculture for their livelihoods. The sector employs 65 percent of the labor force and produces 32 percent of GDP growth.²⁵ However, agricultural production per person did not change in the region from 1960 to 2005 in terms of both overall production and cereal yield.²⁶ Population growth is putting pressure on farmland. One study found out that almost a quarter of rural households in Ethiopia, Kenya, Mozambique, Rwanda and Zambia were virtually landless and had little non-farm income.²⁷

SSA will likely be one of the regions most affected by drought and increase in temperature. Famines, such as those that have frequently affected countries in the Horn of Africa, will probably become more common. Between 1990 and 2020, every country in the region, except Zambia, is projected to experience a decline in agricultural production, of up to eight percent.²⁸ The dual challenges of population growth and climate change are likely to make food insecurity worse.

Thirty-six NAPAs submitted by African countries link population growth to food insecurity.

Figure 4: Agricultural Production, Population and Climate Change, 1990-2020



Source: PAI, Mapping Population and Climate Change website. <http://populationaction.org/climatemap>

Population pressure contributes to food insecurity by increasing a country's vulnerability to food shortages in two ways. The first is more direct losses from events such as droughts and floods. Population pressure is more pronounced in areas that are susceptible to these events, and NAPAs show large numbers of people residing on scarce arable land (ie Central Sudan along the Nile River).²⁹ The second is increased demand for food. This puts additional pressure on the food supply system and limited food resources, such as fish stocks.

Population growth and water resources

Population growth increases demand and competition for water resources and compounds water scarcity.³⁰ SSA is projected to be severely impacted by water scarcity because of climate change. Fifteen countries in SSA, which are home to about 400 million people, are suffering from water scarcity or water stress.³¹ The number is projected to double to more than 800 million by 2050 (Figure 5). Djibouti, Cape Verde, Kenya and Burkina Faso are the most affected by water scarcity, with less than 800 cubic meters of water available per person per year. The water-stressed and scarce countries all have high population growth rates, with Eritrea's the highest at 3.2 percent

per year. Combined with anticipated changes in climate, water shortages are likely to become even more severe, especially in areas where economic and political problems impede access to fresh water. (Figure 5).

The links between population pressures and water scarcity are well articulated in the NAPAs for African countries. Sudan's NAPA, for example, states that "unfavorable weather conditions combined with population growth have rendered the Setaite River incapable of sustaining the town of Gedarif." Zambia's NAPA notes that population increases in urban centers have put pressure on groundwater.

Population growth and climate change vulnerability

Climate change continues to pose a major threat to development and the achievement of the U.N. Millennium Development Goals in SSA.

Globally, the region that has contributed the least to climate change is the least resilient and most at risk of its effects .³²

