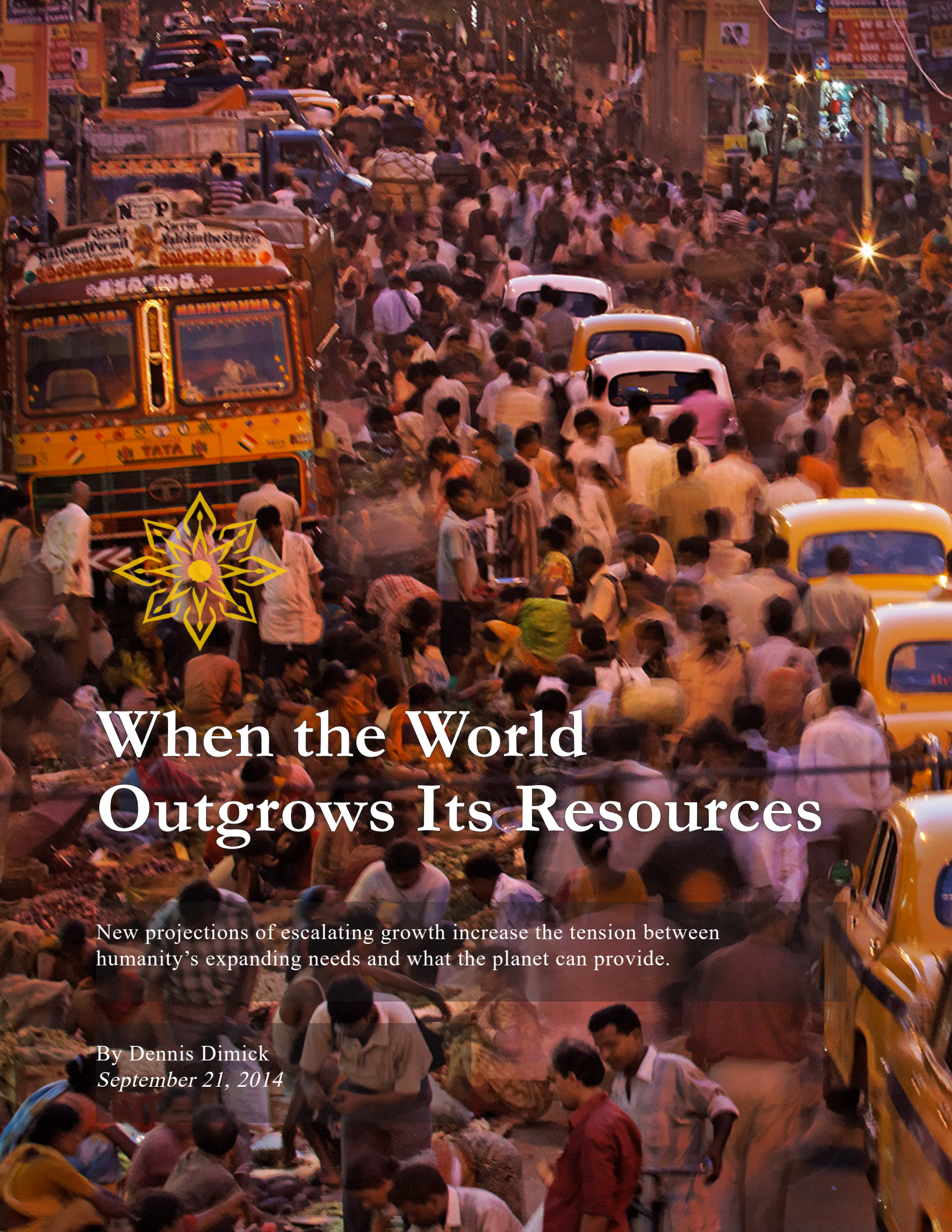

When the World Outgrows Its Resources

New projections of escalating growth increase the tension between humanity's expanding needs and what the planet can provide.

