A Population Primer

America's Too-Many-People-Problem

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I. Introduction

As the United States enters the 21st century it has the distinction of having the largest economy and being the most powerful nation on the planet, although China is emerging as a serious challenger on both accounts. By most measures, the U.S. leads the world except for one major shortcoming: an unwillingness to deal with its exponential population growth and consequent depletion of natural resources.

Those who have a keen ecological sense can readily appreciate the importance of addressing human population issues, as this is paramount to preserving nature and sustaining all life forms on the planet, including humans. Of equal importance is that a right sized population; one that is in balance with its natural resource base is central to a sustainable economy as well. Given these fundamentals, one would expect a powerfully literate U.S. would take the lead in restoring the global environment…but unfortunately that's not the case.

That is not to say that the environment is of no concern to the American people. With each passing year ecological issues get more attention by the electorate, forcing government to assuage environmental organizations and for legislators to at least give lip service to the need for clean air and water, protecting forests, waterways and certain threatened species, etc. Unfortunately, at this juncture Congress and the Administration are more preoccupied with placating commercial interests than addressing ecological degradation. Also, restoring full employment requires an investment in innovation, education, vocational training, and infrastructure repair. Typically ecological restoration has to wait for better times when treasuries are healthier.

As a country we have yet to envision a course of action to reach certain national goals and objectives that heal the damage done to nature and ultimately to ourselves. Our approach has been reactionary and piecemeal at best, scattering legislation to ameliorate pressure groups without a clear vision of what the nation needs to do in the long run.

No Presidential candidate or political party has articulated a thoughtful national environmental plan with any specificity for the electorate to rally behind or to oppose. Politicians often make general and often hollow references to "the environment" as something needing attention, but without mustering much in the way of specifics. Obviously, it is simply political rhetoric with no genuine intent to give credence to environmental restoration or placing it high on the national agenda with adequate priority and enough financial resources to make a difference.

In short, the U.S. has no national population policy and/or environmental plan to deal with the consequences of up-coming demographic challenges. With more than 100 million people expected by mid-century, the U.S. government hasn't a clue as to how to deal with the onslaught, nor does any Administration or Congress in the last several decades seem to really care, even after several comprehensive studies warning of problems and offering solutions. One such exemplary early effort was the Rockefeller Commission.

In a "Special Message" to Congress on July 18, 1969, President Richard M. Nixon boldly made a case for establishing a "Commission on Population Growth and the American Future." At that time there were approximately 100 million fewer Americans and the fertility rate was 1.7 births per woman (compared to 2.06 presently). Nixon was

deeply concerned that population growth could get out of hand and be damaging to the Democracy in many ways.

Here are a couple of quotes from his speech that set the stage for Congress to act. His remarks are particularly prescient in view of our present day problems. "For some time population growth has been seen as a problem for developing countries. Only recently has it come to be seen that pressing problems are also posed for advanced industrial countries when their populations increase at the rate that the U.S., for example, must now anticipate. Food supplies may be ample in such, but social supplies – the capacity to educate youth, to provide privacy and living space, to maintain the processes of open, democratic government – may be grievously strained."

President Nixon goes on to say, "How will we educate and employ such a large number of people? Will our transportation systems move them about as quickly and economically as necessary? How will we provide adequate health care when our population reaches 300 million? I believe…the Federal Government does have a special responsibility for defining these problems and for stimulating thoughtful responses… Perhaps the most dangerous element in the present situation is the fact that so few people are examining these questions from the viewpoint of the whole society…In the government sphere…there is virtually no machinery through which we can develop a detailed understanding of demographic changes and bring that understanding to bear on public policy."

As often happens, the Commission took on the short hand name of its appointed chairman John D. Rockefeller III. In Mr. Rockefeller's transmittal letter of the Commission's report to the President, he says, "After two years of concentrated effort, we have concluded that, in the long run, no substantial benefits will result from further growth of the Nation's population, rather that the gradual stabilization of our population would contribute significantly to the Nation's ability to solve its problems. We have looked for, and have not found, any convincing economic argument for continued population growth. The health of our country does not depend on it, nor does the vitality of business nor the welfare of the average person."

In short the report recommended that the United States should "welcome and plan for a stabilized population."

Why then didn't Congress and or the President commence the job of stabilizing the population with this type of ringing endorsement and recommendations from an assemblage of high powered business executives, economists, and scientists? Much to everyone's amazement Mr. Nixon rebuked the work of his own Commission. Unfortunately, there were aspects of the report that the conservative Nixon could not tolerate either personally or politically.

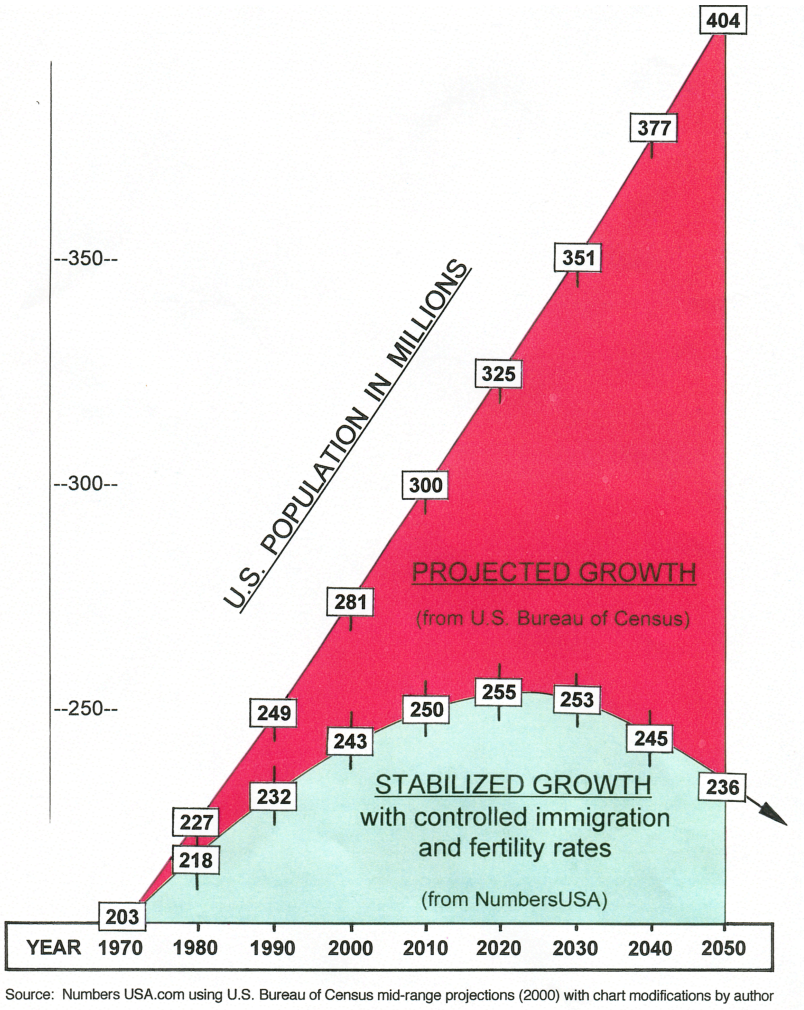
For example, to meet the goal of stabilization "the Commission recommended dozens of changes to U.S. policies, many of which were revolutionary, including the adoption of policies designed to achieve and maintain replacement-level fertility (two children per woman) and the imposition of an immigration ceiling of 400,000 a year. The commission also recommended establishing school-based sex education programs, promoting adoption, passing the Equal Rights Amendment, providing universal access to contraception (including minors), liberalizing abortion laws to increase legal access, funding additional contraceptive research, increasing funding for family planning services, gathering more demographic data (including a mid-decade census), strengthening the Office of Population Affairs and creating state-level population offices."[1]

President Nixon's surprising renunciation of the Rockefeller Commission Report *threw the baby out with the bath water*. Here is how Mr. Charles F. Westoff, the Executive Director of the Commission, described the dismissal of the Commission:

> The President's response issued in May 1972 was a disappointment at every level. After some acclaim for the importance of the research for government planning, the President reiterated his personal opposition to abortion and disagreed with the recommendation that contraceptive information and services be made available to minors, on the grounds that this would weaken the family. No attention at all was directed to the basic analysis of the costs and benefits of population growth and the conclusion that population stabilization was desirable. In effect, the response was narrowly political and greatly at variance with the concerns about population that the President had expressed less than three years earlier.

Like so many political dramas there is usually something going on behind the stage. It should be noted that Nixon was up for re-election and there are those who believe that the Catholic vote was at stake. Should he support some of the more controversial recommendations of the commission, the conservative elements of the Republican Party along with the Catholic Church would oppose his re-election. Needless to say, Mr. Nixon made a calculated political decision that historians will have to assess. Was the nation hurt more by his reversal of course on the Commission's work or by his historical impeachment following the Watergate scandal?

Regardless of what President Nixon's motives were, there is no question that a momentous opportunity was lost in 1972 to begin the process of reaching population stabilization. Had the Commission's recommendations been implemented, demographers suggest that the United States would have reached a peak of 250-255 million around 2020 to 2025 and then leveled out at a lesser count during the rest of the 21st century (Figure 1). Instead the U.S. has an estimated 315 million (as of March 2013) and is adding about 27-30 million people per decade with no let-up in sight. With this level of exponential growth the U.S. is expected to reach well over 400 million by mid-century, which ironically is twice the population size that alarmed the nation in 1969. The question still remains, "Where do we go from here?"



Source: Numbers USA.com using U.S. Bureau of Census mid-range projections (2000) with chart modifications by author

Figure 1. Projected Growth in the U.S. to 2050

Without coming to grips with these obvious demographic hurdles, the nation will continue to flounder, slipping into further disrepair and decline as the global community is doing.

While the United States is a laggard when it comes to population management, women in rural villages and teeming cities of India, Iran, Brazil, Egypt, Mexico and even in parts of Africa, are showing the way. Slowly birthrates are being reduced, demonstrating to the world that it is possible to begin stabilizing populations, *if there is a will to do so*. At the same time many developed countries, particularly Europe, have reached replacement levels of less than 2.1 children per woman and should see their populations slowly decrease, presuming that mass migration is carefully controlled and longevity remains fairly constant.

Unfortunately, despite these promising trends, population momentum will still produce worldwide numbers in the range of 8 to 10 billion during this century. At one time United Nation demographers were hopeful that the earth's population would peak at some point during this century and slowly decline thereafter. They have since refrained from predicting such an apogee or any other reversals in upward trends.

No one knows whether humankind can survive the shoehorning anticipated in overextended megalopolises and whether the web of life can be adequately sustained when the earth's estimated carrying capacity of two billion people is stretched four and five fold. Will Mother Nature's capacity to tolerate this huge overload last long enough for humankind to turn things around? Only time will tell.

Before proceeding further, it is important to let the reader know, that ElbowroomUSA's purpose is to present a wide-angle view of the population challenge confronting the United States. As one explores this compendium of information, it will become apparent that only the surface is being scratched. Because of the ever-expanding universe of data and research plus the very complex human aspects involved, a 360° wrap of the enormous subject is impossible. Yet, certain basic observations can help address the key question: "Do we in American need to re-think our socio-economic policies in view of the too-many-people problem that we face?" And "What are the consequences if we don't?"

Before beginning to answer these questions, fundamentals are covered in Squaring Human Presence with Environmental Sustainability.

II. Squaring Human Presence with Environmental Sustainability

The Holy Grail of environmentalism is sustainability. Are we as humans conducting our affairs in ways that will continue the long-term quality of the environment and resilience of ecosystems? Or putting it differently, since nature sustains us, are we living in ways that won't harm her or ourselves? The honest answer to both questions is "no."

Many of us want to be good stewards by supporting organic farming, recycling, driving fuel efficient cars, bicycling to work, picking up litter, and using green materials, energy efficient lighting, and solar panels, etc. We also want governmental policies that conserve national resources for future generations. Yet, we ignore the very thing that has more direct environmental impact than any other factor…the literal human footprint.

Our sheer numbers on the planet will determine our fate as a species, not environmentalism devoid of population management as currently practiced.

Many economists will try to persuade us that science and technology can and will overcome any short comings in natural resources. *When a key resource is exhausted, humankind with its keen ingenuity and innovation will find an acceptable substitute and no matter how big the populace, technology can compensate for the oversize*. This website does not subscribe to this argument. As discussed in other segments, science and technology brings with it as many problems as it solves. Certainly technology can add value, but it is no substitute for better managing our numbers. If environmental sustainability is our quest, then population management must be employed. The goal is to balance human numbers with nature's capacity to sustain us.

A. The Dynamics of Population Growth

The three principle drivers of population growth are *natural increase* (births minus deaths), *immigration*, and *longevity*; a triad, so to speak, of growth engines. Ideally, the combined output of the triad should be in balance with the nation's ecological carrying capacity (ECC). Let's begin with the triad, which will then lead us to the issue of living within our environmental means.

In 2009 the Census Bureau estimated that there would be 4,256,000 births in 2011 with 2,606,000 deaths for a natural increase of 1,651,000 people. Immigration on the other hand, has added on average 1,050,000 Legal Permanent Residents (LPRs) in each of the last ten years with illegal migrants pushing that number up. In the mid-1990s these unauthorized entries were estimated to be as high as 800,000 per year. More recently there has been a fall-off in illegal trans-border crossings, according to the Border Patrol with the number entering illegally approximating the number of those who are self-deporting (i.e., leaving voluntarily). Assuming this trend will continue, illegal migrants have not for the moment been included in this estimate, leaving the annual immigrant count at 1,050,000.

Another variable to consider is the incremental effect of longevity. Longevity is the expected average life span for an individual based on statistical probability. With the boost from medical science and improved public health plus health insurance coverage, people are living longer which moves the census needle up ever so slightly year after year. Unfortunately, annual census-specific data on this variable are not reported by the Census Bureau. We do know, however, that spread over several decades there are sizeable population gains due to the effect of Americans living longer.

