
22
21
20
19
18
17
16
15
14
13
12

CHAPTER

31

Population Density in Japan: Life in a Crowded Country

31.1 Introduction

Imagine standing on a subway platform in Tokyo, Japan. It is rush hour. The station is crammed with people. You can barely move. The train thunders into the station and comes to a stop. The doors open. The crowd pushes you forward. Suddenly, the person behind you steps on your heel and your shoe comes off. You try to reach down and pick it up, but there are too many people. You are swept into the train without your shoe. Luckily, a station attendant will pick up your shoe and hold it for you. This is not the first time people have lost shoes during the Tokyo rush hour. And it will not be the last.

Tokyo is one of the world's most crowded cities. It is the capital of Japan, a very densely populated country. A country's **population density** is the average number of persons in a unit of area, such as a square mile. The higher that number is, the more crowded the country.

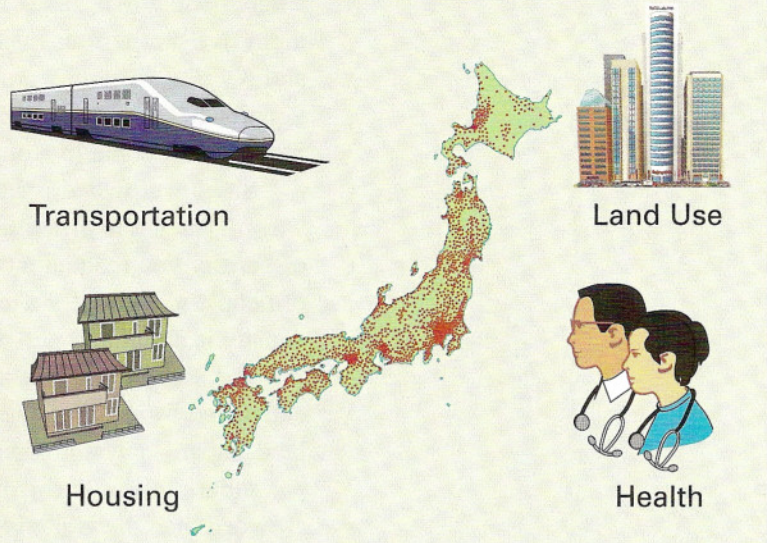
In 2004, the population density of Japan was 880 persons per square mile. In comparison, the United States had a population density of 83 persons per square mile. This means that Japan is almost 11 times as densely populated as the United States. In this chapter, you will learn how Japan's high population density affects life in that country.

Essential Question

How does population density affect the way people live?

The map in the center of this diagram shows where people live in Japan. The areas in red are the most densely populated parts of the country. Around the map are four symbols. They represent aspects of life that are affected by population density. Keep this diagram in mind as you try to answer the Essential Question.

Graphic Organizer



◀ Swimming pool in Tokyo

Mount Fuji over Tokyo Bay
Japan's mountains limit the amount of land that is suitable for living. Many of these mountains, like Mount Fuji, are volcanoes. Mount Fuji was once thought to be a sacred place. Today this beautiful volcano attracts weekend hikers eager to escape crowded cities.

31.2 The Geographic Setting

Japan is an island nation off the coast of East Asia. It is made up of four large islands and about 3,900 smaller ones. On a map, these islands form the shape of a thin crescent moon. All together, the Japanese islands make up an area about the size of Montana. To the west, the Sea of Japan (East Sea) separates Japan from its nearest neighbors, Korea and China. To the east lies the vast Pacific Ocean.

Japan enjoys a moderate **climate**. Summers are warm. Winters are relatively mild, with heavy snowfall limited to the northern islands. Plenty of summer rainfall makes Japan an ideal place for growing rice and other crops.

A Mountainous Landscape About three quarters of Japan is made up of mountains. These mountains were formed when **tectonic plates** collided deep beneath the sea. **Volcanoes** welled up in the cracks between the plates. Over millions of years, liquid rock flowing from the volcanoes built up into mountains.

Today volcanic mountains form the backbone of Japan. Many volcanoes are still active. No one knows when they might erupt again. The highest and most famous Japanese volcano is Mount Fuji. Its snowcapped cone towers above the city of Tokyo.

