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Chapter 8 Notes

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Period 2

Chapter 8: Human Population

*Central Case: China’s one-child policy*

1. China in 2006: 1/5 of 6.5 billion total population
2. Mao Zedong ruled in 1950
	1. 540 million ppl
	2. Believed growth was desirable 🡪 china grew
3. 1970 – improvement in food production, distribution health 🡪 pop 790 million ppl(5.8 births per woman)
4. Neg impacts on soil, water, air, forests
5. The government instituted a one-child policy
	1. Education, marry later, have fewer kids (some only allowed one), contraceptions
	2. By 1975 growth rate from 2.8% to 1.8%
	3. 1979 – more dramatic steps to enfore policy

1 child = better education, longer maternity leave, gov’t job, medical care

More than 1 child = employment discrimination, scorn, fines

* 1. growth rate plummeted
	2. The policy is now less strict
1. Current growth is .6%
2. The successful program has unintended consequences
	1. Killing of female infants
	2. Black-market trade in teenage girls

A. Human Population Growth: Baby 6 (7) billion and beyond

 6 billionth baby on 10/12/1996

The human population is growing nearly as fast as ever

1. Pop doubled since 1964 abd growing 78 million ppl per year (2.5 ppl/sec)
2. 1 billion 🡪1800

2 billion 🡪1930

3 billion 🡪1960

4 billion 🡪9175

5 billion 🡪1987

6 billion 🡪1999

7 billion 🡪2011

1. Exponentially growth – the increased in a quantity by a fixed percentage per unit time
2. Growth rate in 1960s at 2.1% 🡪% 1.2%
	1. Start with one man and one woman 🡪 2393 ppl atfert 40 generations

Is population growth really a problem?

1. Technology, sanitation, medication, and increased food increase population
	1. 🡪 Death rates drop, but not birth rates
2. Population growth was seen as good
	1. Support for elderly, a larger labor pool
3. Cornucopian view: population growth is not bad if new resources can be found
4. Sheldon Richman: humans turn everything into resources 🡪 carrying capacity doesn’t apply
5. Population growth has caused famine, disease, conflict; Less space, food, wealth per person
6. Policymakers still believe population growth increases economic, political, and military strength
	1. Some nations offer incentives for more kids
7. 3/5 euro nations think birth rates are too low
8. 56% non-euro nations think their birth rates are too high and 8% feel are too low

Population is one of several factors that affect the environment

1. The **IPAT model**: I = P ×A ×T ×S
	1. Formula used to see how population affects the environment
	2. Total impact (I) on the environment results from:
	3. Population (P) = individuals need space and resources
	4. Affluence (A) = greater per capita resource use
	5. Technology (T) = increased exploitation of resources
	6. Sensitivity (S) = how sensitive an area is to human pressure
2. For example: increased agricultural production in china
	1. Modern China’s increasing affluence is causing:
		1. Increased resource consumption
		2. Farmland erosion, depleted aquifers, urban pollution
3. Further model refinements include the effects of education, laws, and ethics on the formula
4. Impact equates to pollution or resource consumption
5. Technology has increased efficiency and reduced our strain on resources 🡪 Resulting in further population growth

B. Demography

All principles of pop ecology apply to humans too

Carrying capacity of humans: 1 – 2 billion in healthy enviro 🡪 33 billion in extreme poverty

Demography is the study of human population

1. **Demography**: the application of population ecology to the study of change in human populations
2. Demography data helps us understand human reproduction and effects in community and enviro
3. Predict populations and enviro impacts
4. Demographers study: Population size, Density and distribution, Age structure, Sex ratio, Birth, death, immigration, and emigration rates
* Population size
1. 1.3 bill in china, 1.1 bill in India, 300 million in US
2. Pop size – the absolute number of individuals
* Population density and distribution
1. The UN predicts 9 billion by 2050
	1. Increased density impacts the environment, but relieves pressure in less-populated areas
	2. Highest density: temperate, subtropical, tropical biomes, Cities (china, euro, Mexico, South Africa, India)
	3. Lowest density: away from water
2. Humans are unevenly distributed around the globe
3. Unpopulated areas tend to be environmentally sensitive (high S value in the IPAT equation)Vulnerable to humans (e.g., deserts, arid grasslands)
4. Urban way of life: pollution, strain on resources, fossil fuel consumption, good transportation, and packing, etc.
* Age structure
1. Age structure diagrams (population pyramids) show age structure
	1. Wide base = many young, High reproduction, Rapid population growth
	2. Even age distribution: Remains stable, births = deaths
	3. Canada: .3%
	4. Madagascar: 2.7%



