

# TOO MANY HUMANS, DWINDLING RESOURCES, AND NOT ENOUGH SPACE

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## INTRODUCTION

Global warming, the over fishing of our oceans, deforestation, and pollution are all popular topics in the discussion of our environment and the problems that plague it. Discussions on solving these issues are incomplete without first discussing human overpopulation. It is an ever-growing force aggravating many of the environmental issues faced today and a problem that needs to be addressed. There is no clear answer on how to address the problem of too many humans with a finite amount of space and resources. Further, the right to procreate has been held to be a basic human right.<sup>1</sup> It is a difficult subject to address due to the ethical and moral implications such a problem poses, but one that needs to be discussed.<sup>2</sup>

This paper will address the often-overlooked subject of human overpopulation and examine the role it plays in the environmental health of our planet. Part I will define overpopulation and how it is determined, as well as briefly examine animal overpopulations and their effects on the environment. Part II will turn to human population trends, the carrying capacity of humans on earth, and the environmental consequences of human overpopulation. The environmental issues currently faced in China, India, Africa, and other densely populated areas will be explored. Part III will analyze some of the legal solutions that have been implemented to curb human overpopulation trends and their results, with a focus on the one-child law in China and other government-sponsored programs. Part IV will propose possible solutions and the likelihood of their success.

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<sup>1</sup> Skinner v. Oklahoma, 62 S.Ct. 1110, 541 (1942).

<sup>2</sup> NEW YORK TIMES, *Why We Need To Address Population Growth's Effects On Global Warming* (Jan. 25, 2015) <http://www.latimes.com/opinion/editorials/la-ed-population-and-climate-change-20150125-story.html>.

**I. HOW SPECIES OVERPOPULATION IS DETERMINED AND ITS  
ENVIRONMENTAL CONSEQUENCES**

Various animal populations including rabbits and deer multiply and become overpopulated creating a strain on their environments. It is important to determine how much a given environment can hold of a particular species, or the environment may be stripped of its resources faster than they can be replenished, which may cause starvation in a population and other unfavorable conditions. The research discussing human overpopulation is limited in scope, so examples of overpopulation in animals will be used as a window into what the future may hold for humans.

**A. CARRYING CAPACITY AND ITS IMPORTANCE**

Overpopulation occurs when the population density in a given area enlarges to the point where the area can no longer support the population causing environmental deterioration, decline in the quality of life, or a population collapse.<sup>3</sup> Carrying capacity is defined as the limit to which a given area can sustain a population.<sup>4</sup> Population growth that surpasses the carrying capacity of an area leads to the deterioration of the environment and the eventual collapse of the population as resources become scarce. The availability of food, water, ecological conditions, and space all impact the carrying capacity of a given area.<sup>5</sup> The excess or shortage of particular resources in an area may create artificially high or low carrying capacities, allowing for more or less of the population than would otherwise be able to survive in an area.<sup>6</sup> Human intervention can sustain populations much higher than the normal carrying capacity of the environment by providing food and shelter, as in the case with domesticated pets.<sup>7</sup> Without the help of humans, these animals are

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<sup>3</sup> Nasif Nahle, *Overpopulation*, THE BIOLOGY CABINET  
<http://www.biocab.org/Overpopulation.html>.

<sup>4</sup> *Carrying Capacity*, BIOLOGY ONLINE, [http://www.biology-online.org/dictionary/Carrying\\_capacity](http://www.biology-online.org/dictionary/Carrying_capacity).

<sup>5</sup> Lori Garrett-Hatfield, *What Factors Affect the Carrying Capacity of an Environment?* SEATTLEPI, <http://education.seattlepi.com/factors-affect-carrying-capacity-environment-6190.html>.

<sup>6</sup> *Id.*

<sup>7</sup> *Companion Animal Overpopulation Crisis*, GEORGIA SPCA,  
<http://www.georgiaspca.org/qa-idausa-pet-overpopulation>.

unable to survive in the wild and end up shelters that are quickly filled resulting in no other alternative other than euthanasia.<sup>8</sup>

#### B. THE ENVIRONMENTAL CONSEQUENCES OF OVERPOPULATION IN WILD ANIMALS

Population control methods are most commonly used with deer.<sup>9</sup> “If humans did not hunt deer for sport and food, deer populations would continue to increase until starvation from loss of habitat drove the population back down to sustainable levels.”<sup>10</sup> Nature’s way of maintaining equilibrium in deer populations comes with the additional cost of habitat loss and the disruption of the natural growth of the forests.<sup>11</sup> Forests are a renewable resource, but such growth is impossible if deer populations are allowed to multiply and contribute to the overexploitation of forest vegetation for sustenance.<sup>12</sup> In areas where deer populations run unchecked, there are noticeable sightings of deer in human populated areas. Further, the increasing rate of deer within those areas contribute to a rise in automobile accidents.<sup>13</sup> Such effects are directly related to deer overpopulation; as the number of deer increase, food and resources decrease and the deer are forced to migrate to more densely populated areas in search of food.<sup>14</sup>

One such example of deer overpopulation occurred in Arizona in 1924.<sup>15</sup> Arizona banned the hunting of mule deer in an effort to protect the declining population of the Kaibab deer species.<sup>16</sup> The population grew from 3,000 to 100,000, and by 1924, the deer had overpopulated

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> *Without Hunting, Deer and Other Animals Would Overpopulate and Die Of Starvation*, PETA, <http://www.peta.org/about-peta/faq/without-hunting-deer-and-other-animals-would-overpopulate-and-die-of-starvation/>.

<sup>11</sup> Joe Schwartz, *Deer Proliferation Disrupts A Forest’s Natural Growth*, CORNELL UNIVERSITY (Mar. 7, 2014) <http://mediarelations.cornell.edu/2014/03/07/deer-proliferation-disrupts-a-forests-natural-growth/>.

<sup>12</sup> *Id.*

<sup>13</sup> Dave, Roos, *Effective Methods for Controlling Population and Reducing Accidents*, HOW STUFF WORKS <http://adventure.howstuffworks.com/outdoor-activities/hunting/principles/deer-hunting-car-accidents2.htm>.

<sup>14</sup> *Id.*

<sup>15</sup> Darren Cottriel, *The Right To Hunt In The Twenty-First Century: Can The Public Trust Doctrine Save An American Tradition?*, 27 PAC. L.J. 1235 (1996).

