

ECOLOGY MSCI-270  
PROJECT SUMMARY  
*Hannah Brown*

I have chosen human population growth (and associated contradictions) as my ecological concept because it is seemingly unrestricted. Our exponential growth rate has raised debate as to how much longer it can continue before we hit carrying capacity and what factors we ought to consider when making predictions as to the sustainability of our size. The conclusion I have come to, which I hope is conveyed in the infographic, is that demographic patterns spark ecological concerns, not on account of sheer quantity of people, but rather the quality of their lifestyles, specifically how and what they consume.

Developing countries are still in a period known as demographic transition during which populations shift from having high mortality and high fertility rates to low mortality and low fertility rates. Typically, fertility rates continue to increase while mortality rates decline resulting in the transition, a period of growth. A population enters demographic transition with low rates of growth, experiences high rates when mortality rates decline before fertility rates, then lowers again when fertility rates lower once more [5]. So, despite the decades of decreased rates of population growth in most developed countries due to lower fertility rates driven by medical advances and the “green revolution” [8], developing countries are still growing (and they account for most of the world’s anticipated growth in coming decades) [1,8].

While developing countries are growing, they are actually some of the least ecologically destructive. Even with low rates of growth, developed countries have some of the worst ecological footprints, out-impacting developing countries [3]. Research shows that difference in ecological footprints depends more on lifestyle and less on sheer numbers. It is agreed that population size in isolation means little; one must consider other factors, particularly per capita consumption [6]. Drastic inequities in per capita consumption rates between developed and developing countries [3,4] illustrate that is not that we do not have enough resources to provide for the world’s population, it is that those resources are unequally parceled. These rates of consumption are lesser discussed than population numbers and hence drive the deception that consumption is not the problem [6]. Capitalism thrives on those high rates of consumption, on inequity, on competition.

The contradiction in the public's perception of population growth as causally related to poverty and inadequate food supply is false. The truth of the matter is that population growth, if anything, is the result of (politically induced) poverty, and definitely is not the only/worst culprit as far as ecological impact goes. Blame for environmental damage ought to fall on the rich, not the poor [1]. When one has more income at their disposal, they are bound to consume and waste and pollute more than those who have a lower income and therefore consume less.

This whole debate began with Rev. Thomas Malthus who predicted an ever-growing human population would surpass food production causing impoverishment and worldwide suffering. His law, outlined in his *Essay on the Principle of Population* of 1798, naturalized poverty as a mere part of population growth [5,8]. His ideas still spur debate. Malthusian contemporaries, “doomsters”, maintain that increased population will cause our demise. Others,

“boomsters”, hold that we can postpone carrying capacity and continue living as we do with technological advancement [7]. Neither are completely in the right; we can sustain the world’s population on what we have today if only we share resources and reduce consumption altogether [9]. The population bomb isn’t quantitative—it’s qualitative. Our impact on the environment boils down not to individual factors but to an equation: population size multiplied by consumption and technological impact. The “population bomb” is an intersection of these factors.

Thus, the center of my graphic visually translates the equation in showing the three factors intersecting. The first factor portrayed is fertility rate, the average number of children each woman in a society is having, a major indicator of population growth or decline. Fertility rate differs from place to place, as mentioned earlier, because concern about replacement is heightened when war, disease, and particularly poverty, plague a nation. Also mentioned earlier, Malthus thought that these atrocities provided “balance” between population and food supply [1]. I chose to portray fertility rate in bar form because it is the most numerical of factors and when I think numerical, I think bar. Another factor, poverty, shows the percentage of people in a given country earning \$5 or less per day. This factor is shown in triangles as a sort of marker. It acts as an arrow pointing to the countries as if to draw attention to them. The last factor is per capita consumption, poverty’s foil. Polarity in difference in consumption between the rich and poor means the rich ought to be held responsible for the costs of their lifestyle yet somehow the blame ends up on the poor. I decided on circles for this visual because the bigger they are, the more they literally consume the area.