* 1. China 1970, the median age was 20 🡪 27 in 1995
		1. Fewer people will be working to support social programs
		2. Decreased crime rate (kids no dependent)
	2. Ageing also occurring in the US
		1. care and financial assistance
		2. Taxes will increase for Social Security and Medicare
* Sex ratios
1. Human sex ratios at birth slightly favor males For every 100 females born, 106 males are born
	1. Equals out one men and women reach reproductive age
2. Chinese females are selectively aborted
	1. 120 boys were reported for 100 girls
	2. Cultural gender preferences + The government’s one-child policy = abortion of girls
	3. The undesirable social consequences
		1. Many single Chinese men
		2. Teenage girls are kidnapped and sold as brides

Population growth depends on rates of birth, death, immigration, and emigration

1. Birth and immigration add individuals, and Death and emigration remove individuals
2. Technological advances caused decreased deaths
	1. The increased gap between birth and death rates resulted in population expansion
3. Emigration: War, civil strife, and environmental degradation cause people to flee their homes
4. 1Each year, 25 million refugees escape poor environmental conditions
	1. •This movement causes environmental problems
5. Pop growth changes with food production and quantity
6. Slower rates of growth do not mean a decreasing population—population size continues to increase

A population’s total fertility rate influences population growth

1. **Total fertility rate (TFR)**= the average number of children born to each female
2. **Replacement fertility**= the TFR that keeps the size of a population stable (about 2.1)
3. Causes of decreasing TFR
	1. Medical care reduces infant mortality
	2. Urbanization increases childcare costs
	3. Children go to school instead of working
	4. Social Security supports the elderly
	5. Educated women enter the labor force
4. Euro: TFR from 2.6 to 1.45 in last 50 years 🡪 pop declining in 18 or 43 nations
5. **Natural rate of population change** = due to birth and death rates alone
6. Natural rate of population change in Europe in 2005 was -.1%
	1. Worldwide < 2.1

Some nations have experiences a change called the demographic transition

1. In countries with good sanitation, health care, and food, people live longer
2. **Life expectancy**= average number of years that an individual is likely to continue to live
	1. Increases with reduced rates of infant mortality
	2. 46 🡪 67 yrs.
	3. Global crude death rate has cropped form 20/1000 deaths to 9/1000
3. Urbanization, industrialization, and personal wealth reduce infant mortality rates
4. **Demographic transition**= a model of economic and cultural change proposed in the 1940s and 50s by Frank Notestein
	1. Explains the declining death and birth rates in industrializing nations
	2. A stable pre-industrial state of high birth and death rates changes to a stable post-industrial state of low birth and death rates
		1. As mortality decreases, there is less need for large families and parents invest in quality of life
		2. Death rates fall before birth rates, resulting in population growth
	3. So basically, population growth occurs when society movies from one condition to another
* The pre-industrial stage
1. Death and birth high 🡪 not much growth
2. High birth rates b/ high mortality
* The industrial stages and galling birth rates
1. Transitional stage: declining death rates due to increased food production
2. New ecomonic soccial condition
* The industrial stage and falling birth rates
1. Industrial stage - 3rd stage:
	1. Industrial opportunities fr employment out of home (esp for women)
	2. Children are less valuable b/c ddin’t help meet family needs
	3. Birth control
	4. Birth rates fall 🡪 close gap with death rates 🡪 growth ends
* The post-industrial stage
1. Post-industrial stage – both birth and death rates fallen to low an stable level
2. Pop size levels or declines slightly
3. Society enjoy fruits of industrialization without pop growth

IS the demographic transition a universal process?

