

GLOBAL DEMOGRAPHIC CHALLENGES: CASE STUDY WOMEN

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Research Proposal

Half of the world lives on less than \$2 a day. Everywhere men, women and children live in extreme poverty and suffer. Anthropogenic climate change has intensified famines, droughts, floods, hurricanes and other natural disasters. Modern civilization has altered nature and nature has responded to these alterations. Every year approximately 80 million people are added to the planet, increasing pressure on the land. These added numbers of people require increased food and land resources and produce more pollution. While populations grow, arable lands with high yields do not. It is essential to reduce global consumption of all commodities and reduce pollution. However, if efforts are not made to curtail population growth, a reduction in consumption and pollution will only go so far. Luckily, change is possible and concrete efforts can be made to grow at a sustainable rate and even lower overall populations.

The poorest countries on earth are also those with the highest fertility rates. The majority of people living in extreme poverty have not had basic family planning. Women are underprivileged and often don't understand their own reproductive health. The goal of this paper is to explore the role of women in governing a healthy demography by focusing on the power of education. This paper will discuss the demographic transition in order to explain the stark differences in total fertility rates worldwide. Then it will concentrate on the role of women in developing societies and examine the influence of education on lowering the total fertility rate. This issue will be tackled through peer-reviewed articles, case studies, and excerpts from textbooks. I hope to show that although there are billions of suffering humans, we can collectively improve the human condition and lower human impact on the earth.

Annotated Bibliography

1. Lehr, Carol Scotese. "[Evidence on the Demographic Transition.](#)" [Review of Economics and Statistics.](#) 91.4 (Nov 2009): 871(17). [Expanded Academic ASAP.](#) Gale. California Polytechnic State University. 16 Apr. 2010
<http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A211357170&source=gale&userGroupName=calpolyw_csu&version=1.0>.

This peer-reviewed article explains the demographic transition in great detail. It states that levels of fertility increase and decrease depending on the productivity of the economy within each society. In order to better understand the role of women and their levels of fertility, I must understand the demographic transition. This article gives a cross-cultural perspective on fertility rates. It also shows that depending on productivity, there are varying degrees of educational investment. This is crucial for the advancement of women.

2. Bocquet-Appel, Jean-Pierre. "[The Demographic Impact of the Agricultural System in Human History.](#)" [Current Anthropology.](#) 50.5 (Oct 2009): 657(4). [Expanded Academic ASAP.](#) Gale. California Polytechnic State University. 16 Apr. 2010
<http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A211597290&source=gale&userGroupName=calpolyw_csu&version=1.0>.

This document also takes an in-depth look at the demographic transition. It focuses on the earlier stages when countries make a shift from an agrarian society to an industrial society. Fertility rates greatly change when societies experience this shift. Women's roles are affected when the division of labor undergoes variations and women can more actively participate in the market economy. This article allows me to analyze countries in different stages of the demographic transition and how a shift can help empower women.

3. Bailey, Amy Kate. "[How Personal is the Political?: Demographic Revolution and Fertility Decline.](#)" [Journal of Family History.](#) 34.4 (Oct 2009): 407-425. [Expanded Academic ASAP.](#) Gale. California Polytechnic State University. 16 Apr. 2010
<http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A210146792&source=gale&userGroupName=calpolyw_csu&version=1.0>

This article focuses on the demographic transition but narrows in on the influence of democratic revolutions. It states that after democratic revolutions, not institutionalized democratic practices, the fertility rate declines. The research is taken from European countries. Couples realize their own control over reproductive behaviors and are less inclined to believe political ideologies. This will support my goal of demonstrating the importance of freedom in lowering the total fertility rate.

4. Ryabov, Igor. "[Late-Twentieth-Century Fertility Decline in Moldova: Interplay of Female Autonomy, Wealth, and Education.](#)" [Journal of Family History.](#) 35.2 (April 2010): 164-179. [Expanded Academic ASAP.](#) Gale. California Polytechnic State University. 10 May 2010

http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A223180226&source=gale&userGroupName=calpolyw_csu&version=1.0.

With continued emphasis on the demographic transition, this article represents a case study of Moldova. At one point, Moldova had one of the highest total fertility rates in Europe. Now it has a replacement level of fertility. Ryabov focuses on the importance of female-decision making autonomy, educational attainment and wealth, in order to assess the fertility patterns. This article provides empirical research supporting the ideas that with an increase in education and personal freedom, women will have lower fertility rates. One of the goals of my paper is to show that education and liberation will decrease the fertility rates and in turn lower pressure on the land.

5. Van Bavel, Jan. "[Subreplacement Fertility in the West Before the Baby Boom: Past and Current Perspectives.](http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A222558037&source=gale&userGroupName=calpolyw_csu&version=1.0)" [Population Studies.](http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A222558037&source=gale&userGroupName=calpolyw_csu&version=1.0) 64.1 (March 2010): 1(18). [Expanded Academic ASAP.](http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A222558037&source=gale&userGroupName=calpolyw_csu&version=1.0) Gale. California Polytechnic State University. 16 Apr. 2010
http://find.galegroup.com/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A222558037&source=gale&userGroupName=calpolyw_csu&version=1.0.

This article focuses on the demographic transition within westernized countries. At the time of the drop in fertility between World War I and II, many scholars explained it based on economic crisis and rare war conditions. However, demographers now explain it based on stage 2 of the demographic transition. This article shows that the demographic transition occurs cross culturally and follows a set of conditions. One attribute for explaining this change is the emancipation of women. This is once again a strong factor in lowering the total fertility rate.

6. Adserà, Alicia. "Changing Fertility Rates in Developed Countries. The Impact of Labor Market Institutions." *Journal of Population Economics*, Vol. 17, No. 1 (Feb., 2004), pp. 17-43. Springer. <http://www.jstor.org/stable/20007893>

Here, female participation is emphasized and used to show that female choice has a huge impact on the total fertility rate. With a market economy, women are allowed to work and become competitors with men. Adsera discusses that women choose to delay or abstain from childbirth. As women are empowered their changing role in society greatly affects the fertility rate.

