

AUGUST 2015

BY JASON BREMNER,
KRISTEN P. PATTERSON
AND RACHEL YAVINSKY

BUILDING RESILIENCE THROUGH FAMILY PLANNING: A TRANSFORMATIVE APPROACH FOR WOMEN, FAMILIES, AND COMMUNITIES

**\$24.5
BILLION**

The amount spent on international humanitarian response in 2014.

The powerful combination of family planning and keeping girls in school enables young women to make positive choices about their own health and future.

**300
MILLION**

The 2050 projected population of the Sahel.

In many developing countries, chronic poverty, repeated economic and environmental shocks, and poor health—including lack of access to and use of modern contraceptives—contribute to recurring cycles of crisis. Extreme weather events tied to climate change are increasingly threatening people’s property, livelihoods, and lives. To break these cycles, governments and development partners are creating strategies to reduce vulnerability and build resilience—the ability of individuals, households, communities, institutions, and ecosystems to withstand crises, recover from them, and adapt so as to better endure them in the future.¹

Researchers and development practitioners from diverse fields are studying resilience to better understand different responses to crises (see Box). Research suggests that women are critical to building resilience and should be at the center of resilience programs.² However, the contribution of family planning and reproductive health to the resilience of women, their families, and communities is largely unexplored in resilience research.³ Some evidence suggests that family planning may be transformative in changing people’s ability at multiple levels to adapt to climate change and break cycles of crisis.⁴

This policy brief explores the connections between women, their access to family planning, population, and resilience, and makes the case that investments that aim to improve women’s access to rights-based voluntary family planning are critical to building resilience. This brief aims to help health, climate change, and development practitioners who focus on resilience better understand and communicate these connections in order to embrace and promote family planning as a local, national, and global development priority.

Social Sector Investments Are Needed

From 2000 to 2009, more than 2 billion people worldwide were affected by disasters requiring national and international humanitarian assistance, close to 840,000 lives were lost, and estimates of the economic damage surpassed \$890 billion.⁵ In 2014, international donors spent \$24.5 billion on

BOX

Resilience Has Many Definitions

The United States Agency for International Development (USAID)’s 2012 resilience policy and program guidance defines resilience as “the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.”¹

The Rockefeller Foundation defines resilience as “the capacity of individuals, communities and systems to survive, adapt, and grow in the face of stress and shocks, and even transform when conditions require it. Building resilience is about making people, communities and systems better prepared to withstand catastrophic events—both natural and manmade—and able to bounce back more quickly and emerge stronger from these shocks and stresses.”²

While there is no standard definition, resilience efforts share a commitment to helping people, communities, institutions, and governments avoid recurring crises by building local adaptive capacity and reducing vulnerability to risk of impacts.

1 United States Agency for International Development (USAID), *Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance* (Washington, DC: USAID, 2012).

2 The Rockefeller Foundation, “Resilience,” accessed at www.rockefellerfoundation.org/our-work/topics/resilience/, on Aug. 12, 2015.

humanitarian response, with \$19 billion provided directly by governments and another \$6 billion by private contributors. Sixty-six percent of this official humanitarian assistance went to countries suffering protracted crises and categorized as ‘long-term recipients,’ meaning they regularly receive a high share of humanitarian assistance year after year.⁶

The Horn of Africa is one region that receives a great deal of humanitarian assistance. In 2011, drought and conflict plunged more than 13 million people into crisis in the Horn of Africa. The impact of the crisis, however, was different across the different countries of the Horn, and shows the importance of social sector investments (health and education) as well as transparent governance for building resilience. In Somalia the drought in combination with the protracted civil conflict led to a food security crisis that killed an estimated 258,000 people and resulted in a great exodus from the most affected areas, leaving more than 1 million people internally displaced and another 1 million Somali refugees crossing into other countries.⁷

Elsewhere in the Horn, Ethiopia and Kenya were severely affected by the same drought and famine, but were better able to respond and cope with the crisis. Both Ethiopia and Kenya are among the largest recipients of official development assistance from international donors, much of which is spent on nonemergency assistance such as social and health programs that aim to address the root causes of vulnerability. In contrast, in Somalia, people were already more vulnerable to disaster at the onset of the drought, largely because of the absence of government services and lack of investment in development and safety nets.⁸