<sup>16</sup> *Id.*

their habitat causing two-thirds of the animals to die of starvation.<sup>17</sup> Additionally, in 1990, California enacted Proposition 117, which banned the hunting of mountain lions in an effort to protect mountain lions within the state.<sup>18</sup> Before long, mountain lion sightings had become more frequent with humans, pets, and livestock being attacked by the mountain lions. This was due to the increased lion population outgrowing their natural habitat, forcing the lions to spread and search in the cities and suburbs for food. Proposition 117 was later repealed and a mountain lion management plan was put into place by the Fish and Game commission, once again allowing the hunting of mountain lions through a permit process.<sup>19</sup>

“Overpopulation of a particular species can also occur when there is a decrease in the population of its natural predator.”<sup>20</sup> In 1958, Mao Zedong, the founding father of the People’s Republic of China, launched a campaign to get rid of four pests: flies, mosquitos, rats, and sparrows.<sup>21</sup> The elimination of sparrows proved to be successful, but came with unintended consequences. Without sparrows, locust populations soared causing widespread crop destruction and a famine that lasted three years and claimed the lives of 45 million people.<sup>22</sup> Earth is currently experiencing its sixth mass extinction event, the last one occurring at the time of the dinosaurs, and it remains to be seen what long term effects it will have on our environment.<sup>23</sup>

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<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> Jackson Landers, *Trying To Limit The Number Of Deer, With Surprising Results*, THE WASHINGTON POST (Sept. 29, 2014), [https://www.washingtonpost.com/national/health-science/trying-to-limit-the-number-of-deer-with-surprising-results/2014/09/29/3c16f9dc-28a5-11e4-958c-268a320a60ce\\_story.html](https://www.washingtonpost.com/national/health-science/trying-to-limit-the-number-of-deer-with-surprising-results/2014/09/29/3c16f9dc-28a5-11e4-958c-268a320a60ce_story.html).

<sup>21</sup> *Eliminate The Four Pests (1958)*, CHINESE POSTERS, <http://chineseposters.net/themes/four-pests.php>.

<sup>22</sup> John Platt, *The Great Sparrow Campaign Was The Start Of The Greatest Mass Starvation In History*, MOTHER NATURE NETWORK (Sept. 30, 2013) <http://www.mnn.com/earth-matters/animals/stories/the-great-sparrow-campaign-was-the-start-of-the-greatest-mass>.

<sup>23</sup> Bjorn Carey, *Stanford Biologist Warns Of Early Stages Of Earth’s 6th Mass Extinction Event*, STANFORD NEWS (Jul. 24, 2014) <http://news.stanford.edu/news/2014/july/sixth-mass-extinction-072414.html>.

## II. HUMAN OVERPOPULATION AND THE ENVIRONMENT

Homo sapiens have been on earth roughly 100,000 years and have existed primarily as hunger-gatherers that were dependent on wild animal populations to survive.<sup>24</sup> Death, disease, and high mortality rates kept population growth low, and it was not until 1804 that the world population first reached one billion; a short 200 years later the population has increased past 7 billion.

### A. CARRYING CAPACITY OF HUMANS ON EARTH

The carrying capacity of humans on earth was reached and passed around the mid 1970's when earth's human population was around 4 billion.<sup>25</sup> At this time, humans began to draw resources from the earth faster than the earth could replenish them.<sup>26</sup> At the present rate, it would take the resources produced by 1.6 Earths to provide for the human race at sustainable levels.<sup>27</sup> In the last 150 years, many of the factors that limited human populations were minimized or eliminated allowing for the exponential growth we are experiencing today.<sup>28</sup> Improvements to public health and the elimination of deadly diseases have allowed for increased life expectancy, mortality to decrease, while advancements in food production distribution have provided the support to continue to allow population growth.<sup>29</sup> Current population growth models predict that human population will continue to increase past the year 2100, with the most conservative estimate showing a peak in 2050 at 8.5 billion

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<sup>24</sup> Brian Palmer, *The Real Caveman Diet*, SLATE, [http://www.slate.com/articles/life/explainer/2012/02/the\\_real\\_caveman\\_diet\\_what\\_did\\_people\\_eat\\_in\\_prehistoric\\_times\\_.html](http://www.slate.com/articles/life/explainer/2012/02/the_real_caveman_diet_what_did_people_eat_in_prehistoric_times_.html).

<sup>25</sup> *Earth Overshoot Day*, GLOBAL FOOTPRINT NETWORK (Aug. 3, 2015) [http://www.footprintnetwork.org/en/index.php/GFN/page/earth\\_overshoot\\_day/](http://www.footprintnetwork.org/en/index.php/GFN/page/earth_overshoot_day/). See also DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, *Population Graphs* <http://esa.un.org/unpd/wpp/Graphs/Probabilistic/POP/TOT/>.

<sup>26</sup> *Eliminate The Four Pests (1958)*, CHINESE POSTERS, <http://chineseposters.net/themes/four-pests.php>. (13)

<sup>27</sup> *World Footprint*, GLOBAL FOOTPRINT NETWORK (Nov. 20, 2015) [http://www.footprintnetwork.org/en/index.php/GFN/page/world\\_footprint/](http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/).

<sup>28</sup> Carolyn Kinder, *The Population Explosion: Causes and Consequences*, YALE-NEW HAVEN TEACHERS INSTITUTE <http://www.yale.edu/ynhti/curriculum/units/1998/7/98.07.02.x.html>.

<sup>29</sup> Carolyn Kinder, *The Population Explosion: Causes and Consequences*, YALE-NEW HAVEN TEACHERS INSTITUTE <http://www.yale.edu/ynhti/curriculum/units/1998/7/98.07.02.x.html>.

humans and a decrease down to 7 billion by 2100.<sup>30</sup> The highest estimate shows human population increasing past 17 billion in the next 80 years.<sup>31</sup>

A billion people were added to the planet in the 15 years between 1960 and 1975, increasing the population from 2.5 billion to 3.5 billion.<sup>32</sup> Another billion were added in the following 13 years.<sup>33</sup> A majority of the population growth is occurring in third world countries with a majority of developed countries experiencing a plateau or even a decline in population growth.<sup>34</sup> The immediately apparent issue is one of space. There is only so much land to support so many humans. Even so, there are many other more pressing consequences that will trigger long before humans reach the physical limits of the planet.

#### B. THE ENVIRONMENTAL CONSEQUENCES OF TOO MANY HUMANS

Many of the environmental issues faced today stem from the need to support the amount of humans on our planet.<sup>35</sup> The global livestock sector provides livelihoods to about 1.3 billion people and contributes about 40% to global agricultural output.<sup>36</sup> Livestock accounts for about 30% of the global land use and is one of the major drivers of deforestation in order to make space for pastures.<sup>37</sup> As a direct result of overgrazing and erosion, 20% of the pastures created by deforestation are degraded.<sup>38</sup> These enormous livestock populations are necessary to sustain the current levels of human population, but in turn affect dwindling water resources as well as contribute the greenhouse gasses,

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<sup>30</sup> Population Graphs, *supra* note 26.

<sup>31</sup> *Id.*

<sup>32</sup> POPULATION REFERENCE BUREAU, *Human Population: Population Growth* <http://www.prb.org/Publications/Lesson-Plans/HumanPopulation/PopulationGrowth.aspx>.

<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

<sup>35</sup> Paul M. Caron, *Population Is Root Cause Of Environmental Trouble*, THE MORNING CALL (Apr. 3, 1994) [http://articles.mcall.com/1994-04-03/news/2984193\\_1\\_world-population-population-growth-global-population](http://articles.mcall.com/1994-04-03/news/2984193_1_world-population-population-growth-global-population).