The tectonic plates that built up Japan are still pushing against each other. Whenever one of them moves, the ground shakes. Small earthquakes happen almost every day in Japan. Major earthquakes occur less often, but they can cause much damage. Undersea earthquakes sometimes trigger huge sea waves called **tsunamis**. When these waves hit the coast, they can wash away whole villages.

Limited Land for Living Only about an eighth of Japan is **arable land,** or land suitable for farming. The rest is too hilly to plow and plant. It is also too mountainous for large towns and cities.

The amount of arable land affects **population distribution,** or where people live. Japan has about 127 million people. Nearly all of them live on the four main islands of Hokkaido, Honshu, Shikoku, and Kyushu. But they are not distributed evenly on these islands. People tend to cluster where land is good for farming. In Japan, about 8 out of 10 people live on limited flat land near the ocean.

So how crowded is Japan? Geographers measure density in two ways. The first is **arithmetic population density**. This is the type of density you read about in the introduction. It compares the number of people to a country's total land area. Japan's arithmetic population density is about 880 persons per square mile.

The second measure is **physiologic population density**. It is calculated by dividing the number of people by the amount of *arable* land. Japan's physiologic population density is about 7,219 persons per square mile. By this measure, Japan is about 17 times more crowded than the United States. As you'll see, high population density affects many aspects of life in Japan.

Geoterms

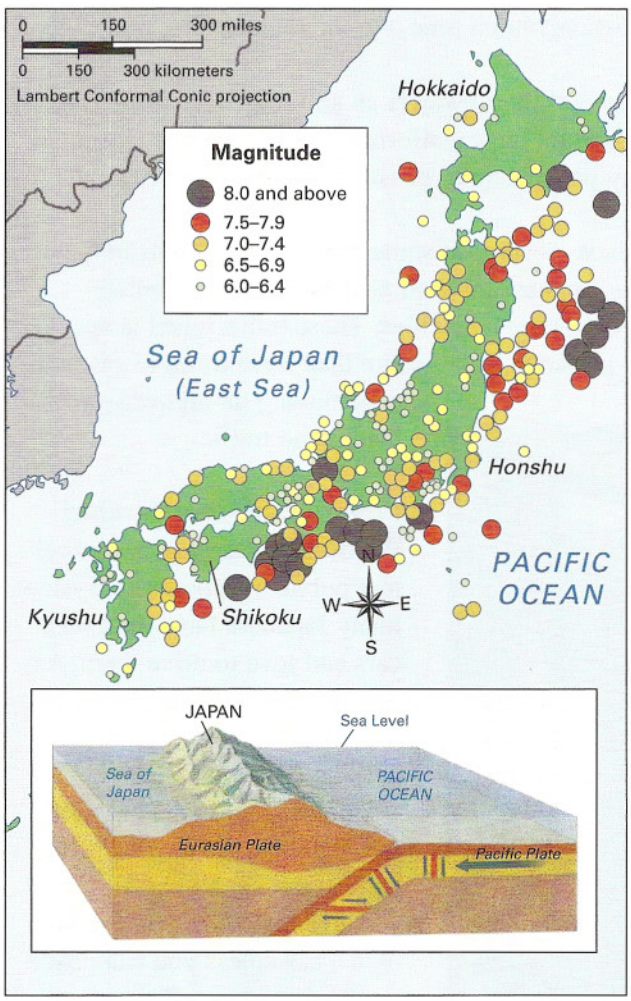
arable land land suitable for growing crops

arithmetic population density the population of a country divided by its total land area

