

Workbook answers

Topic 3

Contemporary urban environments

Urbanisation

1 Urbanisation is the process by which an increasing proportion of a country's population lives in urban areas such as towns and cities.

2

- The levels of urbanisation are higher in North America, Latin America and the Caribbean, Europe and Oceania, where at least two-thirds of the people live in urban areas.
- In these four continents the levels of urbanisation are 12 percentage points or higher above the global average.
- Levels of urbanisation in Asia and Africa are lower and below the global average, especially in Africa where they are only half the levels of urbanisation in the Americas.
- As a developing region, Latin America and the Caribbean appear to be slightly anomalous as the levels of urbanisation are 6 per cent higher than in Europe.
- There is quite a large range of levels of urbanisation around the world – rates are 39 percentage points higher in North America than in Africa.

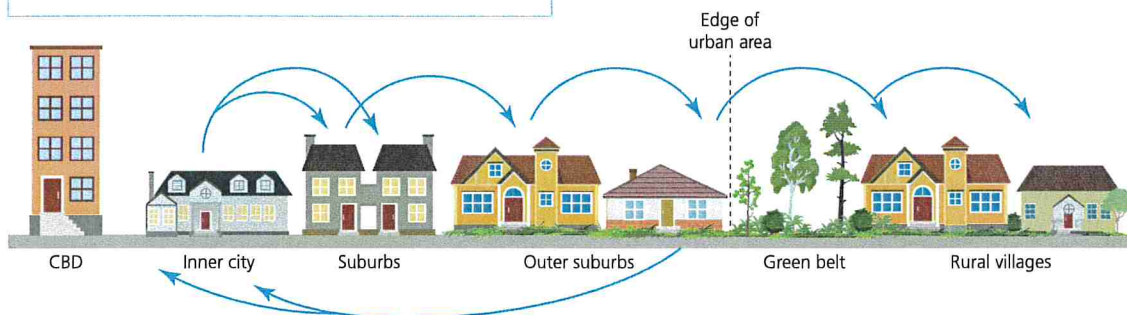
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- The two main causes are natural population growth and migration into urban areas from rural areas.
- Rural to urban migration is often cited as the main cause of urbanisation in developing countries, where urbanisation is the predominant process taking place.
- Rural to urban migration in parts of Asia, Africa and Latin America is usually a result of a combination of push and pull factors.
- Push factors tend to be unemployment and lack of opportunities, particularly for agricultural workers as a result of mechanisation or land reform.
- Pull factors are that urban areas are perceived to have better employment opportunities and the chance of increasing income and standard of living, especially for younger people.
- As most migrants to urban areas in developing countries are younger people of childbearing age, this affects the population structure and has a secondary impact on natural increase as birth rates will be much higher than death rates, given this structure.
- In more developed countries, although there is an element of younger people moving to towns and cities for education opportunities, the main direction of movement is from central to urban fringe areas.

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4

Suburbanisation – decentralisation of people (and associated services) from inner-city areas to suburbs as residents seek to escape crowded areas for more open space and larger houses, especially as they have families. It can lead to urban sprawl and land take, which is only checked by green belt legislation.



Urban resurgence (sometimes known as reurbanisation) – associated with the economic and structural regeneration of an urban area that has suffered a period of decline. This often attracts people to live back in the central area. It particularly appeals to younger and more affluent workers who enjoy the 'metropolitan' lifestyle, especially those who have recently graduated or gained employment in the same city.

Counter-urbanisation – movement of people from large urban areas into surrounding rural villages or smaller towns. This often means 'leapfrogging' the green belt, which contains urban spread. The attraction is the rural idyll and lifestyle of more space, fresh air etc. It often means daily commuting into the city/urban area for most residents.