<sup>36</sup> Christopher Matthews, *Livestock A Major Threat To Environment*, FOA NEWSROOM (Nov. 29, 2006) <http://www.fao.org/newsroom/en/news/2006/1000448/index.html>.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

primarily through manure.<sup>39</sup> The primary greenhouse gas produced by manure is nitrous oxide, a gas with 296 times the greater global warming potential than CO<sub>2</sub> (Carbon Dioxide), and which accounts for 65% of all human related nitrous oxide production.<sup>40</sup>

In 2009, the Stockholm Resilience Centre published a paper identifying nine planetary boundaries that once crossed, could have a cascading effect and cause an irreversible chain of events that would lead to the degradation of our planet and transform it into a less hospitable state.<sup>41</sup> Currently, four of the nine boundaries have already been crossed.<sup>42</sup> These include: climate change, loss of biosphere integrity, land-system change, and altered biogeochemical cycles.<sup>43</sup> Biosphere integrity refers to the biodiversity loss and species extinction, land-system change includes deforestation, and altered biogeochemical cycles include phosphorus and nitrogen cycles.<sup>44</sup>

The more humans exist, the more garbage will be produced. The average person produces 4.3 pounds of waste today, more than 1.6 pounds compared to 1960.<sup>45</sup> Across a person's lifetime, that adds up to 102 tons of trash per American.<sup>46</sup> Over 220 million pounds of waste is produced each year in the United States alone, with over 55% of that waste ending up in landfills.<sup>47</sup> Landfills contribute to the contamination of soil and groundwater as toxic residues leak into the ground.<sup>48</sup> Since Congress passed the Resource Conservation and Recovery Act in 1976, landfills were required to be lined with plastic and/or clay to prevent toxins from leaking into the soil with the lining serving as a barrier and

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Planetary Boundaries 2.0 – New And Improved*, STOCKHOLM RESILIENCE CENTER (Jan. 22, 2015) <http://www.stockholmresilience.org/21/research/research-news/1-15-2015-planetary-boundaries-2.0—new-and-improved.html>.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *How much do we waste daily?* DUKE UNIVERSITY <https://center.sustainability.duke.edu/resources/green-facts-consumers/how-much-do-we-waste-daily>.

<sup>46</sup> Thelma Gutierrez, George Webster, *Trash City: Inside America's Largest Landfill Site*, CNN (Apr. 28, 2012) <http://www.cnn.com/2012/04/26/us/la-trash-puente-landfill/>.

<sup>47</sup> How much do we waste daily?, *supra* note 46.

<sup>48</sup> Thelma Gutierrez, George Webster, *Trash City: Inside America's Largest Landfill Site*, CNN <http://www.cnn.com/2012/04/26/us/la-trash-puente-landfill/>.

keeping the toxins contained.<sup>49</sup> Even with those measures, there are other environmental hazards including the release of hazardous gases including methane.<sup>50</sup> The physical space of necessary to create landfills is not lacking in the United States, but the proximity of landfills to towns and cities limits how many more landfills can be created since no one wants to live near them.<sup>51</sup> Some states are quickly running out of space to put their garbage.<sup>52</sup> Massachusetts and Rhode Island both only have about 12 years until they reach their landfill limits, and New York despite shipping the bulk of its waste across state lines, only has 25 years until they reach their limit.<sup>53</sup> If the number of humans continues to grow at current exponential rates, so will the amount of trash produced.

Topsoil degradation is another consequence of the large scale farming operations that are necessary to maintain human populations. Topsoil comprises between 1% and 5% of the weight of soil and it provides the fertile nutrients necessary to farm.<sup>54</sup> It takes 1,000 years to create just three centimeters of topsoil.<sup>55</sup> At current rates, it is estimated that all of the world's topsoil will be gone within 60 years.<sup>56</sup> About a third of the world's soil is already degraded and this is attributed to chemically intensive farming techniques, deforestation leading to erosion, and global warming.<sup>57</sup> Like the degradation of other resources, the loss of topsoil begins a cycle by limiting the amount of stored carbon, which results in the heating of the planet and causes further erosion.<sup>58</sup>

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<sup>49</sup> Brian Palmer, *Go West, Garbage Can! Are we running out of room for our garbage?*, SLATE (Feb. 15, 2011) [http://www.slate.com/articles/health\\_and\\_science/the\\_green\\_lantern/2011/02/go\\_west\\_garbage\\_can.html](http://www.slate.com/articles/health_and_science/the_green_lantern/2011/02/go_west_garbage_can.html).

<sup>50</sup> *Id.*

<sup>51</sup> Marshall Brian, *What if the U.S. put all its trash in one giant landfill?*, HOW STUFF WORKS <http://science.howstuffworks.com/environmental/green-science/one-giant-landfill.htm>

<sup>52</sup> Brian Palmer, *supra* note 50.

<sup>53</sup> Brian Palmer, *supra* note 50.

<sup>54</sup> John Paul, *The Importance of our Topsoil*, TRANSFORM COMPOST PRODUCTS (June. 1, 2012) <http://www.transformcompost.com/blog/?p=97>.

<sup>55</sup> Chris Arsenault, *Only 60 Years of Farming Left If Soil Degradation Continues*, SCIENTIFIC AMERICAN (Dec. 5, 2014) <http://www.scientificamerican.com/article/only-60-years-of-farming-left-if-soil-degradation-continues/>.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*



Overfishing is defined as the taking of wildlife from the oceans at rates higher than the fish are able to replenish themselves.<sup>59</sup> The earliest instances began in the 1800's with whale populations dropping as they were fished for their blubber, and continues today with the near extinction of many varieties of fish.<sup>60</sup> In the mid-20<sup>th</sup> century, international efforts to increase the availability of protein rich foods led to an increase in fishing capacity.<sup>61</sup> Profit seeking companies were aggressive in their fishing and it is estimated that industrial fishing had reduced the number of large ocean fish to just 10% of their pre-industrial populations.<sup>62</sup> Currently, about one-third of the ocean's fish have been consumed and, if current fishing rates continue, by the year 2050 there will be virtually nothing left to fish.<sup>63</sup>

The economic theory Tragedy of the Commons sheds light on the difficulty of addressing a problem based on human nature.<sup>64</sup> In 1832, William Lloyd, a political economist noticed that communal pastures used by farmers were in lower quality compared to the privately enclosed areas owned by individual farmers.<sup>65</sup> On the farmer's land, the farmer had an incentive to take care of the pasture for future seasons and keep the herd from overgrazing.<sup>66</sup> However, on the communal land, the farmer had no incentive to prevent the herd from overgrazing since the benefit of doing so was for extra food for his own herd, and would not leave the loss to him, but the community at large.<sup>67</sup>

Like in the herd, the same principal applies to the world at large. It was recently discovered that China is fishing at a rate 12 times higher than previously reported with the majority of its fishing coming from the coast of Africa.<sup>68</sup> This is because China has already overfished its own

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<sup>59</sup> *Overfishing*, NATIONAL GEOGRAPHIC  
<http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/critical-issues-overfishing/>.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> Richard Black, *Only 50 Years Left' For Sea Fish*, BBC NEWS (Nov. 2, 2006)  
<http://news.bbc.co.uk/2/hi/science/nature/6108414.stm>.