Increasingly, development partners are looking at situations like the recurring droughts in the Horn of Africa as well as in the Sahel region, and aiming to build resilience and address the root causes of crises. USAID's Policy and Program Guidance, "Building Resilience to Recurrent Crisis," developed in 2012, and the United Kingdom Department for International Development's Humanitarian Policy, "Saving Lives, Preventing Suffering, and Building Resilience," published in 2011, established the common objective of improving resilience across all development and humanitarian programs in all countries where they work. Governments are also developing resilience strategies, such as Ethiopia's Climate-Resilient Green Economy strategy, and recognizing the importance of social sector investments in health and education as components of building resiliency.

Investments in Women and Girls Are Critical

When disasters occur in low-resource settings, women and children often bear the heaviest burden. Natural disasters disproportionately kill women and children, such as in the Asian tsunami of 2004, where survival was much higher among men than women; and recent episodes of severe food shortages in the Horn of Africa drought, where children were disproportionately affected and approximately one in 10 children under 5 died.⁹ And, since women in impoverished households usually are responsible for collecting natural resources and caring for the family, droughts and other natural disasters disproportionately impact poor women and girls.¹⁰

At the same time, women possess substantial individual and collective capacity to help themselves, their families, and their communities to adapt quickly to new circumstances. Based on both the differential vulnerability and impact on women and the outstanding capacity of women, focusing resilience strategies

on women and girls is essential for achieving lasting results. Approaches to building resilience must systematically reduce key gender gaps and ensure that women are given the tools, resources, and opportunities to participate and lead.

How Does Family Planning Contribute to Women's Resilience?

To increase resilience, households and communities need both adaptive capacity—the ability to quickly and effectively respond to new circumstances—and the ability to reduce vulnerability and the risk of impacts.¹¹ There are many different ways to increase adaptive capacity and reduce vulnerability and risk, but since women are important actors in building resilience, a critical question that health, development, and resilience advocates and practitioners need to answer is "How does voluntary family planning contribute to women's adaptive capacity and their ability to reduce their individual and household's risk of impacts?"

The use of family planning can reduce unintended pregnancies and allow for healthier timing and spacing of pregnancies. Forty percent of the 213 million pregnancies that occurred worldwide in 2012 (85 million) were unintended. Fifty percent of these unintended pregnancies ended in abortion and 38 percent ended in an unplanned birth.¹² Research has proven that avoiding unintended and closely spaced pregnancies results in better health and less morbidity and mortality for both mothers and their children.¹³ In addition, research has established a number of social and economic consequences as women recover from unintended pregnancies and, particularly, unsafe abortions. Women cannot fulfill other responsibilities such as making a living, attending school, and caring for their families, and the death of a mother during childbirth or because of an unsafe abortion can quickly plunge a household into crisis.¹⁴

Women who avoid unintended pregnancy and its consequences are more likely to have the time and energy to actively participate in livelihoods and the labor force, and are able to increase their resilience by learning new ways to adapt their livelihoods and reduce risks from natural disasters, climate change, or other unforeseen circumstances. Similarly, healthier children place less of a care burden on mothers, thus freeing them to spend time increasing their own adaptive capacity and reducing risk. Evidence from Bangladesh, for example, suggests that women who consistently have better access to strong family planning programs are more likely to work outside the home, and their households accumulate greater wealth.¹⁵ Resilience experts recognize that having multiple sources of income and financial assets are important factors that are critical for helping households better prepare for and respond to crises.¹⁶

Family planning may also have long-term impacts on adaptive capacity, because family planning programs can result in higher educational attainment for women and thus brighter future earning prospects.¹⁷ Avoiding early marriage, early pregnancy, and the high fertility that often results from starting childbearing early has both immediate and long-term social and health benefits.¹⁸ Women with low levels of education are more

vulnerable to drought, displacement, food insecurity and other crises. Education level, particularly of women, is recognized as a critical factor in reducing risk and building the capacity of households and communities to adapt to climate change.¹⁹ Together, the powerful combination of family planning and keeping girls in school enables young women to make positive choices about their own health and future, which in the long-term may result in greater resilience for them, their future families, and their communities.

