



ENVE203

**Environmental Engineering Ecology
(Dec 10, 2012)**

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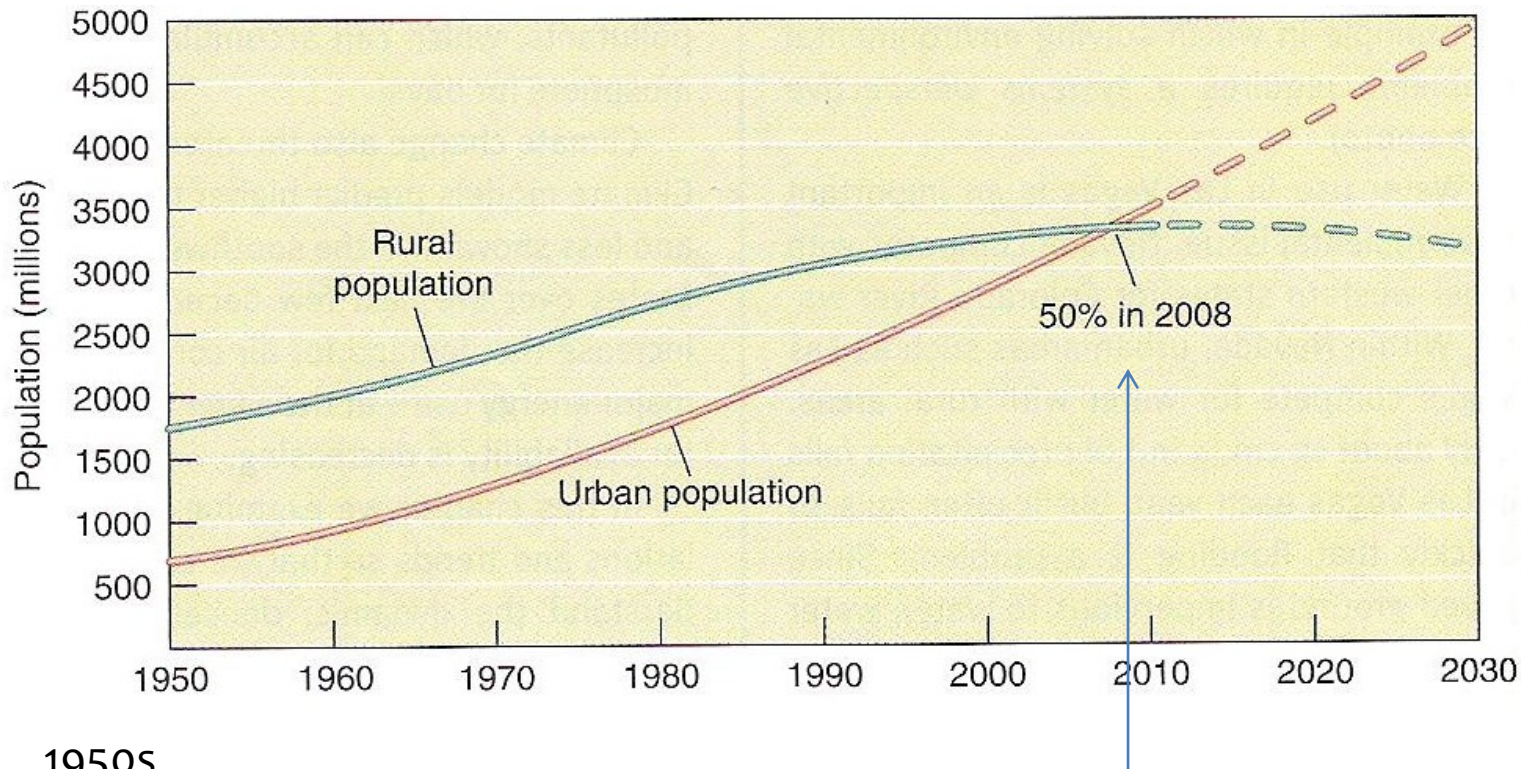
Elif Soyer

‘The Urban Environment’

Population & Urbanization

Urbanization:

The process in which people increasingly move from rural areas to densely populated cities



1950s

< 30 % of the human population lived in cities

In 2008 the human population reached a milestone: for the first time in history, half of the world's population live in urban areas



Population & Urbanization

Distinction between rural & urban areas?