<sup>64</sup> Garrett Hardin, *Tragedy of Commons*, LIBRARY OF ECONOMICS AND LIBERTY  
<http://www.econlib.org/library/Enc/TragedyoftheCommons.html>.

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> Gwynn Guilford, *China Is Plundering The Planet's Seas—And It's Doing It 12 Times More Than It's Telling Anybody*, QUARTZ (Apr. 30, 2013)  
<http://qz.com/78803/china-fishing-more-than-its-telling-anybody/>.

waters.<sup>69</sup> Not all countries are following China's self-serving policies. In 2015, Norway paid Brazil one billion dollars for meeting conservation efforts by cutting Amazon deforestation by 75%.<sup>70</sup> While at first it may not have seemed clear why Norway was paying Brazil, the answer was that Norway benefited from conservation efforts in the Amazon. The Amazon is primarily located in Brazil and legally, Brazil may cut down the forest and use the forest as an asset for lumber or land use. Doing so would come at a cost of the rest of the world as air quality would begin to deteriorate. Abstaining from using the natural resource, Brazil loses a potential resource while the rest of the world gains a benefit. It is through the understanding that all countries are interwoven that Norway is paying Brazil for their efforts.

Natural sources of water such as rivers were not enough to meet society's water needs and, therefore, dams were developed by holding water above ground, as opposed to natural underground aquifers, and has had the unintended consequence of increasing evapotranspiration and the overall human consumption of water.<sup>71</sup> Groundwater is mostly non-renewable, with just 6% of all groundwater renewable within 50 years, the rest taking considerably longer.<sup>72</sup> Annual consumption of water has already passed the planetary boundary and may eventually lead to famine.<sup>73</sup>

The Environmental Protection Agency (EPA) estimates that a trillion-dollar investment is required to keep up with population growth

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<sup>69</sup> *The Role Of China In The Worlds Fisheries* [http://www.europarl.europa.eu/meetdocs/2009\\_2014/documents/pech/dv/chi/china.pdf](http://www.europarl.europa.eu/meetdocs/2009_2014/documents/pech/dv/chi/china.pdf).

<sup>70</sup> *Norway Pays Brazil \$1bn For Slowing Amazon Loss*, THE LOCAL (Sept. 15, 2015) <http://www.thelocal.no/20150915/norway-pays-brazil-1bn-for-slowing-amazon-loss>.

<sup>71</sup> Fernando Jaramillo, et al., *Local Flow Regulation And Irrigation Raise Global Human Water Consumption And Footprint*, SCIENCE (Dec. 04, 2015) <http://www.sciencemag.org/content/350/6265/1248>.

<sup>72</sup> Emily Chung, *Most Groundwater Is Effectively A Non-Renewable Resource, Study Finds*, CBC NEWS (Nov. 18, 2015) <http://www.cbc.ca/news/technology/groundwater-study-1.3318137>.

<sup>73</sup> Erin Blakemore, *Humans Are Draining Even More Of Earth's Freshwater Than We Thought*, SMITHSONIAN (Dec. 3, 2015) <http://www.smithsonianmag.com/science-nature/humans-are-draining-even-more-earths-freshwater-we-thought-180957444/?no-ist>.

in the United States.<sup>74</sup> Cities are already seeing a drop in water quality including a lead epidemic in Flint, Michigan.<sup>75</sup> In Flint, those who could afford it bought bottled water, while those who could not attempted to boil or limit water consumption.<sup>76</sup> The contaminated water came from the Flint River, and the newly elected mayor called the situation a man-made disaster.<sup>77</sup> Lead poisoning is one of the most criminal things that can happen to a population.<sup>78</sup> The effects of the lead poison in the city water will be multigenerational and will include increases in criminality.<sup>79</sup> There is also evidence that the lead exposure may have affected the miscarriage rate of Flint, Michigan residents.<sup>80</sup>

Human expansion has reached all but the most remote and inhospitable areas on earth. This expansion has caused the encroachment on the habitats of numerous species.<sup>81</sup> The cause of this habitat loss is almost entirely a result of human expansion.<sup>82</sup> Species diversity increases an ecosystem's resilience to stress caused by environmental pressures.<sup>83</sup> The loss of diversity can make the natural balance more delicate as each individual species takes on a more important spot in the

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<sup>74</sup> Garret Ellison, *EPA: \$1 Trillion Water Investment Needed For American Population Growth*, MLIVE (Sept. 26, 2015) [http://www.mlive.com/news/index.ssf/2015/09/epa\\_1\\_trillion\\_needed\\_for\\_us\\_p.html](http://www.mlive.com/news/index.ssf/2015/09/epa_1_trillion_needed_for_us_p.html).

<sup>75</sup> Yanan Wang, *In Flint, Mich., There's So Much Lead In Children's Blood That A State Of Emergency Is Declared*, THE WASHINGTON POST (Dec. 15, 2015) <https://www.washingtonpost.com/news/morning-mix/wp/2015/12/15/toxic-water-soaring-lead-levels-in-childrens-blood-create-state-of-emergency-in-flint-mich/>.

<sup>76</sup> *Id.*

<sup>77</sup> Ashley Southall, *State of Emergency Declared Over Man-Made Water Disaster in Michigan City*, THE NEW YORK TIMES (JAN. 17, 2016) <http://www.nytimes.com/2016/01/18/us/obama-flint-michigan-water-fema-emergency-disaster.html>.

<sup>78</sup> Sara Ganim, Linh Tran, *How Tap Water Became Toxic In Flint, Michigan*, CNN (Jan. 26, 2016) <http://www.cnn.com/2016/01/11/health/toxic-tap-water-flint-michigan/>.

<sup>79</sup> *Id.*

<sup>80</sup> Ralph Ellis, *Did Flint Water Affect Miscarriage Rate? Officials Investigate*, CNN (Feb. 12, 2016) <http://www.cnn.com/2016/02/12/health/flint-water-crisis-miscarriages/>.

<sup>81</sup> Michael Evans, *Habitat Loss and Degradation*, EARTH TIMES (May 10, 2011) <http://www.earthtimes.org/encyclopaedia/environmental-issues/habitat-loss-degradation/>.

<sup>82</sup> *The Extinction Crisis*, CENTER FOR BIOLOGICAL DIVERSITY. (Jan. 1, 2015) [http://www.biologicaldiversity.org/programs/biodiversity/elements\\_of\\_biodiversity/extinction\\_crisis/](http://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/).