5 A city or urban conurbation with a population of more than 10 million people.

6

- Megacities have a multi-functional infrastructure offering the best medical, legal and entertainment facilities in a country – they provide opportunities in employment, education and healthcare.
- Many house international financial services, banking, insurance, accountancy, real estate and marketing companies; stock exchanges and major financial institutions are usually located there.
- Many are the headquarters of large TNCs.
- Media and communication centres for global networks can be found in megacities.
- High-quality educational institutions and universities are located there – centres of research and innovation.
- Megacities are often centres of decision-making influence and power on a regional and international level; often the seat of government.
- Megacities become 'cores' for development in countries or continental regions or 'hubs' in a global network/framework of global economic activity.
- They attract most investment and become centres for financial exchange and major service industries (sometimes manufacturing industry in developing countries).
- They produce, on average, two to three times more GDP than other cities.
- *On a regional basis* they can be a force for good or have a negative effect:
 - As a core area, development can spread out into peripheral areas to help the region develop.
 - They can draw in investment, resources and people from the surrounding area, which prevents regional development – this is more often the case in lower income countries where it is difficult to grow the economy beyond megacities.

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- *Globally* – they interact and sometimes compete with other megacities for business but can trigger development of poorer regions by attracting investment and technology.

7

- It is the process of redistributing and dispersing people and functions away from the centre of the urban area towards the outskirts.
- The central business district (CBD) may lose some investment, influence and power.
- Suburbanisation is a decentralising process.

8

A worked example can be found in your workbook.

9

- Deindustrialisation is a process of economic and social change caused by the transfer and reduction of a country's or a region's heavy industry and manufacturing capacity.
- As richer economies develop, the proportionate contribution of the secondary (manufacturing) sector declines (numbers employed and output) but is largely replaced by the growth of the tertiary (services) sector, particularly retail, personal services and finance.
- In urban areas → high levels of structural unemployment with skilled and semi-skilled industrial workers having skills for jobs that have been lost.
- Structural unemployment can be long term until the workforce retrain and gains new skills for service industries.
- Many industrial sites are closed and fall into disrepair or become derelict. They are difficult to sell as no other industrialists need them.
- Many sites are demolished or restructured and designated for other uses.
- These brownfield sites make good locations for new industries such as retail, science or business parks.
- In the UK, these sites are also preferred for new house building to prevent the use of green-belt designated land or greenfield sites, and thus reducing urban sprawl.

10

This question requires an evaluation so you need to consider several arguments both for and against each policy to weigh up successes against failures of the policy.

Urban Development Corporations (1980s)

- They were effective in attracting new businesses to rundown areas and improving the urban environment.
- By the mid-1990s, they had attracted over £12 billion in private sector investment and created 190,000 jobs nationally.
- The property-led approach did little to tackle social problems.
- Local people complained they had little involvement in the process. For example, in the London Docklands, locals did not tend to benefit from the new housing and jobs created.

City Challenge (1990s)

- Local authorities had to bid for funding which resulted in more successful regeneration schemes.
- City Challenge gave equal importance to buildings, people and values.

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- 1997 data revealed that City Challenge had improved over 40,000 houses, created 53,000 jobs and reclaimed 2,000 ha derelict land.
- Resources were thinly spread over large areas.
- Areas that had received government funding from previous schemes were now reliant on a bidding process. Many failed to secure funding because of unsuccessful bids rather than lack of genuine need.
- Money was wasted in preparing bids by local authorities that did not win funding.

New Deal for Communities (2000s)

- Between 2002 and 2008 NDC areas saw an improvement in 32 of 36 core indicators spanning crime, education, health, unemployment, community, housing and the physical environment.
- Evidence found that gaps at both national and local authority levels had generally narrowed.
- The NDC strategy delivered greater positive change for place- rather than people-related outcomes.
- Relatively little net change was achieved for education and worklessness.