A mirrored image of the shape their intersection forms juts out to house the title and short introduction. Portraying the totality of this broad topic was a feat too large for this midterm project, so I took data from about 30 countries for each of the three factors, some countries from each range (lowest, middle, highest), to show how differences in behavior translate to different ecological footprints.

## ANNOTATED BIBLIOGRAPHY

### BOOK

[1] Bookchin, Murray. *Which Way for the Ecology Movement? Essays by Murray Bookchin*. San Francisco: AK Press, 1994.

Murray Bookchin doesn't buy the neo-Malthusian population myth. He suggests that, in fact, populations in many nations are in decline. Nor is food supply lacking. Hunger is a political issue; it has social roots. A mentality that disregards the social context of demographic trends is, in Bookchin's view, short-sighted. In capitalist "grow-or-die" conditions, economic survival depends on competition for the sake of progress at all costs. Bookchin argues that under such a society, destruction of the biodiversity is a sure thing. Competing firms, desperate to stay afloat and out-produce each other, destroy the natural environment, exploiting resources. Bookchin names the worst part of neo-Malthusian thought the deflecting from the underlying issue by placing blame on the poor when it really belongs on the rich (who consume more).

### DATA SETS

[2] United Nations, Department of Economic and Social Affairs, Population Division, "*World Population Prospects: The 2010 Revision – Total fertility by major area, region and country (children per woman)*", <http://esa.un.org/wpp/Excel-Data/fertility.htm>, Accessed 12-April-2013.

The 2010 Revision of the UN's World Population Prospects included various indicators of population, one being fertility rates. Though I did not use data from before 2010, I appreciated the opportunity to look back to 1950 at trends, patterns, and changes.

[3] United Nations Development Programme, "*Ecological footprint of consumption (global hectares per capita)*", <http://hdrstats.undp.org/en/indicators/66006.html>, Accessed 12-April-2013.

This list of countries is of ecological footprints, based on 2007 data from the Global Footprint Network published in 2010. The Human Development Report Office, whose aim is to stimulate policy discussions on issues relevant to human development, published it. I was glad to have found the list, for I was concerned with what data to use to compare consumption.

[4] The World Bank, "*Poverty & Equity Data*", <http://povertydata.worldbank.org/poverty/home/>, Accessed 12-April-2013

This data, generated by the World Bank, is a headcount ratio of people earning \$5 or less per day. The organization aims to reduce poverty and offers free access to collected data in an effort to make information more widely accessible to facilitate changes in policy. The data was especially useful because I was able to compare the \$5 a day data to \$4, \$2.50, \$2, and \$1.50 data. I chose to depict the \$5 data to show just how commonplace it is to be making so little.

### ARTICLES

[5] Bloom, David E. “7 Billion and Counting”, <http://www.sciencemag.org/content/333/6042/562.full>, Accessed 15-April-2013.

David Bloom, in his *Science* article, “7 Billion and Counting”, addresses one question, among many: is population growth impoverishing? Bloom reviews the issue of population growth in relation to economy, mentioning, of course, Thomas Malthus and his *Principle of Population* from his *Essay on the Principle of Population* of 1798. Malthus argued that human population would grow faster than output and expected impoverishment and suffering to take hold. Bloom then suggests other scholars who have preferred an opposite approach, insisting that technological innovation allows us to compensate for increasing numbers of people and avoid catastrophe. I worked some of this into the Boomers/Doomers paragraph.

Bloom also defined demographic transition as used to describe the process of population growth, a key feature of which is that mortality declines before fertility, causing a transitional period of growth. He shows that in this process, changes in the population age structure occur because it is mostly babies who enjoy the decline in mortality, thus resulting in a baby boom until fertility also decreases. This element of the article was useful in understanding why rates of growth are still so large in developing countries; those nations are still in the in between phase between declining mortality and declining fertility.

