

**POPULATION & CONSUMPTION**  
**ANIMAL WELFARE INSTITUTE**



# POPULATION & CONSUMPTION

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In 1804, human population reached a notable milestone: for the first time in history, 1 billion of us occupied the planet at the same time.

It took us a long time to get there. Tens of thousands of years passed between the first tentative steps abroad by a tiny, isolated human population in Africa, and that point in the early 19<sup>th</sup> century when 1,000,000,000 of us had fanned out across the globe.

The climb to the next billion would not be so gradual. In 1927—a scant 123 years after we hit 1 billion—our population reached 2 billion, and we were rapidly gaining ground. Before the 20<sup>th</sup> century ended, human population had mushroomed to 6 billion. In October 2011, we passed 7 billion. By 2050, according to United Nations estimates, 9.6 billion humans will share the Earth. Although the rate of growth has slowed, our number will continue to rise as the 21<sup>st</sup> century progresses.

As our species multiplies, however, others are disappearing. And we are the cause. Renowned Harvard biologist E.O. Wilson explains: “Today as human populations expand and alter the natural environment, they are reducing biological diversity to its lowest level



since the end of the Mesozoic era, 65 million years ago.”<sup>1</sup> At that earlier point in time—long before humans had entered the scene—a 6.2-mile-wide meteorite slammed into what is now Mexico’s Yucatan Peninsula, most likely triggering the Earth’s fifth mass extinction event and terminating the reign of the dinosaurs.

We are now, in fact, in the midst of the Earth’s sixth mass extinction event, this time caused by humans, not meteorites. Species are thought to go extinct naturally at the rate of about 1–5 per year. Scientists say, however, that the current rate is thousands of times that—a catastrophic diminishment that we, as humans, are experiencing for the very first time.

## IMPACT FACTORS: POPULATION, AFFLUENCE, TECHNOLOGY

Our dramatic population expansion is in part a testament to technological advances in obtaining and manipulating resources for our benefit. Though more than a billion humans still live in life-shortening poverty, we are on the whole finding it easier to survive childbirth, feed ourselves, and ward off injury and illness into old age. But our needs and appetites have exacted a steep price from other denizens of the planet—and future generations of humans.



*The human population is now so large that the amount of resources needed to sustain it exceeds what is available at current consumption patterns.<sup>2</sup>*

Three key factors influence humankind's ecological impact on the planet: the total number of people, the level of consumption practiced by each individual, and the efficiency with which we transform natural resources into consumer goods. The interaction between these factors is sometimes expressed in simplified form by the I=PAT equation: **Impact = Population x Affluence x Technology.**

Through more efficient manufacturing and reduction and recycling of waste, we can and often do vastly shrink the "T" component of the I=PAT equation. Indeed, in many ways we are getting more efficient at generating units of consumption at a smaller ecological price per *unit*—whether that unit is 1,000 calories of food or 100 sheets of printer paper.

Even where we have made considerable gains in ecological efficiency, however, there remains a problem: our technology gains are being swamped by the other two factors: population and affluence. A larger, more affluent population means that more and more people are consuming more and more resources. Thus, even as we get better at the production process, our overall impact on animals and their habitats continues to grow.



**We are catching far more fish than the seas can replenish—leading to fishery collapses that reverberate throughout ocean ecosystems.**



**Conversion of Southeast Asian rainforests to plantations for palm oil—used in many processed foods and other consumer products—has left orangutans on the brink of extinction.**

## AN OVERDRAWN EARTH

According to a United Nations Environment Programme (UNEP) report prepared in advance of the 2012 UN Conference on Sustainable Development (the “Rio+20 Earth Summit”), the global use of natural resources rose by over 40 percent from 1992 to 2005—an increase that exceeded population growth.<sup>3</sup> In fact, resource consumption increased on a per capita basis during that time by 27 percent.

The non-profit Global Footprint Network (GFN) measures “ecological footprints”—the amount of productive land required to sustain a single human or a given segment of the population. The ecological footprint measurements indicate that we are using more than the Earth has to offer. For the human population as a whole, GFN calculated that “it now takes the Earth one year and six months to regenerate what we use in a year,” adding, ominously, that “turning resources into waste faster than waste can be turned back into resources puts us in global ecological overshoot, depleting the very resources on which human life and biodiversity depend.”<sup>4</sup>

Overshoot is like having a bountiful trust fund meant to sustain us in perpetuity, and spending down

the principal rather than living off the income. This overspending is having a drastic effect on the world's flora and fauna, as well, says GFN: "The threats facing the rich array of plant and animal life on the planet seem greater than at any time in modern history. Problems such as climate change, water shortages, overharvesting and habitat disruption—symptoms of human pressure on the planet's finite resources—are driving down wildlife populations worldwide."<sup>5</sup>

## WHAT CAN WE DO?

To reduce our impact, we must address all three contributing factors in the I=PAT equation.

