

San Francisco Chronicle

NORTHERN CALIFORNIA'S LARGEST NEWSPAPER

Population growth increases climate fear



Rocinha slum in Rio de Janeiro, long a serious problem, shows one of the dangers of overpopulation - although many Rio slums have improved since 2011. Now half the world, including Brazil, is below the 2.1 fertility rate needed for zero growth.

Photo: Felipe Dana, Associated Press

September 02, 2013

Carolyn Lochhead

California has 157 endangered or threatened species, looming water shortages, eight of the 10 most air-polluted cities in the country and 725 metric tons of trash washing up on its coast each year.

California also has 38 million people, up 10 percent in the last decade, including 10 million immigrants. They own 32 million registered vehicles and 14 million houses. By 2050, projections show 51 million people living in the state, more than twice as many as in 1980.

In the public arena, almost no one connects these plainly visible dots.

For various reasons, linking the world's rapid population growth to its deepening environmental crisis, including climate change, is politically taboo. In the United States, Europe and Japan, there has been public hand-wringing over falling birthrates and government policies to encourage child-bearing.

But those declining birthrates mask explosive growth elsewhere in the world.

In less than a lifetime, the world population has tripled, to 7.1 billion, and continues to climb by more than 1.5 million people a week.

A consensus statement issued in May by scientists at Stanford University and signed by more than 1,000 scientists warned that “Earth is reaching a tipping point.”

An array of events under way - including what scientists have identified as the sixth mass extinction in the earth’s 540 million-year history - suggest that human activity already exceeds earth’s capacity.

Climate change is but one of many signs of environmental stress. “The big connector is how many people are on earth,” said Anthony Bar-nosky, a UC Berkeley integrative biologist.

The world population is expected to reach 9.6 billion by mid-century. The addition will be greater than the global population of 1950.

The United States is expected to grow from 313 million people to 400 million. Economies have expanded many times faster, vastly increasing consumption of goods and services in rich and developing countries.

“The combination of climate change and 9 billion people to me is one that is just fraught with potential catastrophes,” said John Harte, a UC Berkeley ecosystem scientist.

“The evidence that humans are damaging their ecological life-support system is overwhelming,” said the report by the Millennium Alliance for Humanity and the Biosphere at Stanford. “By the time today’s children reach middle age, it is extremely likely that the Earth’s life-support systems, critical for human prosperity and existence, will be irretrievably damaged.”

California Gov. Jerry Brown had the report translated into Chinese and delivered it to Chinese President Xi Jinping in June.

A new epoch?

So complete is human domination of earth that scientists use the term “Anthropocene” to describe a new geological epoch.

The most obvious sign is climate change. People have altered the composition of the atmosphere by burning fossil fuels. But other human impacts, widely discussed by scientists, seldom reach the political arena.

Residues from 100 million tons of synthetic chemical compounds produced each year are so pervasive that they commonly appear in polar bear tissues, whale blubber and the umbilical cords of babies.

Each year, humans appropriate up to 40 percent of the earth’s biomass, the product of photosynthesis, earth’s basic energy conversion necessary to all life.

Humans have converted more than 40 percent of the earth’s land to cities or farms. Roads and structures fragment most of the rest.

Humans appropriate more than half the world’s fresh water. Ancient aquifers in the world’s bread baskets, including the Ogallala in the Great Plains, are being drained.

Only 2 percent of major U.S. rivers run unimpeded. California’s Sacramento-San Joaquin River Delta has been entirely re-engineered. The last time the Colorado River reached the Sea of Cortez was in 1998. The Nile, Indus and Ganges rivers have been reduced to a trickle.

Humans surpass nature as a source of nitrogen emissions, altering the planet's nitrogen cycle.

A quarter of known mammal species, 43 percent of amphibians, 29 percent of reptiles and 14 percent of birds are threatened. African elephants may be extinct within a decade.

A third of world fisheries are exhausted or degraded. Forty percent of coral reefs and a third of mangroves have been destroyed or degraded. Most species of predator fish are in decline.

Ocean acidification, a product of fossil fuel burning, is dissolving calcifying plankton at the base of the food chain.

A garbage gyre at least twice the size of Texas swirls in the Pacific Ocean.

"We're changing the ability of the planet to provide food and water," Harte said.

Even scientists who doubt ecological collapse, such as Michele Marvier, chair of environmental studies at Santa Clara University, acknowledge that "humans dominate every flux and cycle of the planet's ecology and geochemistry."

Water and food

In December, the Interior Department said by mid-century the Colorado River will not support demand from the seven states it supplies, including California. The main reason is expected population growth from 40 million to as many as 76 million people.

Among the remedies considered: towing icebergs from the Arctic to Southern California.

"Phoenix continues to grow at one of the highest rates in the country," said Jerry Karnas, population and sustainability director of the

Center for Biological Diversity, the only national environmental group campaigning to limit population growth. "There is no discussion about what the future Phoenix is going to do when the Colorado River is done."

Ecosystems can endure large stresses. But multiple stresses can act synergistically.

Take food. The World Resources Institute, an environmental think tank, estimates that by mid-century the world will need 70 percent more food, because as people grow wealthier they eat more meat, requiring more grain to feed livestock.

That will require converting more land to crops, even as urbanization destroys prime farmland. Farms are a big source of deforestation and a big emitter of greenhouse gases that cause climate change. Climate change reduces yields by increasing the frequency of droughts and floods. Lower yields will require conversion of more land to farms.

