

## Chapter 20. Population, Urbanization, and the Environment



*Figure 20.1. The Alberta tar sands has become increasingly controversial since Suncor's first extraction plant opened in 1967. Development of the tar sands is a classic issue that pits corporate interests against environmental sustainability. (Photo courtesy of Dru Oja Jay, Dominion/flickr)*

### Learning Objectives

#### 20.1. Demography and Population

- Understand demographic measurements, such as fertility and mortality rates
- Describe a variety of demographic theories, such as Malthusian, cornucopian, zero population growth, and demographic transition theories
- Be familiar with current population trends and patterns

#### 20.2. Urbanization

- Describe the process of urbanization in Canada
- Understand the function of suburbs, exurbs, and concentric zones
- Discuss urbanization from various sociological perspectives

#### 20.3. The Environment and Society

- Apply the concept of carrying capacity to environmental concerns

- Understand the challenges presented by pollution, garbage, e-waste, and toxic hazards
- Describe climate change and its importance

## Introduction to Population, Urbanization, and the Environment

The Alberta tar sands (or bituminous sands) in the northeast of the province have been recognized as an important petroleum resource since the 19th century when the first extensive surveys were made. They cover about 140,000 square kilometres of boreal forest and muskeg, largely in the Athabasca River basin. The petroleum is in the form of crude bitumen, which is a dense, tar-like substance mixed with sand and clay. Extracting bitumen and heavy oils from the tar sands requires pit mining or surface mining; processing the ore with water, steam, and caustic soda; and storing the toxic by-products in tailings ponds. In 1967, when Suncor began the first intensive commercial development of the tar sands, oil was just over \$3 a barrel and the high cost of production limited the rate at which the resource was developed. In 1967, Suncor was producing 15,000 barrels/day. Today at prices that sometimes exceed \$100 a barrel, production is projected to double from the present 1.9 million barrels/day to 3.8 million barrels/day by 2023. Industry projects that eventually 9 million barrels of bitumen will be produced per day (Gosselin et al. 2010; Grant, Angen, and Dyer 2013).

The controversy over developing the tar sands pits two competing logics against one another: environmental sustainability versus capital accumulation. **Environmental sustainability** is the degree to which a human activity can be sustained without damaging or undermining basic ecological support systems. Environmental critics of the tar sands development note that the process of bitumen extraction requires vast amounts of energy, fresh water, and land, while producing significant environmental impacts in the form of greenhouse gases, reduction in air quality, destruction of peat bogs and wetlands, and accumulation of toxic waste in tailings ponds (Grant, Angen, and Dyer 2013). There are also health impacts: local aboriginal groups have experienced a 30 percent greater risk of cancer over expected cancer rates since 1998 (Droitsch and Simieritsch 2010). These are factors in addition to the basic problem of sustainability—they involve human reliance on fossil fuels in the face of potentially catastrophic climate change.

On the other hand, Canada has a capitalist economy based on private investment and capital accumulation (although both the federal and provincial governments have invested in tar sands development at various times). Since 1996 when capital investment exceeded \$1 billion per year for the first time, investment has continued to increase reaching \$4.2 billion/year in 2000 and \$16 billion/year between 2006 and 2008. Net profits for the industry increased from \$3.1 billion to \$37.8 billion between 1998 and 2008. Over the same period, the number of people directly employed in tar sands operations rose from 6,000 to 12,000, not including spin-off jobs in construction and maintenance of facilities and other services. Royalties and other land-related payments to the government of Alberta were \$3.8 billion in 2008 (Gosselin et al. 2010). The tar sands are booming economically, so much so that industry representatives argue that building refineries in Alberta to refine the raw bitumen rather than piping it to distant refineries would “overheat” the economy (i.e., create too many jobs). Some point to the “Dutch disease” effect of this economic development (i.e., that the artificially high petro-dollar is responsible for undermining other important sectors of the economy, notably manufacturing in Ontario and Quebec) (Stanford 2012), and others point to the problem of foreign ownership of Canadian resources (two-thirds of tar sands production is owned by foreign corporations) (De Souza 2012). However, the overall argument from the point of view of capital accumulation is that the benefits to the Canadian economy outweigh the drawbacks.