The health, education, and economic benefits of family planning for women are all important precursors for adaptive capacity and risk reduction, but family planning can also play a transformative role in household decisionmaking, which may also improve resilience. Women who have better access to family planning are more likely to participate in household decisionmaking. Evidence from food security, livelihood, and environment programs suggests that empowered women are more likely to make wise choices regarding diversification of livelihoods, nutrition, and food security.²⁰

Beyond the individual and household benefits of resilience, increased access to voluntary family planning in combination with girls education also has benefits at the population level, such as slowing population growth, which contributes to resilience at the community, national, and regional levels. Rapid population growth generally results from high fertility due to a combination of early marriage and childbearing, unintended pregnancy due to unmet need for family planning, and a desire for large families. In most countries that suffer recurring crises, more than 40 percent of the population is under 15 years old and population

growth rates are greater than 2 percent per year.²¹ In a large country such as Ethiopia, that translates into adding more than 3 million children to the population every year.²² Such rapid growth can make it challenging for communities and governments to keep pace with basic social sector needs, such as building new schools and health clinics, training new educators and health care professionals, and investing the additional resources needed to expand agricultural extension services, create jobs for young people, build resilient institutions and infrastructure, and provide humanitarian assistance during crises.

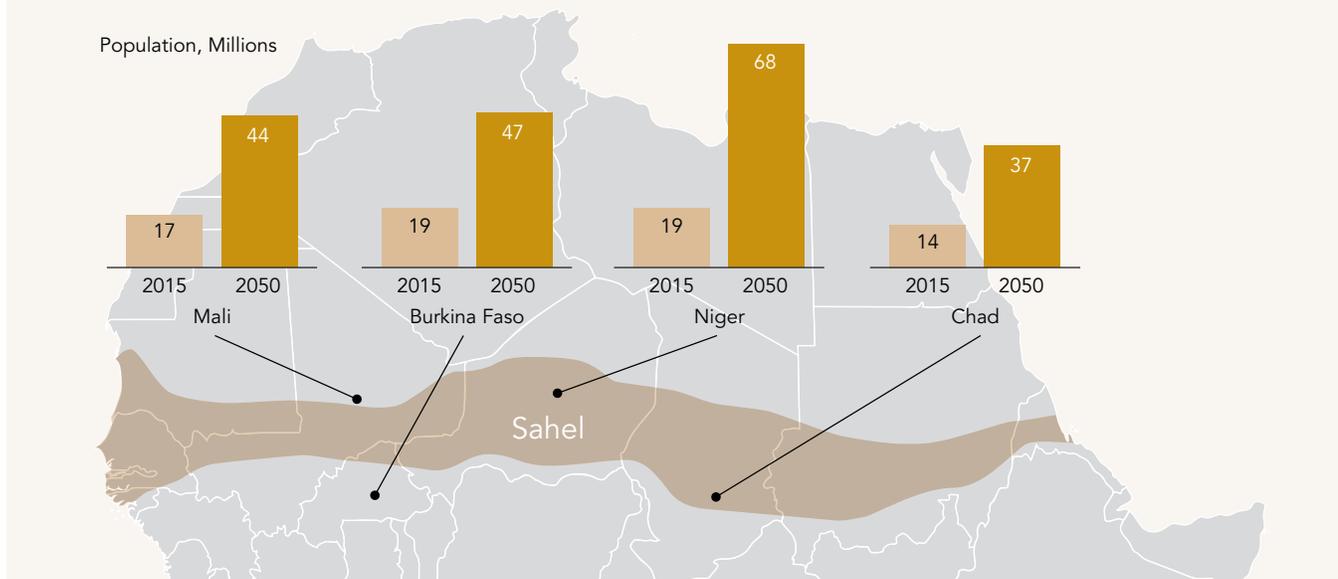
Population Growth and Resilience— A Look at the Sahel

Africa’s Sahel is among the most chronically vulnerable regions in the world due to many factors, including poverty, population growth, and the variable climate. Spanning across the African continent, with the Sahara Desert to the north and the savanna to the south, the Sahel covers an area of over 1.2 million square miles (more than 3 million square kilometers), and includes parts of 10 countries: Guinea-Bissau, the Gambia, Senegal, Mauritania, Mali, Burkina Faso, Niger, Chad, Sudan, and Eritrea (see Figure).

