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Concerns of Human Population Growth

By Sally Taylor, eHow Contributor



Humans traditionally have thought of themselves as separate from ecosystems. Scientists now realize that humans are, in fact, an integral part of the ecosystem. As such, their survival depends on the same aspects of an ecosystem as all other species. If you destroy the balance of these systems, the result can affect the human population as well. With 21st century population numbers that scientists concede are already over the planet's carrying capacity, we are seeing dangerous declines in ecosystems.

What Determines Overpopulation?

When the resources in an ecosystem are plentiful, a species population will grow. When the population becomes so large that it uses more resources than can be replenished, that species declines. The human population is now damaging ecosystems at a rate that is rapidly becoming irreparable. It is this condition that has scientists now agreeing, with only minimal dissent, that we have exceeded carrying capacity levels. Humans are, for example, polluting water at a rate that will leave water scarce for an estimated 3.1 billion people by the year 2025, according to documents published by Maricopa College. Scientists know that when one species declines, whole ecosystem chain reactions result. Survival necessitates bringing our resources back in balance with our numbers.

(2)

Soil Depletion

Agriculture has allowed human populations to flourish. To support an increasing population, we need to be able to produce more food. Unfortunately, as the population grows, we become less able to do so. When we began to use pesticides and fertilizer, we also inadvertently began to alter ecosystems in negative ways. We are losing soil by building, farming and stripping forests. Soil is becoming depleted, and desertification is occurring at the rate of millions of hectares per year. When land is no longer arable, people migrate and stress resources in other locations. As we continue to deplete soil in location after location, our ability to produce food for ever climbing population numbers is jeopardized.

Species Survival

Humans are causing alarming rates of extinction through our impact on ecosystems. We are destroying habitats by clearing land for crops and cutting trees for fuel. We deplete predator, pest and food species by poisoning, hunting and fishing until many drop below the minimum viable population level and are lost. Because species in an environment are interdependent on the existence of other species, a chain reaction, or secondary extinction, starts. This process usually occurs over time, but humans are causing the rapid onset of the sixth great extinction in the history of life on Earth, a problem being addressed by scientists globally.

Global Action

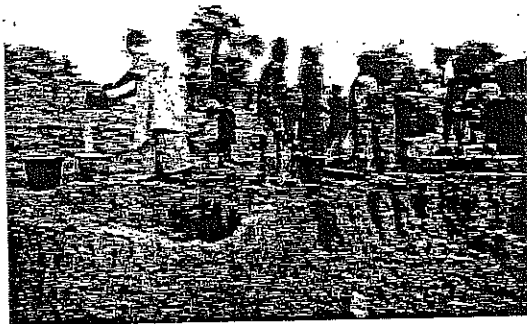
Worldwide action to restore ecosystems has been initiated. The U.N. Millennium Project is addressing issues of human population control through cultural development and contraception. Ecological organizations are enacting the U.N. Agenda 21, restoring environments and enacting conservation measures to prevent further damage. Governments are imposing standards on companies and communities to ensure minimal pollution and maximum ecological activity. Schools are teaching environmental responsibility to students and communities. Whether we succeed in restoring balance will be determined ultimately on how willing we are, as individuals, to minimize our "ecological footprints."

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What Are the Worldwide Causes of Population Growth?

By Scott Johnson, eHow Contributor



According to the U.S. Census Bureau, since 1910 world population has grown from 1.5 billion to 6.9 billion. The United Nations estimates that world population will reach 9 billion by 2050. Population growth increases as death rates decrease more than birth rates increase. Advances in healthcare and agriculture have led to lower mortality rates worldwide. However, considering that population growth is occurring primarily in poor countries, socioeconomic factors also significantly impact population growth rates.

Fertility

The Total Fertility Rate, or TFR, is the total number of children born per woman if all women live through childbearing years. A TFR of 2 is considered the required rate to maintain a stable population. Most of the countries with the highest TFRs are in Africa, with Niger, Uganda, Mali, Somalia, Burundi, Burkina Faso and Ethiopia having fertility rates over 6. All countries with TFRs over 3 have low per capita income rates.