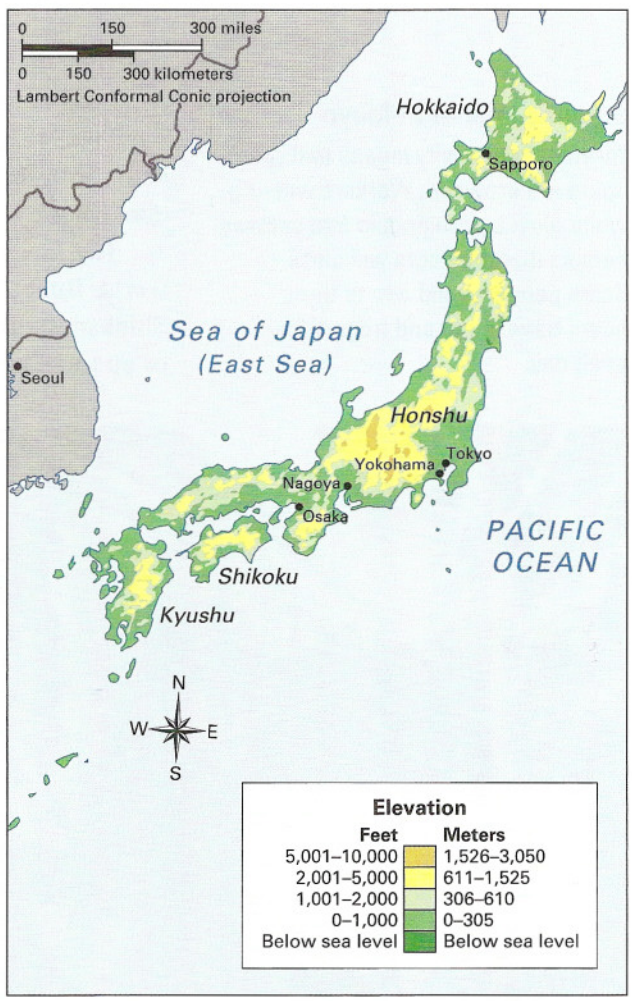
physiologic population density the population of a country divided by its arable land area

population distribution where people live in a country, whether crowded together in cities or spread out across the countryside

Earthquakes in Japan



Physical Features of Japan



When Two Plates Collide

Earth's crust below the Pacific Ocean is called the Pacific Plate. It slides under the Eurasian Plate, which is Earth's crust below the continents of Europe and Asia. When these two tectonic plates rub against each other, Japan is hit with an earthquake.

A Mountainous Landscape

About 70 percent of Japan is covered with mountains. The rivers flowing out of these mountains are too short and steep for boat travel. But they do provide hydroelectric power to Japan.

31.3 How Population Density Affects Transportation

Crowding has a big effect on transportation. What happens when millions of people in a huge city all head out for work in the morning? It takes a long time to get there! The average **commute time** in Tokyo is an hour and a half each day. This adds up to nearly 400 hours every year. That's enough time to watch 160 movies or take 40 flights from Tokyo to San Francisco. And some people's commute time is much higher than the average.

Public Transportation The Japanese have adapted to busy rush hours by creating an efficient public transportation system. Underground subways link one part of a city to another, while trains carry people from town to town. Japanese subways and trains run often. And they almost always run on time—to the minute. You can set your watch by them.

Rush hour in the Tokyo subway is an amazing sight. People wearing white gloves stand on busy platforms. The job of these *pushers* is to shove as many passengers as possible into the cars before the doors close.

The Japanese have developed some of the fastest trains in the world. Bullet trains—named for their shape and speed—called Shinkansen travel between many cities. These trains travel at speeds of up to 180 miles per hour. That's more than three times as fast as cars moving on highways when there is no traffic.

Subway Pusher in Tokyo
Tokyo's high density means that rush hours are crowded. Workers wearing white gloves push people into subway cars so that the doors will close. Some people spend two to three hours traveling to and from work each day.

Private Cars and Parking Problems Despite their excellent public transportation system, many Japanese have their own cars and love to drive them. As car ownership has increased, so have major traffic jams and parking problems.

Parking is such a problem in Tokyo that the city has strict rules about car ownership. If you live in Tokyo, you cannot own a car unless you can prove you have a place off the street to park it. Tokyo has also built high-rise garages that look like giant shoe cabinets. These garages use computer-controlled elevators to stack cars on top of one another.

Capsule Hotel in Japan
Hotels that rent sleeping capsules make good use of space in crowded Japanese cities. Each capsule has a mattress, a television with headphones, and a clock. Guests can spend time in the hotel's restaurants and public areas until they are ready for bed.

31.4 How Population Density Affects Housing

Housing a dense population can present challenges. In Japan, flat land for building is scarce. As a result, Japanese houses are smaller than American homes. Many Japanese families live in apartments no bigger than a family room in an American house.