City Deals (2011 to present)

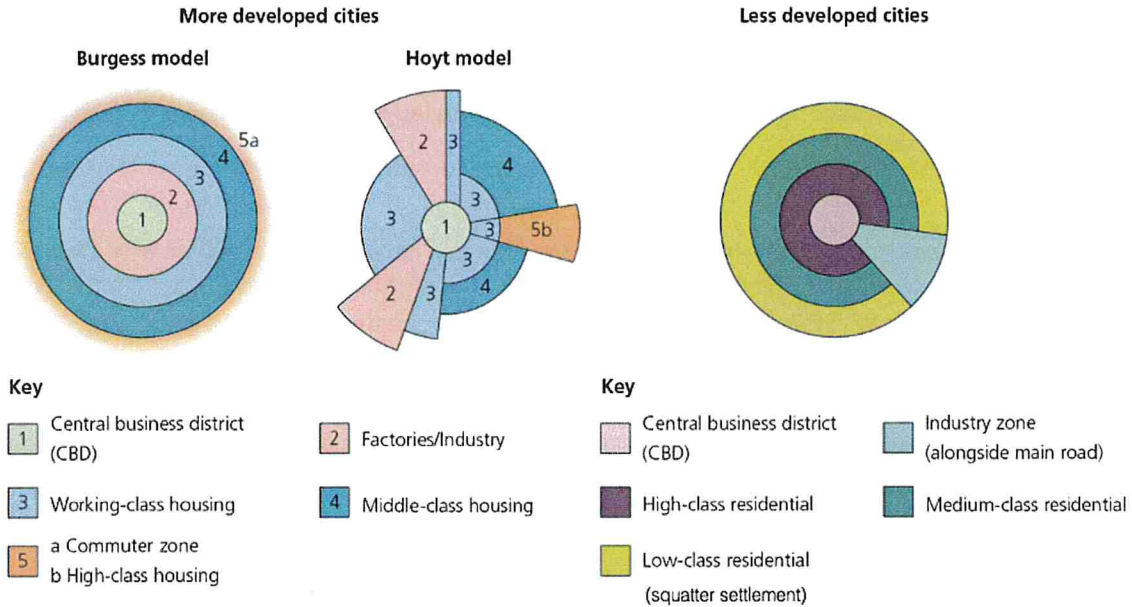
- City Deals are bespoke packages of funding and decision-making powers negotiated between central government and local authorities and/or Local Enterprise partnerships.
- Over 30 deals have been granted since 2011 and they continue to be rolled out.
- They allow cities to take responsibility for decisions on how public money is used and to design their own strategies to encourage business and economic growth.
- Spending on infrastructure developments has been successful in increasing economic activity. It provides some certainty for businesses wishing to invest in cities.
- Funding streams for adult skills and employment has been criticised for being too fragmented preventing a more integrated approach. This is further complicated because of the payment-by-results nature of the funding.

The policies listed above are not exclusive; other specific urban regeneration strategies could be evaluated, including Enterprise Zones, Urban Land Grants and Single Regeneration Budget.

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Urban forms

- 11 Answers could show Burgess, Hoyt (or Mann for UK) models of urban morphology in more developed cities. For a model typical of a less developed city, see the right-hand diagram below.



12

- Both have CBDs with similar functions.
- Both have industrial zones:
 - Industrial zones in older more developed industrial cities tend to form around the city centre, in the inner city, mixed with low-class residential areas (workers). Burgess called this the zone of transition. These have suffered with deindustrialisation.
 - More recently in growing developed cities and in less developed countries, industrial zones tend to follow lines of communication such as major roads, railway or rivers.
- Residential zones are almost reversed:
 - In less developed cities, higher-class housing is often close to the city centre, either in a zone around the centre or in a line/direction developing on one side of the city. The outskirts of the cities and any unoccupied land near rivers or railways are often used for squatter settlements.
 - In high income cities, the inner-city zone is often occupied by lower-class residential areas and the outskirts and fringes are often occupied by better quality housing – though urban resurgence has meant that some high-class apartment-style properties are located centrally.
 - Medium-class residential zones often occupy the zone between the inner city and the fringes in both.

13 Physical

- Topography – depending on the history and original function of the urban areas, city centres can be in a valley near a bridging point (e.g. London) or at the top of a hill in

Workbook answers

former defensive sites (e.g. Edinburgh). Higher-class residential areas tend to be on higher ground in developed cities, though higher/steep ground is sometimes used for squatter settlements in less developed cities.