7. Masahiro Umezaki, Yukio Kuchikura, Taro Yamauchi, Ryutaro Ohtsuka. "[Impact of Population Pressure on Food Production: An Analysis of Land Use Change and Subsistence Pattern in the Tari Basin in Papua New Guinea Highlands.](http://www.jstor.org/stable/4603358)" *Human Ecology*, Vol. 28, No. 3 (Sep., 2000), pp. 359-381. Springer. <http://www.jstor.org/stable/4603358>

These authors analyze the current societal changes in Papua New Guinea. Two different groups are dealing with the changing climate and overpopulation. Lands are not allowed to fallow for a long enough period and disputes have arisen over resources. This article demonstrates the difficulties in dealing with food shortages and pressure on the land. The study done here will emphasize the importance of curtailing population growth for both the people and the environment.

8. Shen, Jianfa. "China's Future Population and Development Challenges." *The Geographical Journal*, Vol. 164, No. 1 (Mar., 1998), pp. 32-40. Blackwell Publishing on behalf of The Royal Geographical Society (with the Institute of British Geographers). <http://www.jstor.org/stable/3060543>

Shen writes about the problems that developing China is facing as it rapidly grows. China provides a unique example of a country that made a conscious effort to reduce its population. However, China's efforts had severe latent effects. Cultural values and a flawed family planning policy have led China to an unequal sex ratio. This article displays that policies must be carefully planned and reviewed before implementation. It also shows that reducing the total fertility rate drastically changes the economy and society.

9. Giordano, Mark. "International Resource Conflict and Mitigation." *Journal of Peace Research*, Vol. 42, No. 1 (Jan., 2005), pp. 47-65. Sage Publications, Ltd. <http://www.jstor.org/stable/30042242>

Resource wars are becoming more frequent throughout the world. Studying the laws of supply and demand is not enough to explain these current and potential conflicts. Giordano illustrates that countries experiencing great economic change, instability, and lacking institutions to properly deal with disputes will be the ones to suffer the most. These countries described are developing countries where the total fertility rate is still extremely high. This article provides an account of the dangers that occur when population growth is not stable and resources are scarce.

10. Duze, Mustapha, Mohammed, Ismaila. "[Male Knowledge, Attitudes, and Family Planning Practices in Northern Nigeria / Connaissance, attitude et pratiques de la planification familiale chez les hommes au Nigéria du nord.](#)" *African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive*, Vol. 10, No. 3 (Dec., 2006), pp. 53-65. Women's Health and Action Research Centre (WHARC). <http://www.jstor.org/stable/30032471>

In designing a family planning program it is essential to cater it to each culture. This article explores the need for men to receive sexual education as well as females. A lesson as simple as how to properly use contraceptives makes a notable difference. Although my paper stresses the importance of female education and freedom, men also need to be educated and involved in reducing population growth.

Global Demographic Challenges: Case Study Women

I. Introduction

- a. Explain current population trends
- b. Discuss statistics of those in extreme poverty
- c. Brief explanation of population growth

Thesis: Although there are billions of suffering humans, we can collectively improve the human condition and reduce impact on the earth.

II. Demographic and Nutritional Context

- a. Discuss the basic needs for a human to survive
- b. Explain issues that are inherent with uncontrolled growth

III. Green Revolution and Fertilizers

- a. Explore consequences and causes of increased pressure on agricultural land
- b. Discuss implementation of synthetic fertilizers

IV. Challenges of Climate Change

- a. Discuss the increase in resource wars
- b. Review the role of climate change in dramatizing problems
 - i. Longer floods and droughts
 - ii. Water scarcity
 - iii. Hotter growing seasons

V. Demographic Transition

- a. Explain the demographic transition
- b. Provide examples of each stage

VI. Role of Women

- a. Focus on the power women have in different countries
- b. Look at case studies where women have more economic freedom
- c. Discuss the power of educational measures in improving the situation

VII. Conclusion

- a. Review the trends and problems
- b. Remind that there are concrete efforts that can change this situation; there is hope

I. Introduction

Half of the world lives on less than \$2 a day. “There are roughly 820 million people around the globe who are currently undernourished (Mann, Pg. 131).” Everywhere men, women and children live in extreme poverty and suffer. Yet every year approximately 80 million people are added to the planet, increasing pressure on the land. There are more people, less water and even less food. These added people require increased food and land resources and produce more pollution. Furthermore, most are born into countries with unstable infrastructures, poor healthcare, and almost nonexistent social welfare programs. While these populations continue to boom, arable lands with high yields do not. In order to adequately support added populations, it is essential to reduce global consumption of all commodities and reduce pollution.

The past several years have shown that the demand for food is much higher than the supply. “Between 2005 and the summer of 2008, the price of wheat and corn tripled, and the price of rice climbed fivefold, spurring food riots in nearly two dozen countries and pushing 75 million more people into poverty (Bourne, Pg. 38).” The crisis of uncontrolled population growth must be addressed, for it is too grave to ignore.

Anthropogenic climate change has intensified famines, droughts, floods, hurricanes, wetland destruction, and other disasters. Modern civilization has altered nature and nature has responded to these alterations. “Stresses such as these could, in turn, lead to increased competition for natural resources, overtaxed social services and infrastructures and conflict between regions and nations (Mann, Pg. 108).” The expected changes in climate will bring about greater water scarcity and hotter, often detrimental, growing seasons. The poor will continue to be hungry. If efforts are not made to curtail population growth, a reduction in consumption and

pollution will only go so far. Luckily, change is possible and concrete efforts can be made to grow at a sustainable rate and even lower overall populations.