Since 1950, the Sahel has experienced increasing climate variability, and between 1970 and 1993, there were 20 years of severe droughts. As a result, the people of the Sahel region are increasingly food insecure. The combination of low rainfall, environmental degradation, insufficient agricultural and pastoralist investment, and civil conflict have led to significant decreases in agricultural production.²³ In 2011, low food stocks and high food prices left over 18 million people with food insecurity.²⁴

FIGURE

Sahelian Countries Where Family Planning Could Build Resilience



Climate experts predict that by 2050 the Sahel will be between 5 F to 9 F (3 C to 5 C) warmer than it is today, and extreme weather events, particularly severe drought, will be even more common. The length of the growing period across most of the Sahel is expected to decline by more than 20 percent, resulting in decreased agricultural and livestock productivity.²⁵

Rapid Population Growth Can Limit Resilience

Despite these difficult conditions, the population of the Sahel is among the fastest growing in the world. Estimates put the population at over 100 million in 2010, more than three times the population in 1950. Projections suggest the population will grow to over 300 million people in the Sahel by 2050.²⁶ This rapidly growing population, in tandem with the changing climate in an already arid region, means that a far greater number of people will be exposed to more frequent droughts and famine. Population growth puts additional pressure on the natural resources that are currently the basis of rural livelihoods in the Sahel. More households means increasing demand for croplands and grazing lands, straining existing land tenure systems and traditional conflict management as croplands expand into grazing areas and grazing lands are shared among more animals and additional users.²⁷ In addition, population growth in combination with agricultural growth and urbanization will strain already limited water sources in the region.²⁸ As a result, experts are predicting that, despite low population density, the Sahel will be unable to adapt to predicted changes in climate and accommodate the expected population growth, and may see a larger outmigration of people as well as increasing conflict.²⁹ Some experts call for a focus on educating and empowering girls and expanding access to voluntary family planning to reduce fertility and slow population growth as part of building resilience in the Sahel.³⁰

The rapid population growth of the Sahel is a result of high fertility, which is related to low levels of school enrollment for girls, early marriage, unintended pregnancy, unmet need for family planning, and a persistent desire for large families. Of the 10 countries in the world with the highest total fertility rate (TFR), or average number of births per woman, four are in the Sahel—Niger (7.6), Chad (6.5), Burkina Faso (6.0), and Mali (5.9).³¹

While education and literacy rates in the Sahel are low overall compared to the rest of Africa and the world, they are especially low for women. The overwhelming majority of women are poor and illiterate with little control over resources in their households or communities. In Niger, for example, only 15 percent of girls enroll in secondary school, and half of women are married before their 16th birthday. Among married women, contraceptive use is very low in the Sahel region. Less than 2 percent of married women in Chad and 10 percent of married women in Mali use modern contraceptives (see Table). By comparison, fertility in both Ethiopia and Kenya has declined to an average of 4 births per woman, and modern contraceptive use among married women is 40 percent and 53 percent, respectively.³²

High fertility and the desire for a large family are related to the high infant mortality rates of the past. Infant mortality rates over the last two decades, however, have declined remarkably throughout the Sahel. In Niger, for example, the number of children who die before their first birthday has been cut in half since just 1990.³³ As a result, more children are surviving and life expectancy is increasing. However, declines in desired family size and fertility that have accompanied this transition in much of the rest of the world, have not yet occurred in the Sahel.

TABLE

Sociodemographic Data for Select Countries in the Sahel Region

	Total Fertility Rate (TFR)	Percent Married Women Using Modern Contraceptive	Percent Females Enrolled in Secondary School	Population (millions)	
				2015	2050
Burkina Faso	6.0	18	26	18.5	46.6
Chad	6.5	2	14	13.7	37.4
Mali	5.9	10	40	16.7	43.6
Niger	7.6	12	15	18.9	68.0

Source: Toshiko Kaneda and Kristin Bietsch, 2015 *World Population Data Sheet* (Washington, DC: Population Reference Bureau, 2015).