When tallying the impact using available data, the triad generates about 2,700,000 new residents per year for an estimated decadal sum of 27 million people. In other words, the nation adds more than twice the combined populations of New York City and Los Angeles to its census roles every ten years.[2] And there is no end in sight.

While it is convenient to separately discuss each of the three variables, in reality they are very much intertwined and interrelated. This can be demonstrated in the subtle relationship between longevity and natural increase. With mortality decreasing from cancer, heart disease, injury, stroke and diabetes, longevity is expected to gradually increase. For example, the life expectancy for a child born in 2011 (all races included) is 78.7 years (76.3 years for males and 81.1 for females). By contrast, in 1975 those numbers were 72.6, 68.8, and 76.8 respectively.[3,4] On average, today's child is expected to live 6.1 years longer than one born 35 years ago.

During the last century, improved life expectancy forecasts reflect the advances made in medical science, nutrition, and public health standards along with the availability of health insurance, particularly Medicare, which helps seniors cope with the aging process. Thus, lengthening life spans will insidiously nudge up natural increase, making it a major force in America's ever-ascending people count. This same mutuality is also seen with immigration.

From past experience, today's immigrant woman most often becomes tomorrow's birth mother. Since migrants (whether legal or illegal) from other cultures tend to have larger families, they have a significant impact on U.S. birth rates. More recently, however, there is evidence that Mexican women are having fewer children than usual. No one knows whether this is a short-term anomaly due to difficult economic times or the beginning of a longer-term trend. Nonetheless, the combination of a large immigrant community coupled with the U.S.' above average birth rate (compared to other "developed" countries) results in a robust natural increase.

This potent force is one of the reasons why many demographers agree that immigration is the main driver of U.S. population growth. For example, in February 2008 Pew Research Center made this observation, "If current trends continue, the population of the United States will rise to 438 million in 2050…and 82% of the increase will be due to immigrants arriving between 2005 to 2050 and their U.S.-born descendants."

Recognizing that we have a flood of people coming, what impact will this have on our natural resource base and do we have enough future capacity to handle the situation? The answers center on the principle dynamic of *ecological carrying capacity*. Most of us are aware of specified load capacities on elevators, maximum numbers in public meeting spaces for fire protection, weight limits on automobiles and trucks, but rarely do we give a second thought that nature too has load limits or capacity restraints.

Like all countries America's landmass has an ecological load or carrying capacity that is constantly in play. But so far, we have chosen to disregard it, believing that Mother Nature will on command somehow muster more of what we need. The point is that a nation can be managing the growth triad yet find itself bumping up against the boundaries of sustainability with serious long-run, socio-economic consequences. (See the section on Ecological Carrying Capacity for a more in-depth discussion).

To conclude, should the U.S. or any other nation want to align human presence with sustainability, it must employ a balanced four-pronged management effort. The next section provides an in-depth grounding in Population Management.

B. What is Population Management?

It is thoughtfully managing the variables of population growth in accordance with the nation's demographic goals. In a practical sense this would mean providing incentives to discourage births when appropriate or increasing or decreasing immigration based on projected growth. When it comes to the variable of longevity, many factors are in play, such as one's genetic make-up, lifestyle, improving public health measures, advances in medical science and evolving technology. The degree to which each factor adds or subtracts from our length of life is still an inexact science. For now, the best approach when implementing population policies is to recognize the long-term effect of longevity, then try to make adjustments in the other two variables of natural increase and immigration to compensate for it.

Trying to control the growth of human population has been an issue for mankind for centuries. As far back as 300 to 400 B.C.E., philosophers like Aristotle were perplexed as to how best to right-size the cities of Greece. He and other leaders of that era instinctively knew that too many or not enough people mattered to local prosperity and self-defense. Whether the term was used, managing population size was critically important then, as it is today.

In more contemporary times, China, India, Iran and the U.S. have struggled with different ways to constrain, if not directly control population growth. So far, the more authoritarian style governments like China and Iran seem to have had the most success with democracies like India and the U.S having less notable results.

Without having implemented the now controversial one-child family planning policy in 1978, China would have added 400 million to its current size of 1.3 billion people, according to its government.[5] While smaller in scale, Iran also has had huge success in dramatically reducing total fertility rates from 7.1 births per woman in 1986 to 2.5 births in 2001. In the last couple of decades, a well-organized and aggressive governmental program to encourage smaller families, mostly through the use of contraceptives, has resulted in a drop in the annual population growth rate from 2.7% to currently 1.2%. What is especially noteworthy is that this remarkable accomplishment came to bare in an Islamic Republic, where initial religious objections gave way to pragmatic needs.[6]

India on the other hand, has had less extraordinary achievements, but still it has made substantial progress. For instance, India has reduced fertility from 5.9 children per woman in the 1950s to 2.6 in 2011. Some of its more progressive southern states are even experiencing fertility rates as low as 1.7, which are regrettably offset by higher propagation in the north. Unfortunately the reductions achieved are not enough to overcome past years of high fertility, thereby creating the phenomenon of unstoppable "population momentum." Because India has not acted fast enough over the years, demographers are predicting that it will become the most populated nation on the planet in about 20 years.[7]

Statistically, the U.S looks much better when it comes to moderating fertility rates and the annual rate of population growth. With the help of Title X Family Planning Services, our freedom to make reproductive choices and society's long-held acceptance of smaller families, the total fertility rate has hovered around 2.0 children for several decades. This in turn has helped to keep annual population growth below 1%. But there's still a problem.

When looking at demographic trends, and seeing what's in store for the nation, there is reason for serious concern. As mentioned before, with continued high levels of immigration plus a steady natural increase, the U.S. is adding about 2.7 million newcomers per year, resulting in a projected census of well over 400 million people by mid-century.

In short, America's moderation is not enough to stop the engine of massive growth…the kind that China and India wish they didn't have. Even if we put an immediate halt to all immigration and were able to maintain replacement level fertility rates, the phenomenon of population momentum would continue to boost our people numbers for several decades to come.

The reason is simply that the nation will continue to have a high concentration of childbearing women left over from past periods of robust fertility and high immigration.

As nature would have it, these women will continue to have babies. These births mixed with increasing longevity for the masses, results in a lag of about two generations to reach *population stabilization*: a point where births match deaths, assuming immigration is tightly controlled during the interim.

A good case in point is China with its one-child population policy that was initiated in the late 1970s. Demographers project that the Chinese census will peak about 2030, some 50 years later, and start a slow decent in numbers. What the eventual population target is has not been articulated, but the availability of natural resources at home and from abroad will be a restraining factor, just as it is for America.

Like China, America is already bumping up against natural resource limitations: fresh water availability, arable land and adequate topsoil for increased food production, nearly depleted marine fisheries and the increasing actuality of climate change. Just imagine, would America be in this predicament had the nation stabilized the population at 250 million, as the Rockefeller Commission recommended in the 1970s? Not only have we not reached population stabilization, but another 100 million are expected by mid-century.

Population management won't solve all of our problems, just make them easier to solve

At some point America has to begin the challenge of better managing population growth and the best way to begin is to scientifically assess its natural carrying capacity. A thorough inventory must be made of marine fisheries, timber, energy sources, water above and below grade, and of remaining arable land for food production. Once done, scientists, economists, and other experts can give a professional estimate of what the nation's population should be, based on a reasonable standard of living going forward.

From there, the Congress can determine a science-based national population policy, on which rational immigration programs can be launched to meet the nation's needs. In the meantime there are obvious steps to take to begin the lengthy process of tamping down growth, such as better securing the borders, declaring a moratorium on immigration, and strengthening family planning services.

As witnessed by the previous review of major world players, the more populace nations have corner-stone policies or strategies in place to better manage growth. Here at home, neither the U.S. Congress nor the Administration has seen the light, despite out of control growth. It's time to make some much needed reforms that will help assure the well-being of future generations.

In this general discussion of population management, there are a couple more critically important points to cover. The first is the pejorative term familiarly known as "population control." In the 1960s when overpopulation was a national concern, the expression was perfectly acceptable. But over time, the phrase has come to mean government's use of coercive and invasive measures to control reproduction (such as those unnecessarily employed in China) and the fear that our sex lives will be under surveillance. For minorities the term has become a fear-inducing code for racial genocide.

Quite frankly, that is why the term "population management" is being used with the emphasis on **management**, not controls or strong-arm tactics. According to the American Heritage Dictionary *control* means to exercise authoritative or dominating

influence over something. When it comes to reproduction or reproductive rights, applying a China-like strategy of coercion or forced measures simply won't work in America and would be soundly rejected.

Our culture requires a more considerate and sensitive approach that respects civil and individual rights coupled with appropriate funding, educational tools and incentives to reach our demographic goals. All of which when gathered together fits nicely under the rubric of "management." Turning to the dictionary again, "trying to cope or deal" with a problem is considered part and parcel of trying to **manage** a challenging situation. Thus, the term *population management* is being used to reflect a cooperative, enlightened approach, rather than applying the heavy hand of governmental edicts, threats, or coercive measures, such as forced sterilizations and abortions. Once the people understand the mission and goals and get behind them, America can trim its size, leading other nations to do the same for the betterment of humankind.

The last point is on the matter of skin color. Population management is color neutral. No matter what race, ethnicity, religion or country of origin, all humans do the same thing…breathe, eat, drink, excrete, consume, create shelter, make a living and reproduce. All of these human functions rely heavily on natural resources. Whether black, brown, yellow, red or white or a mixture thereof, race is irrelevant. What does matter is our behavior, our attitudes and cultural practices.

Most Americans are well aware that America is changing color and so is the power structure. As shown by recent elections, people of all color now lead America. No matter our heritage, we are all in this together and have to find common ground to better manage our human presence on this beautiful land, starting with what we do individually. It's not our skin color that makes us a threatened species…it our sheer numbers. That's why population management is color blind.

Having covered these basics, the reader is ready to select any topic on ElbowroomUSA's menu.

III. Trying to Find More Room

America is on an explosive ascent with no peak in sight. The population quadrupled from roughly 70 million to more than 282 million in the 20th century and the U.S. Census Bureau projects that our head count will be close to 400 million by 2050.

More than 100 million additional people in 40 years is equivalent to adding the current residents of California, Texas, New York, and Florida combined, plus throwing in a few small states for good measure. This stunning trajectory evokes troubling questions. Where are we going to put another 100 million of us, and do we have the space and natural resources to sustain not only our current head count, but the newcomers to boot? If the numbers just keep on pilling on, what is this going to do to our way of life and standard of living?

A. Structural Limitations on Growth

The reality, of course, is that as a society we give lip service to doing what is best for our children's future, but do very little long-range planning even in our personal lives. At any level, government isn't particularly geared to thinking ahead beyond a few years

out, especially when it comes to dealing with demographic trends. The attitude seems to be *when it happens, we'll adjust accordingly*. But times are changing.

Previously we had plenty of room to expand with seemingly limitless resources to support us. Now there are water shortages, fossil fuel use issues, loss of significant amounts of farmland to development, unmet and underserved educational and health care needs, the insidious loss of individual freedoms, and a growing list of other gnarling socio-economic constraints. All of which will require us "to do today what is needed for tomorrow."

For several decades, many organizations and individuals have attempted to coax, cajole, warn, and plead with the media, Congress and several Administrations to address these alarming trends—unfortunately to no avail. With the Great Recession, not enough jobs, rising food and gas prices, plus the difficult winding down of two major Middle Eastern wars, the too-many-people problem doesn't appear anywhere on the agenda. Yet, as discussed on this site, the nation's future depends on society not only living within its financial means, but within its biological means as well. Not doing so will in time threaten the nation's very existence.

Having laid out some general ideas and challenges, it's time to get down to specifics. The first practical issue to be discussed: is there enough room to accommodate all the newborns and new arrivals to America in both the near and long term? Before trying to answer that question, let's see how we stack up with other sizeable nations in terms of room to grow.

B. Comparing America's Size

In Figure 2, the seven largest nations in the world are listed by size based on landmass along with their populations and density. The U.S is the third largest country behind Russia and Canada. It is slightly bigger than China and three times the size of India. Also, America's 315 million residents rank third in population size whereas China is the biggest with 1.3 billion people and India close behind at 1.2 billion. Interestingly enough, Russia, having the most land, has only 114 million people, which is about one tenth of India's population size. Canada and Australia's population densities suggest there is ample elbow room in these countries.

For the U.S. to be in third place by both population size and landmass hasn't seemed to matter much when it comes to measuring economic or military might. Having won the Cold War with the Soviet Union, America has demonstrated that super power status does not necessarily correlate with population size or territory held. To be on the safe side, proponents of growth could argue that a larger U.S. population might deter "Population Billionaires" like China and India from aggression.

On a more practical level, most businesses and corporations see more people as a way to enlarge the labor pool to get a broader talent base and to instill competition to dampen down wages, while growing a larger domestic market for goods and services. For different reasons, immigrant groups share these same ambitions, for they want jobs, not only for themselves, but also for incoming relatives from abroad who also would want share in the heralded American Dream. Both forces in conjunction with "pro-natalists" (those favoring unlimited births) often justify their quest for more people by pointing to vast open spaces that are presumably ready to absorb any newcomer.

In the next section, Distribution of the Population, the assumption that America has room to spare will be tested.