[6] Dahl, Richard. “Population Equation: Balancing What We Need With What We Have”, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1280423/>, Accessed 15-April-2013.

Richard Dahl’s article from the journal *Environmental Health Perspectives* explains that beyond documenting growth, scientists are increasingly concerned with why it is occurring and how it affects ecosystem health. Dahl suggests that heightened demand for and consumption of resources, particularly in richer nations, is detrimental to ecosystems. Though population growth in the developed world has slowed, developed countries nevertheless consume far more than developing ones. Disparity in per capita consumption between more populous but less ecologically destructive developing nations and less populous but more ecologically destructive developed nations indicates a political problem, not one driven by quantitative population data. Dahl quotes geographer Robert Kates saying, “Most people accept the notion that major, long-term environmental problems will stem more from consumption than from population growth”, meaning there is a current shift in attention toward people’s habits as putting pressure on ecosystems as opposed to numbers alone. The article informed the results I found to be true in the data. I found Kates’ quote to be promising and inspiring and aimed to channel that perspective (of directing more attention toward qualitative factors) in my work.

[7] Chin, Gilbert, Tara Marathe, & Leslie Roberts. “Doom or Vroom?”, <http://www.sciencemag.org/content/333/6042/538>, Accessed 15-April-2013.

“Doom or Vroom?”, another *Science* article, references two types of people: “doomsters”, those Neo-Malthusians who assume the worst, and “boomsters” who believe in our ability to engineer our way out of the threatening problem. The article suggests that while it is true that Malthus’ predictions have not materialized, his concerns are still valid on smaller scales in the form of “cluster bombs”. For instance, in developing countries where growth rates remain high and

poverty is rampant. This article added to my knowledge of the debate and was rich with terminology for me to appropriate.

[8] Kunzig, Robert. “*Population 7 Billion*”, <http://ngm.nationalgeographic.com/2011/01/seven-billion/kunzig-text>, Accessed 15-April-2013.

Robert Kunzig’s article from *National Geographic*, a part of the magazine’s special series, “7 Billion”, provided an in depth reflection on the issue. He began by asserting that the global population will keep growing even though, on average, fertility rates are down. This presents two billion more mouths to feed and increased strain on the environment (that is, if we continue living like some of us are).

Kunzig too discusses Malthus and his Law of Population. He traces continued growth in the decades following Malthus’ writing to the spread of New World crops, better sanitation, and improvements in medical science, all contributing to the extension of the average life span and reduced mortality. Paul Elrich (a neo-Malthusian) came along in the 1970s, having seen the world’s population increase drastically, predicting that millions would starve in the near future as a result of having pushed the boundary of population growth too far. His book, *The Population Bomb*, sparked controversy but no bomb, largely because of the green revolution which enabled food production to reach new heights.

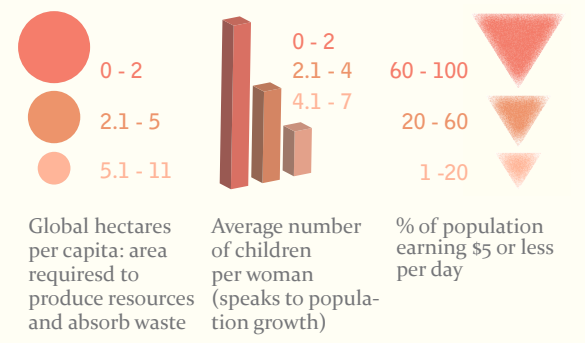
Kunzig agrees that confronting the impact we have on the planet is crucial on our course to feeding an expected 9 billion people by 2050, but asserts that this does not entail fixing on population numbers. Rather, the problem that needs solving is to do with infrastructure, especially because expected growth is in developing nations. I brought all of this into my work; neo-Malthusian beliefs into the Boomers/Doomers blurb, ideas about fixing on consumption over numbers.