The resulting rapid population growth can make it difficult for communities and governments to keep pace with current social sector needs, much less invest the additional resources needed to build resilience to recurring crises and adapt to the expected climate changes in the region. For example, in Niger, where the population is growing by almost 4 percent per year, almost 1 million additional children are born annually, and 52 percent of the total population is under the age of 15. As a result, Niger's population is likely to double in just 20 years, unless fertility starts to decline soon. This growth will require a massive investment in schools, health clinics, and job creation for youth, all of which will compete with the resources that Niger also needs to invest in adapting agricultural and livestock systems, ensuring food security, and building resilience to withstand future crises.

Slowing population growth in Sahelian countries as a means of building community and national resilience will require greater political and financial commitment to educating girls, increasing access to voluntary family planning, and empowering women. When girls stay in school they are more likely to delay childbearing past adolescence and are more likely to gain decisionmaking power in their homes as well as about their health. In the Sahel, 37 percent of women with secondary education use contraceptives, compared to only 4 percent of illiterate women. Postponing first births past adolescence can also lower maternal and infant mortality, reduce fertility, and thus slow population growth.³⁴

Several countries in the Sahel have committed to increasing family planning budgets through Family Planning 2020, a global partnership to enable 120 million more women and girls to use contraceptives by 2020. Mali, for example, aims to increase the state budget allotted for the purchase of contraceptives by 5 percent per year with the objective of increasing demand-driven modern contraceptive use from about 10 percent in 2013 to 18 percent by 2018. If this targeted pace of growth continues, contraceptive use could increase to more than 50 percent of married women by 2050, improving maternal and child health and greatly reducing fertility. Estimates from Mali suggest that the combination of investments in education, family planning, and empowering women could result in slower population growth and a possible future population of 33 million in 2050 as opposed to almost 45 million that is currently projected.³⁵ With fewer young children to support, individual families as well as governments at all levels could spend resources not just on basic needs and social services, but also on infrastructure, new agricultural systems, and jobs needed for resilience and development.

Population and Family Planning Is Important to Resilience

Across many organizations and initiatives, recognition is growing about the importance of population and family planning to resilience. USAID's *Policy and Program Guidance on Building Resilience to Recurrent Crisis*, for example, notes that "efforts to meet the unmet need for family planning may be a necessary component of a larger strategy to build resilience."³⁶

Experts are coming together to discuss these connections. In September 2012, the OASIS (Organizing to Advance Solutions in the Sahel) Conference brought together a multidisciplinary group of experts from Africa and North America to launch OASIS, an initiative led by University of California-Berkeley and the African Institute for Development Policy, to avert a humanitarian catastrophe in the Sahel. Conference participants—a multidisciplinary group of researchers, policymakers, and advocates—discussed new projections of global warming and rapid population growth in the Sahel and began to build the evidence to enable decisionmakers at a national, regional, and global level to invest in catastrophe prevention in the region. All participants agreed that immediate needs require investing in girls and young women, enabling women through family planning to manage their childbearing within a human rights framework, and adapting agricultural practices to climate change.³⁷

And new initiatives are being developed to increase funding for family planning in vulnerable areas. In November 2013, the World Bank Group launched a Sahel Initiative with a development pledge of \$1.5 billion to help countries of the Sahel tackle political, food, climatic, and security vulnerabilities through a coordinated approach to build resilience and promote economic opportunity. Part of this investment is the \$170 million Sahel Women's Empowerment and Demographic Dividend Project, launched in December 2014, that will work across the region to improve the availability and affordability of reproductive health

services while also empowering women and girls through education and life-skills programs.³⁸

Despite these new initiatives, many missed opportunities in other emerging climate resilience initiatives remain. At national and international levels, most programs focused on adapting to climate change or building climate resilient economies either do not recognize these connections, or if they do explicitly acknowledge the connections, the program implementation does not include family planning. For example, many least developed country governments recognized the contribution of population growth to vulnerability and adaptive capacity in their National Adaptation Plans of Action (NAPAs), but none have funded family planning as part of their NAPA-funded climate and resilience programs.³⁹ The following recommendations suggest opportunities to both raise awareness about the relationship between population, family planning, and resilience, and ensure that the recognition of these connections results in new policies and programs.