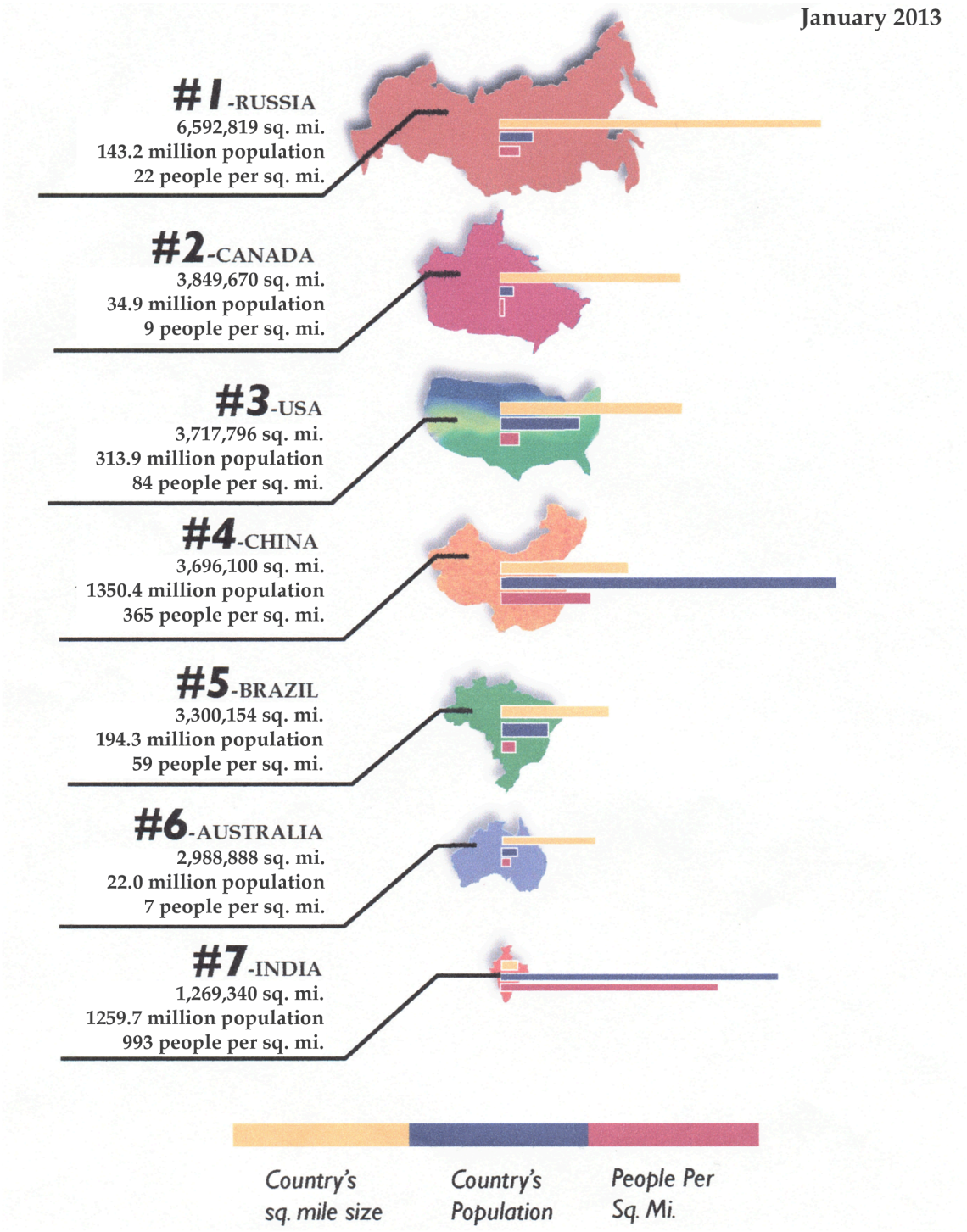


Figure 2. Landmass Compared to Population Density

C. Distribution of the U.S. Population

A nighttime satellite photograph gives a dramatic view of where people live and work in the United States (Figure 3). Megalopolises shine their expansive presence along the Pacific and Atlantic coasts, with brilliant inland clustering along the Great Lakes and major continental waterways and rail systems. A quick scan of this photograph shows that the greatest infill has occurred east of the Mississippi River with remaining open spaces in the western interior, suggesting perhaps more room for another 100 million people or more. Looking at the 2010 census by state, a case might be made that certain states could take on more people. Based on reported density, here are some possible candidates.

Figure 3. Nighttime Satellite Photograph of the U.S.

As one might expect, large western states (such as Alaska, Arizona, Colorado, Idaho, Montana, Nebraska, New Mexico, Nevada, North and South Dakota, Oregon, Utah and Wyoming) have the lowest number of people per square mile (under 60) compared to the U.S. average of 87 people per square mile.[8] The Midwest is similarly inhabited, including Missouri, Minnesota, Mississippi, Oklahoma and Iowa, as well as several smaller states to the east including West Virginia, Vermont, Arkansas and Maine. One could make the assumption that collectively these 22 less-populated states can easily accommodate newcomers. And that is actually happening, as migrants spread out across America. But migrants are also locating in densely populated states with no room to spare.

For example, there are several states on the eastern seaboard that rival the population density highly urbanized countries in Western Europe (i.e., Belgium, the Netherlands and the United Kingdom). Even more surprising is that the states of Delaware, New York, Maryland, Connecticut, Massachusetts, Rhode Island and New

Jersey plus the District of Columbia host more people per square mile than China does on average, with the last three surpassing India's average density.

Major U.S. cities vary in density as well. For instance, New York City's population per square mile is 26,821 and ranks highest in the nation, followed by Paterson, New Jersey, with 17,346 and San Francisco with 17,179.[9] All of which are in league with Singapore, Macao, Hong Kong and Monaco for cheek-by-jowl living.

Despite being squeezed in, a good percentage of the U.S.'s one million or more legal immigrants per year (along with the unauthorized migrants) head for these states and municipalities, because that's where many of the jobs and supportive relatives are. This concentrated influx presents major infrastructure challenges to governments in accommodating the load. And remember, there's a lot more still to come—another 100 million by 2050.

If each one of the 22 less populated states previously mentioned, assimilated their equal share of 100 million expected newcomers, each would add just about 4.6 million people by 2050. That would mean 18 of the states would more than double their present size in less than 40 years, with the other four adding about 70% more to their present base. That's a mass of folks requiring more roads, schools, hospitals, housing, criminal and judicial capabilities, not to mention the infrastructure for business development.

One can foresee a distribution challenge ahead and it would appear to be just a matter of realigning future growth and getting people and enterprises to relocate to those states with seemingly unused land capacity.

Wouldn't it be nice to stop here and declare victory? The Congress would simply create a national population policy calling for the infill of the inland west as was done in the 1800s. Legislation promulgating tax incentives and financial assistance for migrants would be passed and the job would be done. But hold it…there are good reasons why those 13 western states were sparsely settled in the first place—namely, the limited availability of water and arable land for food production.

In an extraordinary book titled "How Many People Can the Earth Support?" the author, Dr. Joel E. Cohen points out that sustainability in a given area is dependent on four intersecting variables: population growth, economics, culture and the environment. His work suggests that while population density figures may indicate room for more people, there's much more involved.

Although density (people per square mile) may show potential open areas for habitation, this can also be deceiving. What this metric fails to expose, is the future sustainability of the area. As a town, city, megalopolis—or a nation, for that matter—gets more congested and is rapidly depleting natural resources, one has to start asking, "With more newcomers, where are we going to get enough water, food, energy and building materials—and do we have the money to build the necessary infrastructure?"

To answer such a multifaceted question, the first order of business is to gauge the ecological carrying capacity (ECC) of the area, region, or nation, and then come to grips with the shortfalls in capacity, if any. Most Americans are unfamiliar with term ECC and the essential role it plays in determining future sustainability. In the next section, we will examine this key concept.

IV. What is Ecological Carrying Capacity?

Addressing the relationship that humans have with the earth is a complex challenge. According to Webster's Dictionary, "ecology is a branch of science concerned with the inter-relationship of organisms with their environments." In the huge stew of life on the planet the best guess at the number of participants (species) interacting with each other is 8.7 million.[10] But our focus is on just one of them – the most pervasively dominant and powerful one – the human being.

Naturally, the earth has biological limitations, which humankind ingenuously tries to get around, if not eliminate, with marginal success. In ancient times nomadic tribes intermittently moved during seasonal cycles, knowing when they had exhausted resources and it was time to find fresh territory. There was an innate appreciation of nature's boundaries, regenerative powers, and their stewardship role.

In modern times that inborn calculus has become far more complex by virtue of an overwhelming human presence coupled with industrial and technological development. Getting a handle on what the land, inland waterways, coastal marine areas, and the sea can provide to ever-growing human demands will be a never-ending challenge to the ecological sciences.

What ecologists have taught us is that any given surface of the earth has a certain capacity to sustain life in relation to the natural resources available, hence the term *ecological carrying capacity*. ECC can be calculated for prescribed areas, regions or nations. If there is an alignment or balance between dependent species and natural resources, the ecological system involved will remain healthy and sustainable. If, on the other hand, species requirements exceed available natural resources, both the offending species and the ecological system are in jeopardy. In short, it's smart to know the ECC of an area before it gets too loaded with people for their well-being, if not survival, is at stake. In the next section, the attempts to develop these early warning systems will be discussed.

A. The Population Bomb & IPAT

One of the early U.S. ecologists to sound an alarm about the too-many-people problem was Dr. Paul R. Ehrlich of Stanford University. In his controversial 1968 book "The Population Bomb," Dr. Ehrlich made a number of dire forecasts about commodity prices, famine and mass starvation, which did not materialize, at least not in the time frames suggested. While the timing was off, the predictions of famine and eventual die-off of millions are still probable, as is seen with unaffordable food prices for the impoverished, growing concerns over food production and the availability of clean water, coupled with civil unrest that threatens established regimes and nation states alike.

The message Dr. Ehrlich was trying to convey—that America needed to rethink the merits of population growth—got lost in the challenges to his predictive accuracy. His ideas of slowing and better managing population growth were discredited when the U.S. didn't experience the calamities envisioned.

Not giving up, Dr. Ehrlich and his wife Anne Ehrlich took a different approach to assessing the impact of people numbers on the nation's environmental health. They created the "I=PAT" equation. Here's how they describe its use in a 1996 article titled "The Most Overpopulated Nation":

> The impact of a population on the environment can be roughly viewed as the product of three factors: the size of the population (P), the level of per-capita consumption or affluence (A), and the measure of the impact of the technology (T) used to supply each unit of consumption. This provides the shorthand equation I=P x A x T, which, although oversimplified (because the three factors P, A, and T are not independent), provides a basis for comparing the responsibility of different nations or groups for environmental deterioration.

From the I=PAT equation, one can see that the population problem in the United States is the most serious in the world. In that same essay the Ehrlichs' postulated that the U.S. population was appropriately sized during World War II. They wrote, "Even if its citizens were just as profligate users of energy as we are, the 135 million United States citizens could satisfy their energy appetite without burning one drop of imported oil or one ounce of coal." They go on to say that there were enough people then to support a strong military and a dominant economic presence in the global market. With our present grand and consumptive lifestyle, they would surmise that 75 million people would be about the right size. (Our current count is more than 315 million residents, as of March 2013).

B. Carrying Capacity Network

Since the advent of the Ehrlichs' IPAT formula, other methodologies for arriving at optimum size have been advanced as well. One organization, Carrying Capacity Network (CCN), a proponent of population stabilization, defines carrying capacity this way:

> Carrying capacity refers to the number of individuals who can be supported in a given area within natural resource limits, and without degrading the natural social, cultural and economic environment for present and future generations. The carrying capacity for any given area is not fixed. It can be altered by improved technology, but mostly it is changed for the worse by pressures, which accompany a population increase. As the environment is degraded, carrying capacity actually shrinks, leaving the environment no longer able to support even the number of people who could formerly have lived in the area on a sustainable basis. No population can live beyond the environment's carrying capacity for very long.
>
> The average American's "ecological footprint" (demands an individual endowed with average amounts of resources, i.e, land, water, food, fiber, waste assimilation & disposal, etc. puts on the environment) is about 12 acres, an area far greater than that taken up by one's residence and place of school or work and other places where he or she is.[11]

We see that the ecological footprint of a single American on the earth is far greater than the soles of his feet or the size of her house. Using CCN's12-acre "rule of thumb" for physical space requirements per person, some interesting calculations can be made. Based on U.S. landmass of 2.4 billion acres, 198 million inhabitants can be supported. This means the nation's current population of 315 million exceeds its ECC by almost 59%. Said differently, when the head count reaches this point, our land mass provides about 7.7 acres per individual to meet their needs. To get the other required 4.3 acres, we have to turn to other nations. While acres are not literally wrested away, we obtain the needed resources from them by virtue of international trade. Over the last several decades, America's continuing trade deficits reflect this transfer from other nations to meet our ever-expanding needs.

C. Global Footprint Network

Another approach to sizing Ecological Carrying Capacity was introduced by the Global Footprint Network (GFN) in 2003. It took the concept a step further with a more sophisticated methodology and broadens the application to the world stage. GFN uses two key constructs: "biological footprint" (BF) and "biocapacity." BF measures humanity's demand on nature, i.e., how individuals, business, cities, nations, or humans as a whole, consume energy, timber and paper, food, fiber and seafood, while developing the land and absorbing carbon dioxide emissions using prevailing technology. In other words, BF measures only what humans take from nature in a given time period without other species' needs factored in.

What nature is *actually capable* of providing in an area, region, or nation is called the *ecological capacity*, or *biocapacity*. This measurement reflects what natural resources are available and the ability of a given land area to absorb wastes. GFN describes biocapacity as "the capacity of ecosystems to produce useful biological materials and to absorb carbon dioxide generated by humans, using current management schemes and extraction technologies."[12] GFN defines "useful biological materials" as "those used by the human economy, hence what is considered 'useful' can change from year to year."[13]

Biocapacity is usually measured in units of global hectares, which according to GFN is a "common unit that encompasses the average productivity of all the biologically productive land and sea area in the world in a given year. Biologically productive areas include cropland, forest and fishing grounds, and do not include deserts, glaciers and the open ocean."

When the BF is greater than the biocapacity, it is called an "overshoot" or a state of depletion. Conversely, when the biocapacity meets or exceeds the BF, there is a sustainable balance between man and place. GFN makes the point that ecological capacity "aims to show the interdependence between a country's biocapacity, its economy and ultimately, the well-being of its people."[14]

Here is how the U.S. is doing based on GFN's published data: when considering both fishing grounds and habitable land areas, the national biocapacity is 4 hectares (9 acres) per person. The average U.S. resident has a BF of 8 hectares (19 acres) predicated on consumption habits and the current standard of living. As one can see, each American has pretty big feet, so to speak, creating a significant overshoot or resource gap. To compensate, America must obtain materials, minerals, foods, products and services from other nations, as reflected in the huge on-going trade deficits.