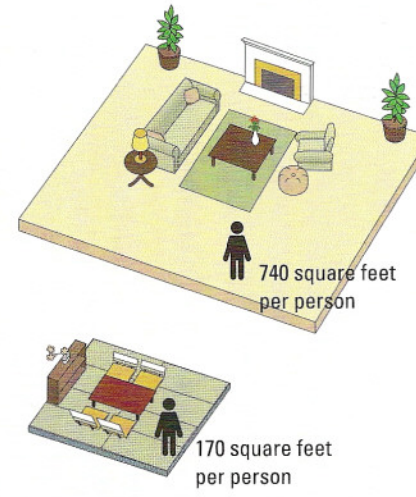
From the Country to the City The Japanese did not always crowd into small homes. Fifty years ago, Japan was largely **rural**. Most people lived in roomy one-story homes on farms. They also lived in **extended families**. Grandparents, parents, and children all lived together under one roof.

This pattern began to change in the 1950s. Many people left the countryside to go to school or work in cities. City apartments were small compared to rural homes. With space so tight, fewer people lived in extended families. Today, most Japanese live in **nuclear families**. These are families with just parents and their children.

Making the Most of Limited Space The Japanese have found clever ways to make the most of limited space. One way is to use rooms for more than one purpose. Many homes in Japan do not have separate bedrooms. At bedtime, mattresses called *futons* are taken from closets and spread on the floor of living rooms to sleep on.

The Japanese also make good use of limited space by making things smaller. Appliance makers produce small stoves and refrigerators to fit in tiny kitchens. Gardeners grow tiny trees called *bonsai* in shallow pots. A 10-year-old bonsai tree might be only a few inches tall.

Crowding even affects people after death. Most cemeteries in Japan are full. "Unless we try something new," warns a Buddhist temple leader, "all of Japan will turn into a graveyard." To save space, most Japanese have their bodies cremated, or burned, after death. A box of ashes takes up much less space than a coffin.



Homes in the U.S. and Japan
Japanese homes are smaller than those in the United States. A typical person in Tokyo has about 170 square feet of living space. A typical person in Washington, D.C., has about 740 square feet of living space.

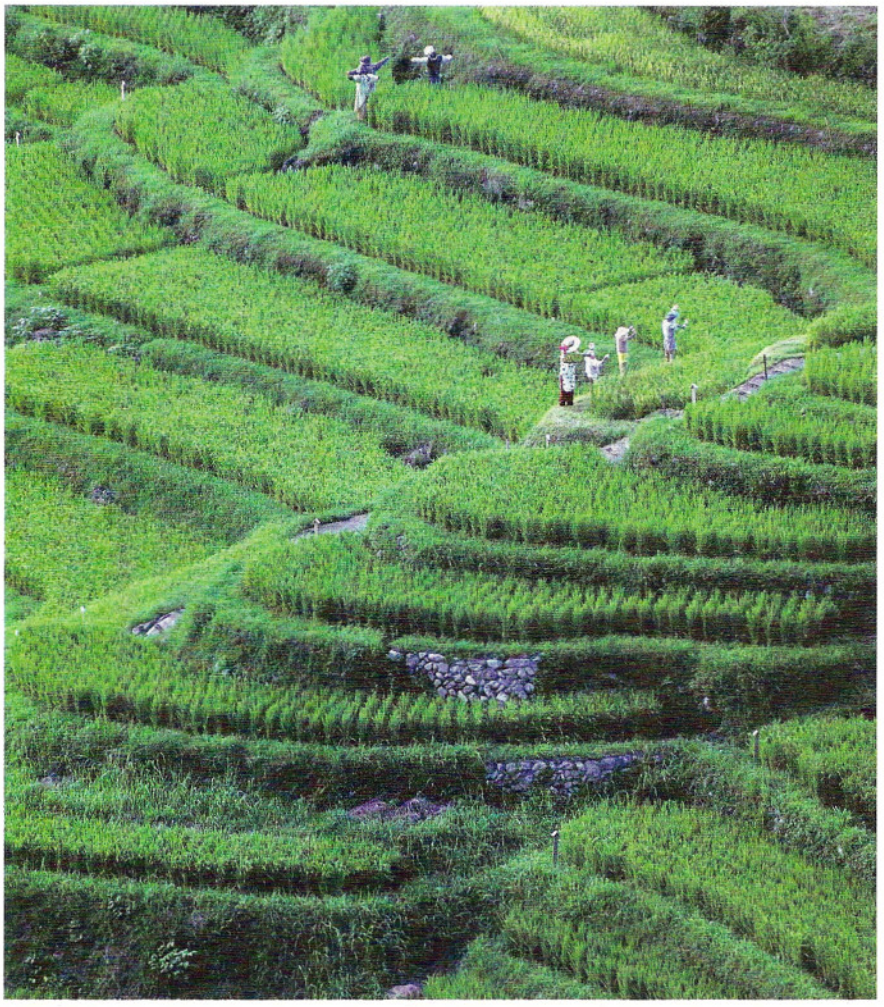
31.5 How Population Density Affects Land Use

Conflicts can arise when people have to share limited land. For years, homeowners blocked plans to expand Japan's Narita Airport. The government offered to move the homeowners to another area. But people resisted the plan. Neighbors even threatened to burn down the new home of anyone who agreed to move.

