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The Land of Freedom:
US GHG Emissions and Population Growth to Drive Global Climate Change

> *About half the earth's biological production capacity has already been diverted to human use. Life-supporting ecosystems are affected everywhere by the planet's 6.7 billion people, which is projected to reach at least 9.2 billion by 2050.*
> – United Nations Population Fund (UNFPA)[1] and Figure 1

Population Growth: A Dirty Big Secret

Water scarcity, depletion of natural resources, agricultural stress, land conversion, and fossil fuel emissions are all hot topics in the environmental arena. However, population growth is very often ignored, and typically only invoked to foster urgency and action to change our modes of consumption. For instance, the UN Framework Convention on Climate Change and the Kyoto Protocol[2], the Rio Declaration on Environment and Development[3], and Forest Principles[4] provides a framework for the international reduction in the consumption of fossil fuels and forest stewardship, but completely ignores the driving factor behind the demand for resources and terrestrial expansion: population growth[5]. It would seem that the most direct way to reduce humankind's impact on the biosphere would be to regulate our rate of propagation, as population growth is a driver in fossil fuel emissions[6].

The fifth chapter of Agenda 21, Demographic Dynamics & Sustainability, does little more than suggest that public national policy consider population growth in the allocation of resources. In short, it urges the adaptation of national policy to accommodate population growth, rather than the growth of population accommodating environmental policy[7]. The same language of accommodation is evident in the Convention on Biological Diversity: *"Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential"*[8].

The United Nations formed the Population Fund (UNFPA) to address any of the problems associated with a growing global population. They advocate women reproductive rights, access to health services, reduction in poverty and infant mortality, family planning, gender equality, elimination of unwanted pregnancies, and they provide population data for sound national policy creation.[9] By advocating contraception, education, fertility choice, and family planning, the UNFPA estimates that Latin America and the Caribbean could reduce fertility by 35%, the Arab states and eastern and southern Africa by 20%, and by 15% in Asia and western Africa.

But what do these utopian reduction rates in fertility mean for GHG emissions? The answer is: very little. Figure 2 represents the above countries in the Non-Annex I group, which comprises the lowest rates of per capital GHG emissions. The UNFPA states that

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"The poorest 20 per cent of countries account for only 1.3 per cent of natural resource consumption." Because the UNFPA's efforts are directed at developing countries, their scope fails to address the population growth problems in the wealthiest countries, which comprise 86% of natural resource consumption and only 20% of earth's population.[10]

Population Growth in the United States

"Despite the slowest decade of population growth since the Great Depression, the USA remains the world's fastest-growing industrialized nation and the globe's third-most populous country at a time when some are actually shrinking."[11] Furthermore, population growth in the US is projected to climb 43% to 439 million[12] by 2050 (Figure 3). As seen in Figure 2, per capita GHG emissions are far higher in North America than the rest of the world. Therefore, it can be inferred that the exploding American population will continue to drive GHG emissions well into the future and implies that regulation of fossil fuels and investment in renewable energy resources by the United States is of primary importance when addressing global GHG emissions.

Population Growth in China

The abuses of the Chinese one-child policy have painted a grim international picture of population control. However, it can not be denied that the goals of the one-child policy may be quickly realized in the future. Figure 4 illustrates the stabilization and decrease in the total Chinese population thru 2100, as projected by the United Nations. The analysis of the humanitarian methods of Chinese population control is beyond the scope of this paper, but their programs may provide valuable insight into how to curb the burden of future US population grown upon natural resources and GHG emissions.