- Natural coastal inlets – often developed as natural ports and become central to the city's activities (e.g. Portsmouth).
- Wind direction – in industrial times, higher-class residential areas tended to be on the upwind side of the city so they received less air pollution etc. For example, many UK industrial cities have better-class housing on the west side and lower-class housing on the east side because of prevailing south westerly winds (e.g. Glasgow, Nottingham, Sheffield, London).

Human

- Land values – these have been highest near the city centre, which is why it was used for business functions. More space could be afforded as you moved out from the city centre, which is why larger housing is often found there (in developed cities).
- Migration – different waves of migration may bring people of different nationalities. Migrants tend to settle and congregate near to people of the same nationality, culture or religion for both security and support networks. This can lead to spatial segregation and the development of 'quarters' or 'ghettos'.
- Agglomeration – many similar industries and certain functions tend to locate near to each other. This could be because certain resources are needed (e.g. water) or certain skills are available or there are cost savings (economies) to be gained in either a collaborative or competitive atmosphere (e.g. Jewellery Quarter in Birmingham, Covent Garden in London).

14

Urban landscape	Characteristics	Reasons for development
Town centre mixed developments	<ul style="list-style-type: none"> • Wide range of leisure facilities including cinemas, theatres, cafés, restaurants, wine bars and other cultural and meeting places • Promotion of street entertainment • Construction of new offices, hotels and conference centres • Availability of spaces, including gardens and squares or plazas • Redevelopment of old buildings (a form of gentrification) and building new 'upmarket' apartments 	<ul style="list-style-type: none"> • To develop a night-time economy • To develop flagship attractions • Raises the status of the CBD for business and encourages tourists to remain near the city centre • Encourages a return to the use of city centres as residential areas • Encourages more affluent residents spending in the local economy
Cultural and heritage quarters	<ul style="list-style-type: none"> • Areas of cities are nominated as they are associated with specific cultural or heritage functions such as: <ul style="list-style-type: none"> – the agglomerated small-scale industry producing specific 	<ul style="list-style-type: none"> • It is a deliberate model used to regenerate declining inner urban areas with a specific industrial heritage.

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	<p>heritage objects or products (e.g. the Jewellery Quarter in Birmingham)</p> <ul style="list-style-type: none"> – the provision of cultural services for consumption such as art galleries, museums, entertainment or even 'learning' quarters 	<ul style="list-style-type: none"> • Areas build a reputation based around specific services or industries, which attracts visitors. • It improves the perceptions of a place by preserving history and culture so that it is viewed in a more positive light.
Fortress developments	<ul style="list-style-type: none"> • Parts of urban areas designed around security, protection, surveillance and exclusion • Strategies have been adopted to deter crime in hotspots by: <ul style="list-style-type: none"> – greater use of closed-circuit television (CCTV) – railings and fencing around private spaces and properties – 'mosquito' alarms, emitting a high-pitched sound heard only by young people, to discourage loitering – effective use of street lighting – speed bumps to prevent joyriding • Use of guards or the electronic control of access into housing complexes, especially in the USA and South Africa 	<ul style="list-style-type: none"> • Usually developed by more affluent communities wishing to segregate themselves from others perceived as threatening or undesirable. • Exclusion based on fear of, or paranoia about, real or potential threats from crime.
Gentrified areas	<ul style="list-style-type: none"> • Renovation of older properties in run-down areas by more affluent home buyers • Areas become more appealing as housing quality improves • Unlike regeneration, it involves the rehabilitation of existing properties/streets on a piecemeal basis undertaken by builders, property developers or individuals, not by large organisations 	<ul style="list-style-type: none"> • Part of urban resurgence • Rent gap – the price of properties falls below their real value, attracting builders or individuals to renovate them for profit • Areas are often closer to city centres so reduces commuting time and costs for buyers working in the city • 'Pioneer image' – creative individuals move into 'edgy' neighbourhoods • Incentives offered by local authorities keen to see improvement in run-down parts of the city