Conflicts over land use are common in Japan. There simply is not enough land to meet everyone's needs. The Japanese have responded in two ways. They have found better ways to use the land they have, and they have created new land.

Building Up and Down One way to make better use of land is to build taller buildings. But this is not easy in an active **earthquake zone**. Until 1965, the heights of buildings in Japan were limited for safety reasons.

Today the Japanese can build upward using **earthquake-resistant construction techniques**. These techniques allow them to construct skyscrapers that can withstand severe shaking. The Japanese have built so many tall buildings in recent years that some people call the construction crane Japan's national bird.

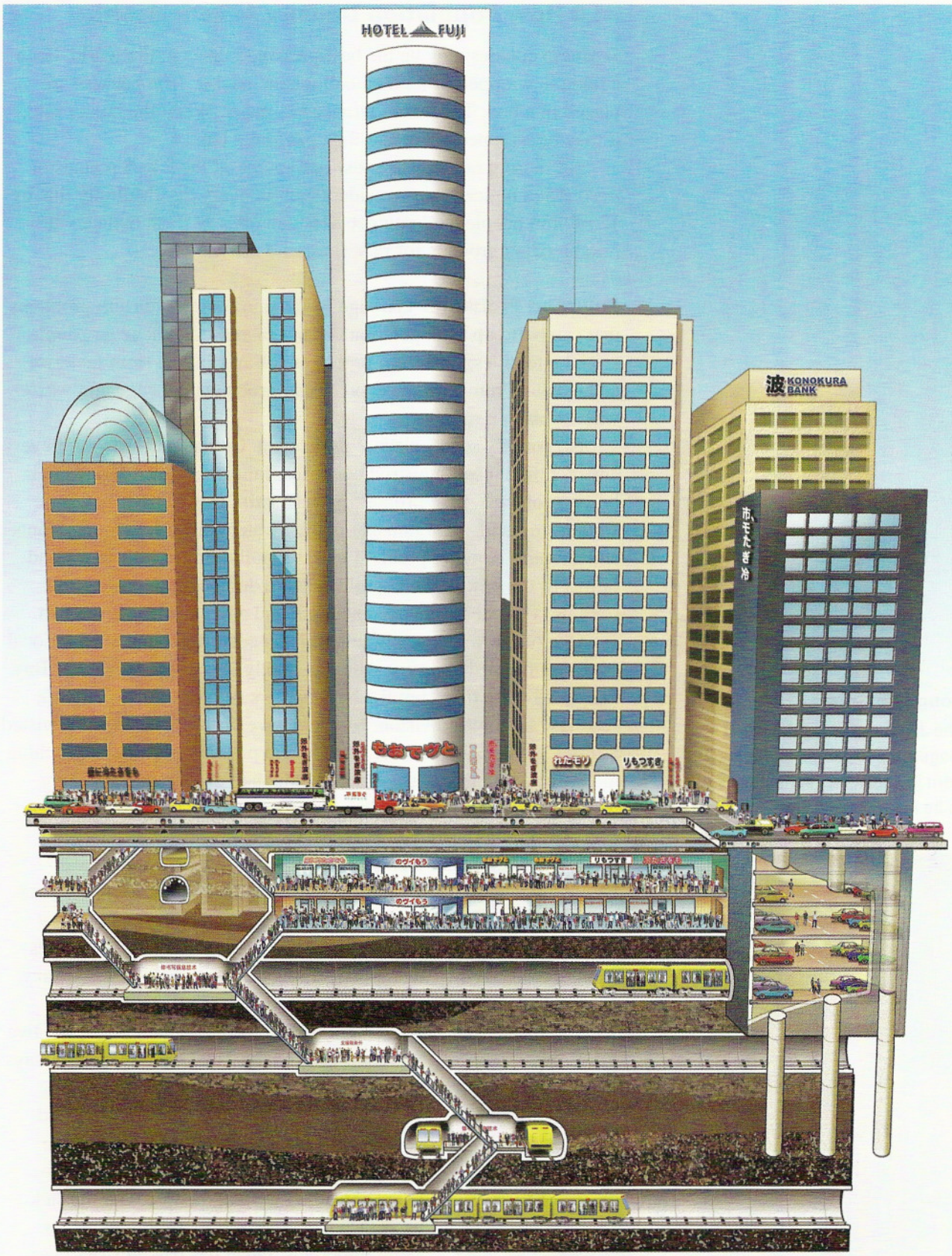


Terraced Rice Fields in Japan
The Japanese have claimed new land for farming by building terraces into hillsides. Working these rice fields on steep slopes is hard work.

Another way to make better use of land is to build underground. Many Japanese cities have underground shopping centers. One large underground center includes a park, an art museum, a Buddhist temple, and even a zoo.

Creating New Land The Japanese have also created new land. For example, they have filled in shallow **wetlands** with dirt and rubble. Much of Tokyo is built on filled-in bays and marshes. Filling wetlands can save farmland from being used for buildings. But it also destroys valuable fish and wildlife **habitat**.