National Composition of Future Global Population Growth

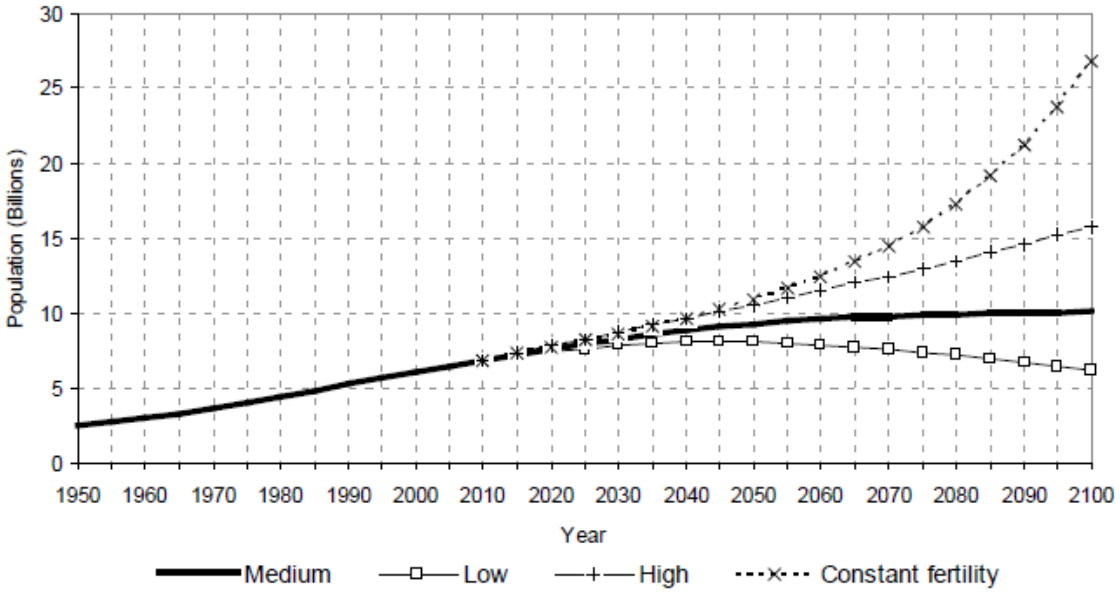
By comparing population estimates for 2010 in Figure 5 and for 2100 in Figure 6, we can see that earth's nationalistic composition will shift dramatically over the next nine decades: India's unabated population explosion will dominate; China's one-child policy pays off; the United States swells; Nigeria takes 3rd place after tripling; and Brazil is surpassed by five countries. As the populations of these poorer countries explode, so should they develop further by utilizing GHG emitting technologies. That is, unless these countries invest heavily in renewable energy as their populations and demands for resources detonate. Obviously, if developing countries take advantage of GHG emitting technologies and the fossil fuel intensive modes of consumption enjoyed by the West, the prospects for keeping global CO2 concentrations below 450ppm is impossible.

Conclusion

As the champion of per capita GHG emissions, the United States should not only confront the per capita carbon footprint, but population growth. The US Census Bureau contributes future population growth to longer life expectancy, from 76 years of age in 1993 to 82.6 in 2050, but primarily to immigration and decedents of immigrants.[13]

Immigration is a volatile American political topic, with protectionists calling for the nation to close their borders. Such political ridicule does little, other than stir emotions and divides the nation. Instituting a national population control program and welcoming immigrants with open arms would seem to establish sustainability and follow American tradition. Our biosphere is counting upon it.

Figure 1. Population of the world, 1950-2100, according to different projections and variants



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2011). World Population Prospects: *The 2010 Revision*. New York: United Nations.

Source: World Population Prospects, The 2010 Revision: *Highlights and Advance Tables*; United Nations (2011); p. xvi; http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2010_Highlights.pdf

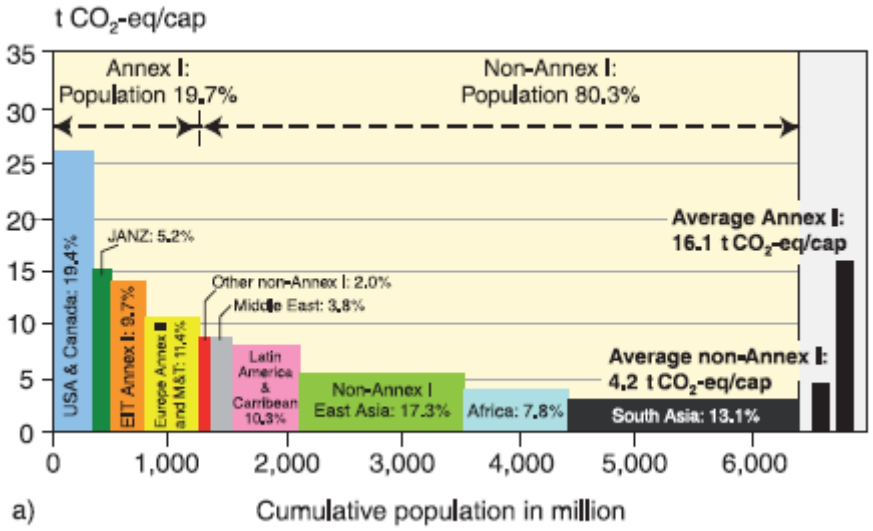


Figure 2. Distribution of regional per capita GHG emissions according to the population of different country groupings in 2004. Source: (Figure 2.2, AR4 Synthesis Report).