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Edge cities	<ul style="list-style-type: none"> • Self-contained settlements beyond the original city boundary and developed as cities in their own right • Often develop close to major roads or airports • Shops, offices and other business functions become decentralised from the original city • A wide range of amenities including schools, shopping malls and entertainment facilities, meaning residents rarely return to the core city 	<ul style="list-style-type: none"> • Largely the result of urban sprawl, especially in the USA where there is more space and no green belt to prevent sprawl • Car ownership in the USA means there is a greater willingness to travel long distances to work and more internal flights are taken • Linked to social segregation where the wealthy have moved to these new fringe/suburban cities, leaving the more disadvantaged in the old city core
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15 Key features of a post-modern Western city include:

- a more fragmented urban form comprising independent settlements (such as edge cities), economies, societies and cultures
- a greater emphasis on producer services and knowledge-based industries rather than industrial mass production
- eclectic and varied architecture (as seen in the London cityscape)
- spectacular flagship developments
- greater ethnic diversity but heightened economic, social and cultural inequalities and polarisation

16 Avoid just listing impacts or causes of deindustrialisation in urban areas. This 'link' question needs you to make clear reference to the role played by globalisation.

Answer will depend on the urban areas you may use as illustration.

Some indicative content:

Deindustrialisation is a decline in the importance of industrial activity for a place. It may refer to the falling percentage of a population who work in manufacturing, or the declining contribution of manufacturing activity to GDP.

Globalisation may have:

- Facilitated a business accessing cheaper labour overseas by outsourcing – manufacturing jobs lost → globalisation has facilitated this loss of jobs in industry.
- Facilitated businesses accessing the means of using FDI more easily to move production overseas by offshoring to take advantage of lower costs or less rigorous environmental or employment regulations.
- Allowed TNCs in MICs to grow and become competitive on a global scale → home-grown manufacturing sectors can no longer compete with cheaper imports so close factories at home.

Workbook answers

Social and economic issues associated with urbanisation

17

- Economic inequality is the difference between levels of living standards, income etc. across the whole economic distribution.
- Inequality exists in all urban areas and enormous contrasts in wealth can be found over relatively small distances.
- Housing developers, builders and planners tend to build housing on blocks of land with a particular market in mind.
- The requirement to include a proportion of affordable or social housing may affect house prices in some areas but wealthier groups can choose where they live, paying premium prices for houses well away from poor areas.
- Changing environments mean that houses built for one purpose are now unsuitable. For example, larger family villas built in Victorian and Edwardian times are now too big for the average UK family. Many have been converted into multi-let apartments.
- Conversely, former poor areas are being gentrified. The 'right to buy' legislation of the 1980s transformed many council estates in the UK when houses were bought by their occupants and improved.
- Living in poorer areas may often mean poorer facilities such as less-successful schools. If exam results are not as good it is harder to find careers that will help lift people out of poverty, so the inequality in deprived areas is reinforced.

18 The content of this answer will depend on the contrasting urban areas that are used.

Some indicative content:

- Social segregation is when groups of people live apart from the larger population due to factors such as wealth, ethnicity, religion or age.
- Cultural diversity is the existence of a variety of cultural or ethnic groups within a society.

Possible related issues:

- Housing:
 - Ultimately the wealthier population of an urban area can afford to choose where to live and will often end up in the better-quality homes in nicer environments – with better liveability.
 - Poorer quality housing areas often have worse access to higher quality services like education and healthcare.
- Changing environments:
 - Sometimes the nature of an urban area can change – in the process of suburbanisation in the UK more affluent and socially mobile populations moved outwards from central areas of the city, 'leaving behind' a less advantaged population and often contributing to the stereotyped deprived 'inner cities' of the UK.
- Segregation based on ethnicity:
 - Initially minority ethnic groups will arrive in a country as new immigrants. Upon arrival they often experience discrimination in the job and housing markets. Often they can only afford to live in the cheapest housing. Therefore, newly arrived ethnic groups often end up 'segregated' in the parts of the urban area

Workbook answers

with the poorest quality housing. Very often these patterns persist for several generations.