Like the Incas of South America, the Japanese create new land for farming by cutting terraces, or areas of flat land, into hillsides. **Terracing** allows farmers to grow rice—Japan's most important crop—on the islands' mountain slopes.



Land Use in a Japanese City

By building both up and down, the Japanese make efficient use of limited city land.

31.6 How Population Density Affects Health

Japanese cookies may be the best-packaged treats in the world. Each cookie is wrapped in its own cellophane packet. The packets are placed in a box. The box is wrapped in paper. When the box is sold, it may be wrapped again and then put into a bag.

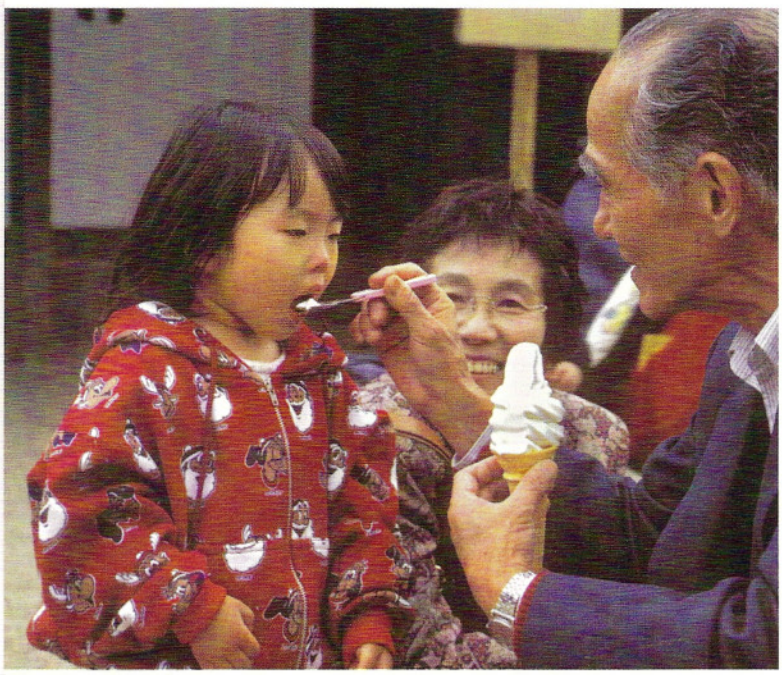
All those wrappings are just one source of the 2 to 3 pounds of trash that a typical Tokyo resident creates every day. Multiply this by 12 million people, and you get piles and piles of trash that can turn into breeding grounds for rats, flies, and disease.

Pollution Problems Garbage is just one source of health problems that can build up as population density increases. Whenever people crowd into cities, **pollution** problems follow. Smoke from factories and exhaust from cars cause breathing problems. **Sewage** and **wastewater** poison rivers.

No country seems cleaner than Japan. City streets are swept every day. Yet, like most industrial countries, Japan has faced serious pollution problems. One problem is **acid rain,** rainfall that has large amounts of acid. Acid rain can pollute water and soil, harming plants and animals. Another problem is water pollution from factories and farms. In the past, **toxic chemicals** were dumped into oceans and streams. The chemicals poisoned fish and anyone who ate the fish.