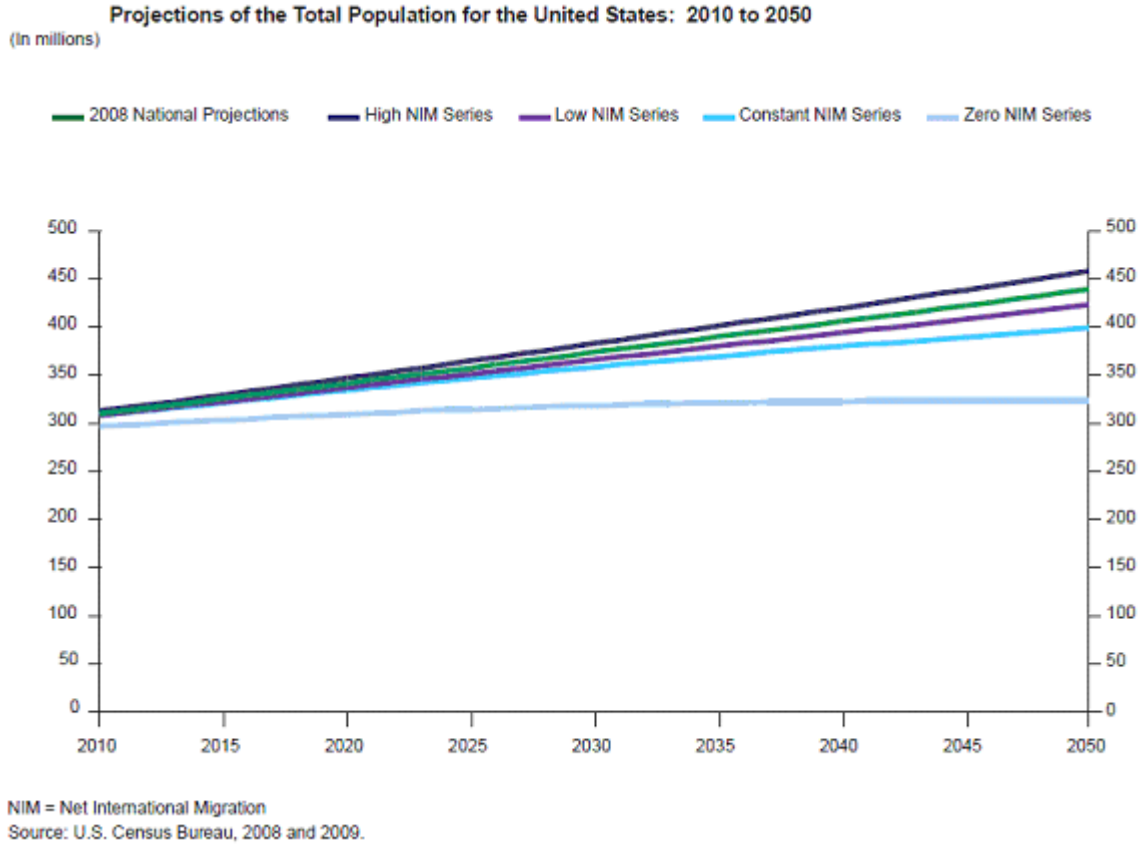


Figure 3 - Source: US Population Projections: 2000 to 2050 (p. 7) by Ortman and Guarneri; http://www.census.gov/population/www/projections/analytical-document09.pdf