### How does sociological research help to understand and respond to these issues?

The 2000 movie *Erin Brokovich* told the story of the legal assistant who spearheaded a \$300 million lawsuit against a California power company. The story is true, and the town of Hinkley, California, is an example of a **cancer cluster**, a geographic area with proportionately higher cancer rates (in the *Erin Brokovich* case caused by a toxin leaked into the

groundwater). It can be very challenging to go up against major governmental or corporate interests, and the Hinkley case is an inspiring example of success; however, the damage wrought on that area's population cannot be undone.

As the stories of the Alberta tar sands and Hinkley illustrate, there are important societal issues connected to the environment and how and where people live. Sociologists begin to examine these issues through demography, or the study of population, and how it relates to sustainability, urbanization, the study of the social, political, and economic relationships in cities. Environmental sociologists look at the study of how humans interact with their environments. Today, as has been the case many times in history, we are at a point of conflict in a number of these areas. The world's population has recently reached 7 billion. A mid-range estimate suggests it will reach 8 billion by 2025 (UN 2013). Can our planet sustain such a population? We generate more trash than ever, from takeout coffee cups to obsolete cell phones with toxic chemicals to food waste that could be composted. Where is it all going? Until it developed the Green Lane landfill site, the city of Toronto was sending up to 140 garbage trucks a day to Michigan State. When that site is full in 2027 it is not clear where the trash will go (Hasham 2013). Cities and city living create new challenges for both society and the environment. These kinds of interactions between people and places are of critical importance.

How do sociologists study these issues? Functionalists note that one of the primary functions that any society needs to perform to ensure its survival is to adapt to the environment. In Talcott Parsons' AGIL schema (see Chapter 1), adaptation was the first of the primary "needs" that a society has to satisfy (1961). The economic system performs the function in human society of adapting to the natural environment to provide for human needs. In a functionalist analysis, when the norms of one system, like the economic system, become detached from, or unresponsive to, the other systems (like the ecological system on which society depends), disequilibrium is felt throughout society. In the 1982 film *Koyaanisqatsi*, this point was illustrated by showing contrasting images of living in balance with nature with images of living out of balance with nature. In the scenes depicting the lifestyle of the fast-paced, urban, consumer society, people pass by in fast motion like sausages on an assembly line. Not only is the economy unhinged from nature in this film, but individual life is shown to have lost meaningful connection with nature. The title *Koyaanisqatsi* is a Hopi Indian word meaning "life out of balance." One type of question that can be asked from a functionalist perspective is therefore: How can society be organized in a manner that restores balance with nature?

A critical sociologist will note that disequilibrium in a society's relationship with the environment does not just happen. There are vested interests that promote unrestricted exploitation of natural resources for short-term private profit. Capitalism is a system in which non-economic values—community life, ecological values, long-term sustainability, etc.—have no place in economic calculations of returns on investment. From the critical sociology point of view, changes in the human/nature relationship have to be examined as outcomes of relations of power and patterns of capital investment. Environmental issues are therefore not distributed equally around the world. Changes in the global mode of production lead to the creation of unsustainable population increases, slum cities, and lax controls on toxic waste in some parts of the world, while in other parts of the world, people consume resources, throw away surplus, and contribute to the problem of global warming at rates that are equally unsustainable.

A symbolic interactionist interested in the day-to-day interaction of groups and individuals might research topics such as how attitudes toward the environment have changed, how individuals negotiate contradictory messages about industrial development and the environment, or how new practices in everyday life (e.g., recycling, smoking, bicycling, the "100-mile" diet, protest activities) emerge as a result of environmental concerns. One interesting question is how discredited theories that challenge research on global warming continue to circulate and produce doubt about the effects of greenhouse gases. Although the days are gone when a premier of Alberta can proclaim that climate science is a hoax, the divide between what is a publicly credible theory and what is not remains more a matter of symbolic interaction than pure science per se.

## 20.1. Demography and Population



*Figure 20.2. Earth's population, which recently grew to 7 billion, could reach 11 billion by the end of the century. (Photo courtesy of David Sim/flickr)*

We recently hit a population milestone of 7 billion humans on Earth's surface. It took approximately 12 years to grow from 6 billion to 7 billion people (United Nations Population Fund 2011). In short, the planet is filling up. It is estimated we will go from 7 billion to 8 billion by 2025. How will that population be distributed? Where is population the highest? Where is it slowing down? Where will people live? To explore these questions, we turn to **demography**, or the study of populations. Three of the most important components affecting the issues above are fertility, mortality, and migration.