Health and Food

Worldwide, mortality rates have been reduced through introduction of health services, preventive education and improvements in food security through advances in agriculture. In the developed world, birth rates have fallen to compensate for longer life expectancy, resulting in stable or shrinking native populations. In poorer countries, birth rates have remained at high levels, while mortality rates have not fallen to the same degree as in developed economies.

Population Growth in Developing Countries

In the poorest of countries, where population growth is highest, children represent a form of economic security. A child can be economically productive, contributing more than she consumes, at a fairly young age. In agricultural communities, children are a valuable source of labor and provide care for parents in old age. Moreover, in poor communities, child mortality is high. Therefore, many people in poor communities may consider it advantageous to have several children, or oftentimes several male children, to ensure that some reach adulthood. Sociological studies also show that population growth tends to be higher in cultures where women are less empowered in family decisions.

Solutions

The rapid growth of world population creates numerous societal problems, including food insecurity, water scarcity and a general overburdening of the resource base. While increased access to family planning and education can decrease fertility rates to a degree, economically insecure people will continue to reproduce at unsustainable rates despite these measures. To bring birth rates down in developing countries, the world community needs a comprehensive approach that places a higher priority on the fight against poverty.

Human Population Growth

Name: _____

Objectives: You will create a graph of human population growth and use it to predict future growth. You will identify factors that affect population growth.

Statistics on Human Population

Year A.D.	Number of People (in billions)
1650	.50
1750	.70
1850	1.0
1925	2.0
1956	2.5
1966	3.3
1970	3.6
1974	3.9
1976	4.0
1980	4.4
1991	5.5
2000	6.0
2004	6.4

Instructions for creating your graph.

Place time on the horizontal access. Values should range from 1650 to 2020.
 Place number of people on the vertical access. Values should range from 0 to 20 billion.
 Make sure that your graph is a full page in size and you have the correct labels for the X and Y access and a title for your graph.

Analysis

1. It took 1649 years fro the world population to double, going from .25 billion people to .50 billion people. How long did it take for the population to double once again?
2. How long did it take for the population to double a second time? _____ A third time? _____
3. Based on your graph, in what year will the population reach 8 billion? _____
4. Based on your graph, how many years will it take for the population of 2004 to double? _____

The Earth's Carrying Capacity

Prior to 1950, the death rate was high, which kept the numbers of humans from increasing rapidly. In the 19th Century, the agricultural revolution increased food production. The industrial revolution improved methods of transporting food and other good. In the 20th Century, advances in medicine, sanitation and nutrition have decreased the death rates further. These factors combined to produce the rapid growth of the human population in the 20th century.

IV. Human Population Growth

1. The history of human population growth: How we began sidestepping controls over our growth rate:

FIRST, Humans developed the capacity to expand into new habitats

- 2,000,000 YPB (years before the present): Early humans were vegetarians, but ate meat when they could get it!
- 200,000 YBP: Humans organized into bands of hunter/gatherers
- 40,000 YBP: Hunter / gatherers spread throughout the world, using knowledge passed on to generations to live in diverse habitats by building fires, building shelter, making clothing and tools.
- Knowledge and language development allowed humans to survive in habitats

throughout the world.

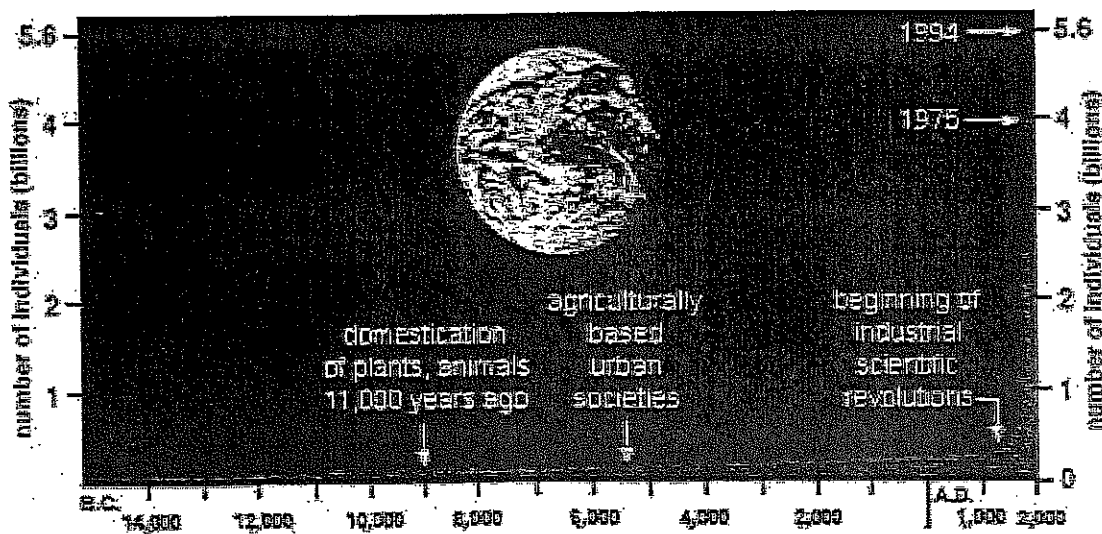
SECOND, Humans increased our carrying capacity in existing habitats