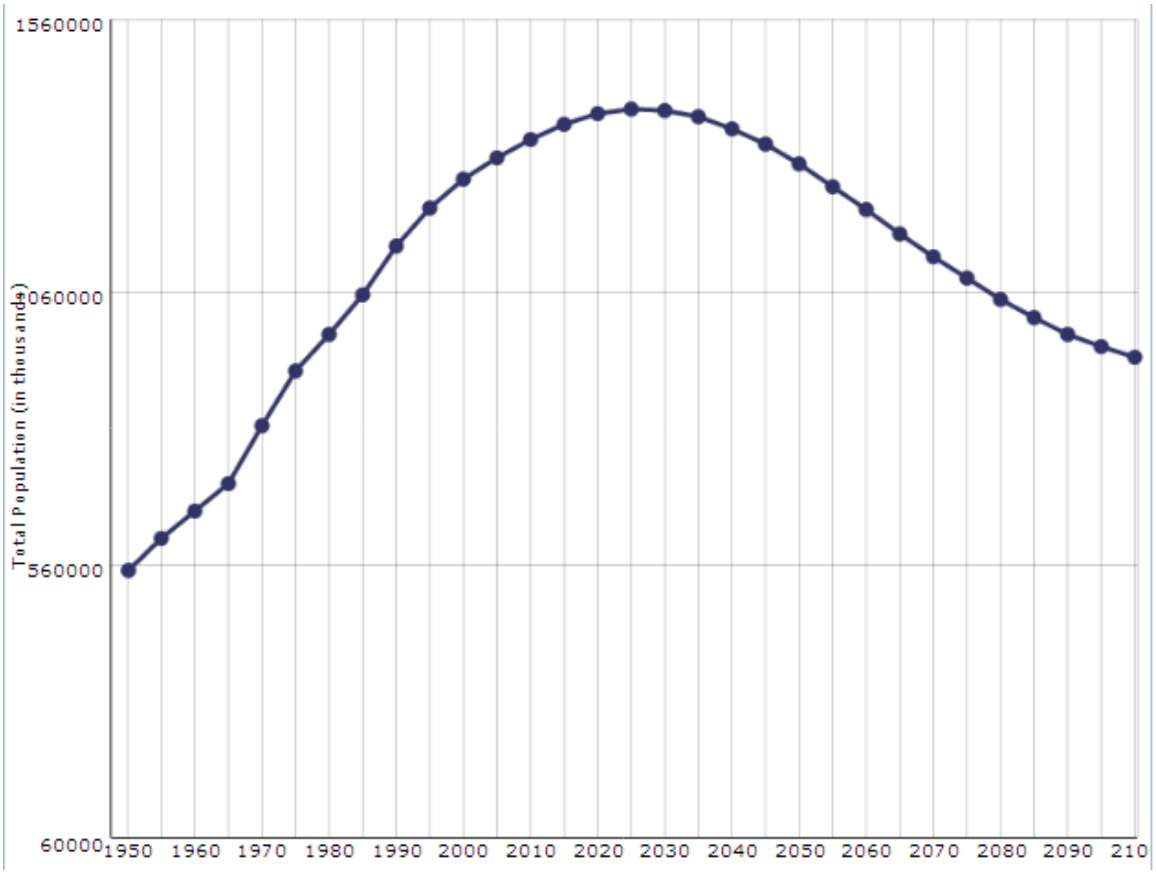


Figure 4 - Projected Population of China 1950 – 2100. Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision. New York; http://esa.un.org/unpd/wpp/JS-Charts/pop-tot_0.htm