### *Stabilizing our population: empowering the poor*

Obviously, we must come to grips with our burgeoning population. An ever-expanding human population creates more pressure to destroy and degrade habitat—transforming wildlands to croplands, consuming energy and producing greenhouse gases, cutting down forests, drawing water from lakes and streams, and converting other natural resources to consumer goods. As the



Human-induced climate change is rapidly altering Arctic ecosystems. Polar bears, who need sea ice to reach their food, now endure shorter hunting seasons and increasingly grim prospects.

organization Population Action International (PAI) explains: “Slower population growth would help people adapt to climate change, reduce the scale of human vulnerability to these impacts, and give nations a chance to make essential investments in health care, education, and sustainable economic development.”<sup>6</sup>

*Tomorrow’s population size depends on the choices couples make about childbearing today.*<sup>7</sup>

In the developed world, many already are electing to have smaller families; in many affluent countries, the growth rate has slowed and even reversed itself. However, in poorer parts of the world, family planning often is easier said than done. Lack of access to reproductive health resources, coupled with gender and economic inequalities put pressure on women to bear many children.

Programs are needed that empower women worldwide to play a more decisive role in determining the size of their families. Often, this empowerment comes not just with access to contraceptives, but with education and—for the poorest individuals—an *increase* in the standard of living, leading to greater economic stability and independence. This involves access to basic life-sustaining resources that most of us take for granted in the developed world.

### *Addressing affluence: the good life, not just the goods*

As for the middle component, “affluence,” the disparity between consumption as practiced in the developed world and that practiced in the developing world is stark. According to PAI, the average person in the United States consumes nearly 50 times more energy than a person in Ghana. The vast majority of greenhouse gases are also generated by the developed world.<sup>8</sup> Thus, even as the developed world slows its population growth, its ecological footprint remains outsized.

In our individual lives, each of us can make choices that result in less resource consumption and a smaller footprint—without diminishing our quality of life. Many

such personal actions are encapsulated in the phrase “reduce, reuse, recycle.” We can drive less, cut energy consumption in our homes, and switch to renewable energy sources where available. We can use things up before discarding them for newer versions. We can also become more conscientious consumers, choosing environmentally friendlier products—preferably those whose environmental claims have been evaluated by independent third parties—and favoring products that can be recycled into new products so as not to drain natural resources further.

Diet is also important. According to a report by the non-profit Environmental Working Group (EWG), “Americans’ appetite for meat and dairy—billions of pounds a year from billions of animals—takes a toll on our health, the environment, climate and animal welfare. Producing all this meat and dairy requires large amounts of pesticides, chemical fertilizer, fuel, feed and water. It also generates greenhouse gases and large amounts of toxic manure and wastewater that pollute groundwater, rivers, streams and, ultimately, the ocean.”<sup>9</sup> EWG advises, for environmental, human health, and animal welfare reasons, eating less meat and opting for meat from organic, pasture-raised, grass-fed animals. From a welfare perspective, animals raised outdoors on pasture are subject to far less stress and have far greater opportunities to express natural behaviors than those raised in close confinement on factory farms.

We each have the responsibility to choose wisely, and consider the effects of our choices on animals, both domestic and wild. Being conscientious consumers involves educating ourselves concerning where our consumer goods come from and how they got to us—and where they go when we are done with them.

### *Technology: getting more from less*

Addressing the third component—technology—involves a more comprehensive strategy. United Nations Under-Secretary-General and UNEP Executive Director Achim





**In pursuit of unbridled production, factory farming systems warehouse animals and leave little room for natural behaviors. Some farmers, though, are reviving pasture-based systems that emphasize sustainability and animal welfare.**

Steiner warns: “Without concerted and rapid collective action to curb and decouple resource depletion and the generation of pollution from economic growth, human activities may destroy the very environment that supports economies and sustains life.”<sup>10</sup>

For this collective action to happen, governments must step in. GFN states bluntly: “Even with significant changes in individual behavior, a large portion of a personal footprint comes from the way national infrastructure is designed, goods are produced, and government and public services operate. In order to allow their citizens to achieve a lifestyle that fits within one



**We depend on bees and other pollinators to help produce our food. Perversely, a heavy reliance on industrial agriculture and its use of pesticides and monoculture crops may be contributing to massive declines in pollinator populations.**

planet, governments need to dramatically improve the efficiency of the built environment and invest in renewable energy and smart land-use planning.”<sup>11</sup>

Although we have made strides in some areas to increase our ecological efficiency, too often in the past, we have used technology to *increase* rather than decrease our impact. As some resources become scarce, we have turned to more destructive, less ecologically sound ways to get at them—scraping the bottom of the barrel to produce barrels of oil and other consumer goods. When it comes to exploiting dwindling fish stocks, we literally scrape the bottom of the ocean with trawl nets, a practice that is enormously destructive to ocean ecosystems.

