

Exercise walk-through

2.2

Consequences of Population Distribution

AP Human Geography

Distribution and resident density

Population distribution

describes where people live; **population density** measures people per area.

Water, climate and landforms interact with employment, transport, politics and settlement history.

This crossing shows crowding at one moment. To calculate resident density, obtain a resident count and a defined land area.



Shibuya Crossing, Tokyo

Density denominators

Measure	Numerator and denominator
Arithmetic density	$D_A = P/A_T$: residents divided by total land area.
Physiological density	$D_P = P/A_R$: residents divided by arable land area.
Agricultural density	$D_F = F/A_R$: farmers divided by arable land area.

A ratio identifies population relative to land. It cannot alone prove food shortage or farming efficiency.

Density calculation: attempt

Original fictional Region A

120,000 residents; 600 km² total land; 100 km² arable land; 2,000 farmers.

Calculate all three densities with units. Explain why their values differ. What additional evidence would you need before claiming food insecurity?

Density calculation: worked check

$$D_A = \frac{P}{A_T}$$

$$D_A = \frac{120000 \text{ people}}{600 \text{ km}^2} = 200 \text{ people/km}^2$$

$$D_P = \frac{P}{A_R}$$

$$D_P = \frac{120000 \text{ people}}{100 \text{ km}^2} = 1200 \text{ people/km}^2$$

$$D_F = \frac{F}{A_R}$$

$$D_F = \frac{2000 \text{ farmers}}{100 \text{ km}^2} = 20 \text{ farmers/km}^2$$

Physiological density uses the smaller arable area; agricultural density also changes the numerator to farmers.

Population pressure and public services

Situation	Mechanism and condition
Dense settlement	More demand for housing and water can strain supply; concentration can also support frequent public transport.
Sparse settlement	Long travel distances can raise the cost of providing clinics and schools per resident.
Carrying capacity	The supportable population depends on technology, consumption and resources. Imports and yields matter alongside arable area.

For Region A, investigate yields, imports and household food access before inferring shortage.

Exercises 2.1-2.2

2.1 Define carrying capacity.

[2]

2.2 State one economic advantage and one disadvantage of a densely populated area. [2]

Exercises 2.1·2.2

2.1 Define carrying capacity.

[2]

2.1

- the maximum population an area's resources/environment can support sustainably
-

2.2 State one economic advantage and one disadvantage of a densely populated area. [2]

2.2

- advantage: large labour force/market, services viable; disadvantage: strain on housing/transport/resources

Exercise 2.3 (a)

2.3 A remote region has a very sparse population.

(a) State one difficulty of providing services there.

[1]

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(a)

- services (schools, hospitals) are costly per person / far apart

Exercise 2.3 (b)

2.3 A remote region has a very sparse population.

(b) Explain why this region may have little political influence.

[1]

Exercise 2.3 (b)

2.3 A remote region has a very sparse population.

(b) Explain why this region may have little political influence.

[1]

(b)

- few people means fewer representatives/votes, so less political weight

Exercises 3.1-3.2

3.1 If a region's population exceeds what its resources can sustain, it has exceeded its^[1]

☐

- A arithmetic density
- B carrying capacity
- C dependency ratio
- D sex ratio

3.2 A benefit of a concentrated population for public services is that

^[1]

☐

- A services are cheaper to provide per person
- B the environment is always protected
- C carrying capacity rises automatically
- D migration stops

Exercises 3.1-3.2

3.1 If a region's population exceeds what its resources can sustain, it has exceeded its^[1]

- ☐ A arithmetic density
B carrying capacity
C dependency ratio
D sex ratio

3.1 B

- the sustainable maximum is the carrying capacity

3.2 A benefit of a concentrated population for public services is that ^[1]

- ☐ A services are cheaper to provide per person
B the environment is always protected
C carrying capacity rises automatically
D migration stops

3.2 A

- concentration makes services viable at lower cost per person

Exercise 3.3 (a)

3.3 A crowded coastal city keeps growing.

(a) State one environmental consequence of this concentration.

[1]

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(a)

- pressure on water/air/land, pollution, loss of green space

Exercise 3.3 (b)

3.3 A crowded coastal city keeps growing.

(b) Explain one reason people still move there despite crowding.

[1]

Exercise 3.3 (b)

3.3 A crowded coastal city keeps growing.

(b) Explain one reason people still move there despite crowding.

[1]

(b)

- jobs, services, and opportunities outweigh the crowding for migrants