Recommended Actions

Raise awareness of the benefits that family planning could provide to enhancing resilience.

Many developing country governments already recognize the contribution of poor health and status of women and resulting population growth to vulnerability and adaptive capacity. The ability of women, families, and communities to quickly and effectively respond to and reduce vulnerability during crises depends on a diverse set of investments that should include family planning. Raising awareness about these connections could help ensure that family planning is seen as a response to self-identified priorities, rather than a strategy imposed by international donors. Furthermore, it may help to ensure that social sector investments, particularly for women and girls, are funded and implemented as part of resilience programs and climate adaptation strategies.

Support research and development of programs that address interactions among family planning, development assistance, resilience, and future humanitarian relief.

Many development agencies are beginning to integrate relief and development planning with an eye toward resilience. USAID has developed Joint Planning Cells (JPCs) for the Sahel and Horn of Africa as well as the USAID RISE (Resilience in the Sahel-Enhanced) Initiative to bring together relief and development teams and partners to work together on how to achieve the shared goal of building resilience. Thus far, none of these efforts explicitly recognizes the role of women and reproductive health. JPCs and partners in the RISE Initiative and other emerging resilience initiatives should be urged to support research and programs that explore the ways in which family planning can build resilience through healthier and smaller families and contribute to ending the cycle of crisis that cripples so many countries.

Support the development of monitoring and evaluation metrics that assess the relationship between family planning and resilience in integrated development programs.

Many multisectoral community-based development projects that simultaneously implement activities focused on reproductive health, primary health, natural resource management, and livelihoods are beginning to frame their integrated efforts in the context of resilience. Collecting data—both quantitative and qualitative—on the added value of these integrated programs, however, has proved challenging.⁴⁰ Increasing support for innovative ways to measure the contribution of family planning to building resilience within integrated programs would be a valuable way to demonstrate the impact of family planning on women’s abilities to engage in agriculture and nutritious food production, participate in markets to build livelihoods, adapt to climate change, and conserve natural resources—all of which yield multiple cobenefits around maternal and child health, food security, nutrition, and resiliency.⁴¹

These recommendations can help guide policy and programs to integrate family planning into resilience strategies, so that women and families are more prepared to manage the challenges they face.

Acknowledgments

This brief was written by Jason Bremner, associate vice president of International Programs at Population Reference Bureau (PRB), Kristen P. Patterson, senior policy analyst at PRB, and Rachel Yavinsky, policy analyst at PRB. Special thanks to Clive Mutunga and Shelley Snyder of the United States Agency for International Development (USAID), and Barbara Seligman, Kristen Bietsch, and Susan Rich of PRB who provided input. This publication is made possible by the generous support of the American people through USAID under the terms of the IDEA Project (No. AID-OAA-A-10-00009). The contents are the responsibility of PRB and do not necessarily reflect the views of USAID or the United States Government.