The poorest countries on earth are also those with the highest fertility rates. The majority of people living in extreme poverty have not had basic family planning. Women are underprivileged and often don't understand their own reproductive health. The goal of this paper is to explore the role that women play in governing a healthy demography by focusing on the power of education. This paper will discuss the demographic transition in order to explain the stark differences in total fertility rates worldwide. This issue will be tackled through peer-reviewed articles, case studies, and excerpts from textbooks. With this research paper I hope to show that although there are billions of suffering humans, we can collectively improve the human condition and lower human impact on the earth.

II. Demographic and Nutritional Context

The notion of controlled population growth makes some individuals cringe. However the intentions behind slowing population growth will benefit everyone living on this planet. “The goal is not reducing, increasing, or stabilizing the numbers of people. It is to help make more possible a richer, fuller life – jobs; homes; resources; freedom from hunger, disease, ignorance; time for development of innate capacities – in short, enriching the quality of life for an increasing proportion of the world's people (USAID, 1965).” Dr. Leona Baumgartner, head of the U.S. Agency for International Development, stated my sentiments perfectly. James Wood, author of “A Theory of Preindustrial Population Dynamics, asks “...what is the relationship between population size or growth and the health and well-being of the individuals making up the population (Wood, Pg. 99)?” Populations that grow at unprecedented rates are not growing

sustainably. It was once thought that populations grew at rates that, "...would preserve local resources and provide everyone with the highest possible standard of living (Wood, Pg. 101)." Thomas Malthus and over 2 billion people on this planet would disagree with the idea of populations growing sustainably. "...Population pressure has led to a net deterioration in health for the great bulk of humanity (Wood, Pg. 101)." Regardless of cultural, political, and social differences, human beings have basic needs to ensure survival. One of the most basic necessities is food.

"An organism can allocate the food it consumes in four ways: it can put it into maintenance, that is, it can support basic metabolic processes while maintaining tissue integrity against trauma or infection; it can put it into somatic growth or the construction of new tissue; it can put it into reproduction; or it can simply lose it through excretion, including heat loss, the unavoidable energetic costs of digestion, and the elimination of indigestible materials and toxic by-products of metabolism." (Wood, Pg. 104)

These four functions of the body are in constant competition for food resources. The individual is always looking for ways to maximize food intake and minimize energy expenditures. Not only does an individual compete with oneself for subsistence, an individual has the whole human race to struggle with and against to meet its own body's needs. This inherent struggle for resources presents great implications for population growth. "The ability to support adequate maintenance is directly related to an individual's current risk of death (Wood, Pg. 104)." According to Thomas Malthus, per capita supply of food decreases as the number of inhabitants increases. If a whole society is growing at an alarming rate, not every individual is guaranteed food to meet its body's fundamental requirements. "Food limitation does indeed cause mortality rates to increase,

especially in young children, among whom the competition between maintenance and growth is at its fiercest (Wood, Pg. 104).”

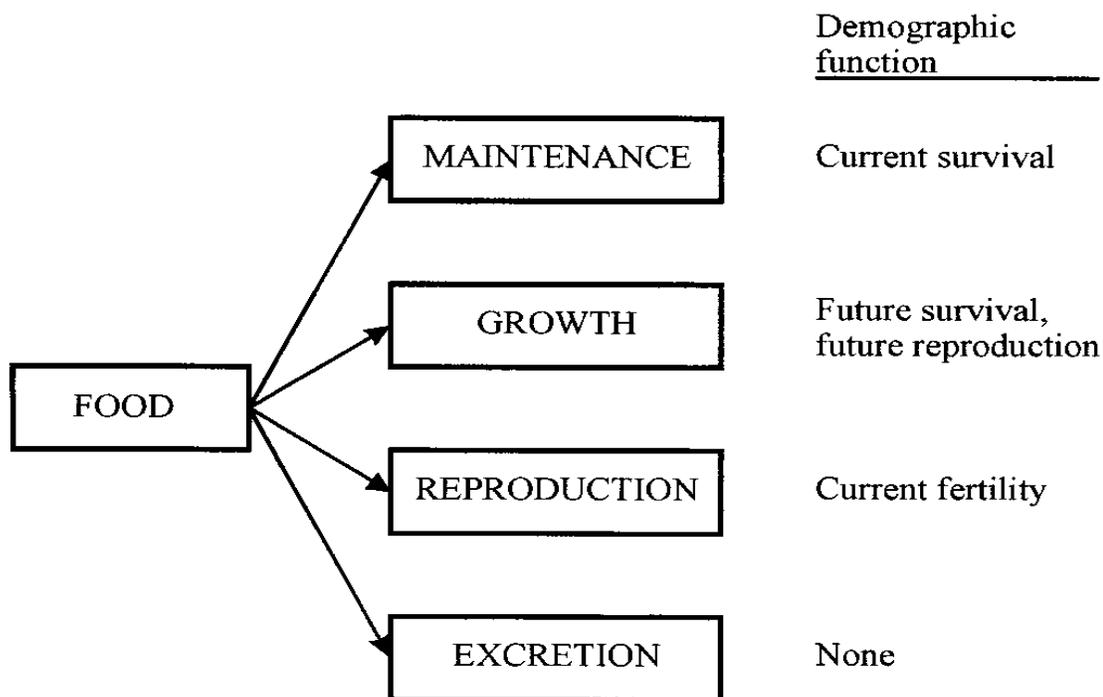


Fig. 2. *The allocation problem in physiological ecology. (Wood, Pg. 103)*

II. Green Revolution and Fertilizers

As stated previously, approximately 80 million people are added to the planet annually. Everyday there are more mouths to feed and resources are being aggressively consumed. There are hopes and delusions that somehow technology will solve food scarcity problems. However, half the world is already starving and uncontrolled rates of growth will not aid this dire situation. “As a general rule, gains in productivity resulting from increasing inputs into an otherwise fixed system of production are not linear but decline as the level of input increases (Wood, Pg. 105).”