[9] Walsh, Bryan. “*Why the Real Victim of Overpopulation Will Be the Environment*”, [http://www.time.com/time/specials/packages/article/0,28804,2097720\\_2097782\\_2097814,00.html](http://www.time.com/time/specials/packages/article/0,28804,2097720_2097782_2097814,00.html), Accessed 13-April-2013.

This *Time Magazine* article is supported by quotes from other authors which I found especially interesting. Joel Cohen, author of *How Many People Can the Earth Support?*, wrote a *New York Times* article just three days prior to Walsh’s, also about population hitting the 7 billion mark. Cohen states, “the world is physically capable of feeding, sheltering and enriching many more people in the short term”, showing that it is not that we are incapable of producing for the number of people on the planet. Jared Diamond, author of *Guns, Germs, and Steel*, likewise explains the “real problem for the world is that each of the 300 million people in the U.S. consumes as much as 32 Kenyans”. The billions of hungry people in the world are not hungry because of a shortage of resources; in fact, there’s excess in developing countries. These quotes reinforce the idea that the real problem we face is consumption.

# DOOMSTERS & BOOMSTERS

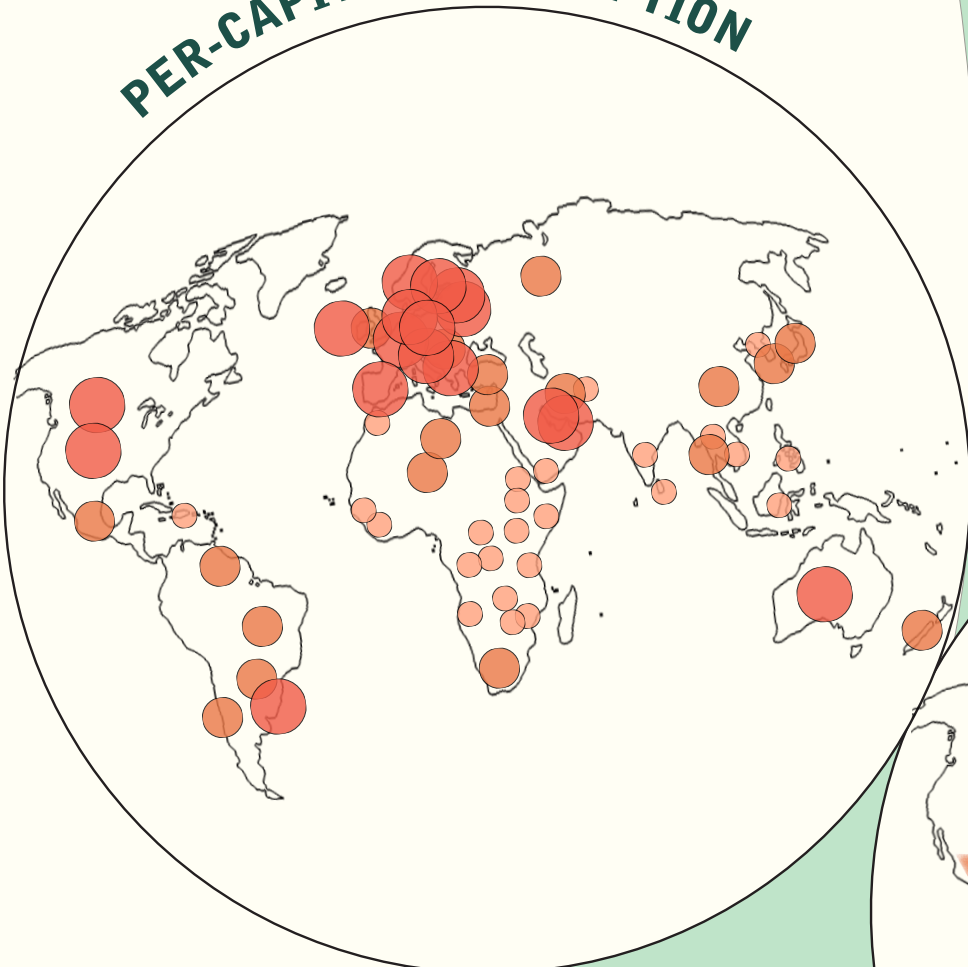
In his *Essay on the Principle of Population* of 1798, Rev. Thomas Malthus predicted an ever-growing human population would surpass food production, suggesting poverty as merely part of the process. Malthusian contemporaries, "doomsters", maintain that increased population will be our demise. Others, "boomsters", hold that we can postpone carrying capacity and continue living as we do (even consume more) with technological advancement. Neither are completely right; we can sustain the world's population and curb ecological destruction today but the gap between rich and poor must be narrowed, resources must be shared, and consumption reduced altogether.