Still, nature has shown great resiliency, said Santa Clara University's Marvier. Peregrine falcons nest in San Francisco skyscrapers. Coyotes roam Chicago.

"We can't just continue dumping nitrogen into the ocean at the same rate and expect everything to be fine," Marvier said. "The good news, though, is that when we do clean up our act, we tend to see some pretty amazing bounce back."

Barnosky agreed that natural systems are resilient. "But you have to give them a chance to be resilient," he said. "Falcons can live in cities. But elephants can't."

People have been predicting disaster for centuries, including 18th century scholar Thomas Malthus and Stanford University ecologist Paul Ehrlich, who in 1968 with his wife Anne predicted famines from runaway population growth in “The Population Bomb.”

Ehrlich said he was right because at least 2 billion people are malnourished.

“You’ll find plenty of people who will tell you not to worry, technology will take care of it,” Ehrlich said. “We’ll feed, house, clothe and so on 9.5 billion people, give them happy lives with no problem at all. That’s exactly the line that Anne and I got when there were 3.5 billion people on the planet. ... The answer is, they haven’t done it.”

Touchy strategy on growth

Reducing population growth was central to the U.S. environmental movement at its birth in 1970, spurred in part by Ehrlich’s book.

Most environmental groups now steer clear of the subject.

Forced sterilizations in India in the 1970s and China’s coercive one-child policy angered feminists and tainted family planning efforts.

Liberals argue that blaming environmental problems on population growth is to “blame the poor.” They say the United States and other capitalist societies consume too much.

Conservatives and religious groups who oppose abortion and celebrate reproduction attack family planning at home and abroad. This summer a House Appropriations panel again slashed money for family planning aid.

Population and consumption each drive ecological damage.

“Even in poorer nations that don’t have the impact that the average American has on the planet, population as it grows squeezes out other species because people need space to live, and the other species need space to live,” said Jeffrey McKee, an anthropologist at Ohio State University. “At some point they come into juxtaposition, and something has to give. So far, it hasn’t been us.”

Population momentum

Plummeting fertility rates, from 4.9 births per woman in the 1960s to the current 2.6, led to the belief that worries about population were overblown.

The drop surprised demographers. Half the world - including Japan and Western Europe but also China, Vietnam, Brazil and other emerging economies - is below the 2.1 fertility rate needed for zero growth. The United States, the world’s third-largest country behind China and India, and the only rich country still growing rapidly, recently saw its birth rate fall to 1.9.

Press coverage has stressed a “birth dearth” that threatens economic growth and elderly retirements, prompting fears that the human species could contract to 1 billion by 2300 because of a failure to reproduce.

But an important exception to falling fertility rates is sub-Saharan Africa, along with such places as Afghanistan and Yemen, where birth rates remain exceptionally high. U.N. demographers sharply raised their population projections last year, adding another billion

people by century's end, to nearly 11 billion, because African fertility rates have peaked at more than five births per woman.

From now until 2050, poor countries will add the equivalent of a city of 1 million people every five days, said a report last year by the Royal Society, a British scientific organization.

Population momentum ensures that absolute numbers will keep rising for decades despite falling birth rates. That's because the exponential growth that took just 12 years to add the last billion in 2011 - and will take just 14 more years to add the next billion - means growth is building from a large base of people, many in their child-bearing years.

Falling birth rates have lulled people into complacency, said J. Joseph Speidel, a professor at UCSF's Bixby Center on Global Reproductive Health. "The annual increment is rising quite dramatically," he said. "We are still adding about 84 million people a year to the planet."

Although rich countries will have problems supporting their elderly, "I'd sure rather have the problems of Spain or Sweden than Nigeria or Niger," Speidel said.

Unintended births

More than 40 percent of the world's 208 million pregnancies each year are unplanned, according to the Guttmacher Institute, a family planning research group. Half of U.S. pregnancies, about 3 million a year, are unintended, according to the National Campaign to Prevent Teen and Unplanned Pregnancy, a Washington advocacy group. About half of them end in abortion.

Across cultures, from Iran to Thailand to California, voluntary access to contraception has slashed fertility rates, Speidel said. But discussion of population growth remains taboo.

"Many young people on university campuses have been taught over the past 15 years that the connection between population growth and the environment is not an acceptable subject for discussion," said Martha Campbell, director of International Population Dialogue at UC Berkeley's School of Public Health, in a recent essay.

Campbell argued that voluntary contraception is not coercive, but blocking women from controlling how many children they have is coercive. When given a chance, she said, women across cultures choose to provide a better life for fewer children.

The Guttmacher Institute said it would cost an extra \$4.1 billion a year, little more than a rounding error in the \$3.8 trillion U.S. budget, to provide birth control to all 222 million women in the world who want to limit their pregnancies but lack access to contraception.

"What many of us really worry about is that there will be this crash landing, from a planet with 9 billion, rapidly down to 5 or so," said ecologist Harte.

"The landing will result from methods of population reduction that none of us want to see, like famine, disease and war," he added. "I don't think anybody has described a workable trajectory that gets us up to 9 and then softly back down to 5."

Population change and birth rates

Small increases in women's fertility rates make a big difference in population growth over time.

The difference between fertility rates of 1.75 and 2 births per woman equals:

-- 2 billion more people in 2100.

-- 5 billion more people in 2200.

-- 7 billion more people in 2300.

A fertility rate of 1.5, just below the current average in Europe, would:

-- Keep world population at its current level of about 7 billion in 2100.

-- Cut world population below 3 billion in 2200.