<sup>83</sup> *Id.*

health of the ecosystem. The loss of a single species can then have dramatic results as in the case of the loss of sparrows in China. Thus, humans have triggered the sixth mass extinction in the earth's history.<sup>84</sup> It is estimated that in the next 50 years, up to a quarter of the world's plant and animal species could go extinct, comprised of a million different species.<sup>85</sup>

Having identified how humans are currently affecting the environment, it only becomes clearer how an exponential increase in humans without intervention will further damage the environment hastening its deterioration. Humans have triggered the last 16 record breaking hot years on Earth, with evidence tracing human impact as far back as 1937.<sup>86</sup> Global warming is caused through the release of greenhouse gasses into the atmosphere that damage the protective layer in the stratosphere that absorbs most of the sun's ultraviolet (UV) radiation.<sup>87</sup> Scientists currently estimate with a 95% degree of certainty that humans are responsible for the earth's current temperature fluctuations.<sup>88</sup> Global warming is accelerated by the increased demand for energy through the use of fossil fuels and an increased rate of deforestation. Regardless of the actions taken now, the effects that humans are already causing are expected to increase for another century or more.<sup>89</sup> These include more severe weather catastrophes such as EF5 tornados, floods, drought, and forest fires. Furthermore, global warming will continue to accelerate the melting of the polar ice caps, contributing to rising sea levels.

Deforestation in arid climates has the added consequence of spurring desertification.<sup>90</sup> As trees are cut down, the vegetative cover that protects against erosion allows wind and rain to wash away the topsoil.<sup>91</sup> Roots serve to bind the soil to the land; once the trees are gone

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<sup>84</sup> *Id.*

<sup>85</sup> Michael Evans, *supra* note 82.

<sup>86</sup> *Human influence on the climate dates back to 1930s*, PHYS (Mar. 8, 2016) <http://phys.org/news/2016-03-human-climate-dates-1930s.html>

<sup>87</sup> Brandon Miller, *Climate Change Report: It's 'Extremely Likely' That Humans Are Responsible*, CNN (Sept. 27, 2013) <http://www.cnn.com/2013/09/27/world/climate-change-report/>

<sup>88</sup> *Id.*

<sup>89</sup> *Id.*

<sup>90</sup> UNESCO, *How does desertification occur?* <http://www.unesco.org/mab/doc/ekocd/chapter3.html>

<sup>91</sup> *Id.*

rain and irrigation causes the once green landscape to become desert. The drop in quality in the nutrients found in the soil negatively impact crop yields, having a direct effect on famine and starvation.

The same way deer overpopulation can cause mass migration, the same holds true for humans. Climate change plays a critical role in mass human migration.<sup>92</sup> As temperatures increase in an area, farming becomes less economical due to the increased difficulty in raising crops and the population moves on in search of an area that can support them.<sup>93</sup> Rapid populations increases is also one of the main contributors to political instability and conflict.<sup>94</sup> This is caused through more people competing for fewer resources to support them, leading to economic inequality and a higher chance of conflict caused by the economic instability.<sup>95</sup> There is currently a mass human migration caused by the Syrian War. It has led to the mass migration of roughly 9 million refugees, making up nearly half of Syria's population.<sup>96</sup> As these refugees have fled, neighboring countries have debated taking them in and some have experienced increases in crime and a strain on resources.<sup>97</sup> Lebanon is currently hosting 1.1 million refugees, making 1 in every 5 people in the country a refugee.<sup>98</sup> The cost to neighboring countries has been high, with England spending more than £700,000 (\$1,000,000) a day to house refugees.<sup>99</sup> With increased population growth, more political and economic instability will ensue causing future instances of mass migration.

Another side effect of human overpopulation is its effect on disease. A pandemic is the worldwide spread of a new disease.<sup>100</sup> There

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<sup>92</sup> Colin Schultz, *Climate Change Is Already Causing Mass Human Migration*, SMITHSONIAN (Jan. 29, 2014) <http://www.smithsonianmag.com/smart-news/climate-change-already-causing-mass-human-migration-180949530/?no-ist>

<sup>93</sup> *Id.*

<sup>94</sup> *Overpopulation May Lead to Conflict*, POPULATION INSTITUTE (July 12, 2007) <https://www.populationinstitute.org/newsroom/press/view/20/>

<sup>95</sup> *Id.*

<sup>96</sup> *Syria's Refugee Crisis In Numbers*, AMNESTY INTERNATIONAL (Feb. 3, 2016) <https://www.amnesty.org/en/latest/news/2016/02/syrias-refugee-crisis-in-numbers/>

<sup>97</sup> *Id.*

<sup>98</sup> Tim Stanley, *Refugee Crisis: What Will The True Cost Of Taking Syria's Displaced Be?* THE TELEGRAPH (Sept. 5, 2015) <http://www.telegraph.co.uk/news/worldnews/middleeast/syria/11846175/What-will-the-true-cost-of-taking-Syrias-refugees-be.html>

<sup>99</sup> *Id.*

<sup>100</sup> WORLD HEALTH ORGANIZATION, *What is a Pandemic?* [http://www.who.int/csr/disease/swineflu/frequently\\_asked\\_questions/pandemic/en/](http://www.who.int/csr/disease/swineflu/frequently_asked_questions/pandemic/en/)

is a strong correlation between pandemics and human density.<sup>101</sup> Predictions show that with each passing year and increases in population, the instances and severity of pandemics increase.<sup>102</sup> The majority of these pandemics originate from animals and are transferred to humans through close contact with infected livestock.<sup>103</sup> HIV was originally contracted through animal contact and the first case of the disease detected in the United States in 1981.<sup>104</sup> The disease has infected 60 million people and caused 30 million deaths.<sup>105</sup> Such diseases are more likely to emerge in densely populated areas such as Asia and Africa and once contracted, quickly spread worldwide.<sup>106</sup> Future pandemics are more likely to cost more, grow faster, and cause more damage due to increasing populations and population density.<sup>107</sup> India specifically shows how infectious diseases can be a hard issue to fix due to the high population density. Roughly 40% of India's population is infected with tuberculosis, an infectious disease spread through the air.<sup>108</sup> Additionally, the highest instances of HIV in India are in the migrant population, with rates 10 times higher than those in the general population.<sup>109</sup>

#### C. CHINA, INDIA, AFRICA AND OTHER HIGHLY POPULATED AREAS

China and India are the two most populated countries in the world with 1.4 and 1.3 billion people respectively.<sup>110</sup> Beijing is the second most populated urban city in China.<sup>111</sup> Smog from construction sites, vehicle exhaust, and the burning of coal blanket the city forcing the

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<sup>101</sup> Bahar Gholipour, *What 11 Billion People Mean for Disease Outbreaks*, SCIENTIFIC AMERICAN (Nov. 26, 2013) <http://www.scientificamerican.com/article/what-11-billion-people-mean-disease-outbreaks/>.

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

<sup>108</sup> HEALTH ISSUES INDIA <http://www.healthissuesindia.com/infectious-diseases/>.

<sup>109</sup> *Id.*

<sup>110</sup> *Countries in the World by Population (2016)*, WORLDMETERS (Jan. 1, 2015) <http://www.worldometers.info/world-population/population-by-country/>.