The **fertility rate** of a society is a measure noting the number of children born. The fertility number is generally lower than the fecundity number, which measures the potential number of children that could be born to women of childbearing age. Sociologists measure fertility using the crude birthrate (the number of live births per 1,000 people per year). Just as fertility measures childbearing, the **mortality rate** is a measure of the number of people who die. The crude death rate is a number derived from the number of deaths per 1,000 people per year. When analyzed together, fertility and mortality rates help researchers understand the overall growth occurring in a population.

Another key element in studying populations is the movement of people into and out of an area. This movement is called **migration**. Migration may take the form of immigration, which describes movement into an area to take up permanent residence, or emigration, which refers to movement out of an area to another place of permanent residence. Migration might be voluntary (as when university students study abroad), involuntary (as when Somalians left the drought and famine-stricken portion of their nation to stay in refugee camps), or forced (as when many First Nations were removed from the lands they had lived in for generations).

### Population Growth

Changing fertility, mortality, and migration rates make up the total **population composition**, a snapshot of the demographic profile of a population. This number can be measured for societies, nations, world regions, or other groups. The

population composition includes the **sex ratio** (the number of men for every hundred women) as well as the **population pyramid** (a picture of population distribution by sex and age) (Figure 20.4).

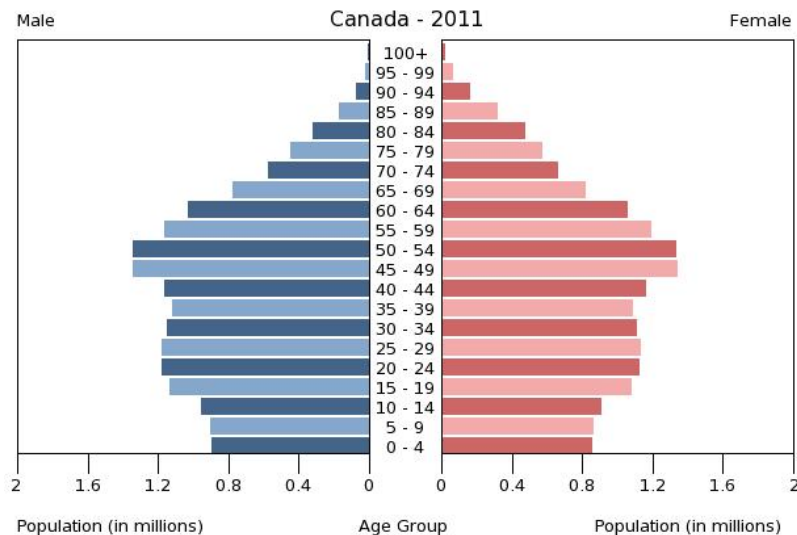


Figure 20.3. This population pyramid shows the breakdown of the 2010 Canadian population according to age and sex. (Graph courtesy of the U.S. Census Bureau, International Data Base)

Table 20.1. Varying Fertility and Mortality Rates by Country. (Chart courtesy of CIA World Factbook 2014)

| Country       | Population (in millions) | Fertility Rate | Mortality Rate | Sex Ratio Male to Female |
|---------------|--------------------------|----------------|----------------|--------------------------|
| Afghanistan   | 29.8                     | 5.4%           | 14.1%          | 1.03                     |
| Sweden        | 9.1                      | 1.9%           | 9.5%           | 0.98                     |
| United States | 313.2                    | 2.0%           | 8.24%          | 0.97                     |
| Canada        | 34.8                     | 1.6%           | 8.3%           | 0.99                     |

As Table 20.1 illustrates, countries vary greatly in fertility rates and mortality rates—the components that make up a population composition. Comparing these four countries reveals that there are more men than women in Afghanistan, whereas the reverse is true in Canada, Sweden, and the United States. Afghanistan also has significantly higher fertility and mortality rates than any of the other three countries. Do these statistics surprise you? How do you think the population makeup impacts the political climate and economics of the different countries? What factors lead to a sex ratio in which men outnumber women?

## Demographic Theories

Sociologists have long looked at population issues as central to understanding human interactions. Below we will look at four theories about population that inform sociological thought: Malthusian, zero population growth, cornucopian, and demographic transition theories.