Figure 5: Projected Population and Water Availability

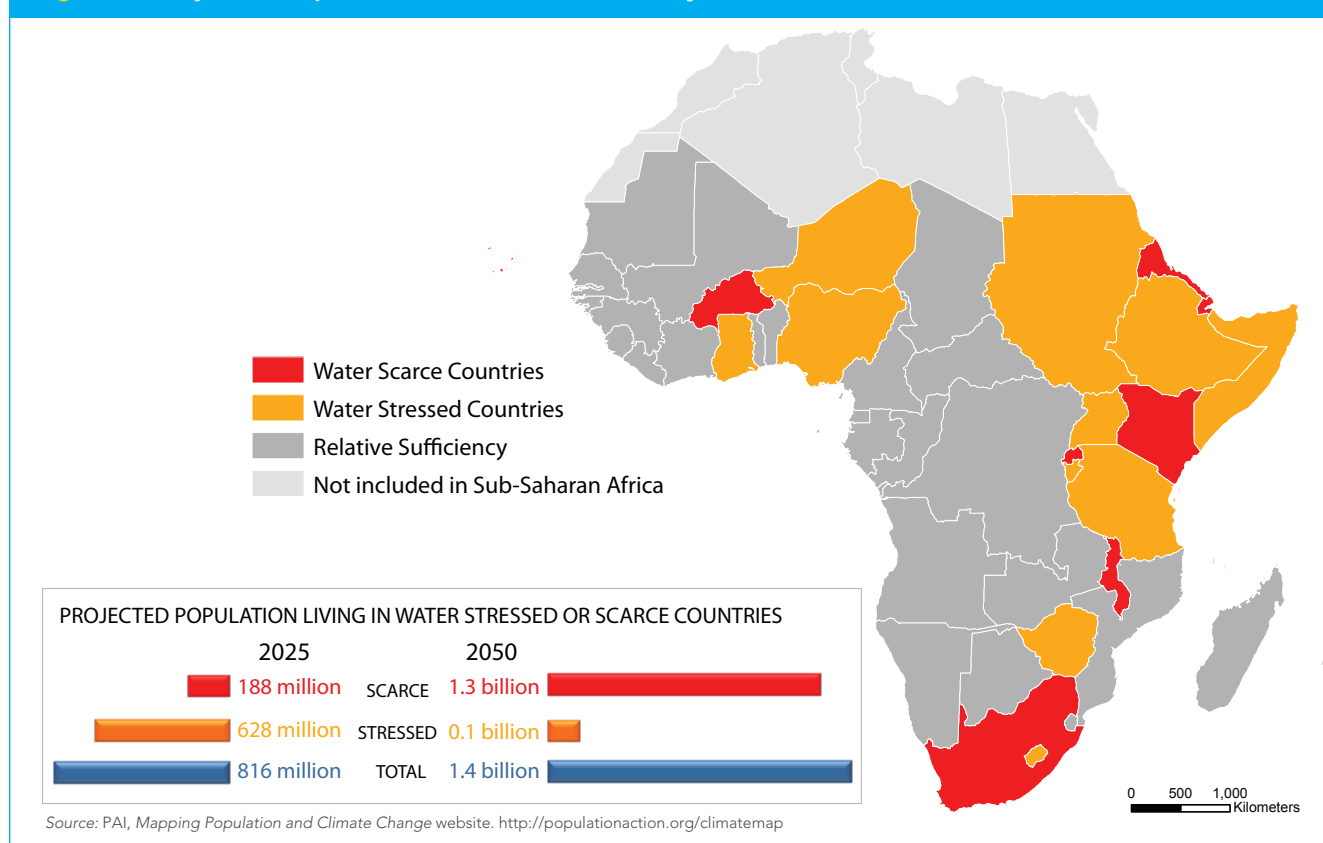
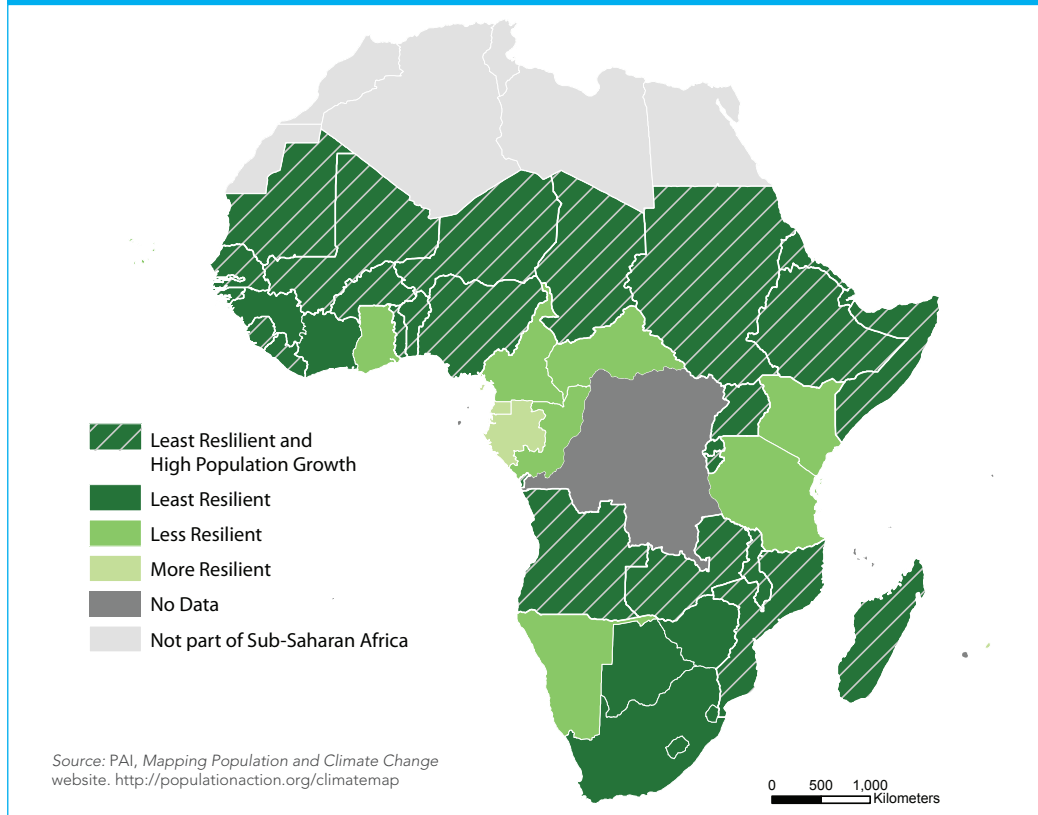


Figure 6: High Population Growth and Resilience to Climate Change in SSA



One way of measuring countries' vulnerability and resilience to climate change is the Vulnerability-Resilience Indicators Model (VRIM). The VRIM has an index which combines 17 physical, social, and economic indicators to assess resilience to anticipated climate change impacts. The index looks at current sensitivity (e.g., food security, human health, water resources) and adaptive capacity (economic, human and civic resources, environment) for the year 2000.

The VRIM groups countries into four categories (most, more, less and least resilient) based on their sensitivity to the effects of climate change and their adaptive capacity to address those effects. In 2000, most of the countries in Africa were rated as least resilient to climate change. These countries are also experiencing rapid population growth (*Figure 6*). Thirty-four countries in SSA have a high population growth rate, higher than a regional average of 2 percent.³³