References

- 1 Development Alternatives Incorporated (DAI), “Resilience—Learning From Practice Across the Development Spectrum,” *Developing Alternatives* (Bethesda, MD: DAI, 2013).
- 2 Mercy Corps, “What Really Matters for Resilience? Exploratory Evidence on the Determinants of Resilience to Food Security Shocks in Southern Somalia,” (Portland, OR: Mercy Corps, 2013).
- 3 Karen Newman et al., “Population, Sexual and Reproductive Health, Rights, and Sustainable Development: Forging a Common Agenda,” *Reproductive Health Matters* 22, no. 43 (2014): 53-64.
- 4 Kirk R. Smith et al., “Human Health: Impacts, Adaptation, and Co-Benefits,” in *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. C.B. Field et al. (Cambridge: Cambridge University Press, 2014).
- 5 Jan Kellet and Dan Sparks, *Disaster Risk Reduction: Spending Where It Should Count* (Somerset, UK: Global Development Assistance, 2012).
- 6 Sophia Swithern, *Global Humanitarian Assistance Report 2015* (Somerset, UK: Global Development Assistance, 2015).
- 7 Global Humanitarian Assistance, “Somalia,” accessed at www.globalhumanitarianassistance.org/countryprofile/somalia#tab-home, on Aug. 3, 2015.
- 8 Hugo Slim, “IASC Real-Time Evaluation of the Humanitarian Response to the Horn of Africa Drought Crisis in Somalia, Ethiopia, and Kenya” (2012), Inter-Agency Standing Committee (IASC) Synthesis Report, accessed at http://reliefweb.int/sites/reliefweb.int/files/resources/RTE_HoA_SynthesisReport_FINAL.pdf, on Aug. 3, 2015.
- 9 Eric Neumayer and Thomas Plümpner, “The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002,” *Annals of the Association of American Geographers* 97, no. 1 (2007): 551-66; and Francesco Checchi and W. Courtland Robinson, *Mortality Among Populations of Southern and Central Somalia Affected by Severe Food Insecurity and Famine During 2010-2012* (Rome: Food and Agriculture Organization (FAO), 2013).
- 10 Neumayer and Plümpner, “The Gendered Nature of Natural Disasters.”
- 11 USAID, *Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance* (Washington, DC: USAID, 2012).
- 12 Gilda Sedgh, Susheela Singh, and Rubina Hussain, “Intended and Unintended Pregnancies Worldwide in 2012 and Recent Trends,” *Studies in Family Planning* 45, no. 3 (2014): 301-14.
- 13 Shea O. Rutstein, “Further Evidence of the Effects of Preceding Birth Intervals on Neonatal, Infant, and Under-Five-Years Mortality and Nutritional Status in Developing Countries: Evidence From the Demographic and Health Survey,” *DHS Working Papers Series* 41 (Calverton, MD: Macro International, 2008).