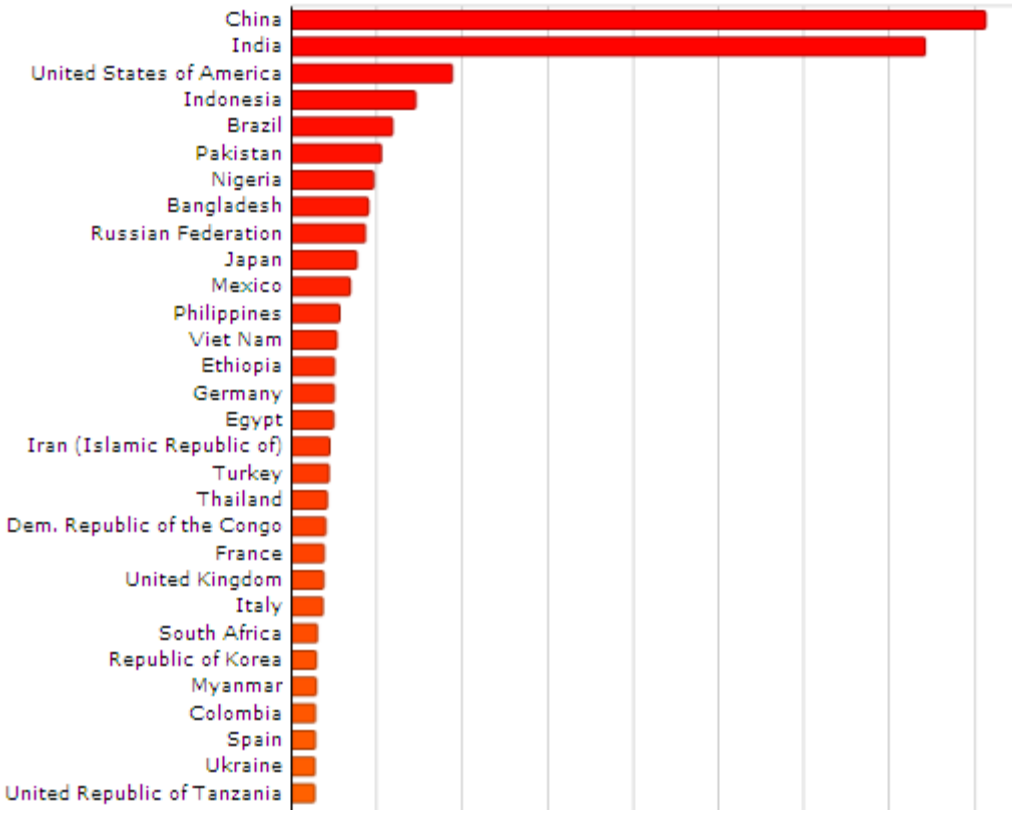


Figure 5 – Total Population in 2010, Top 30 countries. Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision. New York; http://esa.un.org/unpd/wpp/JS-Charts/pop-tot_0.htm

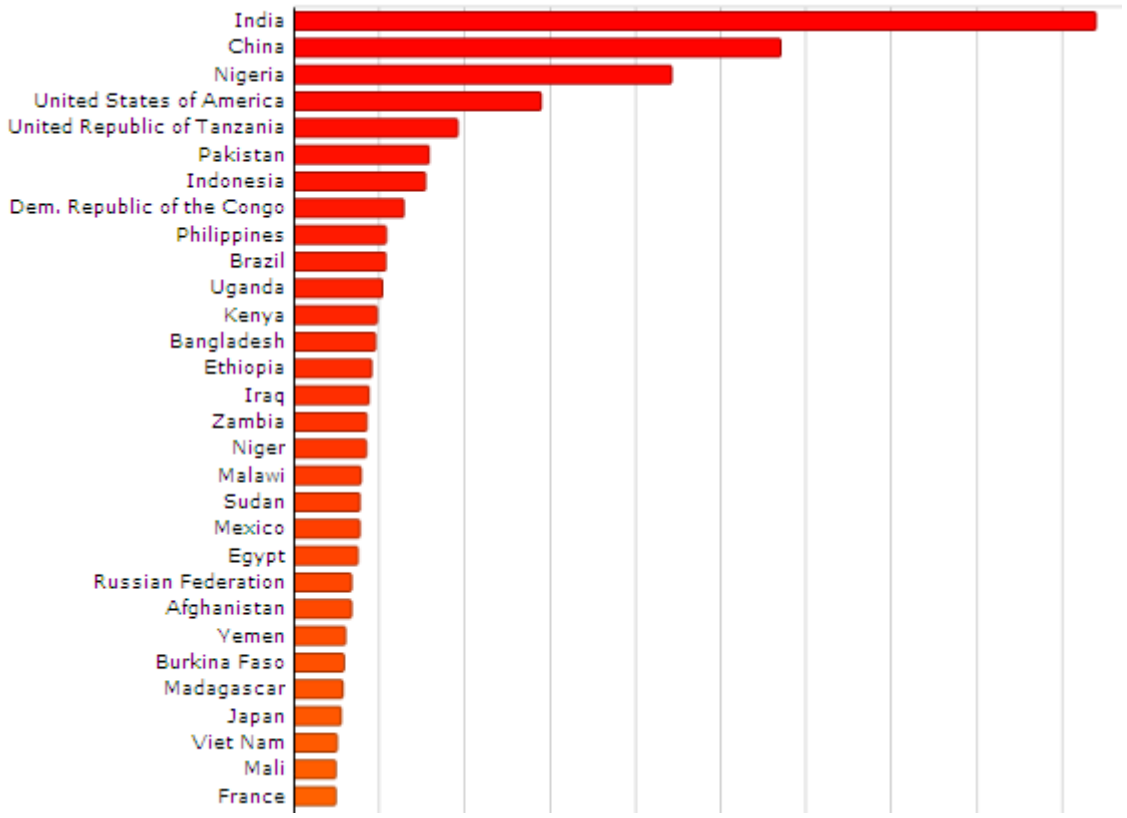


Figure 6 – Total Population Projection for 2100, Top 30 Countries; Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision. New York; http://esa.un.org/unpd/wpp/JS-Charts/pop-tot_0.htm