<sup>111</sup> *China's Statistical Yearbook 2014*, NATIONAL BUREAU OF STATISTICS OF CHINA <http://www.stats.gov.cn/tjsj/ndsj/2014/indexeh.htm>.

inhabitants to wear masks to protect themselves.<sup>112</sup> The still air, cold temperatures, and an increase in humidity are all factors in how smog becomes trapped in one area.<sup>113</sup> Cancer causing particles were recorded at around 256 micrograms per cubic meter, with the World Health Organization considering anything over 25 micrograms unsafe.<sup>114</sup> In December 2015, a red alert was issued for the first time causing construction sites and schools to shut down in an effort to lessen the amount of pollution and protect the public from the health risks the smog presents.<sup>115</sup> India faces similar problems in its densely populated cities. Of the top 10 most polluted cities in the world, 6 are in India.<sup>116</sup> On average, the air quality in New Delhi is nearly 3 times more polluted than that of Beijing's.<sup>117</sup> It is estimated that the smog in India destroys enough crops in a year to feed 94 million people.<sup>118</sup>

Africa is currently the home to 1.2 billion people.<sup>119</sup> The United Nations estimates that the current population will double by the year 2050, with 400 million of these people living in Niger alone.<sup>120</sup> At the same rate, Africans will make up 1 out of every 3 humans on earth by the year 2100.<sup>121</sup> The effects of overpopulation can already be seen in the country with heavy traffic as well as pressure on social services such

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<sup>112</sup> Andrew Griffin, *Beijing Smog 'Red Alert': Schools and Businesses to Completely Shut Down as Chinese Capital Issues First Ever Extreme Warning*, INDEPENDENT (Dec. 7, 2015) <http://www.independent.co.uk/news/world/asia/beijing-smog-red-alert-issued-schools-and-businesses-to-completely-shut-down-as-chinese-capital-a6763286.html#gallery>.

<sup>113</sup> Sui-Lee-Wee, *Still Air Traps Smog in China's Capital Triggering 'Red Alert'*, REUTERS (Dec. 8, 2015) <http://www.reuters.com/article/us-china-pollution-idUSKBN0TR0C920151208>.

<sup>114</sup> *Id.*

<sup>115</sup> *Id.*

<sup>116</sup> Doug Bolton, *Beijing Continues to Suffer from Pollution, but Delhi's Air Quality is One-And-A-Half Times Worse*, INDEPENDENT (Dec. 10, 2015) <http://www.independent.co.uk/environment/beijing-pollution-smog-air-quality-environment-delhi-india-china-a6768611.html>.

<sup>117</sup> *Id.*

<sup>118</sup> Sachin D. Ghude, et al., *Ozone Pollution in India Kills Enough Crops to Feed 94 Million in Poverty*, AMERICAN GEOPHYSICAL UNION (Sept. 4, 2014) <http://news.agu.org/press-release/ozone-pollution-in-india-kills-enough-crops-to-feed-94-million-in-poverty/>.

<sup>119</sup> *How will a population boom change Africa?*, BBC NEWS (Sept. 11, 2015) <http://www.bbc.com/news/world-africa-34188248>

<sup>120</sup> *Id.*

<sup>121</sup> *Id.*

as water, electricity, and education.<sup>122</sup> Women living in the more impoverished areas average about 6 to 7 children each.<sup>123</sup> Part of it is a cultural view that families should be large, with even the president of South Africa being the father of at least 20 children.<sup>124</sup> In African tradition, marriage and procreation are inseparable, with a lack of offspring being a source of taboo and those who cannot have children are often frowned upon.<sup>125</sup>

### III. CHINA'S ONE CHILD POLICY AND OTHER GOVERNMENT INITIATIVES

No example of legal initiatives to curtail human overpopulation is as well-known as China's One-Child policy. Despite a source of controversy with allegations of human rights violations, the policy remained in place for decades and influenced over a billion people. A law that would likely be illegal in most other countries, the One-Child policy served the stated purpose of lowering the levels of population growth in China. Unfortunately, the policy created unforeseen consequences in the makeup of its population, and changes in its culture.

#### A. AN EFFORT TO SLOW DOWN HUMAN POPULATION GROWTH

In 1979, China implemented a policy limiting the amount of children couples could have to one.<sup>126</sup> The policy was enforced through fines, pressure to abort, and even forced sterilization.<sup>127</sup> While controversial, it is estimated that it lowered the population in the first 20 years of the policy by 300 million.<sup>128</sup> This led to many young adults

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<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> Sebastien Berger, *Jacob Zuma 'fathers 20th child with friend's daughter'*, THE TELEGRAPH (Jan. 31, 2010), <http://www.telegraph.co.uk/news/worldnews/africaandindianocean/southafrica/7120593/Jacob-Zuma-fathers-20th-child-with-friends-daughter.html>

<sup>125</sup> Omar Saleem, *Note, Be Fruitful, And Multiply, And Replenish The Earth, And Subdue It: Third World Population Growth And The Environment*, 8 GEO. INT'L ENVTL. L. REV. 1 (1995).

<sup>126</sup> Matt Rosenberg, *China's One Child Policy: One Child Policy in China Designed to Limit Population Growth*, ABOUT (Oct. 30, 2015), <http://geography.about.com/od/populationgeography/a/onechild.htm>.

<sup>127</sup> *Id.*

<sup>128</sup> *Id.*



today having been raised without siblings.<sup>129</sup> Couples without siblings are allowed two children as a safeguard against lowering the population too quickly.<sup>130</sup> The policy ended in 2015 and was updated to allow for up to two children per couple.<sup>131</sup> There is hope that the increase in births will help change the ingrained preference for boys over girls.<sup>132</sup> The long standing policy coupled with the cultural preference for boys, has led to there being 34 million more boys than girls.<sup>133</sup> Human rights activists argue that no government should interfere with the decisions women make whether to have children, when and how many.<sup>134</sup> Seen as a form of oppression, some argue that allowing two children per married couple is not enough and that any restriction on the amount of children a family should be allowed is oppressive.<sup>135</sup>

#### IV. FINDING A SOLUTION

Part of what makes the problem of human overpopulation so difficult is that no one person feels responsible. Each individual who has a child does so with little thought of the global ramifications of such a decision.<sup>136</sup> It is a basic human right to produce an offspring, but the exercise of this right affects everyone.<sup>137</sup> Central to understanding the cause of human overpopulation is finding out what motivates people to procreate. Religion plays an active role in the decision of whether or not to have children.<sup>138</sup> According to Pope Francis, couples that choose not

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<sup>129</sup> *Id.*

<sup>130</sup> *Id.*

<sup>131</sup> Shen lu, Katie Hunt, *China's One-Child Policy Goes but Heartache Remains*, CNN (Dec. 31, 2015) [http://www.cnn.com/2015/12/31/asia/china-second-child-policy-in-effect/index.html?eref=rss\\_topstories](http://www.cnn.com/2015/12/31/asia/china-second-child-policy-in-effect/index.html?eref=rss_topstories).