One of the worst pollution problems occurred in the 1950s. Local factories dumped mercury, which is highly toxic, into Minamata Bay. People who ate fish from the bay's waters suffered slurred speech, seizures, and blurred vision. Mothers gave birth to babies with twisted limbs. Cats who ate the fish turned from pleasant pets into screeching monsters. More than a thousand people died of mercury poisoning before the bay was finally cleaned up.

Long Life Spans
The Japanese enjoy the world's longest life expectancy. A person born in Japan can expect to live to be more than 80 years old.



Long Lives High population density can affect health in still other ways. More car accidents happen on city streets than on country roads. Diseases spread more quickly in cities than in small towns. Even so, **life expectancy** in Japan is among the highest in the world. By 2004, a person in Japan could expect to live 81 years. Clearly, the Japanese have found ways to overcome the health hazards of crowding.

Stand on any street corner in Tokyo and you'll see one way the Japanese try to keep crowding from causing health problems. To avoid spreading disease, people who are sick wear face masks like those used by doctors. More important, Japan has passed strict laws to clean up the air and water. As a result, the air is safer to breathe. Fish from the sea no longer poison people and their pets.

Garbage, though, remains a problem. In 1972, Tokyo opened a huge trash dump on an island in Tokyo Bay. It filled up in just eight years. Another nearby dump is filling up just as fast. "We are full up," a city official says. "We can only survive by reducing." To reduce the flow of trash, Tokyo has turned to **recycling**. Tokyo residents today recycle everything from cans and bottles to cookie wrappers.

31.7 Beginning to Think Globally

In this chapter, you have seen how population density affects aspects of life in Japan. These aspects include transportation, housing, land use, and health.

The Japanese have found many ways to deal with crowding. Japan is a wealthy country. It can afford high-rise office buildings, apartment houses, and a good public transportation system. It can also pay the costs of cleaning up its air and water. Despite crowded cities and pollution problems, the Japanese enjoy long and healthy lives.

Other densely populated countries are not so well off. India has almost the same population density as Japan. It has much more arable land per person. It is also far richer in **natural resources**. Even so, India is a much poorer country. Life expectancy there is just 64 years compared to 81 years in Japan. Think about this contrast as you look at population density around the world.

Life Expectancy in Japan and the United States

	Japan	United States
Women	85	80
Men	78	75

A Crowded Street in Tokyo

The Japanese in this street scene appear well dressed and well fed. People in other densely populated nations are not so fortunate. In many countries, crowding may add to people's misery.

31.8 Global Connections

How does population density affect the way people live around the world? The map shows how people are spread out across Earth. As you study the map, look for population patterns. One thing you may notice is that people are not evenly distributed. Nine out of 10 people live north of the equator. Most also live in mild climate zones and near coastlines. Why might this be so?

Can a place have too many people? The answer is yes and no. Consider Bangladesh and Singapore. Bangladesh is about three times as crowded as Japan. Most of its people are poor farmers with a life expectancy of barely 60 years. In contrast, Singapore is almost 20 times as densely populated as Japan. Its people are well-off city dwellers with a life expectancy close to that of the Japanese.

What other factors contribute to the well-being of crowded countries? Resources and location are both important factors. The Netherlands is a small, densely populated country in Western Europe. It has no important mineral or energy resources. But the Netherlanders have learned to make the most of their fertile soil and good harbors. They produce high-quality farm and factory goods. They trade these goods around the world for resources they lack.