Population and Climate Change Hotspots

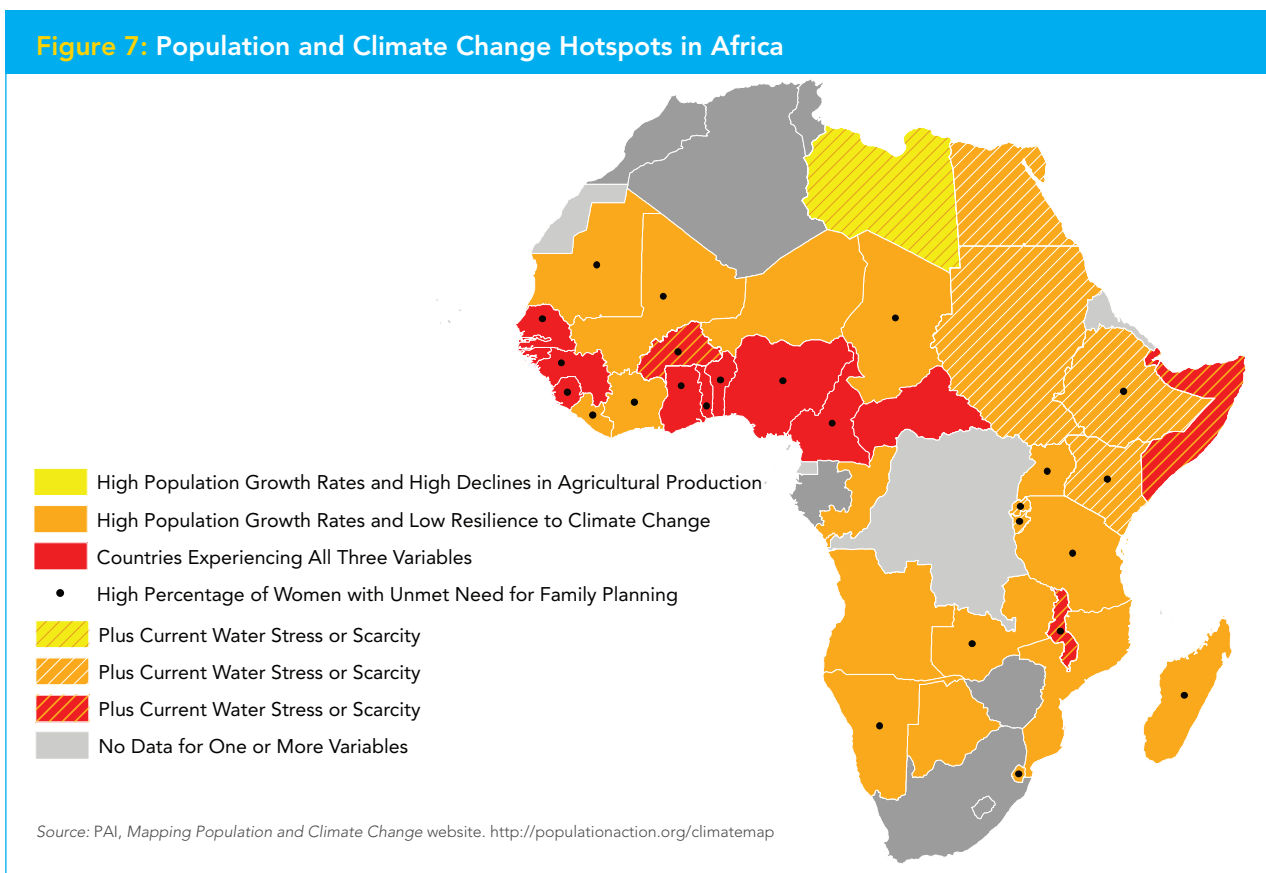
Some African countries are already experiencing high rates of population growth, high projected declines in agricultural production and low resilience to climate change. Such countries can be considered “hotspots” of population and climate change (Figure 7). Fifteen of these “hotspot” countries are in SSA and four of them (Burkina Faso, Djibouti, Malawi and Somalia) are also experiencing water stress or scarcity.

Many of the hotspot countries face widespread poverty, low levels of education, limited access to health services, and high levels of gender inequality. Climate change is

compounding these challenges. More countries will likely share these problems as population grows and limited natural resources are stretched.

Most of the hotspot countries have high levels of unmet need for family planning. Investing in family planning programs could slow population growth and reduce vulnerability to climate change impacts. Women, who are usually responsible for collecting fuel, water and food, are likely to be most affected by climate change. Being able to access contraception and plan their families could help them cope.

Figure 7: Population and Climate Change Hotspots in Africa



IMPLICATIONS AT COUNTRY LEVEL: THE CASES OF MALAWI AND KENYA

Malawi and Kenya are examples of African countries that face combined challenges caused by population and climate change. They both experience high population growth and urbanization rates, and increasing proportions of urban dwellers living in slums. In addition, their agriculture-based economies are undermined by erratic climatic conditions, leading to food insecurity. They are further threatened by increasing water scarcity.

Malawi

Population Dynamics

Malawi, a hotspot country, is experiencing high population growth, high projected decline in agricultural production, and low resilience to climate change. In addition, the country is experiencing water scarcity.

Malawi's population has grown from about 2.9 million in 1950 to 11.2 million in 2000. The annual population growth rate was around 2 percent in the 1950s, peaked at 5 percent in the 1980s, and is now at 3 percent. Malawi's population of about 14.9 million is projected to grow to 49.7 million by 2050.³⁴

Malawi's population growth is driven by high fertility, which has declined only modestly over the past few decades, while child mortality declined steadily. The total fertility rate has declined from 7.2 children per woman in 1970 to 5.8 in 2010.³⁵ The under-five-mortality rate declined from 185 children per 1,000 live births in 1996 to 119 in 2010.³⁶

More and more Malawian women want to have fewer children. The desired family size among married women fell from 5.3 children in 1992 to 4.2 children in 2010. The percentage of married women wishing to stop childbearing increased from 23 to 37 percent during the same period.³⁷ The percentage of married women using family planning increased from 13 percent in 1992 to 46 percent in 2010. This progress is impressive considering that the Government of Malawi banned family planning between 1969 and 1984.³⁸ Still, 26 percent of married women who want to postpone or stop childbearing are not using contraception.³⁹

Although Malawi is predominantly rural, it is urbanizing quickly due to a combination of rural-urban migration, reclassification of rural to urban areas, and natural population growth in urban areas. Its urban population is projected to increase from 15.5 percent to 32 percent by 2050.⁴⁰ About two-thirds of urban residents lived in slum settlements between 1990 and 2007.⁴¹ This group showed poorer health outcomes than rural residents.⁴²