According to GFN, here are some options the U.S. may have to resolve this dilemma:

> When a nation's demand for ecological goods and services exceeds what its own ecosystems can supply, the nation can balance this ecological deficit in two ways: by importing resources from elsewhere, or by drawing down its own stocks of ecological capital. Some nations use a combination of the two, both overdrawing their own biocapacity for export while simultaneously importing additional biocapacity from elsewhere. Comparing the Ecological Footprint of a nation to its own biocapacity can be used to determine whether, in the long run, a nation is capable of meeting its own demands from within its own borders. At the global scale, all nations cannot be net importers, and nations that rely on competition for increasingly scarce imports will be increasingly at risk.[15]

There is, however, another alternative not mentioned by GFN, which deals with the issue of overpopulation and consumption. Using GFN's BF of 8 hectares (19 acres) per American with a landmass of 2.4 billion acres, theoretically, about 126 million people could be sustained, assuming most everything remains static. If somehow this reduction in census could be accomplished, it is very likely that the U.S. could regain a trade surplus along with less environmental degradation. (For more on this topic, see the section on Demographic Economics). Certainly cutting the current population by 60% is unrealistic as a near term corrective measure, but it does however, help make a point: that population size makes all the difference in the world as to whether environmental sustainability, thus human survivability, is doable.

D. Neighboring Nations' Biocapacities

To underscore the impact that population has on biocapacity, let's look at our neighboring nation states. On average, Canadians have a BF of 7 hectares, but interestingly, with their only slightly larger landmass than the U.S., the biocapacity per Canadian is 15 hectares, giving Canada plenty of environmental wiggle room. If the two nations are about the same size, what makes the big difference in biocapacity? A key factor is population size; Canada has 34.4 million people, slightly over one-tenth of America's head count. Its bio-output has not been diminished by several decades of human overload, unlike the U.S. Should it keep consumption and population growth in check, Canada's prospects for long-term sustainability and prosperity are excellent.

Data from Homeland Security indicates there is major exodus of Canadians to the U.S. During the ten-year period from 1990 to 1999 about 19,500 Canadians on average left for the U.S. annually compared to 276,000 Mexicans who migrated to the U.S.[16] That's a huge disproportion from which we hypothesize that insufficient biocapacity is associated with people vacating their homeland. This would be a worthwhile research project for a keen student of demographics to undertake.

Mexico, which is far less prosperous and is approximately one-fifth the size of the U.S or Canada, suffers from a significant ecological deficit. Its biocapacity is 1.5 hectares to support a BF of 3.4 hectares, meaning that each Mexican needs twice what nature can provide. Proportionally, if Mexico were as big as the U.S. or Canada, its census would be around 580 million. The take away is that no matter how you slice or dice the numbers, our southern neighbor is overpopulated and under resourced. It is not surprising that the U.S. has been a relief valve for Mexican population pressures and socio-economic stresses. As Mexicans emigrate for a better life, there are unwittingly shifting their country's ecological overload with the full blessing of their government.

Needless to say, those legal and illegal crossings are not well accepted by Americans. As the U.S. experiences a prolonged and difficult economic recovery, there is a scarcity of jobs. Adding to the labor pool is seen as unwelcomed competition, especially for those with lower educational skill sets, circumstantially pitting them against immigrant workers.

Equally important is that the U.S. has a similar deficit ratio in biocapacity to that of Mexico with the same causative factors: too many people heavily drawing down critical resources, such as food, energy and water. For Mexicans there is an escape to the north, but not for Americans. Besides having a colder climate with broad expanses of difficult to inhabit areas, Canada has a high bar of immigration requirements with conscientiously enforced laws, thereby discouraging Americans to permanently relocate whether legally or otherwise.

Whereas Mexico's dwindling biocapacity is due to an historically high internal birth rate, America's problem is different; a seemingly unstoppable influx of migrants from all over the globe. Volumes are high from Central and South America, Asia, Europe (particularly Russia), the Caribbean, and Africa, exacerbating an ever worsening situation. (For more on this topic, refer to A Noble Notion Gone Bad).

Needless to say, America needs to deal with the reality that immigration policy, as currently constituted and administered is slowly killing the nation's ability to naturally sustain itself. Reform is needed and soon based on a national population policy that wisely recognizes nature's limitations. This important topic is covered in the next section, Guiding National Population Policy Using EEC.

E. Guiding National Population Policy Using ECC.

Ecological Carrying Capacity (ECC) is one of the most important principles to grasp in explaining the current population crisis. Few Americans are familiar with the idea that our existence and sustainability are dependent on an ecological carrying capacity. So knowing and understanding what ECC is and how our lives revolve around Mother Nature is central to our existence (see What is Ecological Carrying Capacity? for more information).

In reviewing all the prior methodologies to calculate ECC, none of them has suggested that America has room for more people—quite the contrary. It is our perspective that this nation's insatiable quest for more growth at any cost implicitly calls for more misguided immigration and unintended births. It defies credulity that private and public sector leadership are ignorant of the present ecological "overshoot" and the consequent profound domestic and foreign policy ramifications.

For instance, can the U.S. rely indefinitely on other nations to overcome its biocapacity shortfall, as global competition for limited resources heats up from an expected surge of $1–$2 billion more people by 2050? Even today China and India are seeking to tie up future energy sources for their fast-rising economies. And that says nothing about other emerging nations like Indonesia and South Korea with the same keen interests. What impact does that have on America's sustainability? These are certainly unsettling questions at this juncture, yet they should be addressed in the context of a much-needed national population policy that recognizes the underlying issue of sustainability in a hotly competitive world.

Finally, if America is to endeavor to right-size the population at some point, ECC is a critical criterion for determining the appropriate balance between people numbers and the nation's natural resource capabilities. The various methodologies employed to arrive at carrying capacity or biocapacity should be standardized and sanctioned by a prestigious body such as the National Academy of Sciences. Armed with bio-technical standards, policy makers will have a better chance of persuading the electorate that legislatively promulgated population targets are grounded in science. At the same time the nation's leadership at all levels of government will have better demographic guidance in planning future social and physical infrastructure changes.

V. America's Infrastructure and the Impact on Elbowroom

Each day America's infrastructure is taken for granted. Yet, it is essential to the smooth functioning of our daily lives and to the economic prosperity of the nation. We humans need interconnected streets, highways, railroads, bridges, inland waterways, dams, energy grids, airports, water and sewer systems. But that's not all…there are libraries, hospitals, courts, prisons, schools, etc., all of which come under the rubric of *infrastructure*.

As each new person is added to our nation, there's a tad bit more demand put on the whole system. At the end of the year after adding about 2.7 to 3 million more newcomers, those tiny bits add up, creating a heavier load of wear and tear. The infrastructure affected has to be eventually adjusted to accommodate increasing demand. Maybe the need doesn't become readily apparent, but at some point the accumulative stress and strain will show up requiring more money for repairs and/or replacement. There's another factor to throw into the mix: how does every expanding infrastructure impact our personal freedoms?

How many times have we adjusted our schedules to avoid heavy traffic congestion? Found our family or recreation time eroded by slower commutes? Moved away because a once residential neighborhood was transformed into an industrial zone? Perhaps the city or county decided to build a power plant nearby or maybe a prison. Or the lifestyle of a farmer erodes as houses and shopping malls creep in on his pastoral farm.

In this quest for unlimited growth there is another intangible reality that lays victim. Personal freedoms along with silence and solitude are insidiously lost, as crowdedness becomes a way of life in both suburbia and metropolitan centers. These priceless intangibles that lift the human spirit are being forsaken in the name of economic progress. As we all know too well, if today's urban dwellers want peace and tranquility, they often have to travel many miles to find them. Nevertheless, the nation has chosen growth over quiescence and that means, of course, ever-expanding infrastructure and the continued encroachment upon open space to meet our national economic goals. Realizing that we are sacrificing elbowroom in the name of growth, it's time to get down to basics to see how human need dramatically impacts life on the planet.

While not a startling finding, infrastructure creation is directly attributable to eight primary human functions: *breathing, eating, drinking, human waste disposal, shelter, consumption, making a living and sexual reproduction*. Table 1 (next page) shows how each of these eight functions results in a complex of primary and secondary infrastructures with several sub-systems and a myriad of services taken for granted.

Each primary function uses one or a combination of several natural resources such as air, water, land, food, timber, and the extraction of gas, oil and different minerals. In time as the population grows, the primary infrastructure evolves into innumerable subsystems with the application of technology to boost efficiency and output.

Once the population reaches a certain critical mass in a given locality, another surge in expansionary development occurs, further encompassing adjacent lands with repeated progressive cycles. These build-outs engulf huge amounts of timber and farmland, deserts, wetlands, and underground energy sources, displacing farmland and habitats of other species. As often seen, one of the unintended consequences of this

incessant march into adjoining space is that meeting one human need begins to conflict with fulfilling another important one. For instance, based on an analysis of the National Resource Inventory of 2007 the American Farmland Trust reported, "Between 1982 and 2007, 23 million acres of agricultural land were converted to developed uses. This represents an area the size of Indiana."[17] In other words during the 25 year period in question, one state's worth of farmland, forests, and open land was removed from the country's agricultural capacity in order to accommodate the infrastructure needed for over 70 million new residents.

To make matters worse, farmers are complaining that not only are they losing farmland, but some of the most fertile growing fields. And if this keeps up, (and it is) highly productive farmland will become scarcer and more costly, causing food price increases and more food insecurity for over 46 million impoverished Americans.[18]

Thus, the goal of growing America by 70 million was accomplished, but in the process, the capacity to feed them took a hit. Or putting it another way: we're biting off the land that feeds us.

Table 1. Primary and Secondary Infrastructure Resulting from Primary Human Functions

Basic Human Functions →	**Primary Infrastructure** →	**Secondary Infrastructure**
BREATHING	Oxygen from photosynthesis (trees & vegetation	**Ground, air & water transportation systems** Local roads, state and interstate highways Railroads (passenger & freight) Airlines and Airports & federal flight control systems Maritime services – seaports, inland waterways, and major river management **Power productions & distribution** Dams, power plants, transmission line and regional grids. Natural gas storage sites plus piping systems **Health care system** Doctors, hospitals, clinics & health plans **Governments & social infrastructure** Governance: Villages, city councils, county, state and federal administrations plus legislatures Public Safety & Security: Police & Fire and Rescue Education: Primary, secondary, trade & higher institutions of learning Library & Internet Services Social Services: County, state & federal agencies Veterans Administration, Social Security, Medicare, Medicaid, etc. Private service clubs (Kiwanis, Rotary, Elks, Lions, etc.) Non-governmental: Disaster relief agencies, faith-based human services, family planning agencies, environmental and population management groups
EATING	Agricultural & Fisheries Production Commercial food distribution	
DRINKING	Water treatment & distribution Commercial beverage production & distribution	
HUMAN WASTE DISPOSAL	Sewer treatment and sanitary discharge Landfill and recycling	
SHELTER	Housing (stationary & mobile) Commercial lodging	
CONSUMPTION	Commercial and industrial products, supporting financial enterprises	
MAKING A LIVING	Construction and operation of primary and secondary infrastructure	
SEXUAL REPRODUCTION	Prenatal, birth & newborn care	

A. Infrastructure Planning

Since the U.S. Census Bureau conducts a residential count every ten years and from this data makes forecasts, one would expect municipalities, regional governments, state or federal agencies to be planning well in advance of anticipated need. But that doesn't seem to be the case. Unfortunately, what usually happens is that over utilization creates systemic breakdowns that have to become intolerable before repairs or expansions occur. In a speech to the Texas Transportation Forum on January 3rd 2011, Pennsylvania Governor Rendell rhetorically asked, "How many bridges have to fail — how many levees have to break before we wake up?" In other words, our infrastructure is failing us at many different stress points in America with human and economic catastrophes waiting to happen.

In a report released in September of 2011, the Texas A&M Transportation Institute (TTI), a well-regarded national consulting group, made this observation, "The interstate highway system grew rapidly from the late 1950s to the mid 1980s and the U.S. economy grew along with it. Since then, growth in the interstate system has virtually stopped...Congestion does more than choke our highways, it chokes our economy, making it harder to buy what we need and harder to keep or find a job."[19]

In a 2004 freeway operating report, TTI made this comment on the impact of population growth:

> The increasing population growth in Texas has placed enormous demand on the transportation infrastructure, particularly the freeway systems. There is a growing realization that the construction of sufficient freeway lane capacity to provide free-flow conditions cannot be accomplished in developed urban areas due to cost, land consumption, neighborhood impacts, environmental concerns, and other factors. Like other transportation agencies nationwide, the Texas Department of Transportation (TxDOT) is searching for methods to better manage traffic flow and thus improve the efficiency of existing and proposed networks.[20]

While Texas is trying to cope with the aftereffects of population growth, there is little to suggest that federal, state, county, or city governments across the nation are doing any better or as well. The other high growth states (California, New York, Florida and Illinois) are struggling with the same challenge: how do we maintain infrastructure capacity in the midst of unrestrained population growth, mounting land and construction costs, plus consequential environmental and health concerns?

Looking at the situation more broadly, the American Society of Civil Engineers (ASCE) indicates that governmental entities at all levels have let the nation's vast infrastructure slide into decline and disrepair. In 2009, ASCE released a Report Card for America's Infrastructure grading 15 infrastructure categories with D+ overall and estimated the need for a $2.2 trillion investment to bring conditions to acceptable levels.[21]

There is no indication that accelerated future use due to population growth was factored in the assessment or projected costs. Nonetheless, these trillions in "unfunded liabilities," as economists like to call them, are probably understated and unacknowledged by either state or federal budgetary agencies. This is a sorry situation and the reader (and every American, for that matter) is encouraged to visit the ASCE's website (www.asce.org) for a foreboding infrastructure exposé.