- 12,000 YBP: Humans shifted to farming - agriculture, domestication of animals and wild grasses (rice, corn, wheat, rye), irrigation, to meet specific human needs. (Human population in 10,000 BC: 5-10 million)
- Agriculture increased the carrying capacity for the human population.

THIRD, Humans sidestepped limiting factors over our growth rate

- ~200 YBP: (1802) Knowledge of disease processes, increased medical care, improved sanitary conditions, use of fossil fuels for heat, warmth = dropped death rate sharply. (Human population in 1800: 1,000,000,000)
- ~100 YBP: (1902) Development of antibiotics, surgical procedures, vaccines, machines, allowed support of larger population. (Human population in 1930: 2,000,000,000)
- Knowledge about disease and treatments allowed humans to sidestep limiting factors to growth.

2. Growth curve for the human population: YIKES!!!!



Urban Area	Population	Area (km ²)	Density
1 Tokyo-Yokohama	27,245,000	2,819	9,664
2 Mexico City	20,899,000	1,351	15,465
3 Sao Paulo	18,701,000	1,168	16,017
4 Seoul	16,792,000	685	18,965
5 New York	14,625,000	3,298	4,434
6 Osaka-Kobe-Kyoto	13,872,000	1,281	10,825
7 Bombay	12,101,000	246	49,202
8 Calcutta	11,898,000	541	21,990
9 Rio de Janeiro	11,698,000	673	17,367
10 Buenos Aires	11,657,000	1,385	8,416
11 Moscow	10,446,000	981	10,646
12 Manila	10,156,000	487	20,867
13 Los Angeles	10,130,000	2,874	3,525
14 Cairo	10,099,000	269	37,509
15 Jakarta	9,882,000	197	50,225
16 Teheran	9,779,000	290	33,726
17 London	9,115,000	2,263	4,028
18 Delhi	8,778,000	357	24,580
19 Paris	8,720,000	1,118	7,797
20 Karachi	8,014,000	492	16,292

Top 100 countries ranked by population. Feeling a little less crowded now?