“In recent decades there has been impressive growth in food production, which has been attributed to the development of improved, disease-resistant varieties of staple

crops; the increased use of chemical fertilizers and pesticides; and the expansion of irrigated cropland. Nevertheless, per caput food production actually declined in 51 developing countries while rising in only 43 between 1979-1981 and 1986-1987. Among the African countries, 25 experienced a drop in per caput cereal production. In Latin America, production was also disappointing: 17 countries suffered a decline (UNFPA, 1990). In Asia, food production has managed to keep slightly ahead of population growth largely because of new breeds of Asian rice and the use of tremendous amounts of agricultural chemicals. However, in some areas losses from poor land management have erased the benefits which had been gained (Repetto *et al.*, 1989). Consequently, developing countries' food imports are rising dramatically to compensate for local deficits.” (FAO)

With modern technology, food production has dramatically increased and many agricultural lands in the developed world are cultivated using more efficient methods than ever.

Unfortunately, many people don't realize that food production has a diminishing rate of return and that the world cannot support an infinite amount of people.

There is often not enough arable land to support growing populations.

“While the absolute availability of land may not, by itself, predict economic outcomes, it is true that human populations continue to grow from unprecedented levels, presenting major challenges for food supplies. In the last quarter-century, humankind has added more people to the planet than existed in 1900. With the growth in human population has come a decrease in land available for agricultural expansion, both because most suitable lands have already been appropriated and because cities, roads, and other structures increasingly cover the landscape.” (Giordano, Pg. 49)

Due to growing populations, large areas of farmed land no longer enjoy healthy fallow periods. It is essential to allow the land to fallow and to rotate crops because this maintains the integrity and diversity of the soil. In rural Guatemala and throughout the world, the greater population rates, sporadic droughts and famine, and encouragement from fertilizer corporations, all lead to the application of synthetic fertilizers. Synthetic fertilizers are the most common type of fertilizers; they are typically inexpensive and easy to use. But these fertilizers do more than just aid in the increased growth of the plant; the excess nutrients create soil degradation and runoff of top soil. Even more, the fertilizer only helps the plant, not the soil, which leads to a lack of organic matter in the soil. The synthetic fertilizers often contain dangerous amounts of mercury, lead, arsenic, and other toxic metals. Vegetables and fruits are indirectly poisoned and then consumed. The fertilizers represent a diminishing rate of return. In the beginning, farmers produce much more food using the synthetic fertilizers. But, as soil weakens and the plants grow accustomed to the fertilizers, the rate of return drops significantly. Rural Mayan farmers originally enjoyed the dramatic increase in production but the output eventually decreased significantly. For a portion of time these farmers were more independent from the labor market but eventually came to depend on the synthetic fertilizers and in turn depend on governments and corporations supplying the fertilizer.

This is not a rare occurrence. Farmers that begin using fertilizers for the increase in productivity and use it unsustainably often find themselves in trouble. The indigenous people found themselves in a tough predicament; Wuqu' Iq', a sixty-nine-year-old Mayan farmer shared her thoughts. "You need poison to keep your farm going. There is no harvest if you do not apply poison, but there is also much disease in this poison (Carey, Pg. 283)." Both farmers and plants grow accustomed to synthetic fertilizers and their effects. Plants only need a small amount of

fertilizer during the first few harvests but over time each input needs to be greater. This is expensive and harmful for plants, land, and farmers. Making a return to organic farming proves to be challenging. One Mayan Kaqchikel man said, “The land lost strength because it was not allowed to rest, the synthetic fertilizer is just like a cup of coffee for breakfast, it wakes you up but it does not nourish you (Carey, Pg. 303).” Not only do synthetic fertilizers erode agricultural land, they are toxic to human health.

It is important to address the benefits of synthetic fertilizers. Fertilizers are not evil and can help increase yields and make land more productive. Fertilizers also made land that was typically too difficult to cultivate, valuable and productive. However, if not used in moderation and knowledgeably, the fertilizers will destroy the root of one’s existence, the land. International and regional actors need to realize that their efforts to weave synthetic fertilizers into Guatemalan farms and developing farms throughout the world, lead to poisonous fertilizers being stitched into the lives of human beings. Much more than crops are changed by synthetic fertilizers.

Inhabitants in developing countries are interested in the implementation of synthetic fertilizers because they must deal with the issue of population growth. Weakened soils and poisoned land and water affects local and international climate. By lowering populations and making conscious decisions about family planning, it is possible to survive off local subsistence farming. Indeed, it is possible to live healthier.

III. Challenges of Climate Change

While examining the intensity of climate change it becomes clear that “humans have become a force of nature, triggering changes in immense ecosystems—changes which could rebound, threatening our own livelihoods, and the lives of future generations (Dow, Pg. 8).” The Industrial Revolution brought about great changes to humanity and modern society. Personal and public transportation, factories and booming economies, all consume and produce mass amounts of energy. Carbon dioxide, the most notorious greenhouse gas, is released into the atmosphere through energy production and transportation. Carbon dioxide levels are higher now than they have been in the last 650,000 years (Dow, Pg. 9).” Citizens of developed countries and the wealthy throughout the world enjoy a high standard of living, consuming cheap energy and natural resources at unsustainable rates. These rates of consumption come at a price.