What has happened over the years is that as the domestic economy has expanded by leaps and bounds, the attendant benefits have accrued mostly to the private sector, while leaving the liabilities of infrastructure development and maintenance to the government, i.e., taxpayers. With an obsessive drive to pump up local economies to produce more jobs, general infrastructure concerns got short shrift in the mix of expedient politics and budgetary priorities. There is no better way to see what took place than to probe three key subsystems of the nation's infrastructure: energy, the electrical grid, and water.

B. Energy in America

There's plenty of energy to go around on the planet despite the fact that easily accessible oil is being depleted. In the U.S. many experts believe domestic oil production has peaked and that supply will gradually end near the close of this century. But will it? Recent discoveries of huge reserves, particularly in North Dakota's Bakken-Williston area, has turned America's future oil and natural gas outlook on its head.

Another significant discovery adding to the brighter fossil fuel picture is the Green River Formation, "an assemblage of over 1,000 feet of sedimentary rocks that lie beneath parts of Colorado, Utah, and Wyoming and contain the world's largest deposits of oil shale. The U.S. Geological Survey (USGS) estimates that the Green River Formation contains about 3 trillion barrels of oil and that about half of this may be recoverable, depending on available technology and economic conditions. This is an amount about equal to the entire world's proven oil reserves."[22] This huge find has both good and bad news for the nation.

First, the good news. Increasing domestic capacity coupled with hydraulic fracturing ("fracking") and new horizontal and deep-water drilling technologies make extracting harder to reach oil and gas reserves progressively more feasible. This is contingent on current market prices being sustained. If prices fall below recovery costs, drillers can't make a profit, resulting in rig abandonment until better times. Thus, domestic supply will still be subjected to the vicissitudes of the market place.

As for the bad news, hydraulic fracturing requires huge amounts of water that, in many drilling areas, is limited at best. Drillers are competing with farmers and residents particularly in the southwest for a dwindling supply of potable water (see USA's Water Challenge). Also, there is alarm over possible contamination of aquifers with chemicals used in the fracking process, though research to date has been inconclusive on this point. Assuming these worries are resolved, what about atmospheric pollution and the carbon emissions released from fossil fuel burning linked to global warming? For the moment, short term energy independence seems to have trumped the longer term deleterious consequences of carbon burning.

Many are saying that the U.S. dependency on foreign oil supplies will be coming to a gradual end, as the industry ramps up home-based production. That seems to be borne out by data showing that slightly less than half of our daily 19.1 million barrel consumption comes from other countries. According the Department of Energy, in 1977 about 70% of imported oil came from OPEC (Organization of the Petroleum Exporting Countries) nations, but today that figure has fallen off to slightly less than half.[23]

Surprisingly, more of our oil now comes from Canada than from Saudi Arabia. Keep in mind that in 2010 the U.S. produced half of its own oil and has become a bigger exporter of petroleum products like diesel and gasoline. In effect a sizeable amount of

imported oil is being refined domestically and then returned to the world market where it sells at prices higher than the domestic market would support.

While energy independence is clearly in the cards with the recent ramp-up of domestic production, the troubling issue of continuing to burn hydrocarbons in the face of global warming still remains. Since the U.S. is one of the planet's biggest carbon emitters, the U.S. needs to hasten the transition to cleaner energy sources, such as natural gas, geothermal, solar and wind power, or some yet-to-be-discovered non-fossil fuel energy source. Unfortunately, the abundance of cheaper oil and gas threatens to stall this much-needed transformation.

As we humans know all too well, there is the tendency to procrastinate on large-scale issues, especially in the absence of an immediate crisis. As long as oil still gushes somewhere and gasoline comes out of the pump nozzle at tolerable prices, with plenty of electricity to meet household and industrial needs, tomorrow can wait. Needless to say, energy policy in America is at best unsettled in the face of these recent dramatic changes and political divisiveness on how to secure the future.[24]

Further compounding any energy changeovers are the conflicts involved in unstable geopolitics. While the U.S. may become more energy self-sufficient in time, the threatening actions of rogue nation states can wreak havoc on oil supply and market prices, often causing a chain reaction of obstacles that block the best-laid energy transition plans.

The civil unrest from the overthrow of dictators in Libya and Egypt, plus Iran's periodic threats to choke off the oil supply to Europe and the U.S. through the Straits of Hormuz, easily demonstrate how tenuous the flow of natural resources can be. Furthermore, as giants like China and India grow in economic strength, coupled with continuing needs of developed nations, the drawdown on global resources will accelerate. This means increased price competition with no end in sight.

Another unpredictable factor and a big driver in utilization of natural resources is planetary population growth. By 2050 another 2 billion people are expected, making competition for energy, water, agricultural and horticultural commodities even more keen. History has shown that such competition for natural resources provokes wars, famine, and increased incidents of disease, making foreign affairs ever more complex and difficult.

Clearly both America and the rest of the globe are in for a very protracted transition away from petroleum to more sustainable energy sources. Success depends on our ability to manage change in the face of overwhelming human numbers and global conflict. Speculating on the speed and form of this energy transition is far beyond the scope of this research. Suffice it to say that whether this will be a human triumph or a calamity will depend upon courageous, visionary leadership over several decades. Do we have the mettle to do it?

C. The Electrical Grid

Any discussion of the nation's infrastructure would be incomplete without addressing the electrical grid. While often referenced in the media, most Americans pay little attention to it, until found sitting in the dark with their essential appliances shut down. Perhaps, it would be helpful to describe what this huge thing is that keeps "America the Beautiful" humming.

Simply put, the U.S. electrical grid is a complex network of independently owned and operated power plants distributing their services on high voltage transmission lines across regions of the lower 48 states. The Federal Energy Regulatory Commission (FERC) along with other regional and local agencies oversees this intricate network. Visualize the U.S. electrical grid by clicking here. This complex system is stuck with the age-old problem – underinvestment. Here's what the American Society of Civil Engineers concluded in their report:

> The "information economy" requires a reliable, secure, and affordable electrical system to grow and prosper. Unless substantial amounts of capital are invested over the next several decades in new generation, transmission, and distribution facilities, service quality will degrade and costs will go up. These investments will involve new technologies that improve the existing electric system and possibly advanced technologies that could revolutionize the electric grid. While much is still left to be accomplished, recent efforts have raised the grade to a "D+" in the 2009 Report Card.[25]

In an article, "Energy Armageddon Coming to America," David Fessler, Energy and Infrastructure Specialist for the Oxford Club writes, "America's electric grid is on the brink of disaster." He describes a series of recent major black-outs and power interruptions that have plagued the country due to an overburdened grid. Not only is it in disrepair, but also continued population growth is putting additional strain on an aging and inadequate structure. Below are some paraphrased apprehensions Mr. Fessler outlined should the grid go down:

1. The flow of petroleum in pipelines could be interrupted, causing significant and costly supply interruptions to users.

2. National defense systems critical to the nation's safety and security could be shut down for extended periods.

3. Since hospital patient life-support systems run on electricity, prolonged outages could put lives in jeopardy.

4. Water treatment plants could be prevented from processing safe drinking water.

5. The productivity of the nation's businesses, industries and households could be seriously reduced by extended brown- and black-outs.[26]

Fortunately for both the energy and power sectors, there are many workable solutions and alternatives to fixing the problems with great hope for a smart and timely transition to superior and more eco-friendly systems. But for another finite resource, water, there are few such options. It is truly a precious resource with few techno-substitutes.

D. USA's Water Challenge

"Water is the oil of the 21st century." Of all the finite natural resources, water is the key to life on the planet. There is no substitute. "Nothing can survive without water, plant or animals, humans included."[27] Yet, there is probably no other natural resource that is more taken for granted by the average American. If it comes out of the tap clean and drinkable, and it's there when you want it, what's the concern? Of course, there is much more involved and this section will touch on the macro issues with guidance to other sources for a more in-depth review.[28] To get an excellent overview of the American

water challenge, read the Government Accountability Office (GAO) 2002 report summarizing the nation's water challenges. Below is a poignant overview:

> National water availability and use has not been comprehensively assessed in 25 years, but current trends indicate that demands on the nation's supplies are growing. In particular, the nation's capacity for storing surface-water is limited and ground-water is being depleted. At the same time, growing population and pressures to keep water instream for fisheries and the environment place new demands on the freshwater supply. The potential effects of climate change also create uncertainty about future water availability and us.
>
> State water managers expect freshwater shortages in the near future, and the consequences may be severe. Even under normal conditions, water managers in 36 states anticipate shortages in localities, regions, or statewide in the next 10 years. Drought conditions will exacerbate shortage impacts. When water shortages occur, economic impacts to sectors such as agriculture can be in the billions of dollars.

On their website United States Geological Survey points out there are three major components of the water infrastructure: drinking water, wastewater, and storm water. Dams, lakes, streams, rivers, ground water, aquifers, wells and rain feed water supplies. All of the subsystems involved are in serious disrepair. As confirmed by the American Society of Civil Engineers, the nation's overall water infrastructure got a "D" on its most recent Report Card.[29]

Not only is there systemic degradation, but the weather isn't helping either. Since the 2002 GAO report, drought conditions have worsened in Texas, Oklahoma, Louisiana, Alabama and Georgia. By contrast, those living along rivers in North and South Dakota, Nebraska and Missouri would find Mother Nature much too generous with spring runoff causing severe flooding and hindering much-needed agricultural production.

The potential effects of climate change also create uncertainty about future water availability and use. Water managers in 36 states surveyed by the GAO said they anticipate water shortages in the next 10 years, even under "average water conditions." But most climate experts expect global warming to create more droughts, floods, and extreme storms. Thus, future supply looks unpredictable and maybe uncontrollable.

In the U.S., roughly 80% of pumped water goes to agriculture with the rest flowing to cities and/or commercial applications. "The rapid increase in water use in the U.S. is stressing both surface and groundwater resources. Currently, the draw on groundwater is 25% higher than its natural replenishment. For example, in some regions of Arizona, water from aquifers is being pumped 10 times faster than it is being replenished."[30]

Shortages are one thing, but decrepit water and sewer systems make things worse for the consumer and taxpayers. "The U.S. faces a sinkhole epidemic as its century-old water and sewer infrastructure leaks and erodes," exclaims a New York Times article posted on a water industry trade website.[31] It gives examples of growing sinkhole problems where a 40-foot sewer repair truck vanished. In another sinkhole incident a two-year-old boy tragically disappeared. These serious accidents are emblematic of long-standing neglect and underinvestment in the whole system.

A CNN website article on January 11, 2011 titled "Experts: U.S. water infrastructure in trouble" highlighted these alarming statistics:

- U.S. averages 700 water main breaks daily

- In the biggest systems, 30% of water pipes are 40 to 80 years old
- Bacteria, viruses could enter water supply through bursting water pipes
- Cities need money to repair, maintain U.S. water pipes infrastructure

The EPA's third report to Congress in 2009, called the "Drinking Water Infrastructure Needs Survey and Assessment," seems to concur with private sector experts. Based on data collected from utilities in 2007, the EPA found that the nation's 53,000 community water systems and 21,400 not-for-profit water systems will need to invest an estimated $334.8 billion between 2007 and 2027 to restore system capabilities.[32] These figures do not include the upgrade in the sewage systems, which will add billions more. These are big dollars awaiting a Congress plagued by gridlock over ways to resolve America's huge and growing deficits.

Prior to the 80s, the federal government set an untenable precedent by granting to communities millions of tax dollars for repairing or upgrading water systems. In more recent years, there has been minimal funding and even with the recent Great Recession stimulus monies, the appropriations were no match for the huge need. If government at all levels is not up to the task, what are the alternatives?

Economist David W. Riggs of George Mason University views the free market with appropriate incentives as the best way to manage fresh water extraction and distribution. "The problem is not that there is insufficient water but current institutional arrangements offer no incentive to use water efficiently…in publicly administered systems of water allocation, water is often used wastefully and has resulted in politically influential groups getting easier access to water while many of the poor are not served and must resort to buying their water at relatively high prices. Experience clearly shows that the best way to allocate water is through a flexible market place rather than an inflexible bureaucracy."[33]

Mr. Riggs goes on to say that small operators will not be able to garner enough capital in the free market to do the necessary upgrades, making them inefficient and vulnerable to buy outs by larger firms. In short, unfettered capitalism is the best answer to infrastructure renewal and efficiency. And he may be right, but for now local governments are struggling to meet the challenges in a very uncertain environment with no clear direction from Washington D.C.

Another alternative to meet freshwater demands is desalinization technology. Throughout the world there are over 12,500 water desalination plants providing freshwater to areas chronically stressed by shortages, such as the Middle East and North Africa. In the U.S., plant numbers are slowly increasing along the coasts of Florida, Texas and California, where seawater supply is easier to extract and process into drinkable water. For those living further inland, transporting desalinated water from the coast either by transit or through pipelines becomes more cost prohibitive with each mile traveled.

While at first blush it would appear that desalination is a neat techno-solution to freshwater shortages, there are some drawbacks.[34] One of them is that it takes a great deal of costly energy to remove the salt in seawater. Once removed, concentrated salt solutions or brine can be ecologically damaging, depending on how it is returned to the environment and dispersed. Also, desalinization intake pipes have been known to cause significant mortality of sea life and the discharge of chemicals from the cleaning of plant processing pipes also affects aquatic life.

While desalination has some negatives, the reality is that it may be one of few viable choices left as freshwater supplies become scarce and too contaminated to drink. Another option slowly gaining acceptance is to reprocess sewer effluent for household uses, but that of course will take time to prove bio-safety and for the public to esthetically accept in the face of few or no other options.

The supply of water is obviously affected by climatic conditions, growing pollution and increased demographic demands. The whole subsystem is plagued by long-term neglect and serious leakages. As water shortages spread across the nation in these recessionary times, there is growing concern that there is not enough public funding to fix the problems. Will private enterprise have to take over the nation's public water services? Will the poor be able to afford the increasing cost of water and will the government have to supply "water stamps"? These are questions that other nations have tackled with mixed results. Soon it will be America's turn.