How many people live there?

or

How people make a living there?

- Most people residing in rural areas

Harvesting natural resources

Fishing, logging, and farming

- Urban areas

People have jobs not directly connected with natural resources



Characteristics of Urban Population

Every city is unique in terms of its

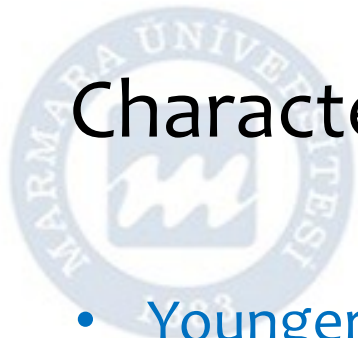
- Size
- Climate
- Culture
- Economic development

One of the basic characteristics of city populations compared to populations in rural areas

- Far greater heterogeneity with respect to race, ethnicity, religion, and socioeconomic status

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Characteristics of Urban Population

- Younger people in urban areas than the surrounding countryside

Reason?

Because of high birth rate?

Influx of many young adults from rural areas?

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- Different proportions of men and women

Cities in developing nations tend to have more men

Cities in HDCs often have a higher ratio of women to men

(little chance of employment after graduation, so they move to urban areas)



Urbanization Trends

51% of the world population currently lives in urban areas

Urban towns: Towns with populations > 2000

Source: *Population Reference Bureau (PRB)*

In 2011

Urban inhabitants comprised 75% of the total population of HDCs

But only 46% of the total population of developing countries

Urbanization Trends

Megacities

Cities with > 10 million inhabitants



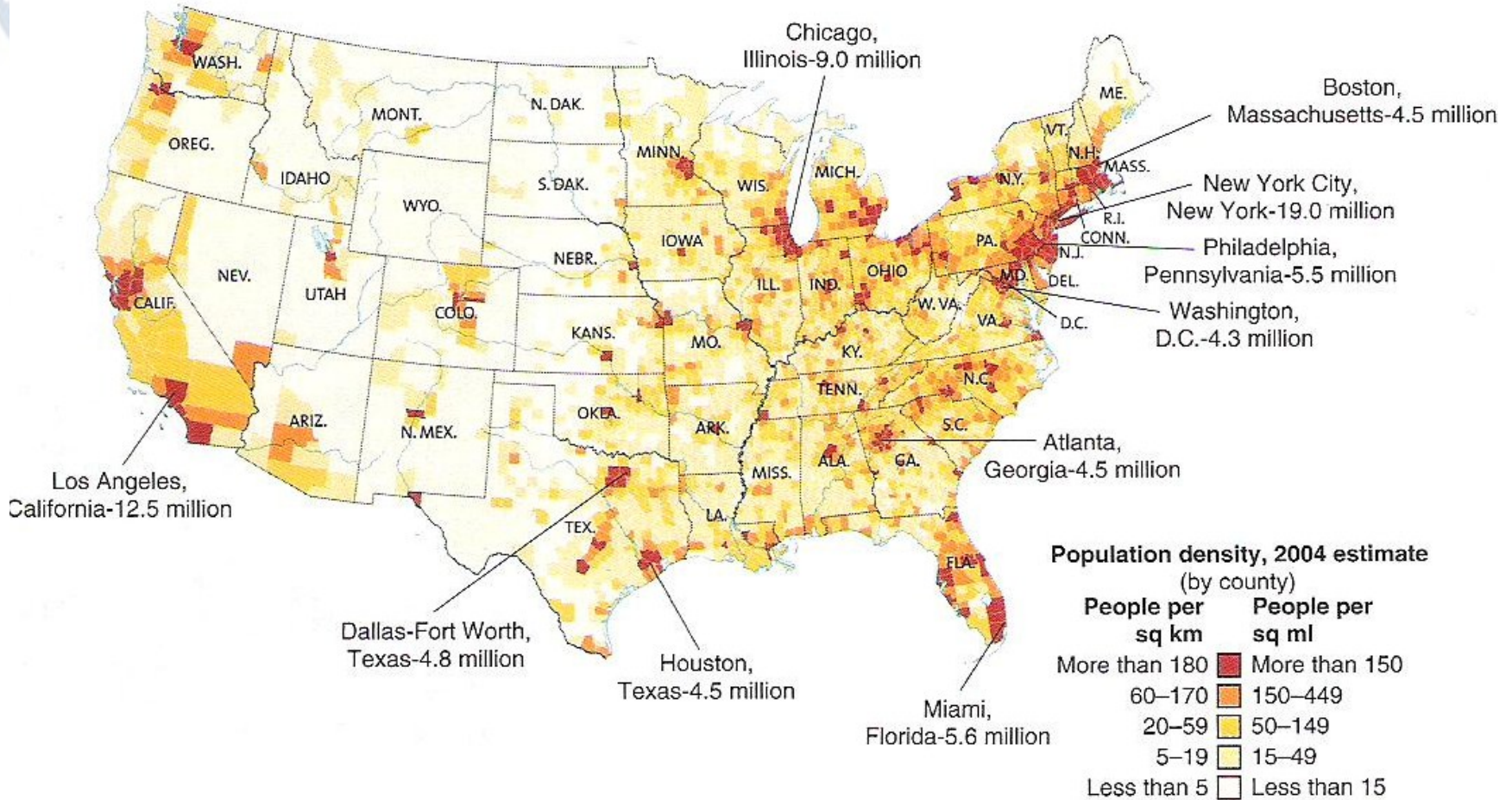
Urban agglomeration:

An urbanized core region that consists of several adjacent cities or megacities and their surrounding developed suburbs

Example: Tokyo-Yokohama-Osaka-Kobe agglomeration in Japan which is home to about 50 million people



Urbanization Trends



U.S. Urban agglomerations



Urbanization Trends

Urban Agglomeration

Turkey?

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Urbanization Trends

The World's 10 Largest Cities

1975	2007	2025 (Projected)
Tokyo, Japan—26.6*	Tokyo, Japan—35.7	Tokyo, Japan—36.4
New York–Newark, USA—15.9	Mexico City, Mexico—19.0	Mumbai (Bombay), India—26.4
Mexico City, Mexico—10.7	New York–Newark, USA—19.0	Delhi, India—22.5
Osaka–Kobe, Japan—9.8	Mumbai (Bombay), India—19.0	Dhaka, Bangladesh—22.0
São Paulo, Brazil—9.6	São Paulo, Brazil—18.8	São Paulo, Brazil—21.4
Los Angeles, USA—8.9	Delhi, India—15.9	Mexico City, Mexico—21.0
Buenos Aires, Argentina—8.7	Shanghai, China—15.0	New York–Newark, USA—20.6
Paris, France—8.6	Kolkata (Calcutta), India—14.8	Kolkata (Calcutta), India—20.6
Kolkata (Calcutta), India—7.9	Dhaka, Bangladesh—13.5	Shanghai, China—19.4
Moscow, Russian Federation—7.6	Buenos Aires, Argentina—12.8	Karachi, Pakistan—19.1

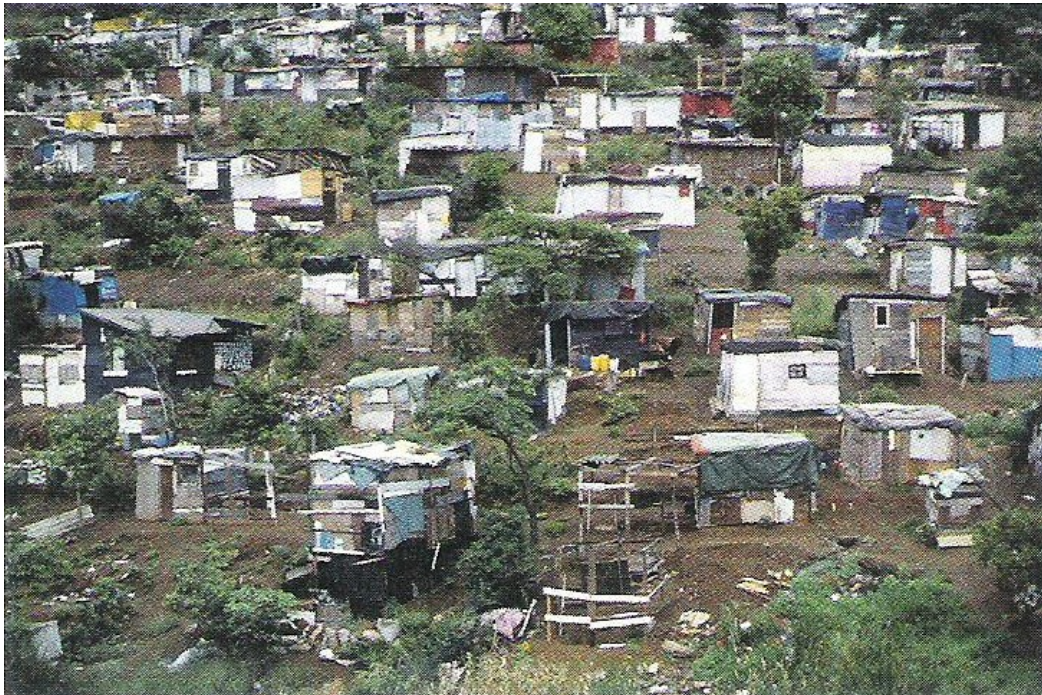
*Population in millions.