Farmers feel the need to use fertilizers and other methods to increase production not only because of human growth but to cope with climate change. Climate change affects growing patterns and which crops can be successfully cultivated in a given region. Higher temperatures can stress plants and prolong growing seasons. Longer growing seasons are beneficial if the right crops are being harvested; farmers must be especially observant and specific in what they decide to grow. “Higher concentrations of carbon dioxide speed growth and increase resilience to water stress (Dow, Pg. 58).” This initially seems to be a benefit but “...pests and diseases may also increase in response to the more benign climatic conditions (Dow, Pg. 58).” However, not all regions will be negatively affected by temperature fluctuations. Crop calendars are adaptable and planning according to a projected temperature will allow agriculturists to persevere through weather extremes. “Agriculture in temperate climates may actually benefit from longer growing seasons and warmer temperatures (Dow, Pg. 58).” While some regions benefit, others are

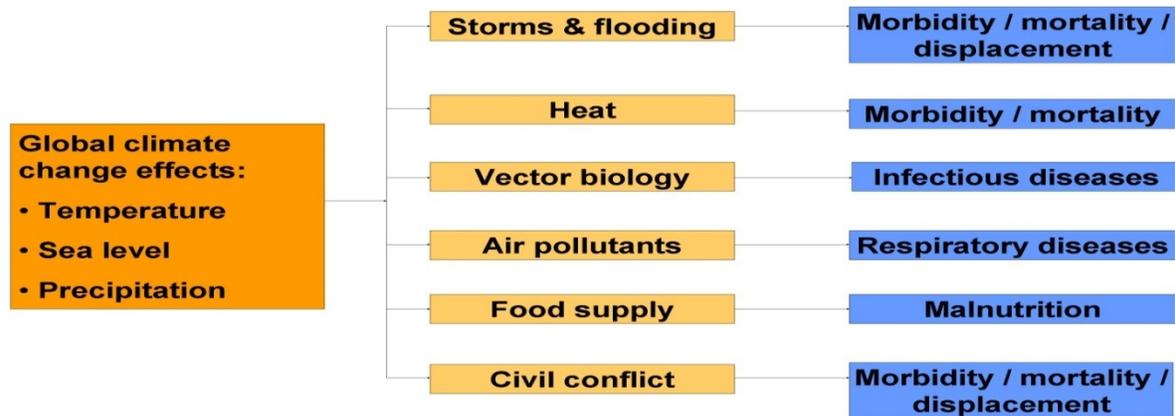
harmed. Tropical and sub-tropical regions are likely to experience reductions in rainfall and an “...increasing risk of drought, or of more intense rainfall and soil erosion (Dow, Pg. 58).” Agricultural production will notably decline. Food security in these regions is already stressed; the poor are likely to suffer greater malnutrition.

Local and foreign ecologies are affected at differing levels by anthropogenic changes in climate.

“Across large parts of Africa and Asia, the timing and the abundance of rains determines whether crops will support households, or whether hungry people will need to search for alternative sources of food and income. Sometimes, these dry periods last for years. The poor – among them the elderly and the sick – are most severely affected, and many thousands die. Where other disasters, such as HIV/AIDS, already afflict households, diminished resources create greater hardships.” (Dow, Pg.10)

Climate will naturally change, regardless of human behaviors and actions. But researchers worldwide are aware of the man-made impacts of climate change. Many environments are under constant pressure, agricultural land is stressed to produce increased amounts of food and nutrients. Pollution and land-use change add to the stressors that the natural environment already faces.

Potential Impacts of Global Climate Change on Human Health



(Tennessee Department of Health)

The developments of modern consumer societies have grave repercussions. Signs of wealth and freedom, such as the personal automobile, are revealing themselves to be agents of pollution and environmental destruction. “On a per capita basis, both historically and currently, wealthy industrialized nations benefit from activities that release a disproportionate level of greenhouse gas emissions (Dow, Pg. 10).” The wealthy enjoy cheap luxuries while the poor, on average, deal with the consequences. “Of those living on less than a dollar a day, few have electricity, cars, refrigerators, or water heaters. But, because their lives are tied to climate conditions and they have few resources to buffer against bad or progressively difficult conditions, they are likely to bear the highest human costs (Dow, Pg. 11).” The poor throughout the world survive on agricultural practices such as farming, fishing, and animal domestication. With anticipated temperature rise of up to 2 degrees Celsius, these people are likely to struggle with annual coastal flooding. In addition to “changing precipitation patterns, either wetter or drier, along with altered temperature, will affect crop productivity, availability of food and water

for livestock, as well as feeding locations of fish (Dow, Pg. 11).” How people survive and thrive in their ecologies is being altered due to the human impact on the earth.

Many Westerners adopt an attitude that climate change will not affect them personally, that floods, earthquakes and natural disasters are random occurrences. Many fail to understand the connection between human actions and the environment. Climate changes, “...facilitate the move of human, plant, and animal diseases into areas where they were previously little known and where doctors, veterinarians, agriculture extension specialists, and money for treatments are all in short supply (Dow, Pg. 11).” With increased immigration and emigration of the poor, pathogens are spread, affecting everyone. Natural disasters and diseases in one part of the globe affect weather and health patterns in a distant location. Planet Earth is much smaller than some international and local bodies would like to acknowledge. “Climate change is as much a humanitarian and human development concern as it is an environmental one (Dow, Pg. 11).”

Water resources are intricately related to agricultural development and in essence, human development. “It is now estimated that about 30 percent of the world’s population experiences water shortages. In 30 years that number is likely to be two-thirds of the world’s population (Kerbo, Pg. 51).” Environmental pollution, increased consumption, and population growth lead to the depletion of fundamental resources. A lack of potable and agricultural water will take its toll. Countries with weak infrastructure will have even more trouble managing prevalent rates of disease and death. This decline in water availability will slow economic development causing more hunger and suffering.

“Modern society has relieved us of the burden of growing, harvesting, even preparing our daily bread, in exchange for the burden of simply paying for it. Only when prices rise do we take notice. And the consequences of our inattention are profound (Bourne, Pg. 38).” Currently,

countries are at war over natural and basic resources. Climate change is projected to limit resources even more. “Sustainable approaches to development will be necessary to decrease the vulnerability of society, ecosystems, and the environment to future changes (Mann, Pg. 108).”

The purpose in discussing climate change and the declining availability of resources is neither to be negative nor to rant. Rather, through addressing serious issues and publicizing the reality of personal and public decisions, we can move forward in the right direction in the future. There are tangible efforts that can be made to curtail negative effects of climate fluctuations. We live in an exciting time where we can truly see the power of individuals throughout the world come together in the pursuit of bettering the planet. But there is a sobering truth that, “the mere fact that institutions may evolve to mitigate international resource conflict in the face of declining resource supply or rising resource demand, does not mean that they will evolve, or that they will evolve rapidly enough to avert all resource crises or conflicts (Giordano, Pg. 54).” Many political promises are made but not all are kept. It will be difficult and challenging to meet the needs of our dynamic societies and live sustainably, but it is possible.