<sup>132</sup> *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> Latanya Mapp Frett, *The End of China's One-Child Policy Isn't Enough*, TIME (Nov. 9, 2015) <http://time.com/4098745/china-one-child-policy-rights/>

<sup>135</sup> *Id.*

<sup>136</sup> Daniel Engber, *Global Swarming*, SLATE (Sept. 10, 2007) [http://www.slate.com/articles/health\\_and\\_science/green\\_room/2007/09/global\\_swarming.html](http://www.slate.com/articles/health_and_science/green_room/2007/09/global_swarming.html)

<sup>137</sup> *Id.*

<sup>138</sup> Scott Newman, *Couples Who Choose Not To Have Children Are 'Selfish,' Pope Says*, NPR (Feb. 12, 2015) <http://www.npr.org/sections/thetwo-way/2015/02/12/385735269/couples-who-chose-not-to-have-children-are-selfish-pope-says>.

to procreate are selfish and are evidence of a greedy generation.<sup>139</sup> In a visit to the Philippines, a highly populated nation, the Pope defended the Catholic Church's ban on artificial contraception as against church doctrine and urged that Philippine families be sanctuaries of respect for life.<sup>140</sup> In a country where roughly 81% of the population is Roman Catholic, the Catholic Church's official stance on issues such as contraception become central to understanding and predicting future population growth.<sup>141</sup>

Because of the fundamental right to procreate, a government mandate is unlikely to be helpful or legal in combating the problem.<sup>142</sup> Unless and until the problem has become urgent enough to be apparent in the United States, any government limitation on the fundamental right to procreate is unlikely to pass strict scrutiny.<sup>143</sup> A change in this trend must come from a collective cultural change in the values of society as a whole and a voluntary effort from the individual, not a mandated order from the collective.<sup>144</sup> Understanding what influences families to have children is the first step in learning how to address those influences.

#### A. RAISING AWARENESS THROUGH EDUCATION

The countries experiencing the greatest population growth are third world countries.<sup>145</sup> Most of the population growth in the next century will come from the forty-eight least developed countries, thirty-two of which are in Africa.<sup>146</sup> Due in part with the agrarian societies of these

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<sup>139</sup> *Id.*

<sup>140</sup> Scott Newman, *Couples Who Choose Not To Have Children Are 'Selfish,' Pope Says*, NPR (Feb. 12, 2015) <http://www.npr.org/sections/thetwo-way/2015/01/16/377686009/pope-on-visit-to-philippines-defends-catholic-ban-on-contraception>

<sup>141</sup> *Religion in the Philippines*, TAGALOG LANG (2010) <http://tagaloglang.com/religion-in-the-philippines/>.

<sup>142</sup> Daniel Engber, *Global Swarming*, SLATE (Sept. 10, 2007). [http://www.slate.com/articles/health\\_and\\_science/green\\_room/2007/09/global\\_swarming.html](http://www.slate.com/articles/health_and_science/green_room/2007/09/global_swarming.html).

<sup>143</sup> *Skinner v. Oklahoma*, 62 S.Ct. 1110, 541 (1942).

<sup>144</sup> Daniel Engber, *supra* note 143.

<sup>145</sup> Shelly Shah, *Types of Society: Tribal, Agrarian and Industrial Society*, SOCIOLOGY DISCUSSION <http://www.sociologydiscussion.com/society/types-of-society-tribal-agrarian-and-industrial-society/2190>.

<sup>146</sup> John Vidal, *World Needs to Stabilize Population and Cut Consumption, says Royal Society*, The Guardian (Apr. 25, 2012)

countries, children are more than just a means to pass on legacy, they are an economical unit.<sup>147</sup> Each additional member of the family is one more permanent worker to till the fields and assist in the arduous process of the harvest.<sup>148</sup> The United States experienced a lower birth rate following the transition to an industrial society.<sup>149</sup> The transition lowered the need to rely on children as a source of labor.<sup>150</sup> On the contrary, children in industrial societies are now a cost as opposed to a benefit, creating a financial incentive to keep families smaller.<sup>151</sup> Furthermore, due to the lower quality of healthcare, the HIV epidemic in Africa, and generally high mortality rates, there is an unconscious pressure to have more offspring with the expectancy that some will not live to see adulthood.<sup>152</sup> As long as third world countries remain agrarian, it is unlikely that their population growth will decrease.<sup>153</sup>

Not all countries are experiencing population growth, some are even losing population. Japan lost 244,000 of its population in 2013.<sup>154</sup> One of the greatest determinants in population growth is the educational level obtained by women.<sup>155</sup> In Japan, 53% of the population earns a college degree, one of the highest in the world.<sup>156</sup> Increasing the rates of education on a global scale may help curb the population growth and keep them at more sustainable levels, although a recent study showed that educated women are no longer having fewer children compared to

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<http://www.theguardian.com/environment/2012/apr/26/earth-population-consumption-disasters>.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> GLOBAL ISSUES, *Poverty and Population Growth: Lessons from our own Past* (Dec. 2, 2000) <http://www.globalissues.org/article/206/poverty-and-population-growth-lessons-from-our-own-past>.

<sup>150</sup> *Id.*

<sup>151</sup> *Id.*

<sup>152</sup> *Id.*

<sup>153</sup> *Id.*

<sup>154</sup> Adam Pasick, *Japan is rapidly losing population—and half the world is about to join it*, QUARTZ (Jan. 2, 2014) <http://qz.com/162788/japan-is-rapidly-losing-population-and-half-the-world-is-about-to-join-it/>.

<sup>155</sup> *Id.*

<http://www.iiasa.ac.at/web/home/research/researchPrograms/WorldPopulation/Research/ForecastsProjections/DemographyGlobalHumanCapital/Education.en.html>.

<sup>156</sup> Leigh Montgomery, Stacie Williams, *Countries with the Highest College Graduation Rates*, THE CHRISTIAN SCIENCE MONITOR (Aug. 9, 2010) <http://www.csmonitor.com/USA/Education/2010/0809/Countries-with-the-highest-college-graduation-rates/Japan-53.7-percent>.

their less educated counterparts.<sup>157</sup> A short-term solution that would benefit all would be for first world countries lacking in population growth to make up the population difference through immigration. Allowing for easier immigration from countries suffering from overpopulation such as China and India would alleviate the problems faced in those countries while making up the population difference in the countries that need it.

Improving the availability of contraceptives is also a powerful tool in managing populations. In 2006, 49% of all pregnancies in the United States were unintended.<sup>158</sup> Women in the United States most likely to have unintended pregnancies were those who were less educated or were lower-income.<sup>159</sup> In the United States, 99% of sexually active women between the ages 15-45 have used contraceptives.<sup>160</sup> In Africa, the average drops down to 43%, with only 35% for those in the lower quintiles of income.<sup>161</sup> Guatemala is another country where the lack of contraceptive use is affecting population growth.<sup>162</sup> The country is predominantly Roman Catholic and therefore, contraceptives are largely unavailable and socially taboo. The population of Guatemala doubles every 22 years. The Catholic Church maintains that population growth is seldom the cause of poverty and environmental problems. Lowering the disparities of contraceptive use across countries and economic levels would aid in the management of unplanned pregnancies through better family planning practices.<sup>163</sup>

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<sup>157</sup> Moshe Hazan, Hosny Zoabi, *Highly Educated Women No Longer Have Fewer Kids*, VOX (Dec. 11, 2015) <http://www.voxeu.org/article/highly-educated-women-no-longer-have-fewer-kids>.