- Cultural diversity:
 - Large cities are often praised for their multicultural environments and high levels of ethnic diversity.
 - As outlined above, individuals from particular cultural or ethnic backgrounds may find themselves living together in certain parts of the urban area.
 - This can create thriving vibrant areas of cultural diversity fostering a greater range of employment opportunities, specialist ethnic shops and religious centres, and diversity of the arts and cuisine.
 - Problems can also arise due to this 'cultural segregation' – disagreements and suspicions can often develop between different parts of the urban community, often stemming from a lack of communication and understanding between groups; but very often the root causes of these problems lie in deprivation and poverty, and are not directly related to culture and ethnicity.

19 a

- On average people in Cambridge can expect to live 1.6 years longer than people in Oxford.
- There is a significant difference in the levels of unemployment – unemployment rates are over 2.5 times higher in Oxford than Cambridge.
- The range in values is much greater in Oxford than Cambridge → life expectancy has a range of 15.4 years across wards in Oxford, whereas in Cambridge the range is 8.2 years. For unemployment the range in Oxford is 8.5 percentage points, while it is 3.9 in Cambridge.
- The standard deviation figures confirm the patterns identified above. In Oxford there is greater spread around the mean for both variables than in Cambridge.
- Life expectancy and unemployment values in Cambridge are more clustered around the mean than in Oxford → less inequality in Cambridge.
- In Cambridge around two-thirds of the population can expect to live within 2.6 years of the mean, i.e. they can expect to live between 78 and 83.2 years.
- In Oxford around two-thirds of the population can expect to live within 3.4 years of the mean, i.e. they can expect to live between 75.6 and 82.4 years.
- The standard deviation for unemployment is twice as high in Oxford, suggesting there is much greater variance in the unemployment levels for Oxford wards than for Cambridge wards.

b

- The data suggest that there is a greater level of inequality for Oxford wards than Cambridge wards for both life expectancy and unemployment.
- Unemployment levels for some wards in Oxford are obviously high, for example, in Blackbird Leys and Churchill, while levels in some wards in Cambridge have very low levels, for example, Castle and Newnham.
- The data only allow an assessment of relative inequality between the two cities. Having the same figures for the average values for the UK as a whole would allow a more in-depth assessment of the extent to which these inequalities actually raised issues of deprivation.

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20 Generic strategies could include:

- enforcing a living wage
- local progressive taxation systems, e.g. council tax
- providing/improving schools; encouraging integration between students from segregated communities
- supporting low-skilled workers to improve their skills; focus job creation in deprived areas
- providing/improving public transport
- enforcing minimum environmental standards such as air quality or availability of open space

Urban climate

21 A microclimate is a small-scale variation in temperature, precipitation, humidity, wind speed and evaporation occurring in a particular environment such as an urban area.

22

- Surfaces in the city tend to be less reflective than those in rural areas – materials such as bricks, concrete and tarmac have a much lower albedo, acting like rock and absorbing heat.
- Air pollution from vehicles and industry increases cloud cover, creating a pollution dome and trapping heat within the urban area.
- Water falling on surfaces is removed more quickly so there is less evapotranspiration, giving more energy to heat the atmosphere.
- Heat is generated in urban areas by buildings, vehicles and industries.
- All the above factors lead to a phenomenon known as an Urban Heat Island (UHI).

23 A worked example can be found in your workbook.

24 Increased frequency and intensity of weather phenomena in urban areas:

Weather type	Reasons for increased frequency and intensity in urban areas
Precipitation	<ul style="list-style-type: none"> • Higher urban temperatures encourage the development of lower pressure over cities in relation to the surrounding area. • As ground surfaces are heated, rapid evapotranspiration occurs, resulting in cumulus cloud and convectional weather patterns. • High-rise buildings and a mixture of building heights induce air turbulence and promote increased vertical motion. • Low pressure caused by rising air draws surface winds in from the surrounding rural area. • Urban pollution can increase cloud formation and rainfall. • Cities may also produce large amounts of water vapour from industrial sources and power stations.
Thunderstorms	<ul style="list-style-type: none"> • The urban heat island generates convection. • Thunderstorms are produced by convectional uplift under conditions of extreme instability. • The updraught of air through the central area of the towering cloud causes rapid cooling and condensation. • There are more pollutants for water droplets to form around and these, together with hail and super-cooled water, coalesce during collisions in the air.
Fog	<ul style="list-style-type: none"> • Fog is associated with industrialisation in urban areas.