IV. Demographic Transition

Examining worldwide population trends may seem intimidating. Certain developed countries have a below replacement fertility level, meaning that parents are not having enough children to replace and care for them. On the other hand, certain developing countries have an extremely high fertility level; women are having as many as six children on average but do not have enough resources to adequately provide for them. When mortality rates are high, parents choose to have more children and exemplify a quantity strategy to make sure they have enough children surviving. If resources are abundant and the life expectancy is longer, parents choose

to invest more in each child and exemplify a quality tradeoff. The ecology and available resources in any setting directly affect the reproductive strategy that parents adopt. Focusing on the demographic transition will lead to an understanding of issues and trends in populations. “A demographic transition can be defined as a quantitative leap in the self-regulated flow of population inputs and outputs that is determined by a qualitative change in the causal mechanisms underlying the regulation (Bocquet-Appel, Pg. 657).”

There are four stages in the demographic transition. In stage one, pre-modern times, birth and death rates are high. These rates generally balance each other and the population is stable. This explains why the population on Earth was constant or slowly growing for about 2,000 years, even though birth rates were quite high. The economy was based on agriculture and it was logical to have bigger families. Many hands make lighter work; the more children one had, the more help on the farm and maintaining property. The amount of risk in a certain environment greatly affects the level of parental investment for their offspring, and even the decision to increase their fitness by reproductive success. Extrinsic risk is, “any unavoidable factor that can reduce an organism’s reproductive value (Quinlan, Pg. 121).” Extrinsic risk stands apart from parental care and often reduces the positive effects of additional efforts from parents. Depending on the level of extrinsic risk, parents choose to invest in reproduction or focus their energies on their living offspring. In pre-modern society, extreme famine often meant death or extremely poor living conditions, an extrinsic risk. Families lacked large surpluses and when famine and droughts occurred people typically starved. Parental investment can only go so far in these situations and a tradeoff exists between quality and quantity. “Basic parental care should usually benefit offspring, but extrinsic risk creates substantial diminishing returns to parental effort (Quinlan, Pg. 121).” Instead of investing in quality, famine, poor sanitation conditions and a lack

of resources push parents toward investment in fitness. "...Humans are also likely to possess adaptations to adjust fertility onset and fertility rates in relation to changing environmental conditions (Belsky, Pg. 265)." They reproduce at a higher rate because the level of mortality increases during hard times. Parents want to ensure that their family can outlive the shortages. During times of high risk, females will choose to reproduce earlier. "...Early birth is a strategic response to the rapid decline in health...(Belsky, Pg. 268)." Life-threatening experiences and our ability to adapt to them have shaped our life history.

In the premodern stage, the medical revolution had yet to occur and infant mortality was at a higher rate than present times. Having more children increased the likelihood that several would survive the first five years of life. Bigger families also meant that when the parents grow old, their children would be able to care for them. This was before social security or pension systems. Children were assets and not financial burdens.

The second stage of the demographic transition occurs with rapid population growth. With the knowledge of better sanitation, health practices, and nutrition, death rates significantly drop. Although death rates drop, birth rates still remain high. The technological innovations occur at a faster rate than cultural changes. Parents still view children as assets and they are all living longer because of the augmentation of public health and sanitation. Extrinsic risks are less frightening and play a smaller reproductive role owing to the advent of modern medicine. This cultural lag accounts for the high population growth rates.

During the third stage of the demographic transition, the cultural views and beliefs shift, bringing about change and lower birth rates. Birth and death rates become more stable as people make conscious decisions to have fewer children and invest in high quality offspring. As an economy changes from agrarian to industrial, children are viewed differently and become more

expensive to rear. Families move from the countryside to urban centers and livelihoods are dramatically modified. Instead of many hands making lighter work, "...each new pair of hands to help is another mouth to feed (Wood, Pg. 105)." Children can become financial burdens, thus human pair bonds decide to postpone childbirth and/or have fewer children. "As people become more affluent, as life provides many more opportunities beyond having children, and as it becomes much more expensive to raise each child from birth through university years, many people are deciding not to have children at all (Kerbo, Pg. 45)." As the economy changes so does cultural and familial life.

"... in environments in which inheritance greatly boosts an individual's ability to earn an income (each dollar inherited generates on average two dollars of earned income) wealthy parents can attain higher long-term fitness at equilibrium than poorer parents by producing fewer children (A.R. Rogers, unpublished). In summary, the rich and skilled may produce fewer children than the poor and unskilled because different groups within a society vary in the learning trajectories of their offspring, in the effects of inherited wealth on earning power, and in wealth. This outcome arises purely from mechanisms shaped by ordinary adaptive processes. Furthermore, once such fertility reductions appear among the rich, they can potentially spread to other social classes, even if the appropriate conditions do not exist in these groups, by the process of indirect bias posited by cultural evolutionists." (Borgerhoff Mulder, Pg. 269)

Fertility reductions among the rich are visible throughout the world, mainly in developed countries. Developing countries go through the transition phases, but have not reached stage three. The majority of developing countries are stagnated in stage two with high birth rates and lower death rates. Modern medicine has spread worldwide, but cultural beliefs that come with