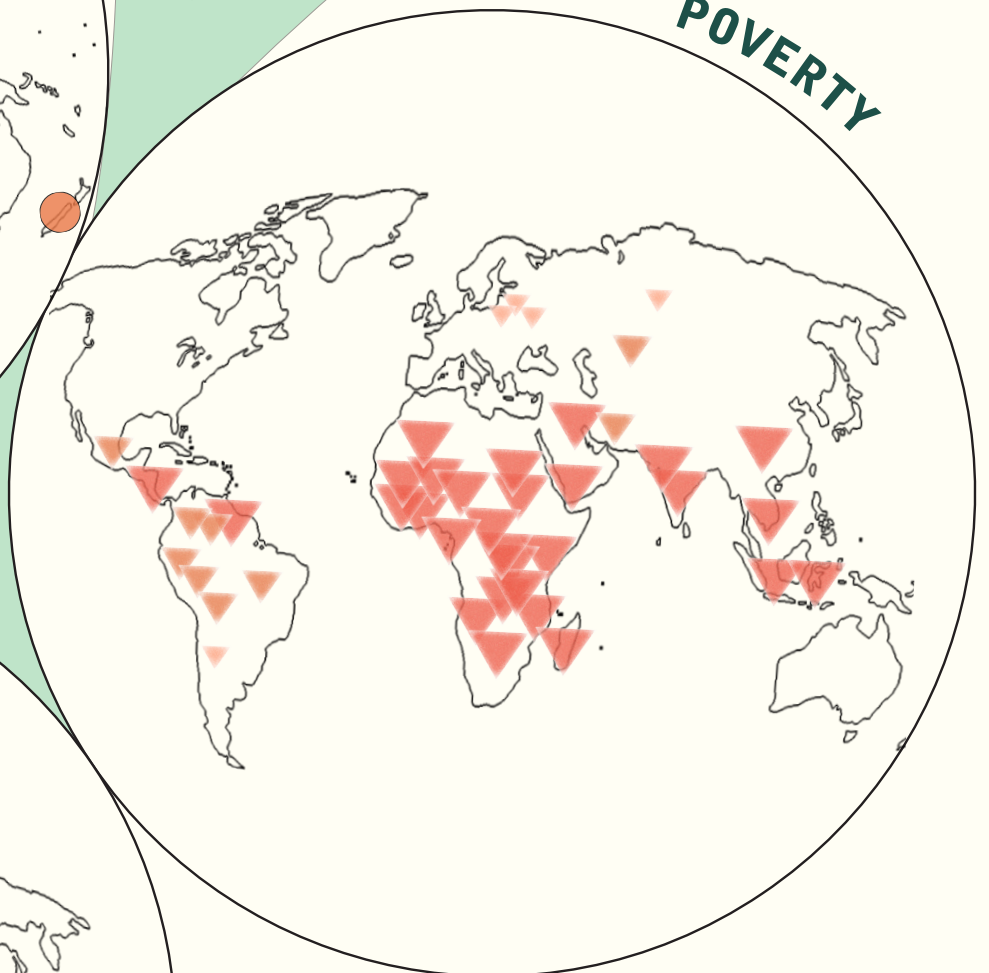
## SPARKING A POPULATION BOMB

Demographic patterns pose ecological concerns, not on account of sheer quantity of people, but rather the quality of their lifestyles. The sustainability of our species lies at the intersection of the economy (consumption), equity (poverty), and the environment.