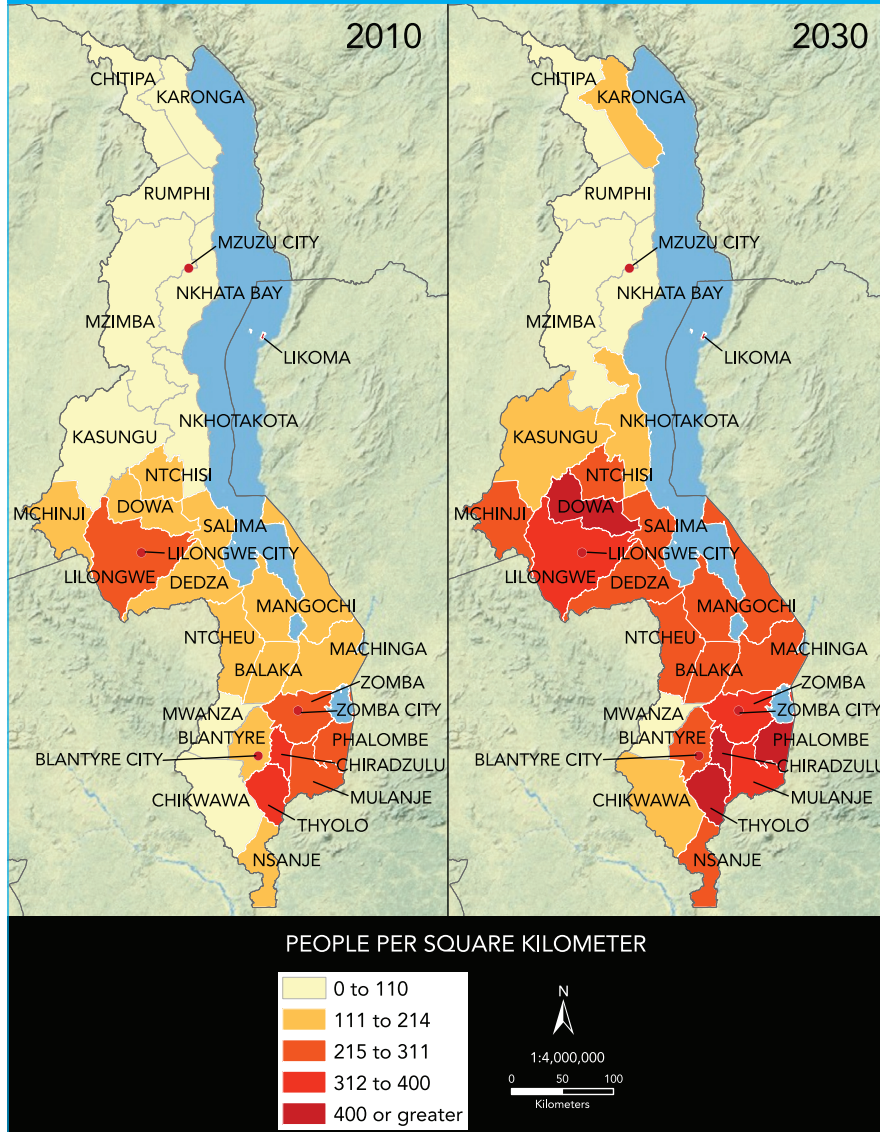
Links between Population, Environment, and Climate Change Challenges

Malawi has a total land area of 94,080 square kilometers, of which 20.7 percent is arable land.⁴³ Climate change challenges facing Malawi include: water scarcity, unpredictable weather patterns, recurring flooding and droughts, drying up of rivers and lakes, low fish supplies, excessive temperatures, landslides, frequent bush fires, increased prevalence of water-borne diseases, and low and unstable hydro-electric production.

Malawi's economy and food supply are vulnerable because of a reliance on rain-dependent agricultural production. The country's rapid population growth has put pressure on land and other natural resources, leading to fragmentation of small land holdings and over-exploitation. These effects will be compounded as the population grows.

Malawi's population density of 126 people per square kilometer is among the highest in Africa, and it will grow six-fold to 803 people per square kilometer by 2050.⁴⁴ Pressure on arable land is even higher. About 766 people share every square kilometer.⁴⁵ Between 2010 and 2030, close to half of Malawi's land area will have excessively

Figure 8: Current and Projected Population Density in Malawi



Source: PAI, *Mapping Population and Climate Change* website. <http://populationaction.org/climatemap>

high population density, and a quarter will have densities that are higher than the current average (Figure 8).

Interactions between population growth and climate change risks have far-reaching ramifications on human and environmental well-being. More people are settling in fragile ecosystems, the fish supply is low, disease patterns are changing, livelihoods are at risk, and people's capacity to adapt to effects of climate change is compromised.

One clear environmental consequence of rapidly growing population in Malawi is deforestation. Between 1990 and 2010, Malawi lost about 17 percent of its forest cover, at an annual rate of 1 percent.⁴⁶ Agricultural expansion, growth of human settlements, dependence on wood for cooking, and low levels of reforestation all contributed to this deforestation. Malawi is also over-dependent on hydroelectric power, which is vulnerable to drought and inadequate rains.