E. A Vicious Cycle in a Growth Economy

After examining these three subsystems, it is abundantly clear that infrastructure maintenance and repair has not been a top priority for any level of government. The attitude seems to have been, "if it ain't broke, ignore it." Yet affordable energy, reliable electricity and safe water are quintessential not only to the workings of everyday America, but to its future prosperity as well.

On top of that, political and business leadership presumes that continued and uncontrolled economic expansion is a desirable end in itself. As a result, there is a de facto policy of unrestrained population growth, further exacerbating a fast declining infrastructure network. With nearly 2.7 to 3 million people added to the country's population rolls each year, there is no end in sight to the demand curve. The projected explosion of a 100 million more residents in less than 40 years by the U.S. Census Bureau begs this question as well: "How can the nation continue to patch over the present situation, add more people and then somehow design and finance an improved infrastructure costing at least 2.2 trillion dollars, while the nation is going further into debt every minute?"

Also, this perennial cycle of more economic growth (more people, more infrastructure with increasing taxes to pay for all of it) only necessitates another round of the same to pay for the last one. It's like the inveterate gambler doubling down hoping to make up for previous bad bets. It's a vicious cycle with no end in sight, yet the stakes are high. Is it time to rethink our failing economic growth strategies? Since they aren't serving us very well, why are we so tenaciously holding on to them?

F. Global Warming

No environmental issue has captured more media attention in the last 50 years than global warming. While science rarely reaches certainty, most of the scientific community has concluded that the preponderance of evidence suggests that the extraordinary rapidity of the earth's surface temperature increases over the last few decades is due to the release of man-made greenhouse gases.

There remains a smaller minority of scientists who hypothesize that the current warming trend may be do to other causes such as solar flux, ultraviolet radiation associated with sunspot cycles, changes in the interplanetary magnetic field, earth bound natural cycles like El Niños, or "Urban Heat-Island" effects, etc.; however, there

has been no cogent case made for them.[35] Stuart D. Jordan, a physicist and astrophysicist at NASA Goddard Space Flight Center, states "to date, no convincing case can be made that global warming is caused by natural processes over which we may have no control in the foreseeable future."

Suffice it to say, there is a scientific consensus that human activity creates greenhouse gases, which in turn trap heat in the atmosphere, resulting in global climate changes. How far-reaching the effects will be, the timeline for major changes, and the consequences, are questions being advanced by highly powerful meteorological modeling. For now it is quite evident that oceans are warming, glaciers are melting and sea levels are rising, but to what extent and over what time periods remains uncertain. There is concurrence on a 12-inch average rise in sea levels during the last century, yet the Intergovernmental Panel on Climate Change (IPPC) is unable to predict what will happen in the next 100 years. "In its 2007 Fourth Assessment Report, the IPCC used new satellite data to conclude that shrinkage of ice sheets may contribute more to sea level rise than it had thought as recently as 2001. The panel concluded that it could not "provide a best estimate or an upper bound for sea level rise" over the next century due to their lack of knowledge about Earth's ice.[36]

Nonetheless, there is enough information at hand to motivate many nations to gear up for coastal inundations, as seen in small villages along Alaskan coasts and some island countries making plans to pick up and relocate to higher ground.

With action now, there is an opportunity to manage and ameliorate the anticipated adverse effects. Doing nothing and waiting for absolute certainty is no longer an acceptable option for coping with one of the most vexing problems facing contemporary humanity. It's better to employ a policy of "no regrets" or putting it more colloquially, "it's better to be safe than sorry."

G. The Role of Population in Global Warming

For some time the role of humanity in climate change has been controversial with the debate focusing on a variety other etiological factors. But in the last decade two key science organizations have pinpointed the source of our problems. The International Panel on Climate Change made this statement in its Second Assessment Report in 1995:

> During the past few decades, two important factors regarding the relationship between humans and the Earth's climate have become apparent. First, *human activities*, including the burning of fossil, land-use change and agriculture, are increasing the atmospheric concentrations of greenhouse gases (which tend to warm the atmosphere) and in some regions, aerosols (microscopic airborne particles, which tend to cool the atmosphere) [emphasis added]. These changes in greenhouse gases and aerosols, taken together, are projected to change regional and global climate and climate-related parameters such as temperature, precipitation, soil moisture, and sea level.[37]

The National Academy of Sciences (NAS) concurs and on its website is a report titled, "Climate Change, Evidence, Impacts, and Choices" explaining how CO_2, (the predominant greenhouse gas) plus methane and nitrous oxide, have been historically measured and are scientifically considered "forcing agents" in producing earth warming. The report concludes, "Together, these lines of evidence prove conclusively that the elevated CO_2 concentration in the atmosphere is the result of *human activities* (author's italics)."[38]

Amazingly, "the United States is responsible for about half of the human-produced CO_2 emissions already in the atmosphere and currently accounts for roughly 20% of global CO_2 emissions despite having only 5% of the world's population."[39] The report goes on to say that, as China and India ramp up their economies and the U.S. becomes more energy efficient, it is anticipated that China's economy, if it hasn't already, will eclipse our output. Now that the new data are in, the Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC) reports that China became the world's biggest emitter in 2008, the U.S. is second and India is third.[40]

Whether we will remain number two or slip down the culprit list will be determined by the effect of 100 million newcomers by 2050 and how well we can continue to cut emissions in relation to China and India's output. According to the CDIAC, China led the way in 2009 with an output of 2.01 trillion metric tons of carbon emissions, the U.S. was second at 1.44 and India third with little over half a trillion metric tons. A ways down the list is the Russian Federation, which is also headed to the top of this list as their economy rapidly expands.

On a per capita basis the U.S remains number one with 4.64 metric tons on average, compared to China's 1.57 and India's 0.45.[41] Assuming an industrial expansion to meet growing population increases, America's addition of another 100 million newcomers by mid-century, could increase annual emissions by over 30 percent, releasing another 430 million metric tons of greenhouse gases into the atmosphere. Needless to say, our future population growth has serious global warming consequences.

In cutting through all this data, suffice it to say, that when compared to China we are currently doing much better. With a more modest growth in our economy and the on-going rapid transition from coal power to natural gas, along with more fuel-efficient automobiles plus other energy improvements, there is growing optimism that the CO_2 emissions can be significantly reduced.[42] But there is a caveat, few seem to notice that all of this good work could be blunted by on-going exponential population growth. But there is more to the population equation than simply the challenge of staunching atmospheric carbon releases.

Especially disconcerting is rising sea level due to melting polar ice caps and continental glaciers that is slowly encroaching upon U.S. coastal communities where millions live and work. Lowland areas like Chesapeake Bay, the Florida Keys, the Gulf Coast, San Francisco Bay, and much of Puget Sound will be subjected to higher storm surges, rising tide levels and eventual submersion, forcing many inhabitants to relocate inland.

Maybe dikes, fill, and locks will preserve some localities but at extraordinary costs yet to be determined. As global warming proceeds, tens of thousands will gradually lose their property to ocean encroachment and will have to find new inland residences at a time when crowding in America will be at its historical peak. Also, interior communities will have their own set of water challenges from more expansive droughts and polluted waters. As one would guess, there will be a scramble to find solutions, while the nation advances into unprecedented and uncertain climate patterns.

Clearly, the number of humans on the face of the earth has a major effect on the implications of climate change. America will not escape impending climate events and has to start now to address its demographic problems. In its own self-interest, if not that of the globe, restricting the flow of immigrants is critical to controlling the head count and resultant emissions; welcoming newcomers and then teaching them to be consummate consumers doesn't help the planet. But encouraging a lower birth rate does

and this would help immeasurably to slow natural increases, a key driver of people growth.

The benefits of better population management in a changing-climate world are two-fold: 1) a reduction in greenhouse gases and 2) fewer people in need of homes as rising waters force them out of uninhabitable lowlands. There is no better time than now to get started.

VI. Roadblocks to Population Stabilization

The increasing number of people in the United States doesn't generate much buzz at cocktail parties, nor is it a hot topic of political debate. While some might want to passionately discuss the demographic implications, most Americans are oblivious to such trends. Yet, they draw ire from urban sprawl, traffic congestion, poor schools, pollution, high gas and food prices and the like. Determining what causes these frustrations is left to the government and the political elite to resolve. After all, that is what officials are paid to do.

For many, demographics don't mean much unless translated into economic or political opportunity or, conversely, impending peril. Those in business generally view local or regional population growth as a sign of economic vitality and an affirmation of right-doing by government. The fact that populations are exploding here and around the globe, is seen as an ever expanding consumer sector ripe for exploitation. No better example is commodity trading, where oil, food, agricultural products, minerals, water, etc., offer rich prospects for profits as they become scarcer.

These are times when the most difficult decision of all is to acknowledge the obvious.

-World Resources Institute

But for others exponential growth is socio-environmentally problematic and unwelcomed, especially in the magnitude presently anticipated. Here in the States our numbers continue to climb just like in the rest of the world. As mentioned several times, the U.S. Census Bureau projects the population to reach more than 400 million in less than 40 years, putting an incredible strain on all systems either natural or man-made. Also, our trade deficit suggests that the U.S. is increasingly dependent on foreign resources and products to sustain our growing size. It's a grim reality that America is no longer self-sufficient, having to rely on other nations, friendly or not, to sustain us.

As discussed in What is Ecological Carrying Capacity? one way to tell if the nation is living within its ecological means is to measure whether we are living within our ecological carrying capacity (ECC). Several differently measures of ECC clearly indicate that the U.S. is way beyond environmental sustainability with an estimated human load of 315 million and growing. Obviously there is reason to be concerned; yet government and the media are comatose on the subject.

Rarely does this scale of overpopulation show on any politician's radar screen, and the average citizen seldom comprehends what it all means. Someday when there may be an awakening to this ticking time bomb and a genuine national effort is initiated to do something about it, a very high wall of ignorance, opposition, and fear must first be confronted. Here are several major obstacles that make climbing this high wall of

resistance exceedingly difficult. They are formidable to say the least, but they can and will have to be acknowledged and resolved.

Obstacle 1: Misplaced Emphasis on Overconsumption

For several decades the environmental community has protested that Americans are "resource hogs" and consume too much for our earthly good. The refrain says our houses are too big, we eat too much, have unneeded gadgetry, and drive when walking, biking, or public transportation would do. Rather than facing up to exponential population growth, environmentalists have settled for reduced consumption as the silver bullet for solving ecological woes.

Many environmental organizations see rapacious living as a global sin against nature and have zeroed in on American consumerism as the cause célèbre of broad-scale degradation of ecological subsystems around the earth. Their familiar criticism goes something like this: *We use too much energy and produce more than our fair share of greenhouse gases with gas guzzling SUVs and smoke stack pollution…too much of the planet's precious bio-products end up in our medicine cabinets…suburban McMansions are symbols of our avarice…and tons of toxic garbage and trash are left in landfills hoping for innocuous decay…finite resources are frivolously wasted on adult toys and thing-a-ma-bobs. If only Americans would realize that we owe the planet responsible stewardship by reducing our wants and needs.*

No doubt the U.S. is noted for its excesses, but what exactly does overconsumption mean? Before answering that question, the noun "consumption" needs to be understood. In everyday vernacular, it means the act of using something, or allowing it to decay or to be destroyed. Physiologically, consumption is also the taking in of air, food or medicine. And in economic terms, consumption of materials and natural resources takes place in the production of goods and services. Gathering all of these different aspects of consumption, it should be noted that seven of the eight essential human functions previously mentioned could be construed to fall under the rubric of "consumption." One outlier though, sexual reproduction, doesn't easily fit into the construct. Before exploring *this* critical activity, overconsumption will be addressed, and then we will return to the topic of propagation.

Just what is overconsumption? In a nutshell, it is consuming too much based on some vague standard vested in one's critical mind. Like beauty, it is in the eye of the beholder. For example, your ostentatious McMansion of 6,000 square feet far exceeds the average American's house size, but to you it's puny in comparison to your billionaire friend's five-floor, 25,000-square-foot palace down the street. In other words, overconsumption seems relative and one has to ask, "compared to what?"

In messages from the environmental community, there often seem to be unspoken directives about behavior with a hint of moral condemnation for exceeding some unclear notion of what is considered appropriate. Until such time that societal standards are established as to what is acceptable, limiting overconsumption will remain a function of the market place. For instance, when oil becomes too expensive and high gas prices become unaffordable to most, consumption goes down and prices correct, which is true for almost all commodities. Also, the production and sale of fuel-efficient vehicles mostly occurs when fuel prices are high, and not when environmentalists mount their soapboxes.

Granted, the U.S. is often criticized for its excessive use of natural resources in maintaining an envious living standard. Yet other nations, like China, India, along with other emerging Asian nations, are in hot pursuit of the same things. So what is good for the goose is good for the gander. In short, if a nation or individual can afford to over-consume, it will be too tempting to do so, irrespective of the stress on ecosystems.

So far no amount of jawboning by environmentalists about voluntarily purchasing fewer goods, building smaller houses, or driving more efficient vehicles has had much effect. When a nation is so imbued with an "if-you-can-afford-it-buy-it" mentality, self-restraint slips out the window.

No doubt, reducing consumptive excesses would have salutary benefits. Certainly a few million more people could be shoehorned onto the land, if all lived much more parsimoniously. But is that the answer to living well in America? What about the desire for elbowroom and solitude? Is being packed together from border to border in some vast unending megalopolis what the American people really want? By contrast, polls show that Americans dream of living on a savannah with a big home surrounded by five wide-open acres, and not in crowded suburbs that stretch from one big border city to another.

When domestic consumption is two thirds of the Gross National Product, what happens if it is scaled back as environmentalists suggest? The nation would still have to confront the root cause of ecological degradation: too many people and their offal despoiling the land and living conditions.

It's pretty clear that if our national head count better fit America's ecological carrying capacity, excessive consumption would become less of an issue. In short, too much consumption is not the problem per se, it's too many people overwhelming nature's ability to sustain the way we live. Simply cutting back won't be enough. But for now the environmental community is sold on reduced consumption and this mistaken notion is getting in the way of a more enduring solution.