- 14 Susheela Singh, "Global Consequences of Unsafe Abortion," *Women's Health* 6, no. 6 (2010): 849-60.
- 15 Shareen Joshi and T. Paul Schultz, "Family Planning as an Investment in Development: Evaluation of a Program's Consequences in Matlab, Bangladesh," *Center Discussion Paper* no. 951 (New Haven, Conn: Yale University Economic Growth Center, 2007).
- 16 Mercy Corps, "What Really Matters for Resilience?"
- 17 Gustavo Angeles, David Guilkey, and Thomas Mroz, "The Effects of Education and Family Planning Programs on Fertility in Indonesia," *Economic Development and Cultural Change* 54, no. 1 (2005): 165-201.
- 18 Cynthia Lloyd, *New Lessons—The Power of Educating Adolescent Girls: A Girl's Count Report on Adolescent Girls* (New York: Population Council, 2009).
- 19 Wolfgang Lutz, Raya Muttarak, and Erich Striessnig, "Universal Education Is Key to Enhanced Climate Adaptation," *Science* 346, no. 6213 (2014): 1061-2.
- 20 Reshma Naik and Rhonda Smith, *Impacts of Family Planning on Nutrition* (Washington, DC: Futures Group, Health Policy Project, 2015).
- 21 Toshiko Kaneda and Kristin Bietsch, *2015 World Population Data Sheet* (Washington, DC: Population Reference Bureau (PRB), 2015).
- 22 United Nations (UN) Population Division, *World Population Prospects: The 2015 Revision* (New York: UN, 2015).
- 23 OXFAM, "Food Crisis in the Sahel: Five Steps to Break the Hunger Cycle in 2012," Joint Inter-Agency Briefing May 2012, accessed at www.oxfam.org/sites/www.oxfam.org/files/ib-food-crisis-sahel-31052012-en.pdf, on Aug. 3, 2015.
- 24 USAID, "Sahel Joint Planning Cell Strategic Plan: Reducing Risk, Building Resilience, and Facilitating Inclusive Economic Growth," accessed at www.usaid.gov/sites/default/files/documents/1866/Sahel%20JPC%20Strategy%20Summary_28%20June%202013.pdf, on Aug. 3, 2015.
- 25 Philip K. Thornton et al., *Mapping Climate Vulnerability and Poverty in Africa* (Nairobi: International Livestock Research Institute, 2006).
- 26 John F. May, Jean-Pierre Guengant, and Thomas R. Brooke, "Demographic Challenges of the Sahel," accessed at www.prb.org/Publications/Articles/2015/sahel-demographics.aspx, on Aug. 3, 2015.
- 27 A. Ickowicz et al., "Crop-Livestock Production Systems in the Sahel—Increasing Resilience for Adaptation to Climate Change and Preserving Food Security," in *Building Resilience for Adaptation to Climate Change in the Agriculture Sector*, proceedings of a joint FAO/OECD workshop, ed. Alexandre Meybeck (Rome: FAO/OECD, 2012); and Matthew D. Turner et al., "Livelihood Transitions and the Changing Nature of Farmer-Herder Conflict in Sahelian West Africa," *Journal of Development Studies* 47, no. 2 (2011): 183-206.
- 28 Isabelle Niang and Oliver C. Ruppel, "Africa," in *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. V.R. Barros et al. (Cambridge: Cambridge University Press, 2014).
- 29 UN Environment Programme (UNEP), *Livelihood Security, Climate Change, Migration, and Conflict in the Sahel* (Geneva: 2011, UNEP).
- 30 Malcolm Potts et al., "Crisis in the Sahel: Possible Solutions and the Consequences of Inaction," accessed at <http://oasisinitiative.org/post/60187895297/potts-2013-oasis-report> 2013, on Aug. 3, 2015.
- 31 Kaneda and Bietsch, *2015 World Population Data Sheet*.
- 32 Kaneda and Bietsch, *2015 World Population Data Sheet*.
- 33 UN Population Division, *World Population Prospects*.
- 34 Judith Bruce and John Bongaarts, "The New Population Challenge," in *A Pivotal Moment: Population, Justice & the Environmental Challenge*, ed. Laurie Mazur (Washington, DC: Island Press, 2009).
- 35 Health Policy Project, Futures Group, "RAPID Women Mali: A New Advocacy Tool for Women Leaders" (September 2011), accessed at www.healthpolicyinitiative.com/Publications/Documents/1460_1_RAPID_Women_Sept_27_2011_FINAL_FOR_WEB.pdf, on Aug. 3, 2015.
- 36 USAID, *Building Resilience to Recurrent Crisis*.
- 37 The OASIS Initiative: Organizing to Advance Solutions in the Sahel, accessed at <http://oasisinitiative.org/>, on Aug. 3, 2015.
- 38 World Bank, "World Bank Approves \$170 Million to Improve Reproductive Health and Education for Women and Girls in Africa's Sahel Region" press release (December 2014), accessed at www.worldbank.org/en/news/press-release/2014/12/18/world-bank-improve-reproductive-health-education-women-girls-africa-sahel-region, on Aug. 3, 2015.
- 39 Clive Mutunga and Karen Hardee, "Strengthening the Link Between Climate Change Adaptation and National Development Plans: Lessons from the Case of Population in National Adoption Programmes of Action (NAPAs)," *Mitigation and Adaptation Strategies for Global Change* 15, no. 2 (2010).
- 40 Rachel Winnik Yavinsky et al., *The Impact of Population, Health, and Environment Projects: A Synthesis of the Evidence* (Washington, DC: Population Council, 2015).
- 41 Jason Bremner, *Population and Food Security: Africa's Challenge* (Washington, DC: PRB, 2012).



POPULATION REFERENCE BUREAU

The Population Reference Bureau **INFORMS** people around the world about population, health, and the environment, and **EMPOWERS** them to use that information to **ADVANCE** the well-being of current and future generations.

www.prb.org

POPULATION REFERENCE BUREAU

1875 Connecticut Ave., NW 202 483 1100 PHONE
Suite 520 202 328 3937 FAX
Washington, DC 20009 USA popref@prb.org E-MAIL