Kenya

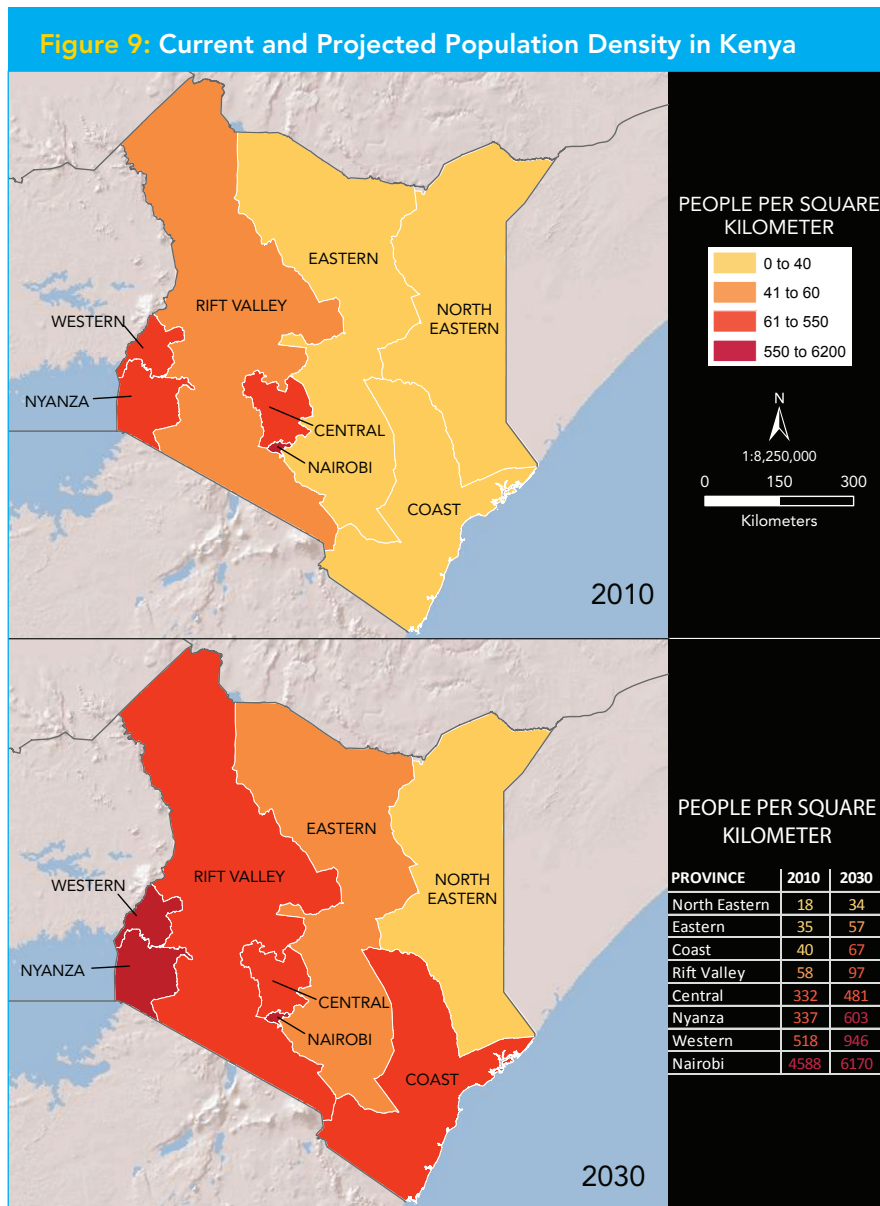
Kenya faces similar population, climate change, and environmental challenges to Malawi. Based on our regional analyses, Kenya faces high population growth, moderate projected decline in food production, high levels of water scarcity, and low resilience to climate change.

Population Dynamics

Kenya's population grew from about 6 million in 1950 to about 41 million today. It is projected to grow to 96.9 million by 2050. Annual population growth was around 2.8 percent per year in the 1950s, peaked at 3.8 percent in the 1980s, and is now at 2.7 percent.⁴⁷

In 1978, Kenya had the highest total fertility rate in the world at 8.1 children per woman. This propelled the country's population growth at a time when the country was seeing large declines in child mortality. Since then, Kenya's total fertility has declined to 4.6 children per woman in 2008.⁴⁸

The percentage of married women using modern contraception increased from 7 percent in 1978 to 46 percent by 2009. However, fertility preferences in Kenya have changed only slightly between 1989 and 2009. The desired number of children among married women of childbearing age has declined from 4.8 in 1989 to 4.0 by 2009. The percentage of married women who want to end



Source: PAI, *Mapping Population and Climate Change* website. <http://populationaction.org/climatemap>

childbearing remained constant around 48 percent. Still, 26 percent of married women have unmet need for family planning.⁴⁹

Kenya is one of the most rapidly urbanizing countries in Africa. About 24 percent of its population now lives in urban areas, and close to half will be doing so by 2050.⁵⁰ About 55 percent of Kenya's urban population lived in slum settlements between 1990 and 2007.⁵¹ Coastal urban centers like Mombasa face climate change stresses such as flooding and dwindling fish supplies.

Links between Population, Environment, and Climate Change Challenges

Kenya has a total land area of 569,250 square kilometers, of which about 20 percent is arable.⁵² The livelihoods of the majority of Kenyans depend on rain-dependent agriculture, with less than 1.5 percent of the land under irrigation.⁵³ Many semi-arid areas that face persistent drought, water and food shortages (like the North Eastern Province) also have the highest levels of fertility.

Kenyan stakeholders in our research study noted the same environment and climate change challenges as those reported in Malawi. In addition, they expressed concerns

about rising sea level and change in ocean currents, and increasing desertification. Climate change is already affecting Kenya's agricultural sector and threatens to stifle its economic growth. The country faces frequent and intense droughts and floods, leading to food insecurity. As the climate changes over the next century, agricultural production in Kenya is projected to decline while population grows.

Kenya's current population density of 70 people per square kilometer is expected to grow to 276 people per square kilometer by 2050. The density of 889 people per square kilometer of arable land shows a farmland shortage in the country.⁵⁴ Western and Nyanza provinces' already high levels of population density will increase as high fertility continues to propel rapid population growth. Population density is also accelerating in the Rift Valley, one of the main breadbaskets for the country (Figure 9).