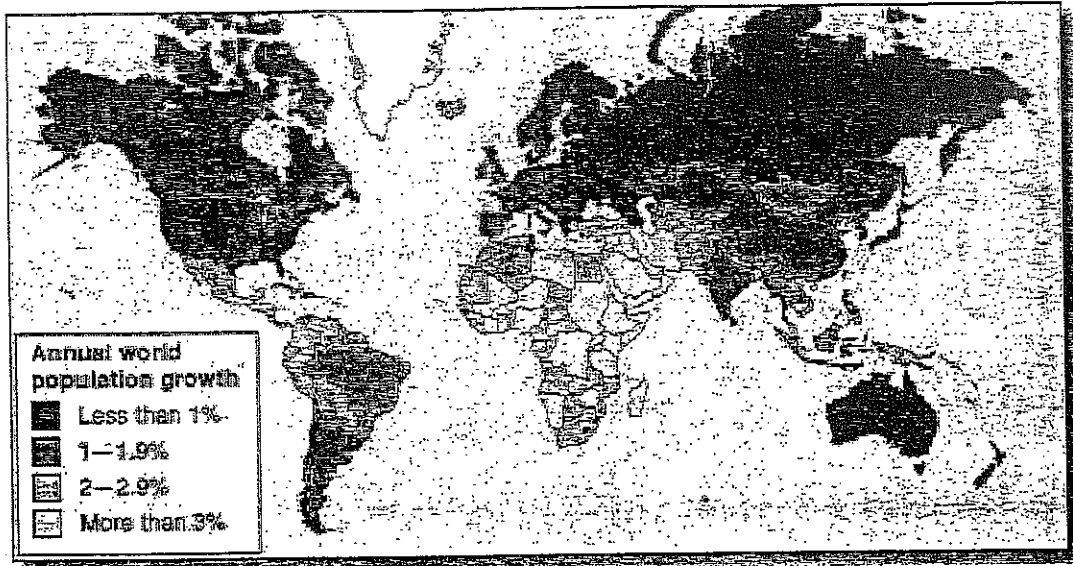
You decide: which country is the most overpopulated in terms of resource consumption and creation of environmental damage? See more at [Population and the Environment](#)

	U.S.A.	India
Production / consumption of goods & services	21%	1%
Use of world's non-renewable resources	25%	3%
Creation of world's trash and pollution	25%	3%
Percent of world's population	5% ~280 million	16% ~1.10 billion

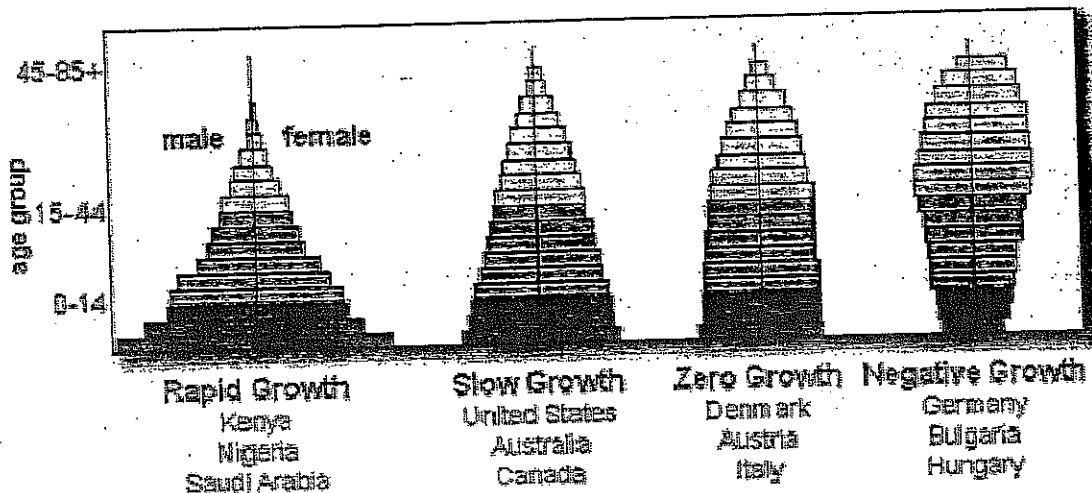
V. Population Control

Many governments are trying to lower birth rates through family planning programs.

- Average "replacement rate" of ~2 children per couple
- But, even if each couple on the planet decided TODAY to have only 2 kids, the human population would keep growing for another 60 years because of all the young people around today who will one day reach reproductive age! (Currently, more than 33% of the world's population is in the pre-reproductive state!)
- Today: total fertility rate in the US - 6.5 in 1950 and 3.1 in 1995



A country's age structure tracks the number of people in the pre-reproductive, reproductive, and post-reproductive years. Age structures for a few countries:



Slowing the birth rate - some trends:

- Delayed reproduction: until '30s (rather than teens or 20s)
- Use of natural or artificial means of birth control
- Nature's most important check on human fertility - breastfeeding!
- Breastfeeding prolongs the return of menstruation after childbirth, and inhibits ovulation. Note: don't count on it :-)
- The erosion (in the 1930s - 60s) of breastfeeding and, with it, the early return of fertility has fueled the exponential growth of the human population! (80s and 90s - big comeback!)