Source: “Urban Agglomerations 2007,” U.N. Population Division Department of Economic and Social Affairs.

Urbanization Trends

Substandard housing (slums or squatter settlements)

- Critical issue in developing countries
- Illegally occupy the land they build on and cannot obtain city services such as clean water, sewage treatment, garbage collection, paved roads, or police and fire protection



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Urbanization Trends

Homelessness

HDCs and developing countries
share the same problem



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The City as an Ecosystem

Urban ecosystem:

A heterogeneous, dynamic urban area studied in the context of a broader ecological system

Urban Ecology uses the methods of both

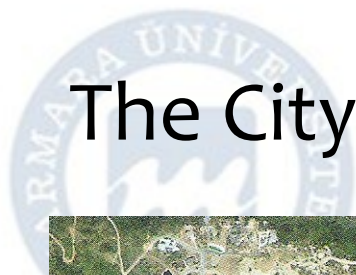
- Natural science
- Social sciences

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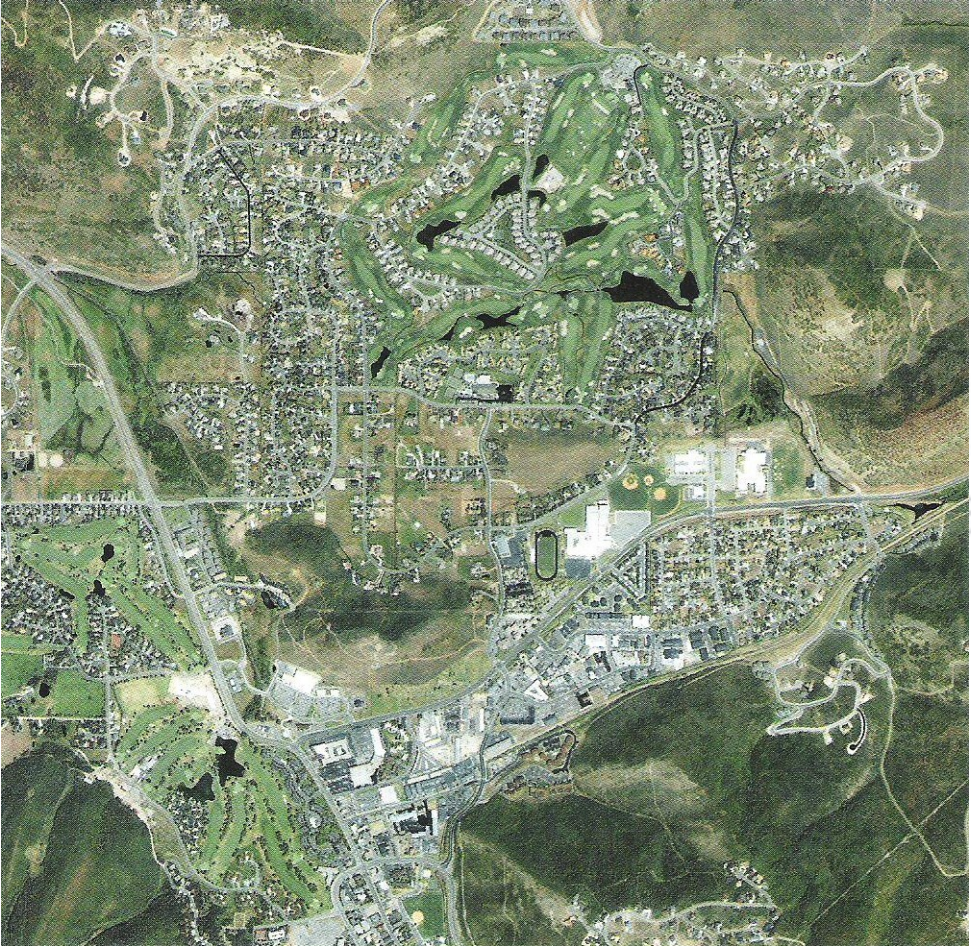
Four variables (POET)