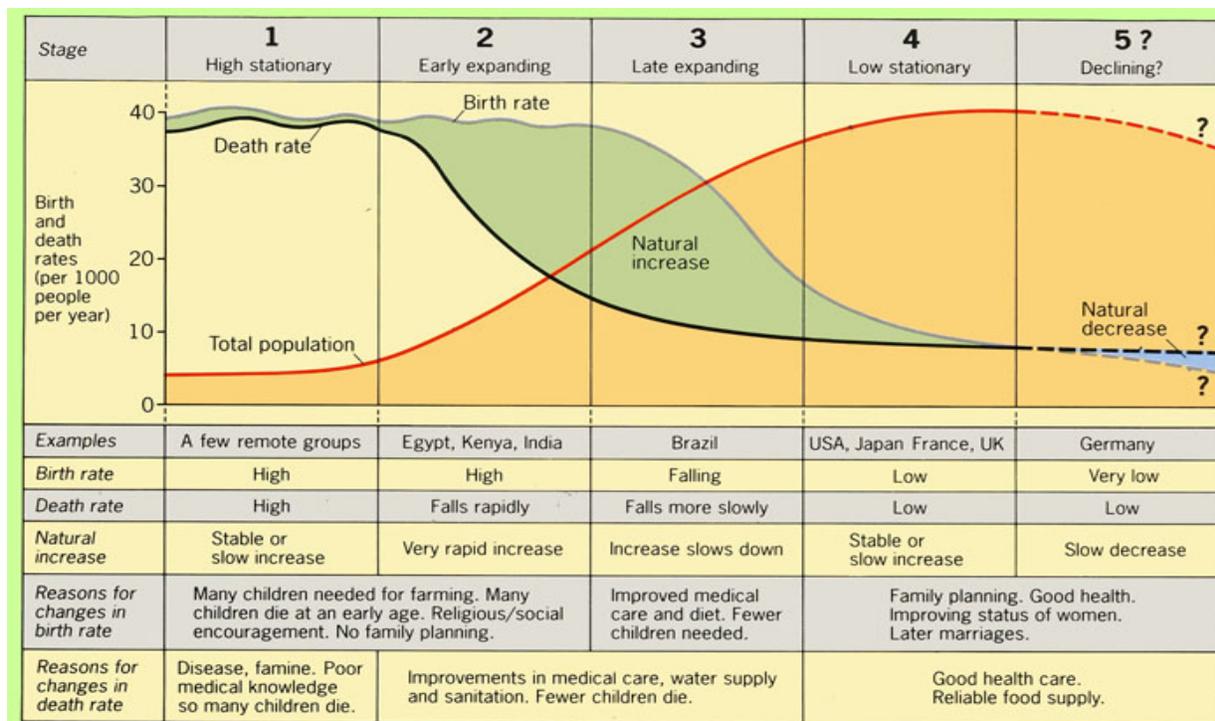
economic change and development have not. “The economic and health improvements do not seem to be enough or sustainable, or evenly spread around the nation, to have an impact on people’s values and beliefs about the worth of having large families (Kerbo, Pg. 45).” Developing countries experience economic growth and stimulation but with an increased presence of highly developed international economies. Countries such as the United States, Great Britain, France, Canada, Australia, and several other countries, had the opportunity to develop their markets with less international intervention. A high level of international economic infiltration into developing domestic markets often curtails economic growth in these transitioning countries. “...Less developed countries desperately need sustained economic growth, but to help this along it is also important to introduce population control programs to help reduce poverty (Kerbo, Pg. 45).”

While developing countries enhance their economies and bulk up the market place, industrialized countries experience a slow changing birth rate in stage four of the demographic transition. Industrialized countries throughout the world are in stage four; low birth rates matched by low death rates. As stated previously, cultural and economic changes lead to smaller family size and couples deciding to postpone childbirth. The United States is in stage four because it is a developed country with a total fertility rate of 2.06 children born per woman (CIA). This is a sustainable rate because on average, couples are having enough children to replace themselves and potentially be provided for as they age. On average, Americans are in demographic equilibrium.

Although overpopulation and limited resources are two grave issues, certain countries are experiencing sub-replacement fertility levels. This phenomenon is often categorized as the fifth stage of the demographic transition. In this stage, markets are heavily developed and successful.

Many couples choose not to have children or if they do have children, they wait until later in life and have very small families. Countries in this position face problems of population aging and decline. The death rates are higher than the total fertility rate of 2.01 children per woman. In coming years, there will most likely be a population pyramid that is highly skewed at the top. A population pyramid is a diagram that displays the distribution of ages in a given society. As the population ages, there will not be enough independents in the working class. Independents are individuals in a society usually from ages 15-50 that are capable of working and contributing to social services. They contribute largely to social welfare programs and provide services to dependents, children and elderly who are not able to work. There will be a high number of dependent elders. Many Northern European countries face challenges and threats to their social security and pension systems. Countries acknowledging these challenges realize that encouraging immigration can work to balance out the challenges of a declining and aging population.

In each stage of the demographic transition, women have different roles in society. The varying degrees of power and influence, maintained by the division of labor, affect the total fertility rate. When women are given more economic empowerment and political freedom, they begin to have power over their reproductive capabilities. Education and liberation, lead inevitably to changing rates of fertility.



Demographic Transition in five stages. (Relf, 2010)

V. Role of Women

It is important to review factors of climate change and to understand the demographic transition. Population pressure on the land directly affects how well humans live. The demographic transition model provides insight into the differing rates of total fertility worldwide. Declining rates in food production and availability of arable land make it necessary to slow population growth. Although the current world state seems dire, change is possible.

Developing countries throughout the world have the highest total fertility rates. Throughout these countries, women's roles in society are limited. These roles can change and this can make a lasting impact. "...Improvements in women's rights help to reduce poverty and speed economic development (Kerbo, Pg. 47)." Females contribute a great deal of labor but their efforts often go underappreciated and unnoticed. In patrilineal societies, economic contributions

of females are minimized and it is viewed as inappropriate to work outside of the home (Wiley, Pg. 133).” However, women are responsible for half the food production in developing countries (WHO).” Women harvest, cultivate, and prepare food for their families and communities. Women are responsible for their children; this includes feeding, bathing, and providing shelter physically and emotionally. Not all domestic duties are accounted for in national labor statistics. Their integral role in agriculture is not acknowledged by the majority of governments. To guarantee more representation and equality for women, they must have a role in government. “Women rarely participate other than in rather peripheral ways in shaping their country's economic and social policies. Successful policies will secure women's involvement from the outset and will also ensure that development does not merely mean additional burdens for women (WHO).” Women need greater access to healthcare and resources that will help improve their situation.