1. It has occurred in Europe, the U.S., Canada, Japan, and other nations over the past 200–300 years
2. But it may or may not apply to developing nations
	1. The transition could fail in cultures that place greater value on childbirth or Grant women fewer freedoms
3. For people to attain the material standard of living of North Americans, we would need the natural resources of four and a half more Earths

C. Population and Society

 Demographic transition theory = societal factors + statistical study of human factors

Women’s empowerment greatly affects population growth rates

1. Fertility rates drop when women gain access to contraceptives, family planning programs, and educational opportunities
2. 2003: 53& of women worldwide reported using contraceptive method (86% in China)
	1. Six euro nations, Costa Rica, Cuba, New Zealand, Canada, Brazil, and Thailand shoed above 70%
	2. US at 68%
	3. 23 african nations at less than 10% 🡪 high fertility rates in sub-Saharan Africa (5.6 TFR)
	4. Africa TRF
3. Many men resist women’s decision
4. Fertility are lower where women have their own voice and choices
5. Over 60% of the world’s poor are women
6. We are a long way from achieving gender equality
7. Violence against women remains shockingly common making
8. The gap is obvious at high levels of government (only 13% elected officials are women worldwide)
	1. Us lags behind Europe and even developing countries

Populations policies and family-planning programs are working around the globe

1. Funding and policies that encourage family planning lower population growth rates in all nations
2. Thailand’s gov’t-sponsored educational-based approach to family planning reduced its growth rate from 2.3% to .7% in 2005
	1. Brazil, Mexico, Iran, Cuba, and other developing countries have active programs
	2. India polices are much toooo weak, and its pop will overtake China by 200 million ppl in 2050 if they don’t strengthen
3. Blue = with family planning; Red – without family planning
4. 1994’s UN population conference in Cairo, Egypt where 179 nations called for universal access to reproductive health care within 20 years 🡪 gov’t more focused in pop-related issues
5. US often declined family planning efforts if UN (Bush in 2001)

Poverty is strongly correlated with population growth

1. Poorer societies have higher population growth rates
	1. They have higher fertility and growth rates, with lower contraceptive use
	2. consistent with the demographic transition theory
2. 99% of the next billion people added will be born in poor, less developed regions that are least able to support them
	1. In 1960, 70% of all people lived in developing nations; As of 2010, 82% live in these nations
3. Poverty exacerbates population growth Population growth exacerbates poverty
4. Population growth in poor nations increases environmental degradation
	1. Farming degrades soil in arid areas (Africa, China)
	2. Poor people cut forests, deplete biodiversity, and hunt endangered species (e.g., great apes)
	3. Great apes killed for “bush meat”

Comsumption from affluence creates environmental impact

1. The population problem is not only in poor countries
2. Affluent societies have enormous resource consumption and waste production
3. People use resources from other areas, as well as from their own
4. Ecological footprints are huge
5. We are living 20% beyond our means (passed maxed eco footprint in 1987)

The wealth gap and population growth contribute to violent conflict

1. Over hald earth’s ppl live below $2 per day (poverty)
2. Richest one fifth use
	1. 80 times the imcome of the poorest one fifth
	2. 86% world resources (14% for rest 4/5)
3. As gas between rich and poor get wider, more ppl are becoming poor
4. Increasing tensions between “haves” and “have-nots”
5. US Dept of Defense and State takes poverty into account when planning warfare

HIV/AIDS impacts African populations

1. HIV and AIDS 🡪 great mortality than natality
2. 2004: 38 million affected, 25 million of those in Sub-Saharan Africa
3. Low use of contraceptives also contributes
4. 1 in 13 aged 15 to 49 affected (1 in 5b in south countries)
5. The AIDS epidemic is having the greatest impact since the Black Death in the 14th century
6. 6000 die every day
7. 96/1000 infacnt mortality

Severe demographic changes have social, political, and economic repercussions

1. AIDS undermines the ability of poor nations to develop
	1. Millions of orphans are created
	2. Fewer teachers and workers to fill jobs
		1. 1999 Zimbabwe lost 600 teachers and replaced with only 300
		2. SOuthen Africa loses $7 Billion per year b/c of declines in labor forces
	3. Families and communities break down
	4. Income and food production decline
	5. Debt and medical costs skyrocket
2. **Demographic fatigue =** governments face overwhelming challenges related to population growth
	1. With the added of stress of HIV/AIDS, governments are stretched beyond their capabilities
	2. Other countries MUST help, or affected countries will fail to go through demographic transition
		1. Rising death rates 🡪 pre-industrial condition
3. Developing nations must reduce pop and develoed countries must reduce consumption

**Conclusion**

1. The human population is larger than at any other time
2. Rates are decreasing but populations are still rising
3. Most developed nations have passed through the demographic transition
4. Expanding women’s rights slows population growth
5. Sustainability requires a stabilized population to avoid destroying natural systems