- Population
- Organization
- Environment
- Technology

They do not function independently of one another

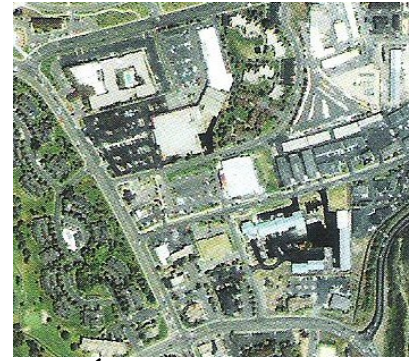


The City as an Ecosystem



Urban land use patterns exhibit different configurations

Enlarged & cropped views



Mixed use (commercial, industrial, and residential)



Single-family residential

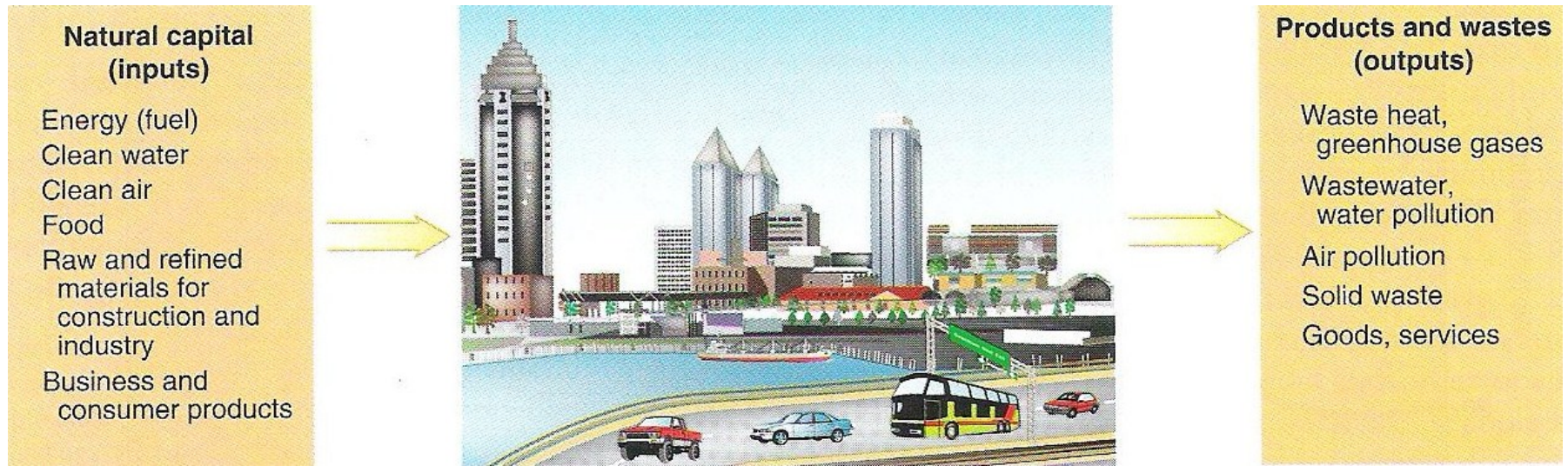


Undeveloped (natural) open space



The City as an Ecosystem

Like natural ecosystems, cities are open systems

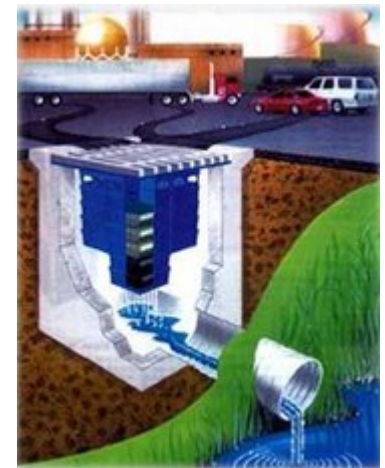


The human population in an urban environment requires inputs from the surrounding countryside