<sup>158</sup> CENTERS FOR DISEASE CONTROL AND PREVENTION, *Unintended Pregnancy Prevention* <http://www.cdc.gov/reproductivehealth/unintendedpregnancy/>.

<sup>159</sup> *Id.*

<sup>160</sup> GUTTMACHER INSTITUTE, *Contraceptive Use in the United States* (Oct. 2015) [http://www.guttmacher.org/pubs/fb\\_contr\\_use.html](http://www.guttmacher.org/pubs/fb_contr_use.html).

<sup>161</sup> Andreea A Creanga, et al., *Low Use of Contraception among Poor Women in Africa: an Equity Issue*, World Health Organization (Feb. 1, 2011) <http://www.who.int/bulletin/volumes/89/4/10-083329/en/>.

<sup>162</sup> Omar Saleem, *Note, Be Fruitful, And Multiply, And Replenish The Earth, And Subdue It: Third World Population Growth And The Environment*, 8 GEO. INT'L ENVTL. L. REV. 1 (1995).

<sup>163</sup> WORLD HEALTH ORGANIZATION, *Contraceptive Prevalence Rate, Total Fertility Rate, Unmet Need For Family Planning*, [http://www.wpro.who.int/reproductive\\_health/data/en/](http://www.wpro.who.int/reproductive_health/data/en/).

## B. COMBATING INFANT MORTALITY RATE

A high infant mortality rate contributes to a higher fertility rate.<sup>164</sup> In other words, by lowering the infant mortality rate in developing countries suffering from a high fertility rate, the fertility rate will naturally go down. Economic inequality and poverty both play factors in a high infant mortality rate. There is also an inverse relationship between infant mortality and female literacy rates.<sup>165</sup> Improving the quality of life of those in developing countries through education, better access to health services, and economic stability would have the added effect of lowering the infant mortality rate in those countries and in turn stabilize population growth to more manageable levels.

The United States has the highest infant mortality rate of among first world countries.<sup>166</sup> The cause for this statistic is the same as is in third world countries: babies born to poor mothers are significantly more likely to die within the first year of life than those born to wealthier mothers.<sup>167</sup> While infant mortality rates within the first few weeks of life are mostly equal, the difference arises after the infants have left the hospital.<sup>168</sup> This is due to poor families inability to access healthcare after the child has left the maternity ward.<sup>169</sup>

## C. REDUCING CONSUMPTION

The primary problem with current human population levels is the rate at which resources are being consumed. An alternate solution to lowering human growth is to lower the consumption resources, effectively raising the carrying capacity.<sup>170</sup> Humans consume many of

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<sup>164</sup> Alex Jackson, *Fertility Rates*, GEOGRAPHY NOTES <https://geographyas.info/population/fertility-rates/>.

<sup>165</sup> Lauren Suave, *Linking Infant Mortality With Female Literacy Rate*, UNIVERSITY OF NORTH CAROLINA <http://www.unc.edu/~sauve/Final/>.

<sup>166</sup> Christopher Ingraham, *Our infant mortality rate is a national embarrassment*, THE WASHINGTON POST (Sept. 29, 2014) <https://www.washingtonpost.com/news/wonk/wp/2014/09/29/our-infant-mortality-rate-is-a-national-embarrassment/>.

<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *Id.*

<sup>170</sup> John Vidal, *World Needs to Stabilize Population and Cut Consumption*, says *Royal Society*, The Guardian (Apr. 25, 2012) <http://www.theguardian.com/environment/2012/apr/26/earth-population-consumption-disasters>. (82)

the earth's natural resources including: oil, wood, water, and fish at rates much greater than the planet can replace them.<sup>171</sup> Even in regards to beef, the amount of space and resources required to sustain such large amounts of cattle indirectly pull on natural resources. China is building an animal cloning facility at the cost of over \$31 million in order to provide food for its growing population.<sup>172</sup> The current goal is to provide 5% of the countries meat consumption and produce 100,000 cow embryos per year.<sup>173</sup> Through efforts such as these, the impact humans have on the environment and its limited resources can be mitigated or even eliminated, extending the timeline in which overpopulation becomes an issue.

### CONCLUSION

Human overpopulation is the fire fueling many of the environmental issues we face today. The rapid expansion of human development has come at the price of the habitats of many creatures. Displaced animals are unable to fend for themselves and die off or venture into human areas causing friction between interactions, as in the case of deer collisions. The need for fuel is rapidly depleting the world's non-renewable energy reserves, polluting the air we breathe, breaking down the ozone layer accelerating global warming, and even causing earthquakes. The need for food is causing the overfishing of our oceans, the over grazing of our lands, and the loss of vital topsoil. Once these resources are gone, they will be gone for good and will affect the path of the human race for the rest of its existence with widespread famine and death.

There is only one way to solve the problem and it is by curbing the population growth of humans. At first glance to the possible answers, only unethical and immoral ones come to mind but the best solution is neither. Such a goal can only be achieved through a collective global effort. This note has identified that high population growth is caused by poverty, illiteracy, poor healthcare access, and income inequality.

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<sup>171</sup> NEGATIVE POPULATION GROWTH, *Effects of Overpopulation: Wildlife and Habitat Destruction* [http://www.npg.org/wp-content/uploads/2013/07/effects\\_of\\_overpopulation\\_wildlife.pdf](http://www.npg.org/wp-content/uploads/2013/07/effects_of_overpopulation_wildlife.pdf).

<sup>172</sup> Alex Swerdlhoff, *China Is Building a Giant Animal-Cloning Factory to Feed the Masses*, MUNCHIES (Nov. 28, 2015) <http://munchies.vice.com/articles/china-is-building-a-giant-animal-cloning-factory-to-feed-the-masses>.

<sup>173</sup> *Id.*

Giving aid to third world countries through humanitarian efforts would improve the quality of life in overly populated areas, lower infant mortality rate, and thereby bringing stability to human growth. In the short term, cutting consumption, or changing the processes to renewable resources such as alternative energy and animal cloning would allow a higher number of humans to exist than otherwise and alleviate some of the immediate issues faced with too many humans and limited resources. Allowing people from highly populated areas to immigrate to countries such as Japan would be mutually beneficial and allow humanitarian efforts in developing countries to take effect. To hold otherwise risks political instability and forced mass migration.

Changing immigration policy to give preference and incentive to those in highly populated countries coupled with increased aid to these countries would likely serve to level off the rates of population growth.

The role human overpopulation plays in the environment is continuously growing and undeniable. The topic is intertwined with political, ethical, and moral implications and has become an almost taboo subject, but that does not lessen the importance of opening the lines of communication and creating a dialogue to begin the exchange of ideas to collectively reach a solution. It is an unexpected problem in which everyone contributes and affects the rest of the planet. Not discussing the effects of overpopulation increases the risk of crossing more planetary barriers, which leads to catastrophic consequences with irreversible effects for our planet, its species, and us.