Between 1990 and 2010, Kenya lost 6 percent of its forest cover at an annual rate of 0.3 percent.⁵⁵ With much of the population dependent on forests for their livelihoods and energy needs, rapid population growth will increase pressure on this valuable resource. Strengthening the country's reforestation program could ease this pressure.

POLICY FRAMEWORK FOR POPULATION, CLIMATE CHANGE AND ENVIRONMENT IN KENYA AND MALAWI

Given the strong links between population and climate change, tackling the issues jointly at the policy and program levels makes sense. Looking at rapid population growth and climate change risks together would help identify groups of people who are vulnerable to these twin challenges and illuminate how to help them adapt.

Population growth and climate change are increasingly recognized as key development challenges in policy documents and among stakeholders in both Kenya and Malawi. Stakeholder interviews revealed a high level of awareness of population and climate change challenges in both countries, and highlighted the need to link the two issues at policy and program levels. But until recently, key players coordinating climate change work in both countries did not pay attention to population issues.

Malawi's development blueprint through 2016, the Malawi Growth and Development Strategy (MGDS) II, recognizes both climate change and population dynamics as important for sustainable development. The MGDS II identifies climate change and population among its priority areas and calls for including these issues in policies, plans, and programs across sectors. Kenya's development blueprint, Vision 2030, recognizes population growth and urbanization as factors in the country's development. Although climate change was not highlighted in the original Vision 2030 plan produced in 2004, it has been included in the 2013-2017 Medium Term Plan for the implementation of Vision 2030.

The recent recognition of climate change and population in some national development policies is a positive step that is likely to pave way for integration of the two issues in more policies and programs in Malawi and Kenya.

Currently, population and reproductive health policies in the two countries highlight the impact of population growth and urbanization on environmental conservation and sustainable development. The policies call for partnerships across sectors in addressing population issues.

Both Malawi and Kenya revised their population policies in 2010, which are yet to be approved. Kenya produced its first population policy in 1966 and has had two other policies since then. Malawi approved its first population policy in 1994.

While environmental policies include population dynamics as part of preservation of natural resources, they stop short of calling for population interventions. For example, Malawi's NAPA highlights links between population and climate change, and states that investments in reproductive health and family planning should be a priority for adaptation. However, it did not propose a specific project that included reproductive health or family planning.

Malawi has recently begun drafting a policy on climate change. The country's government is building a National Climate Change Response Framework and Strategy, which will support national and local governments in delivering long-term climate-resilient and sustainable development. The program seeks to include climate change within broader development policies, plans and programs; harmonize existing policies; and coordinate strategic responses to climate change. The program is run by the Department of Development Planning in the Ministry of Economic and Development Planning.

Kenya has made some headway in coordinating climate change work. The 2010 National Climate Change Response Strategy (NCCRS) lays the groundwork for adaptation and mitigation measures to be integrated in all government planning, budgeting, and development goals. It calls for a joint action plan involving the private sector and civil society to tackle climate change.

The strategy recommends a comprehensive policy and legal framework to make climate change policies

more cohesive. It also aims to strengthen vulnerability assessment, impact monitoring, research capacity, and communication, education and awareness campaigns. It underscores the need to develop a financial mechanism and incentives that will enhance investments and make programs sustainable. Kenya is drafting a climate change policy and law based on the strategy, and efforts are being made to strengthen the institutional framework for coordinating climate change issues.

COORDINATION AND IMPLEMENTATION CHALLENGES IN KENYA AND MALAWI

In both countries, integration of population and climate change issues at policy and program levels is limited and each sector implements its activities separately. This is because of a lack of strong coordination institutions and systems; multiple policies tackling population and climate change issues; lack of funding; and lack of technical expertise in program design and research.

Coordination: Government officials, donors and civil society in both countries highlighted the need for strong coordination across sectors and harmonization of climate change policy and program responses.

In Malawi, stakeholders noted that coordination of climate change work is weak. A formal coordination mechanism for climate change issues has been recently set up as a project at the Ministry of Economic Development Planning in Malawi. Stakeholders disagreed as to whether the coordination arm should remain there or be placed at the Department of Environmental Affairs. While the Economic Development Planning Ministry could help mainstream climate change in other sectors, Environmental Affairs deals with most technical climate change issues.

Similar coordination concerns were raised in Kenya. There, climate change work is coordinated by four bodies—the inter-ministerial National Climate Change Steering committee, which is headed by the Prime Minister; the Climate Change Coordination Unit at the Prime Minister’s office; the Climate Change Secretariat, located at the Ministry of Natural and Mineral Resources, and the Climate Change Unit at the National Environment Management Authority (NEMA), which is responsible for technical coordination of climate change issues. In an effort to mainstream climate change issues, a climate change desk officer has also been allocated in all ministries. But many stakeholders highlighted the need to clarify roles and responsibilities of the prime Minister’s office, the Ministry of Natural and Mineral Resources, and NEMA. Others suggested placing the coordination role at the planning ministry.

Kenya is also transitioning to a decentralized government after adopting a new constitution in 2011. This could be an opportunity to focus on community efforts to adapt to the effects of climate change, including increasing access to family planning services. However, the same coordination challenges seen at the national level could also hinder community efforts.