Produces outputs that flow into surrounding areas

Environmental Problems Associated with Urban Areas

- Growing urban areas affect land use patterns and destroy or fragment wildlife habitat by suburban development
former forest, wetlands, desert, or agricultural land in rural areas
- Cities affect water flow by covering the rainfall-absorbing soil with buildings & paved roads
- Storm systems → to handle the runoff from rainfall polluted with organic wastes (garbage, animal droppings, etc.), motor oil, heavy metals





Environmental Problems Associated with Urban Areas

- Airborn emissions from automobiles, factories

Worst situation in developing countries

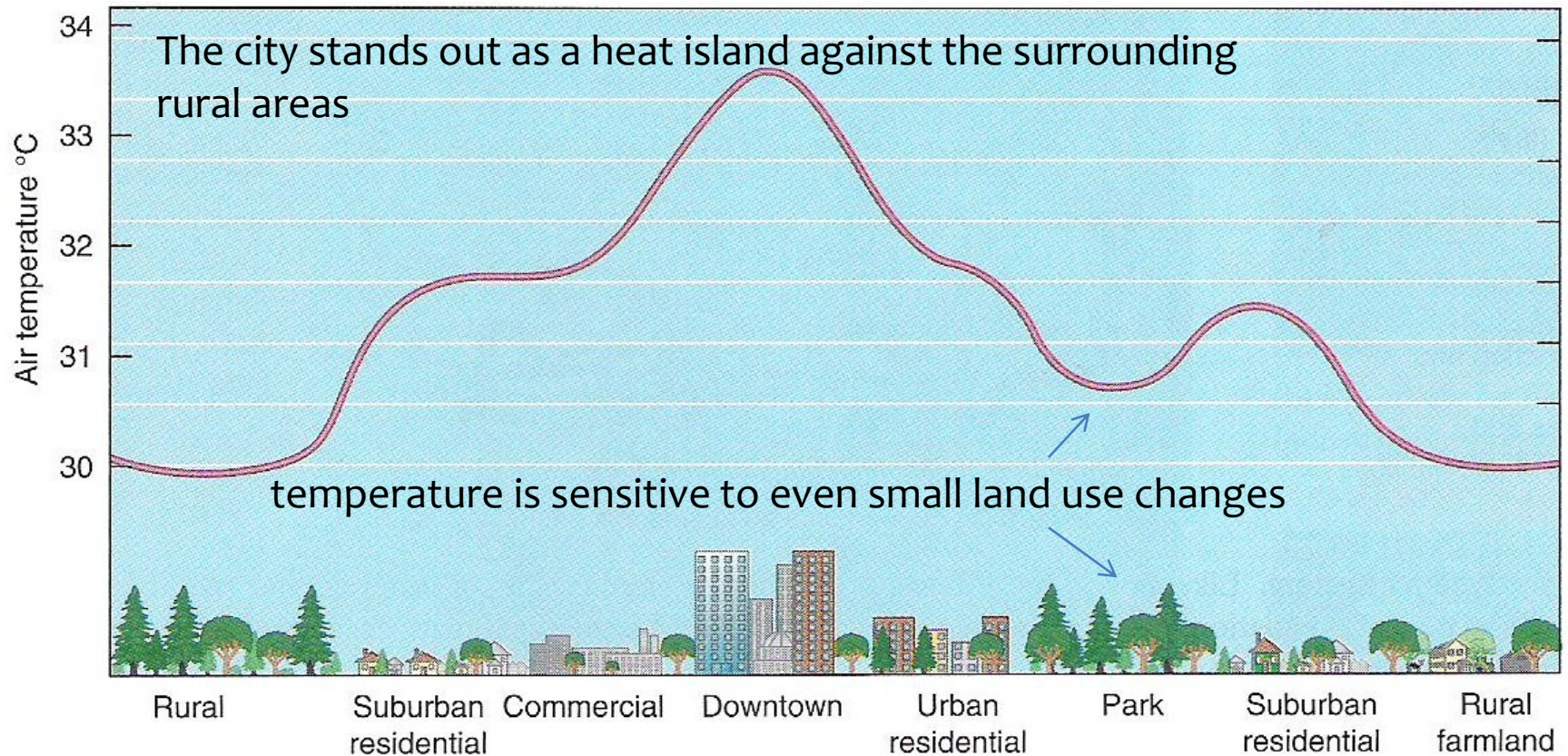
In Mexico City, the air is so polluted that school children are not permitted to play outside during much of the school year