By Dennis Dimick
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"We are already using the equivalent of 1.5 planets."

There are more than 7 billion people on Earth now, and roughly one in eight of us doesn't have enough to eat.

The question of how many people the Earth can support is a long-standing one that becomes more intense as the world's population—and our use of natural resources—keeps booming.

This week, two conflicting projections of the world's future population were released. As National Geographic's Rob Kunzig writes here, a new United Nations and University of Washington study in the journal Science says it's highly likely we'll see 9.6 billion Earthlings by 2050, and up to 11 billion or more by 2100. These researchers used a new "probabilistic" statistical method that establishes a specific range of uncertainty around their results. Another study in the journal Global Environmental Change projects that the global population will peak at 9.4 billion later this century and fall below 9 billion by 2100, based on a survey of population experts.

Who is right? We'll know in a hundred years.

Population debates like this are why, in 2011, National Geographic published a series called "7 Billion" on world population, its trends, implications, and future. After years of examining global environmental issues such as climate change, energy, food supply, and freshwater, we thought the time was ripe for a deep discussion of people and how we are connected to all these other issues—issues that are getting increased attention today, amid the new population projections.

After all, how many of us there are, how many children we have, how long we live, and where and how we live affect virtually every aspect of the planet upon which we rely to survive: the land, oceans, fisheries, forests, wildlife, grasslands, rivers and lakes, groundwater, air quality, atmosphere, weather, and climate.

Children read the Koran using flashlights in Wantugu, Ghana
Photograph by Peter DiCampo

A crowded street in Calcutta, India, reflects the looming threat of overpopulation, which will further strain resources already in limited supply. Photograph by Randy Olson, National Geographic Creative

World population passed 7 billion on October 31, 2011, according to the United Nations. Just who the 7 billionth person was and where he or she was born remain a mystery; there is no actual cadre of census takers who go house to house in every country, counting people.Instead, population estimates are made by most national governments and international organizations such as the UN. These estimates are based on assumptions about existing population size and expectations of fertility, mortality, and migration in a geographic area.

We've been on a big growth spurt during the past century or so. In 1900, demographers had the world's population at 1.6 billion, in 1950 it was about 2.5 billion, by 2000 it was more than 6 billion. Now, there are about 7.2 billion of us.

In recent years we've been adding about a billion people every 12 or 13 years or so. Precisely how many of us are here right now is also a matter of debate, depending on whom you consult:The United Nations offers a range of current population figures and trends, the U.S. Census Bureau has its own estimate, and the Population Reference Bureau also tracks us.

The new UN study out this week projects that the world's population growth may not stop any time soon. That is a reversal from estimates done five years ago, when demographers—people who study population trends—were projecting that by 2045, world population likely would reach about 9 billion and begin to level off soon after.

But now, the UN researchers who published these new projections in the journal Science say that a flattening of population growth is not going to happen soon without rapid fertility declines—or a reduction in the number of children per mother.

Immigrant women at a Sikh festival in Spain. Research suggests that the more education a woman receives, the fewer children she is likely to have. Photograph by Randy Olson, National Geographic Creative

In most parts of sub-Saharan Africa that are still experiencing rapid population growth. As Rob Kunzig wrote for National Geographic, the new study estimates that "there's an 80 percent chance . . . that the actual number of people in 2100 will be somewhere between 9.6 and 12.3 billion."

A History of Debates Over Population

In a famous 1798 essay, the Reverend Thomas Malthus proposed that human population would grow more rapidly than our ability to grow food, and that eventually we would starve. He asserted that the population would grow geometrically—1, 2, 4, 8, 16, 32—and that food production would increase only arithmetically—1, 2, 3, 4, 5, 6. So food production would not keep up with our expanding appetites. You might imagine Malthus' scenario on geometric population growth as being like compound interest: A couple have two children and those children each produce two children.

Those four children produce two children each to make eight, and those eight children each have their own two kids, leaving 16 kids in that generation. Article continued on next page.