Fragmentation of policies: The lack of an overarching policy on climate change was noted as a barrier to effective integration of climate change and population issues. Even in cases where the other issue is mentioned, implementation strategies and programs do not address it. One government official in Malawi said:

“There are too many people working on one thing (climate change). Different ministries come up with the same policies; so harmonization of these policies is key... every ministry is trying to address food security issues, so you find conflicting policies on food security. [Ministry of] Lands has their own policy on land” (Government official, Kenya)

Funding: Many stakeholders noted that lack of funding is a major obstacle for addressing climate change in ministries where this is not the core business. The government provides limited funding for climate change work and relies heavily on donor funding. This means that ownership of the

climate change programs by government is lacking. For instance, the Ministry of Health is underfunded to address the disease impact of climate change.

Technical Capacity: Stakeholders noted weak technical capacity in program design, implementation, and evaluation as challenges in developing effective responses to climate change, especially across sectors. Most of the climate change research remains on a global scale, and there is little application of this data at national and sub-national levels. For example, there has not been mapping of communities that are vulnerable to climate change risks in order to devise targeted programs. The imprecise forecasting of rainfall and other weather patterns is a major cause of anxiety among farmers. There is also weakness in creating proposals to tap into global funding mechanisms for climate change programs.

Integration at program level: Lack of good coordination at the policy and strategy level filters down to communities where programs are implemented. There is inadequate public awareness on the link between population dynamics and climate change. For instance, the Ministries of Agriculture and Environment address issues related to food security, but with limited reference to population issues like family size and migration. Some programs addressing climate change issues do consider gender, children and the disabled, especially in emergency planning. Stakeholders called for better awareness of the benefits of linking the two issues among program designers and implementers.

POLICY RECOMMENDATIONS

The following recommendations will help integrate policies and programs on population and climate change the context of sustainable development.

- 1. Integrate policies and programs to address climate change and mainstream it across development sectors.** This should include setting up strong coordination and governance systems. Oversight is needed to make sure various sectors work together to avoid duplicating efforts and wasting resources.
- 2. Prioritize population in national climate change and development plans, with adequate resources for effective implementation of programs.** In particular, climate change plans and programs should include expanding access to family planning. This will boost resilience to climate change.
- 3. Prioritize meeting women and their partners' needs for family planning as it will yield a 'triple win' in the U.N. sustainable development framework.** Universal access to family planning would reduce fertility rates and slow population growth, which would help: (1) reduce poverty by improving and expanding health, schooling and economic opportunities; (2) protect and manage natural resources for economic and social development; and (3) reduce inequality and create greater opportunities for all through social development.
- 4. Improve technical capacity in program design, research and application of research to decision-making processes.** Decision makers engaged in climate change policy, planning, and implementation at all levels should have access to research on population trends, climate change and development. It is important to strengthen technical capacity of local experts to design and carry out integrated programs, and to monitor and evaluate these programs. This includes supporting efforts to improve training of local climate change experts
- 5. Incorporate population, reproductive health and family planning into global and regional institutions and frameworks for sustainable development.** Such institutions include the African Union and the UN Economic Commission for Africa. The frameworks include the post-2015 MDG, the International Conference on Population and Development (ICPD), and the post-Rio +20 agendas.

ENDNOTES

- 1 UN Population Division. 2011a.
- 2 UN Population Division. 2011a.
- 3 UN Population Division. 2011b.
- 4 Singh et al. 2009
- 5 Hardee and Mutunga. 2009
- 6 Because future trends cannot be known with certainty, the United Nations Population Division uses three projection (low, medium, and high) variants to project the population until 2100. The three variants have different assumptions regarding future trends in fertility, mortality and international migration. The medium-variant assumes a relatively sustained decline in fertility, which is made possible through investments in family planning/ reproductive health. UN Population Division. 2011a.
- 7 WCED. 1987.
- 8 Das Gupta et al. 2011.
- 9 United Nations. 1994.
- 10 United Nations. 1992.
- 11 UN Population Division. 2012.
- 12 UN Population Division. 2011a.
- 13 Population momentum refers to the growth that populations continue to experience for many years even after reaching replacement level fertility. This is the result of young people who are already born entering and going through their reproductive periods. As a result, the year when replacement level fertility is reached has an effect on the ultimate population size. See: Venture Strategies and AFIDEP. ND.
- 14 UN-HABITAT. 2011.
- 15 UN Population Division. 2012.
- 16 APHRC. 2002.
- 17 UN-HABITAT. 2011.
- 18 UN Population Division. 2012.
- 19 Satterthwaite.2009.
- 20 Though Cairo is not situated on the Coast, Klein et al (2002) notes that... "... cities like Dhaka, Calcutta, and Cairo are situated at some distance from the sea, yet they are considered coastal because of their deltaic setting.."
- 21 Klein et al. 2002.
- 22 IPCC. 2007.
- 23 Zulu et al. 2011.
- 24 Mutunga and Hardee. 2010.
- 25 World Bank. 2010.
- 26 Das Gupta et al. 2011.
- 27 Jayne et al. 2003.
- 28 Based on PAI calculation. See PAI. ND. Additional details on "Detailed Methodology Section" section in the Annex
- 29 Mutunga and Hardee. 2010.
- 30 PAI. 2011.
- 31 Countries are classified as water scarce or water stressed if there are fewer than 1,000 and 1,667 cubic meters of renewable fresh water available per person per year respectively. See details on "Detailed Methodology Section" section in the Annex
- 32 IPCC. 2007.; UNFPA. 2009.
- 33 See details on "Detailed Methodology Section" section in the Annex
- 34 UN Population Division. 2011a.
- 35 UN Population Division. 2011a.
- 36 NSO and ICF Macro. 2011.
- 37 NSO and ICF Macro. 2011.
- 38 Chimbwete et al. 2005.
- 39 NSO and ICF Macro. 2011.
- 40 UN Population Division. 2012.
- 41 UN-HABITAT. 2011.
- 42 Zulu et al. 2011.; Emina et al. 2011.
- 43 FAO. 2011.
- 44 UNPD 2011a
- 45 FAO. 2011.
- 46 FAO. 2011.
- 47 UN Population Division. 2011a.
- 48 KNBS and ICF Macro. 2010.
- 49 KNBS and ICF Macro. 2010.
- 50 UN Population Division. 2012.
- 51 UN-HABITAT. 2011.
- 52 Republic of Kenya. 2009.
- 53 Republic of Kenya. 2011.
- 54 Republic of Kenya. 2009.; Republic of Kenya. 2011.
- 55 FAO. 2011.
- 56 PAI. ND.