Obstacle 2: The So-Called "Smart Growth" Solution

"Compacting" is a familiar way of compressing home garbage and trash, and a similar idea has been developed to do the same with the way city dwellers live. Many planners, developers, bureaucrats and environmentalists endorse "Smart Growth" or "New Urbanism" as the ultimate solution to proper land use.

It is a way of increasing urban density with attractively designed inner city multi-residential and high-rise buildings with aesthetic greenbelts and an array of conveniently placed shops and services. Environmental organizations like the Sierra Club endorse the concept, as it theoretically channels development into vacant or abandoned lots, rather than invading open land.

A concomitant objective is to get people out of their automobiles by making public transit readily available and reengineering towns to be more pedestrian and bicycle friendly. Certainly if living by Smart Growth designs became prevalent, oil consumption could be reduced in large measure with less encroachment into valued open spaces.

While on the surface Smart Growth is alluring, it fails to address a key underlying issue. Whether you stack people up in skyscrapers or sprawl them out, the fundamental problem of ecological support still remains. Certainly better land use will marginally lessen the impact of humans on the environment, but not enough to materially offset the

many acres of ecological footprint that tags along with each of us no matter where we live. (Please see What is Ecological Carrying Capacity? for more information). "More people living closer together simply demand more resources from areas in which they do not live."[43]

Redesigning urban living arrangements to make them more livable is laudable, but it doesn't alter the need for vast acres of farmland for food production and waste management, protecting vital freshwater resources, growing massive amounts of timber for construction and fiber uses, obtaining minerals for concrete and/or other building materials, keeping open land for mining or simply providing open space for recreational use. All of which are threatened by incremental growth in the outer ring of metropolitan areas.

To get more elbowroom and/or obtain more affordable housing, Americans have continued to move to the suburbs and the exurbs, even during this economic recovery.[44] Others, however, see the exodus from the cities reversing due to the recession, as a recent article in USA Today suggests.[45] For now, it is probably too early to tell whether a new demographic trend has emerged in one direction or the other. Suffice it to say that when the economy stabilizes a better picture will emerge.

One thing that hasn't stopped, however, is continued population growth. And the challenge of finding a place to put an estimated 2.7 to 3 million newcomers each year will probably continue. As had been the trend, the conversion of open and productive land to residential, commercial, and infrastructure uses seems inevitable with no end in sight. "According to the 2007 NRI (National Resource Inventory) 4,080,300 acres of active agricultural land (crop, pasture, range, and land formerly enrolled in the Conservation Reserve Program) were converted to developed uses between 2002 and 2007. This represents an area roughly the size of Massachusetts."[46]

In the next survey by NRI, which will include the economic recovery years, demographers and agricultural economists can assess whether the consumption of farmland by developers continued, thereby threatening the nation's future ability to produce food.

To conclude, Smart Growth or better land use can indeed mitigate over-crowdedness in the near term, but to tout it as a grand fix to our future growth challenges is to create a false sense of security. Stacking and packing them in will not resolve our 100 million-more-people-problem coming down the pike. Once again, when legislators, urban planners and developers see Smart Growth as a silver bullet, it obscures reality and keeps us from addressing the root causes of our crowded cities, namely uncontrolled mass immigration and a higher than needed birth rate. As long as smart growth offers faux hope, better solutions such as population management will be put off to the detriment of future generations.

Obstacle 3: The Fallacy of Techno-Fixes

Technological innovations promote the fallacy that human ingenuity can and will provide solutions to natural resource limitations, effectively expanding the earth's ecological carrying capacity. In reality, however, technology rarely provides a lasting solution.

In Ecological Carrying Capacity, the I=PAT formula of Drs. Paul and Anne Ehrlich was introduced as a tool to measure the impact of a population on a given environment. A key component was the application of technology to mitigate the adverse impact of both human numbers and consumption, yet recognizing that technology itself may add to depletion of precious resources. From the Ehrlichs' perspective, technology is a double-edged sword that sometimes can help if it doesn't create its own set of problems in doing so. (For such an example, read Fishing Technology—Boom And Bust?).

By contrast, so-called "free marketers" view techno-fixes in a very different light. In the book "Global Warming and Other Eco-Myths", Nicholas Eberstadt makes a strong case that the world's people are healthier and prospering, irrespective of huge and growing numbers of inhabitants. He attributes this to "unprecedented and extraordinary improvements in material living standards over the past century, and over the past few decades in particular…to the shift on a global scale from the reliance on natural resources to the reliance on human resources as fuel for economic growth…to a profound and continuing worldwide augmentation of what some have called human capital and others term *human resources*—the human potential to generate a prosperity based upon knowledge, skills, organization, and other innately human capabilities."[47] In other words, whatever shortfalls in natural resource that may occur, the genius of humankind can substitute for them, making life better.

Fishing Technology—Boom And Bust?

In the last several decades, very large factory trawlers (some 440 feet long) have been built with the capability of not only catching huge quantities of seafood, but also preparing the catch for market and putting it into on-board cold storage for later distribution at dockside. These factory trawlers are designed to set expansive nets to plunge downward and bring in tons of bottom fish or lay out many miles of a single line with hundreds of fish hooks to reel in tons of highly prized blue-fin tuna or sword fish for restaurant tables around the globe.

Helping these ships get properly located, as well as keeping them apprised of ever changing weather conditions, are the latest in satellite navigational aids. Once there, high tech sonar is used to locate the catch. In the battle of wits with humans, even wily fish don't stand much of a chance with this kind of sophisticated tackle.

Initially, these huge seagoing enterprises were the marvel of the oceans for they were hailed as modernity's answer to bringing a seemingly endless supply of much-needed protein to an ever-enlarging human market. What really surprised the fishing industry was that this intensive large-scale fishing in the course of few short years depleted many marine species to the point of near extinction. Due to over-fishing many of these monster trawlers and their crews are now sitting idle with a dark cloud of uncertainty hanging over the future of the world's fishing industry.

So what appeared to be a grand boon, busted when man had no choice but to accept the reality that the oceans have natural resource limitations, heretofore thought to be endlessly abundant.

In the same book, Ronald Bailey further differentiates the philosophical positions of ecologists and those who call themselves "liberal democratic capitalists" (or what this author calls "free marketers").

> …Environmentalist ideologues have been proven wrong because they fail to understand that the economic processes in which humans engage are radically different from the ecological processes that govern other creatures. Human beings not only consume given resources, but also make new resources by using their fertile minds. Economic growth and increases in human well-being are not fueled by simply using up resources the way a herd of zebra would do, but by creating new recipes to use the limited resources available in ever more effective ways. Coal, tin, freshwater, forests, and so forth may all be limited, but the ideas for extending and improving their uses are not.[48]

Below are examples of applying human ingenuity to bolster the output of natural resources, as found in the Audubon Society's "Fast Facts on Conservation":

> U.S. farmers are growing far more food per acre today than they did 40 or even 20 years ago.
>
> We are using less grazing land per capita than we did 40 or even 20 years ago, due to changes in the way we raise beef and dairy cows (i.e., feedlots) plus the mechanization of hay fields.
>
> The U.S. is using less forest per capita than we did 40 or even 20 years ago. Modern lumber mills waste less wood and modern forest managers know a great deal more about both sustainable wild forest management and the rapid growth of pulpwood on tree plantations. As a consequence, the per capita use of forest land in the U.S. has actually declined, not increased, in the last 40 years.
>
> The nation is using less oil per capita than we did 25 years ago…a 25% decline.[49]

While it is very encouraging that the nation has maximized the output of key natural resources, there have been some serious unintended consequences. Certainly better yields from farmers are exemplary, but at what costs? With the heavier use of pesticides and fertilizers, there is downstream pollution, resulting in the poisoning of aquatic life accompanied by the creation of marine dead zones. Increased use of irrigation has resulted in draw-downs of aquifers and reservoirs beyond replenishment rates with legal conflicts over water rights by competing users. As seen with oil, significant reductions in per capita use are negated by ever-escalating population growth accompanied by progressive CO_2 emissions. It seems technology takes us one step forward, only to find ourselves back-stepping in the long run.

Michael G. Hanauer, the Director of Population Connections, sums up the situation nicely with this statement in his article, titled "OverPopulation and OverConsumption: Where Should We Focus?": Frequently, we believe that technology can solve any problem. The inherent fallacy in this approach is that the greatest cause of new problems is the techno-fix solutions to old problems. Even our present population growth was brought on by technology, which prevented or cured disease and allowed large gains in food productivity (often by increased use of fertilizers and pesticides, and cruel treatment of farm animals). *But, the most important implication here is that technology rarely produces lasting solutions, only additional difficult choices and tradeoffs* [emphasis added].[50]

As long as America buys into the idea that science and technology can solve our natural resource problems, humanity will continue to deny that "self-limitation" is necessary in order to survive as a species.

Obstacle 4: Economic Interests

Short-term economic interests determine the nation's direction. Most facets of American life are influenced and controlled by economics. Federal, state, and local governments are in the grip of industrial, commercial, and financial enterprises that influence legislation with their largesse and effective lobbyists. Expect nothing but strong opposition, since curtailing growth is seen as an anathema to the free enterprise system and an assault on sizeable future market opportunities.

In short, if population stabilization has a chance at all of succeeding in the U.S., the advocates must make a convincing economic case to corporate America and businesses of all sizes that future prosperity is dependent upon it.

Obstacle 5: Religious Objections

Some religions will have moral objections to limiting population growth. Among Christians, opposition will most likely come from fundamentalist denominations. Many are against one or all of these reproductive rights: contraception, sterilization, and/or abortion—believing that abstinence is the only morally acceptable method of birth control. From their perspective, dealing with overpopulation means that the government will fund these unacceptable birth control methods with their taxpayer dollars. While it is uncertain as to how pervasive this attitude is among the religious denominations, political opposition to population stabilization can be anticipated from a strong "Right to Life" coalition.

The challenge before various Christian denominations is whether population stabilization will be seen as a fresh opportunity to re-align the moral influence of the church, that is, salvaging and protecting one of God's greatest assets (nature on earth), or whether it will be seen as a threat to an age-old denominational strategy of enhancing power and societal influence by growing congregational size.

Further, can religion move from its preoccupation with saving sinners to saving human presence on earth? For centuries the purpose of life was to gain entry into heaven, and living on earth was merely seen as a moral proving ground. Consequently religions have seen the earth as unnecessary to maintain, in effect making it disposable, for the earth is merely a stepping-stone. Why be bothered with preserving it, when one is going to heaven anyway or maybe even to hell?

With the very survival of the human race dependent on stabilizing and then reducing global numbers, a fundamental question arises: Which is the higher moral value, to protect the Creator's work or adhere to long held beliefs that will ultimately lead to the destruction of humanity on earth?

Many in the church will see the choice quite stark and clear, while others entrenched in dogma and tradition may find acceding to the changing paradigm to be agonizingly reprehensible and may put up vigorous opposition. Nonetheless, it certainly creates a monumental moral dilemma for the churches in America and other religions around the globe.

Obstacle 6: Individual Demographic Sovereignty

Some may see population stabilization as a threat to "Individual Demographic Sovereignty."[51] Nearly every U.S. citizen believes in an innate right to live and work

where desired and to have as many children as wanted. The report of forced abortions and sterilizations in China, in conjunction with a well-defined and executed population strategy, frightens many in the U.S. The words *population control, family planning, birth control*, etc. conjure up draconian methods by government to determine family size and to invade American bedrooms.

For some minorities, anything having to do with population control is just a euphemism for eugenics, genocide and/or some devious scheme by the Euro-American culture to maintain dominance. Needless to say, any population stabilization effort has to be openly discussed, exquisitely sensitive to word choice and very careful to assure that Individual Demographic Sovereignty will be guarded and preserved. In a democracy, totalitarian dictates similar to those employed by the Chinese government simply won't work. To attempt such measures, as history has shown, would be misguided to say the least.

Ironically, as population expands, more laws and regulations are imposed to assure social order and stability, resulting in an insidious encroachment on personal freedoms. What future generations in America have to fear is that overpopulation will become so severe that Individual Demographic Sovereignty will be swept aside in favor of drastic public safety measures to keep order. A smart citizenry will get ahead of the curve and begin to control growth. Yet, there will be confusion about Individual Demographic Sovereignty. Some will fight measures to better manage population size fearing loss of freedom. Others will see it as the only way to assure future individuality and personal rights. Working through these issues will not be easy.

Obstacle 7: Genetic Drive and Cultural Expectations

As a result of evolution, most humans have an inborn drive to pass their genes onto the next generation. This powerful urge is often reinforced by fears of being alone in old age, encouragement from religious institutions to rear many children, the desire to raise children with siblings, or the idealized vision of a large and happy family. Classism or racism can also play a role in motivating people to produce large families. To be sure, the right to unrestricted reproduction is an ideal held dear, which will make the development of a national population policy politically challenging to say the least.

Obstacle 8: Politicians

Most politicians shy away from tackling overpopulation. Since a legislator usually wants to be re-elected, campaign money has to come from large donors, corporate interests, and citizens who have not been put off by his or her voting record and public positions. Since there are so many contentious issues involved, legislative efforts to initiate some form of population management might be perceived to be political suicidal. Of course, when constituents make it safe for politicians to address the too-many-people problem, then legislative ideas will come out of the woodwork.

Also, any effective solutions will require a constancy of effort and consistent legislative oversight over a protracted period with few near-term rewards for the "politicos." Most observers of Congress question its ability to sustain the pursuit of long-term national goals.

Obstacle 9: Funding

Since large-scale government funding is questionable at best, any national population stabilization effort will have to be initiated and financed mostly by the private sector—at least at first. This in itself presents obstacles: the boards of directors of well-capitalized foundations are generally composed of people whose wealth has been acquired by the free enterprise system, and eventually limiting market size won't sit well. Personal religious convictions can play a not-too-subtle role as well, further reinforcing the age-old idea that an abundance of people is a blessing, not a curse. Funding a movement that is seen to curtail market opportunities or limit numbers may be too radical an idea for many to embrace.