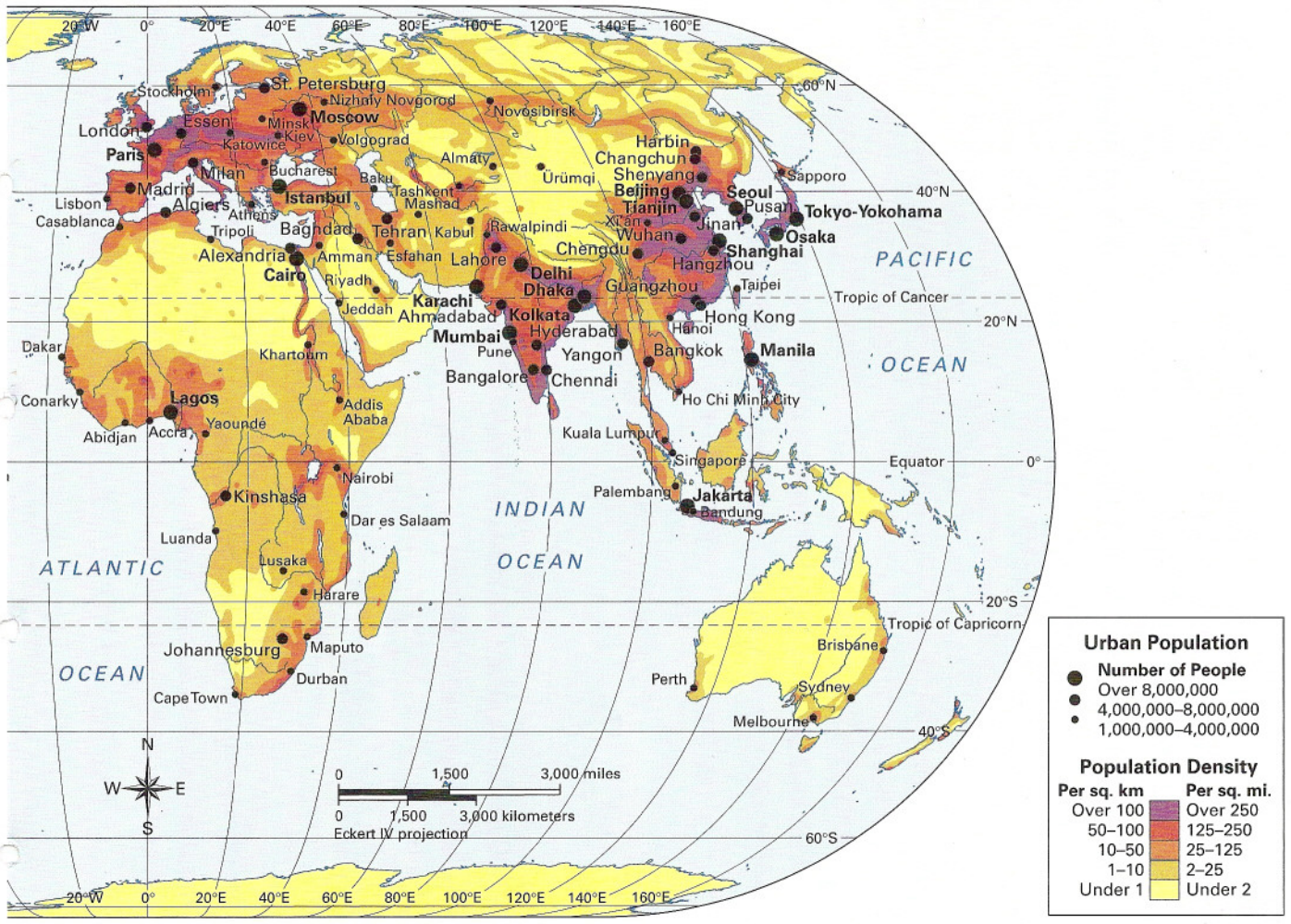
How does population density affect a nation? Population density alone does not make a nation rich or poor. Nor does the amount of resources. What matters more is how people use what they have.

Population Density Around the World

Arithmetic Population Density

Country	People per Square Mile of Land
Australia	7
Bangladesh	2,734
Colombia	103
Egypt	198
Japan	880
Netherlands	1,247
Nigeria	390
Singapore	16,492
United States	83

Sources: *The World Factbook 2004*, Central Intelligence Agency, and The World Bank Group.



Urban Population

Number of People
- Over 8,000,000
- 4,000,000–8,000,000
- 1,000,000–4,000,000

Population Density

Per sq. km	Per sq. mi.
Over 100	Over 250
50–100	125–250
10–50	25–125
1–10	2–25
Under 1	Under 2

Life Expectancy

Country	Average Life Expectancy (years)
Australia	80
Bangladesh	62
Colombia	71
Egypt	71
Japan	81
Netherlands	79
Nigeria	50
Singapore	82
United States	77

Per Capita Income

Country	Average Income per Person*
Australia	$21,650
Bangladesh	400
Colombia	1,810
Egypt	1,390
Japan	34,510
Netherlands	26,310
Nigeria	320
Singapore	21,230
United States	37,610

*Amounts are in U.S. dollars.