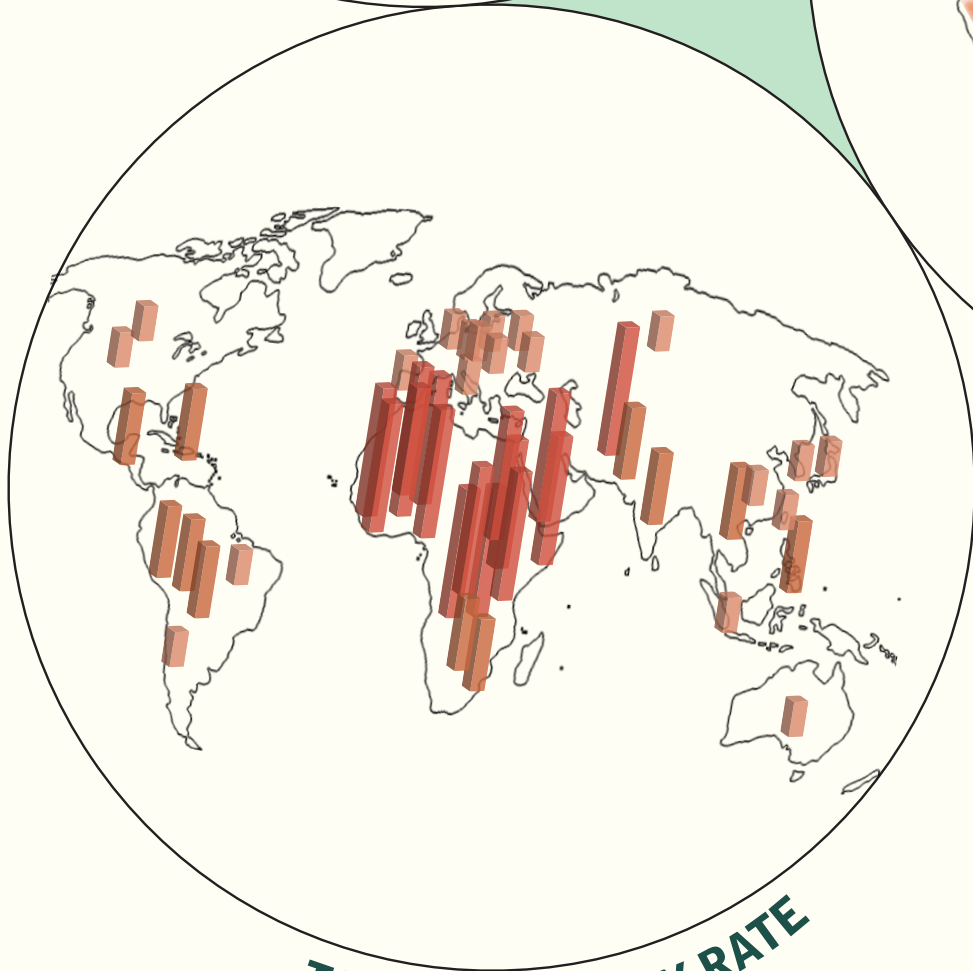
### PER-CAPITA CONSUMPTION



### POVERTY



### TOTAL FERTILITY RATE



1 BILLION IN 1804

2 BILLION IN 1927

3 BILLION IN 1960

4 BILLION IN 1974

5 BILLION IN 1987

6 BILLION IN 1999

7 BILLION IN 2011

PROJECTED 9 BILLION BY 2050