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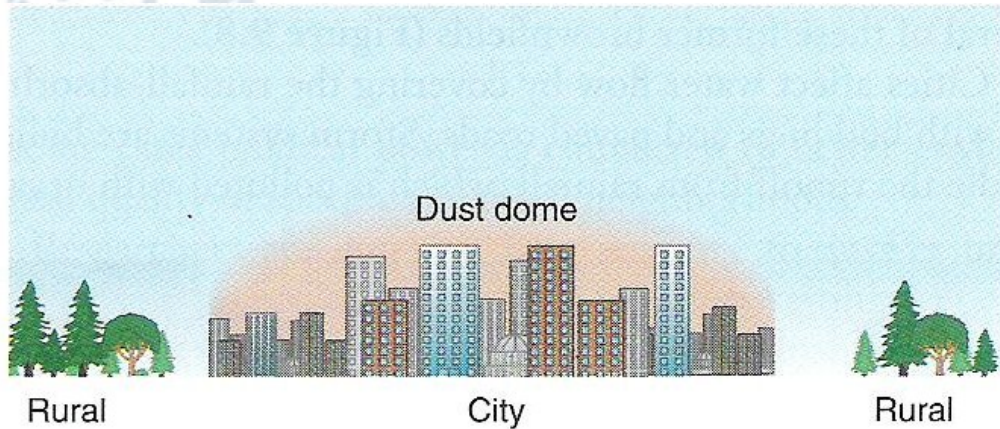
Environmental Problems Associated with Urban Areas

- Streets, rooftops, and parking lots in areas of high population density absorb solar radiation during the day and radiate into the atmosphere at night



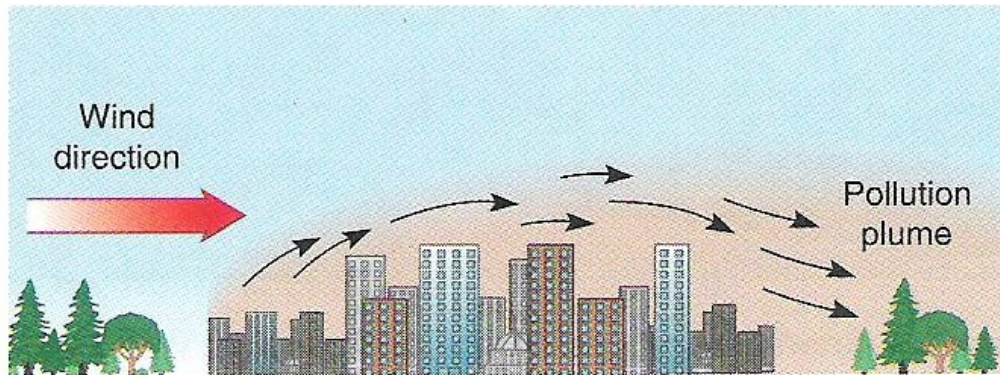
Urban heat island

Environmental Problems Associated with Urban Areas



A dust dome of pollutants over a city when the air is somewhat calm and stable

Dust dome:
A dome of heated air that surrounds an urban area and contains a lot of air pollution



When wind speeds increase, the pollutants move downward from the city



Environmental Problems Associated with Urban Areas

Noise Pollution

Sound is called noise pollution when it becomes loud or disagreeable, particularly when it results in physiological or psychological harm

Most of it human origin

Vehicles

Traffic