This leaves only those foundations and wealthy individuals with the vision to see the value in striving for an optimum population size for the greater long-term good of the nation. Such courageous organizations and individuals are out there, but identifying and engaging them will require extraordinary leadership and resources.

Obstacle 10: Environmentalists and Other Non-Governmental Organizations

Environmental non-governmental organizations (NGOs) in the United States might be expected to enthusiastically support the trimming of population size for sound ecological reasons, but that doesn't seem to be the case. Many environmentalists believe or hope that the adverse biophysical effects of overpopulation can be mitigated by science and technology and/or by motivating individuals to reduce consumption. This is a less risky strategy than publicly advocating population stabilization, which inevitably leads to confronting the volatile and contentious issues previously mentioned. Further, it avoids the possible consequences of offending their membership and outside funding sources, from which essential operating dollars are garnered.

Many well-recognized *population* NGOs have also taken to safer ground. They are focusing on international family planning, gender equality and reproductive rights, and promoting the idea that mass migration can be stopped by promoting social justice around the globe. This strategy presumes that when socio-economic parity among nations is achieved, migration around the globe will cease, giving eventual relief to the United States and Europe. Advocates have no idea how long it will take to achieve neither this world-wide dream nor what will happen in the meantime to the standard of living and quality of life in receiving nations.

While these less risky public postures may avoid political landmines, many dissenters within NGOs are beginning to reshape policies. Hopefully these visionaries are bringing more focus to existing policies as well as energy and resources to U.S. population management. Until this quiet revolution takes place within the ranks, don't look for a concerted push to put overpopulation at the forefront of the American environmental agenda. Going it alone seems to be the only option available and that is precisely what three or four independently functioning population groups are doing, such as Californians for Population Stabilization, Carrying Capacity Network, Negative Population Growth, and Population-Environment Balance to name a few.

These non-governmental entities are boldly advocating reform of immigration, by polling and educating the public on needed changes to socio-economic policies that mindlessly promote growth. While limited funding tends to constrain their impact, there have been recent successes in turning back ill-advised amnesty efforts, which would

have only encouraged more illegal entry into the country. Clearly these determined NGOs are slowly garnering America's attention and support. But they are doing it without much recognition from the media.

Obstacle 11: The Media

Television, radio, major newspapers, blogs and social networking could be enormously helpful in framing the growing population issues for America with objective, journalistic reporting. Yet, these media outlets shy away from the topic. Certainly there has been widespread coverage of illegal immigration, past events like Earth Day, or when startling global population statistics are released. But noticeably absent is the much needed focus on America's burgeoning numbers and what they mean to our near term infrastructure needs, lifestyles or to our children's futures.

As census numbers climb, there is little attention or penetrating analysis on the ramifications to such things as urban traffic congestion, sprawl, ever-expanding educational needs, food productions, availability of key resources, plus other everyday issues related to the U.S. growth mania. The media simply fails to tie our serious infrastructure problems to explosive population growth occurring in every corner of the U.S.

Why there is so little interest in this mounting crisis that affects everyday life in America must be left to speculation. Many believe that the same corporate complex that covets growth, calls the shots in Congress and also controls newspapers, radio and television, thereby easily thwarting journalistic investigation. For now it appears that any well-organized population movement will have to rely on paid internet, air time, and print space to reach the heart and minds of the people.

Obstacle 12: Ignorance

Most citizens do not link population growth to increased societal costs nor are they much interested in seeing this inexorable connection. For instance, when asked whether there are too many cars or too many people, the answer is more often than not, "too many cars…more public transit is the solution." Sprawl, with its incessant march of new housing, strip malls, parking lots, streets and sewers into nearby farmland and open spaces is seen as progress, and not for what it really is – a release of urban population pressures with more infrastructure costs and taxes in the making. Even in this era of governmental budget slashing, no real debate takes place on whether unfettered growth is really the answer to our economic woes, particularly much needed stable employment.

There are countless other examples in health care, education, air transportation, and energy where Americans and government are creatively adapting to the "symptoms of the disease" but eschewing the root causes. The question that plagues us all is, "do we not see the connection or do we not *want* to see it?"

Obstacle 13: Political Correctness

Political correctness exists in every obstacle mentioned, causing continuing suppression of public discussion. If brave enough to take a position counter to mainstream thinking, inevitable and sometimes harsh criticism follows. Here are some examples. Those calling for real immigration reform are often labeled xenophobic, racist or both for they want to see significant reductions in the number of foreign newcomers.

Some church groups see supporting birth control, especially for young adults, as immoral and promoting promiscuity, although they acknowledge that teen pregnancies cripple educational and economic opportunities for young people. At the extreme, anyone advocating population control is seen as a nihilist wanting to be a sex cop.

Needless to say, in America today there are politically acceptable positions on most subjects, including various aspects of the population conundrum. For example, it's politically correct in some camps to support a woman's right to birth control, while it is not politically correct to support governmentally funded abortions. If any progress is to be made, it is going to require breakaway thinking on the part of the citizenry. While speaking out on the too-many-people-problem may be politically acceptable, zeroing in on the solutions touches many sensitive nerves. Anyone taking a leadership position in this mammoth effort has to be tough-minded, thick-skinned and willing to take some serious heat.

Obstacle 14: Near Term Distractions Keep the U.S. From Looking Ahead

When the nation's leadership is bombarded by unpredictable events, priority is put on extinguishing the fires, not on fire prevention. Over the last decade, the War on Terror, the Iraqi and Afghanistan wars, the Israeli-Palestine conflict, the Arab Spring, nuclear proliferation struggles with Iran and North Korea, huge mid-western floods, hurricanes hitting the Southeast and Eastern Coasts, the BP oil spill and the uncertain restoration of the Gulf Coast, plus scattered international conflicts have seized attention and resources. What to do about the nation's burgeoning head count gets scant notice, but it should, for in the long-term running up the head count makes solving these challenges much more difficult.

The soon-to-be-ended trillion dollar wars in Iraq and Afghanistan, coupled with a jacked-up, artificial economy based on too much credit, have laid waste to America's financial strength and standing in the world. State and municipal budgets are plagued by underfunding from a shrinking tax base, with underemployment and stagnant wages sapping the vitality of a consumer driven economy. With all this adversity, the political leadership is consumed with trying to restart a faltering country and blindly ignores the obvious. Had we better controlled mass migration, the oversized labor pool built up over the last two decades wouldn't exist. Yet, the government continues to accept over a million new legal immigrants each year, with a reckless disregard for what this practice is doing to the employment of American workers.

This nation has to get a grip on its size and change priorities while putting sound demographic policy at the top of the agenda. But will it be able to do so, while the inane conservative-liberal tug of war prevails?

Obstacle 15: Warring Constituencies

Without a widely recognized and agreed upon problem definition, divergent forces will continue to frustrate any resolution of the nation's population concerns. These forces are: 1) the "pro-choice, anti-immigration control" constituency and 2) the "pro-immigration control, pro-life constituency. While confusing and nuanced, anecdotal information seems to confirm this set of contradictory attitudes.

More often than not, if one is for reproductive choice, then he or she tends to be supportive of bestowing rights on illegal immigrants and applying a light hand in enforcing immigration laws. On the other hand, if one favors strict controls on

immigration, one is generally "pro-life" and opposed to government sponsored family planning programs, while striking down or severely restricting abortion rights.

Ironically, the groups championing family planning have helped to reduce the birth rate, yet their efforts are unwittingly making room for more migrants. On the other hand, the conservative pro-life contingent wants to minimize illegal entry, but favors robust propagation irrespective of the socio-economic consequences. If the two forces could get together on a national family planning initiative, thereby preventing unintended births and abortions, while teaming up to moderate and control immigration, the U.S. would be able to better manage population size and make life better for all American families. But so far, these impassioned opponents are unable to find common cause. Whether they would ever do so for the good of the nation seems unlikely.

Obstacle 16: Paralysis of Scale

When a challenge is too big, overly complex and dangerously controversial, a *paralysis of scale* sets in. As the nation has grown over the last 40 years, has it become too big to manage? The failed regulatory control of banking and credit systems, the BP environmental disaster, the poorly planned and executed Iraq and Afghanistan occupations, and growing liabilities such as the national debt, Social Security, Medicare, mass immigration, a failed national drug policy etc., suggest political gridlock and a pernicious federal ineptitude that has grown worse as the nation has gotten bigger.

People complain about the size of government, yet small government is impossible when the nation's head count mounts every decade by 27 to 30 million people. As the census has tripled over the last century, what has happen to government? It is the nature of people to want more services and they expect their legislators to provide them. When America better manages it population size, governmental size will fall in line.

To fix America will require some very unpopular decisions affecting huge numbers with straightforwardness on the part of our leaders. Thus far, no President or Congress has shown the political courage, integrity and personal strength to do so. It is hopeless, so why bother? Well, bother we must, as there is no other option and nowhere else for us to go.

VII. Forfeiting Elbowroom for the Common Good

Aside from living within our ecological means, where should the line be drawn on personal freedoms? What about elbowroom, solitude and our sense of individualism? The more people pack together, the more personal freedoms are compromised for the common good and collective security.

The range of sacrifice may include crowded public spaces, longer lines, traffic congestion, urban noise, heightened security measures, more violence, less personal privacy, and more regulations and restrictions to cope with growing scarcities. For example, Southern California, particularly southern Orange County and the San Diego area has experienced extraordinary population growth since World War II. This beautiful area, once with vast arid stretches of landscape, has been in-filled with millions of people and houses accompanied by the formation of several sizeable cities. Unfortunately, the water supply has not kept up with demand and much of the water comes from an ever declining source – the Colorado River, where growing numbers of

up-stream users with water rights have siphoned off their share first. To say the least, water management is critical to the whole southwest United States.

The lead to the San Diego Union Tribune's editorial on November 12, 2012 read "That Dog May Cost You $100,000/Day." It seems the regional quality control board was promulgating new regulations that "Under the draft rules, ordinary homeowners may face six years in prison and fines of $100,000 a day if they are deemed serial offenders of such new crimes as allowing sprinklers to hit the pavement, washing a car in the driveway, or, conceivably, failing to pick up dog poop promptly from their own backyards, let alone the sidewalk."

The article goes on to say that firefighters would be forced to capture and scrub the water running down the streets from fire hoses used when extinguishing burning buildings. Needless to say, these severe measures are being protested and the outcome is uncertain. But the story strikes at the heart of the issue. Rather than anticipating the inevitable water shortages years ago and limiting habitation in these arid lands, the local government supported unrestricted development. Now there is only one option left – to hopefully regulate a way out of this mess.

While seemingly extreme, this example may become the "new normal" in time. As scarce resources are depleted in heavily populated areas, regional agencies and municipalities will have to promulgate more rules in an attempt to slow down growing demand. This means that personal freedoms in almost all facets of our lives will be trampled upon in the name of serving the greater public good.

On a broader scale, because the people hold the federal government responsible for national security in this era of terrorism, personal privacy will be compromised in the name of protecting the masses from extremists and other deranged individuals. Emails, private telephone conversations, as well as office and outdoor conversations are subject to "bugging" in order to stop espionage, suicide attacks, bombings, and other mayhem. Certainly there are legal protections to guard against unlawful invasions of privacy, but they seem to insidiously erode as terrorism reigns.

While many enjoy close contact with strangers, others are leery of rubbing elbows with the crowd, as daily competition increases for space, transportation and jobs. For the most part, city dwellers are quite willing to forfeit some rights to an urban authority out of the practical necessity of around-the-clock personal and public security. As cities expand into rural communities or as townships grow into smaller cities, invariably citizens sacrifice some degree of freedom and space in the name of order and safety. The question remains for us all…how much are we willing to give up to future population growth?

VIII. Summary

It's pretty clear that the United States is getting literally too big for its britches—that is to say, nature's ability to support us. Already, an estimated 315 million people are swamping the ecological carrying capacity of our landmass, with another 100 million or more expected by mid-century. As a result, the United States is facing a monumental resource challenge. The Population Primer lays out many important issues confronting the nation, but argues that managing our population size is the necessary first step and integral to America's future well-being.

No longer can vast open spaces be filled with development, as they are needed to feed and water the millions crowded into widely spread cities. As the nation searches for energy solutions, more water sources, and greater agricultural production in an era of uncertain climate changes, heavy reliance is being put on technology to bail us out. But techno-fixes by themselves will be insufficient to tackle the task before us.

There is little doubt that the American economy has failed in the last few painful years, but the reality is that it started faltering in the 1970s. (There are many reasons for this (see Demographic Economics). The need for a reconstituted economy plus a huge national infrastructure repair will demand wholesale changes in the way the nation thinks about population growth. As it stands, there are three interdependent options for future U.S. sustainability:

A. Do nothing and hope other nations in this unstable geo-political world will continue to sell us much needed natural resources through international trade, while continuing to lend us the money to pay for them.

B. Drastically reduce the domestic demand for natural resources by curtailing consumption and reducing the American standard of living, hopefully stretching available resources enough to accommodate the 100 million new residents expected by mid-century.

C. Gradually stabilize population growth with the goal of eventually right-sizing the nation to better fit available domestic natural resources and re-establishing self-sufficiency, while lessening the demand for unpredictable foreign-based resources.

All of the options above will require personal sacrifice to one degree or another. The question is which one will most likely get us out of the mess we are in? Obviously Elbowroom.org recommends option C, as it offers the best hope of turning the nation around in the long run. The other two alternatives will have to be in play for some time as well, until option C takes hold enough to eliminate them. However, to simply opt for A or B without C will simply mark time and kick the can down the road, leaving the heavy lifting to an up-coming generation.

One thing to keep in mind as you decide: the choice rests ultimately with us the people, the citizens of the United States, not our political leaders. Once we make it safe for them, they'll act, but not until we make it clear that it's *game over for mindless growth* and that we want a sustainable America for our children. Then, they'll come along, but not until then.

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