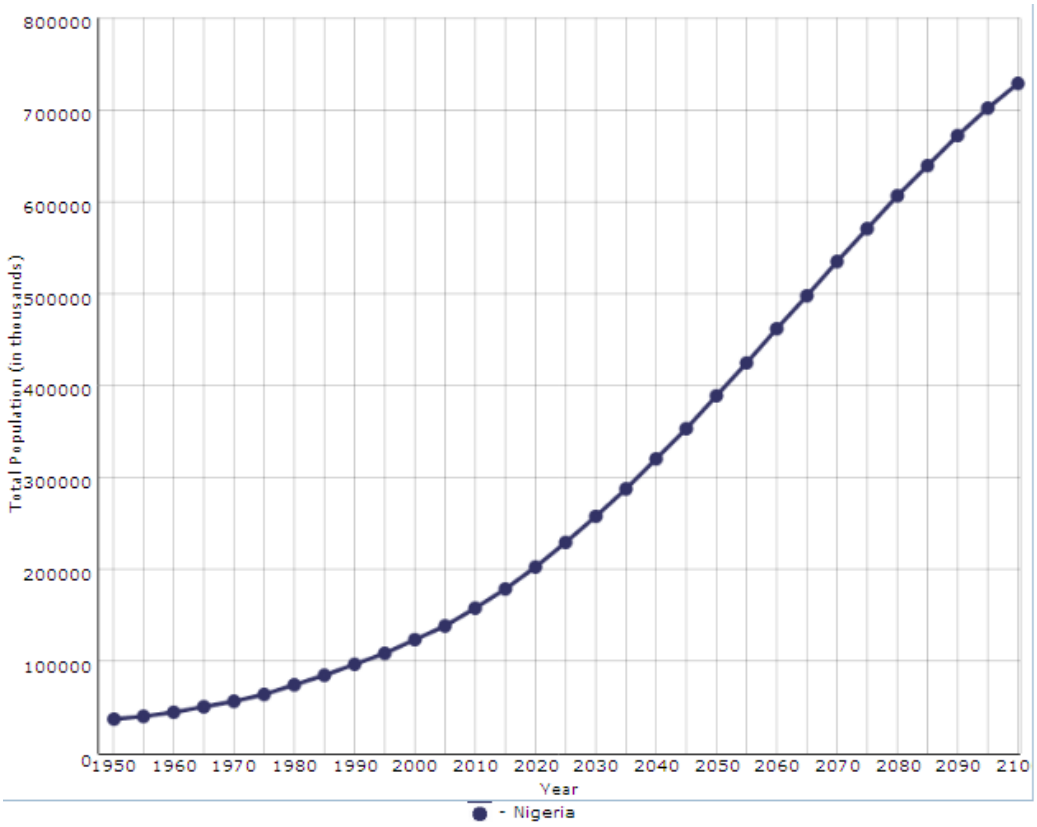


Figure 7 – The projected population in Nigeria explodes three-fold by 2100. Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision. New York; http://esa.un.org/unpd/wpp/JS-Charts/pop-tot_0.htm

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[1] Family Planning and the Environment http://www.unfpa.org/rh/planning/mediakit/docs/sheet3.pdf
[2] http://unfccc.int/essential_background/kyoto_protocol/items/1678.php
[3] http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm
[4] http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm
[5] Climate change is expected to exacerbate current stresses on water resources from population growth and economic and land-use change, including urbanization (AR4 Synthesis Report p. 49; http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf)
[6] The effect on global emissions of the decrease in global energy intensity (-33%) during 1970 to 2004 has been smaller than the combined effect of global income growth (77%) and global population growth (69%); both drivers of increasing energy-related CO2 emissions (AR4 Synthesis Report p. 4)
[7] Policies should be designed to address the consequences of population growth built into population momentum (Agenda 21 5.16; http://www.un.org/esa/dsd/agenda21/res_agenda21_05.shtml).
[8] Convention on Biological Diversity (p. 2) http://www.cbd.int/doc/legal/cbd-en.pdf
[9] UNFPA Website (About Us) - http://www.unfpa.org/public/home/about
[10] Family Planning and the Environment http://www.unfpa.org/rh/planning/mediakit/docs/sheet3.pdf
[11] http://www.usatoday.com/news/nation/census/2011-01-06-us-population_N.htm
[12] US Population Projections: 2000 to 2050 by Ortman and Guarneri; http://www.census.gov/population/www/projections/analytical-document09.pdf
[13] http://www.census.gov/population/www/pop-profile/natproj.html