In short, we must encourage environmental stewardship, not continue to provide economic rewards for waste and destruction.

### *One planet*

Together, collectively, we can reduce our footprint, and the burden of our population on planet Earth. For the poor, that may mean higher standards of living and greater access to vital resources, combined with economic

incentives to preserve natural areas. For the affluent, it means choosing wisely and reevaluating our relationship with our “stuff.” Each of us can ask ourselves: What is it that really contributes to a higher quality of life? Can I get what I need from what I already have? Which is more important—the latest gadget or a living planet? And for governments, it means the political will (backed by citizen pressure) to change the infrastructure and the incentives—away from profligate “spending” of precious resources and callous disregard for what our actions do to ecosystems and animals, and toward environmental preservation and production processes that work *with* the natural system rather than against it.

We only have one planet. We share it—with more than 7 billion people and an uncountable host of other residents, as well. Being good neighbors will benefit us all in the end.

<sup>1</sup>Wilson, E.O. (2006). *Nature revealed: Selected writings 1949–2006*. Baltimore, MD: The John Hopkins University Press (p. 536).

<sup>2</sup>Achim Steiner, UN Under-Secretary-General and UNEP Executive Director, as quoted in Kanter, J. (2007, October 25). Humanity is putting Earth, and itself, at risk, UN environment report says. *The New York Times*. Retrieved from [http://www.nytimes.com/2007/10/25/health/25iht-25environ.4.8054823.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2007/10/25/health/25iht-25environ.4.8054823.html?pagewanted=all&_r=0)

<sup>3</sup>United Nations Environment Program. (2011). *Keeping track of our changing environment: From Rio to Rio+20 (1992–2012)* (Job Number: DEW/1234/NA). Nairobi: Author. Retrieved from [http://www.unep.org/geo/pdfs/keeping\\_track.pdf](http://www.unep.org/geo/pdfs/keeping_track.pdf)

<sup>4</sup>Global Footprint Network. (2014). World footprint: Do we fit on the planet? Retrieved from [http://www.footprintnetwork.org/en/index.php/gfn/page/world\\_footprint/](http://www.footprintnetwork.org/en/index.php/gfn/page/world_footprint/)  
See also: Global Footprint Network. (2010, October). *Ecological footprint atlas 2010*. Oakland, CA: Author. Retrieved from [http://www.footprintnetwork.org/images/uploads/Ecological\\_Footprint\\_Atlas\\_2010.pdf](http://www.footprintnetwork.org/images/uploads/Ecological_Footprint_Atlas_2010.pdf)

<sup>5</sup>Global Footprint Network. (2012). The ecological footprint and biodiversity. Retrieved from [http://www.footprintnetwork.org/en/index.php/GFN/page/the\\_footprint\\_and\\_biodiversity/](http://www.footprintnetwork.org/en/index.php/GFN/page/the_footprint_and_biodiversity/)  
See also Galli, A. (2010). Stomping on biodiversity: Humanity’s growing ecological footprint. In *Commonwealth Ministers Reference Book 2010*. London: Henley Media Group in association with the Commonwealth Secretariat. Retrieved from [http://www.footprintnetwork.org/images/uploads/Galli\\_2010\\_Commonwealth%20Book.pdf](http://www.footprintnetwork.org/images/uploads/Galli_2010_Commonwealth%20Book.pdf)

<sup>6</sup>Population Action International and Population Justice Project. (2011, May). *Population and the environment: Where we’re headed and what we can do*. Washington, DC: Authors. Retrieved from <http://populationaction.org/wp-content/uploads/2012/01/popenvguide.pdf>

<sup>7</sup>Id.  
<sup>8</sup>Population Action International. (2012). 7 billion. Retrieved from <http://populationaction.org/topics/7-billion/>  
See also Population Action International. (2011). *Why population matters*. Washington, DC: Author. Retrieved from <http://populationaction.org/wp-content/uploads/2011/10/Why-Population-Matters.pdf>

<sup>9</sup>Hamerschlag, K. (2011, July). *Meat eater’s guide to climate change + health*. Washington, DC: Environmental Working Group. Retrieved from <http://www.ewg.org/meateatersguide/a-meat-eaters-guide-to-climate-change-health-what-you-eat-matters/#sthash.nXph7T69.dpuf>

<sup>10</sup>UNEP, *supra*, note 3.

<sup>11</sup>Global Footprint Network. (2011). Footprint calculator frequently asked questions. Retrieved from [http://www.footprintnetwork.org/pt/index.php/GFN/page/footprint\\_calculator\\_frequently\\_asked\\_questions/](http://www.footprintnetwork.org/pt/index.php/GFN/page/footprint_calculator_frequently_asked_questions/)



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