“Insuring women's health by implementing family planning and maternal child health services will not only bring down fertility rates, it will also mean that women will have more time for other activities including growing food and tending the land. If women have improved access to family planning services - accompanied by changes in traditional beliefs and attitudes about the role and status of women - they will bear fewer children. The downward spiral of large families, poverty and landlessness can be broken.” (FAO)

Young women do not always have enough authority in their households to voyage to a health clinic to seek personal and prenatal healthcare. They are not allowed to take time off from work

or are too constrained by their husbands and domestic duties. These conditions must be challenged and changed.

Many females living in these countries with high birth rates are not afforded with the opportunity to receive an education. Their primary role is that of caregiver and mother. This role is extremely important but also limiting. Women must be recognized for their dual role as caregiver and food producer. These women have the potential to better themselves and their country through increased involvement in the public and economic sectors. Several studies funded by the World Bank, United Nations, and the International Fund for Agricultural Development show that,

“... (1) better educated women contribute more to the economy; (2) when given the chance, rural women seem to manage family budgets and economic resources better than men and are even more likely to repay microloans; and (3) women who have more rights and education are more aware of the importance of population control for the family, with the influence to demand the use of birth control. The World Bank, for example, shows that when these conditions are improving for women the income level of less developed countries often improves and government corruption decreases.” (Kerbo, Pg. 47)

The overall health in a country is shown to increase as women begin to be politically and socially involved.

Thailand provides a convincing example of the positive change empowered women can bring. Many Thais have mixed marriages with Chinese, whom hold onto patrilineal traditions of male domination. However, the income gap between males and females is similar to that of many industrialized developed countries. Many professional and technical positions are held by

females in Thailand. “Of the top 10 exporting corporations accounting for much of Thailand’s rapid growth in the 1980s and early 1990s, 7 had a majority of women at the top (Kerbo, Pg. 49).” Women occupy important positions and this has created a more egalitarian country. Thailand has 70 percent female participation in the labor market. Half of university students in Thailand are females. “The strong influence of Thai women within the family is no doubt one reason for the success Thailand has had in reducing population growth (Kerbo, Pg. 49).” Thailand is also unique due to its matrilineal family system. In a matrilineal system, land is inherited through daughters and when men marry, they move to live with their wives’ family. This tradition gives even more power to women because they own the rights to land and this creates more influence in the economy.

Women are not the only individuals that need to be sexually aware and educated. Many populations of men are also unaware of healthy and safe sexual practices. As mentioned earlier, Thailand has received recognition for its decline in total fertility rates. This did not happen without well executed educational initiatives. Senator Mechai Viravaidya of Thailand honestly evaluated the issue of prostitution in the country. “With the realistic assumption that prostitution will never be completely eliminated, Mechai’s approach is to find ways to educate people as quickly as possible about the AIDS epidemic and provide them with the means to protect themselves (Kerbo, Pg. 46).” He started events such as “Miss Anti-AIDS Beauty Contest;” this event celebrated women who protected themselves against AIDS through safe sexual intercourse. While the beauty contest was in progress, a man dressed up as “Superman” distributed condoms to the crowd. Events like this might seem trivial, but properly developed and followed up with educational measures, these events make a difference. During the 1970s Thailand faced a population that was growing too rapidly. Mechai “...became involved in activities to educate

people about the benefits of smaller families and helped provide the means for limiting family size (Kerbo, Pg. 47).” Mechai made even more efforts to educate people and in turn slow population growth. He founded the Population and Community Development Association. This association created a connection with a popular restaurant in Bangkok called “Cabbages and Condoms.” Customers can eat a vegetarian meal and then shop in a section of the store that is reported to have the world’s largest supply and selection of condoms. “An added feature: Male customers of the restaurant can take the dinner receipt to the clinic next door for a free vasectomy (Kerbo, Pg. 46).” Yes, this does sound a bit odd but it is effective. “After 25 years, the rate of population growth in Thailand dropped from 3.3 percent to 0.9 percent (Kerbo, Pg. 46).” In 2004, Thailand had a birth rate of 1.9 children per woman, just below zero population growth. Thailand has also greatly reduced the growth of HIV infection and actually dropped the rate of infections.

“One American university research team reported an 80 percent drop in all sexually transmitted diseases in Thailand since 1984. The number of new infections each year has dropped almost fourfold since 1990. One estimate is that over the coming decades perhaps 2 million lives have been saved in Thailand because of programs like Mechai’s. AIDS and HIV infection is still a serious problem in Thailand, but rational and well-designed action has been taken with positive results.” (Kerbo, Pg. 46)

The results are astonishing and motivational. Well developed programs truly make a difference and change the economy and well-being of a country. These programs can be replicated throughout the world.

VIII. Conclusion

Positive change in the demographic and human condition is possible. People need proper encouragement, support, and education. We can promote and develop initiatives that will change future population trends. By examining population growth and focusing on ways to willfully decrease the total fertility rate, pressure on the land will decrease. The decreased pressure will aid in lowering total pollution and climate change. As population rates stabilize, we can channel our efforts on reducing personal consumption and strive towards sustainability. “Malthus argues that population pressure is a gift from a benevolent God to spur mankind’s industry and inventiveness; without it, we would lapse into sloth, apathy, and brutishness (Wood, Pg. 111).” Malthus views population pressure as a challenge to mankind. What will be done? We have the choice to crumble beneath the problem and do nothing or we can powerfully rise to the occasion. “...It is a challenge that we must confront, for the alternative is a future that is unpalatable, and potentially unlivable. While it is quite clear that inaction will have dire consequences, it is likewise certain that a concerted effort on the part of humanity to act its own best interests has great potential to end in success (Mann, Pg. 197).”

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