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ANNEX I: DETAILED METHODOLOGY AND ANALYSIS

The study employed both quantitative and qualitative research methods to examine links between population dynamics, climate change, and sustainable development. The analyses took place at two levels (i) sub-Saharan Africa (SSA) region, and (ii) national level, specifically on Kenya and Malawi.

QUANTITATIVE ANALYSIS

To examine links between population dynamics, climate change and sustainable development, the project analyzed quantitative data on population, environment, and developmental factors that contribute to climate vulnerability in the SSA region.

In particular, it examined the impact of different fertility scenarios of population growth on climate vulnerabilities, such as the projected availability of fresh water and agricultural productivity. We also analyzed the relationship between demographic trends, climate resilience and reproductive health.

The analysis identified population and climate hotspots by furthering PAI's hotspots analysis⁵⁶ to a regional level. Population and climate hotspots are countries with rapid population growth, low resilience to climate change, high projected decline in food production, water scarcity and high unmet need for family planning.

Hotspot countries are those experiencing all three of the below factors:

1. High projected decline in agricultural production between 1990 and 2020 (decline of greater than 2.982 percent)

PAI calculates the projected agricultural production based on a crop model adopted by the Socioeconomic Data and Applications Center (SEDAC) at Columbia University. The model estimates projected yields in 2020 of four major cereal crops (wheat, rice, maize and soybean) based on 1990 production levels and, taking into account uncertainty in the expected impact of climate change.

Hotspot countries include those where projected declines in agricultural production in relative terms are above the median of all countries projected to experience declines in agricultural production between 1990 and 2020. Therefore, only countries projected to experience a decline of more than 2.892 percent are included.

Data Source(s): SEDAC, Columbia University
<http://sedac.ciesin.columbia.edu/mva/cropclimate/>

2. Low resilience to climate change

A resilience rating that falls in the 1st or 2nd quartile of the *Vulnerability-Resilience Indicators Model (VRIM)* dataset

Resilience to climate change is measured in the VRIM, an index that combines 17 physical, social, and economic indicators to assess the resilience of a society to anticipated climate change impacts. The index measures countries' abilities to recover from occurrences of climate change according to indicators of current sensitivity (e.g., food security, human health, water resources) and adaptive capacity (economic, human and civic resources, environment) for the year 2000.

Countries for which data are available are grouped into four categories (most, more, less and least resilient) and mapped according to these quartiles. Hotspot countries include those in the lower two quartiles of resilience.

Data Source(s): Yohe et al. 2006

3. Rapid population growth

A population growth rate greater than 2 percent

Countries with high rates of population growth are those where the population growth rate is above the median of all countries between 2005 and 2010.

This group includes all countries where populations were estimated to grow by more than 2 percent annually over the period, based on UNFPA. 2008 and McNicoll G 1984.

Data Source(s): UN Population Division 2011a
<http://esa.un.org/unpd/wpp/Excel-Data/population.htm>

Other variables employed in the hotspots analysis are:

4. High Unmet Need for Family Planning (above 18.4%)

Unmet need for family planning is determined in large household surveys. Based on a nationally representative sample, currently married women who do not wish to have a child in the next two years (including women who wish to have no more children

at any time) and are not using a contraceptive method are considered to have an unmet need for family planning.

Countries where unmet need for family planning is **above the median rate of 18.4 percent**, as measured in surveys between 1997 and 2010.

Data Source(s): MEASURE DHS
<http://www.measuredhs.com/Where-We-Work/Country-List.cfm>

For countries with no recent DHS, a secondary source is the UN Population Division 2011b (World Contraceptive Use 2011)
<http://www.un.org/esa/population/publications/contraceptive2011/contraceptive2011.htm>

5. Countries currently experiencing physical water stress or scarcity (Less than 1,667 m³ per person per year)

Countries are classified as water scarce or water stressed according to widely used measures established by hydrologist Malin Falkenmark.

We use data on the amount of total renewable freshwater available in each country (2008-2012) from the Food and Agriculture Organization of the United Nations. Total renewable freshwater includes the amount of both internal and external renewable water available to a country. This value is then divided by 2010 population figures provided by the United Nations Population Division to produce a per capita rate.

Countries are classified as water scarce if there are **fewer than 1,000 cubic meters** of renewable fresh water available per person per year, and as water stressed if there are **fewer than 1,667 cubic meters** available per person per year.

Data Source(s): FAO, Aquastat
<http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en>

UN Population Division 2011a
<http://esa.un.org/unpd/wpp/Excel-Data/population.htm>

Falkenmark and Widstrand. 1992.

QUALITATIVE ANALYSIS

In order to understand the extent to which policies addressing population challenges and climate change and related issues link up the issues, we conducted a desk review of policies and strategies, and carried out in-depth interviews with stakeholders in Kenya and Malawi. The stakeholders included government policy makers, development partners, researchers, and representatives of civil society organizations in Kenya and Malawi.

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