Workbook answers

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| | <ul style="list-style-type: none">• Higher levels of pollution, especially from burning fossil fuels, include particles.• Particles in pollutants act as condensation nuclei, encouraging fog formation.• Fog usually occurs under high pressure conditions during the night as temperatures fall. |
|--|--|

25 There are a number of possible effects:

- The surface area of cities is uneven because of the varying height of buildings – winds are affected by the size and shape of the buildings.
- Buildings exert a powerful frictional drag on the air moving around them and this can cause changes in wind speed and direction.
- Average wind speeds are lower in cities than in the surrounding areas and they are also lower in city centres than in suburbs.
- The frictional drag on air moving over and around buildings creates turbulence, giving rapid and abrupt changes in both wind direction and speed.
- In the lee of the building there is a zone of lower pressure, causing vortices behind it.
- High-rise buildings slow air movement but they also channel air in one direction into the gaps between them, especially on long straight streets (e.g. New York's 5th Avenue). This channelling effect increases the speed of the wind.
- Similarly, if the gap between buildings gets increasingly narrow this 'funnels' the wind causing a build-up of pressure known as the Venturi effect, which can cause major problems due to the speed and strength of the wind.
- Winds in such places can be so powerful that they make buildings sway and can blow passing pedestrians off their feet.
- On calm and clear nights when the urban heat island effect is at its greatest, convectional processes can draw in strong localised winds from cooler surrounding areas. In recent years the UHI effect has been accentuated when a city overheats during the daytime in summer. Increasing use of air conditioning units makes it far worse.

Urban drainage

26 a

- Rural areas contain more natural surfaces such as forests, grassland, farmland and wetlands, which intercept precipitation and allow it to infiltrate more slowly into the ground.
- Urban surfaces tend to be impermeable, which prevents rainfall from infiltrating.

b

- Impermeable surfaces → rapid surface runoff with little infiltration.
- Groundwater and soil water levels are reduced, so base level flows are also reduced.
- Urban areas are designed to shed water quickly.
- Sloping roofs, rounded guttering and cambered roads → rapid movement of water away from the surface to prevent flooding.
- Water usage is higher and intensified in urban areas. Sewage drainage systems dispose of water quickly.
- Rainwater runoff is directed into underground storm drainage systems acting like a high density drainage system.

Workbook answers

- When the water leaves the storm drains and empties into streams, these fill rapidly.
- Urban areas are more likely to have flooded rivers after heavy rainfall.
- Discharge is 'flashy', with a high peak and a short lag time and steep rising and falling limbs.

27

- This is a new approach to managing rainfall using natural processes in the landscape to reduce and control flooding and provide amenity areas for the community.
- Roof water is collected in water butts for use in gardens or flows to grass channels called swales. It then travels onto grass basins where it is stored in ponds before release into local ditches.
- Rain falling on roads or paths soaks through a permeable tarmac or block paving where it is filtered and stored in the stone below, or it flows into grass channels that have a stone filter drain underneath before it joins the rest of the SUDS system.
- Usually there will only be a little water in the detention ponds and the swales when the rainfall is light.
- If it rains heavily the swales and basins fill for a short period, protecting areas downstream.
- Water is collected, cleaned and stored in the local landscape, providing an attractive place for recreation and wildlife conservation.

28

- a The managing of previously damaged rivers in an attempt to restore natural processes and improve biodiversity. The aim is to provide benefits to both people and wildlife.
- b Answer will depend on the project studied. Some generic reasons for and aims of river restoration include:
- Huge amounts of damage have been done to many urban rivers.
 - Over recent decades there is increasing awareness of how damaged drainage systems could provide significant amounts of amenity services to people and the environment.
 - Often river restoration works alongside river conservation, and the protection, preservation and management of wildlife and natural resources.
 - Very often river restoration in urban areas has to balance with the needs to maintain some level of flood defence.

Urban waste and its disposal

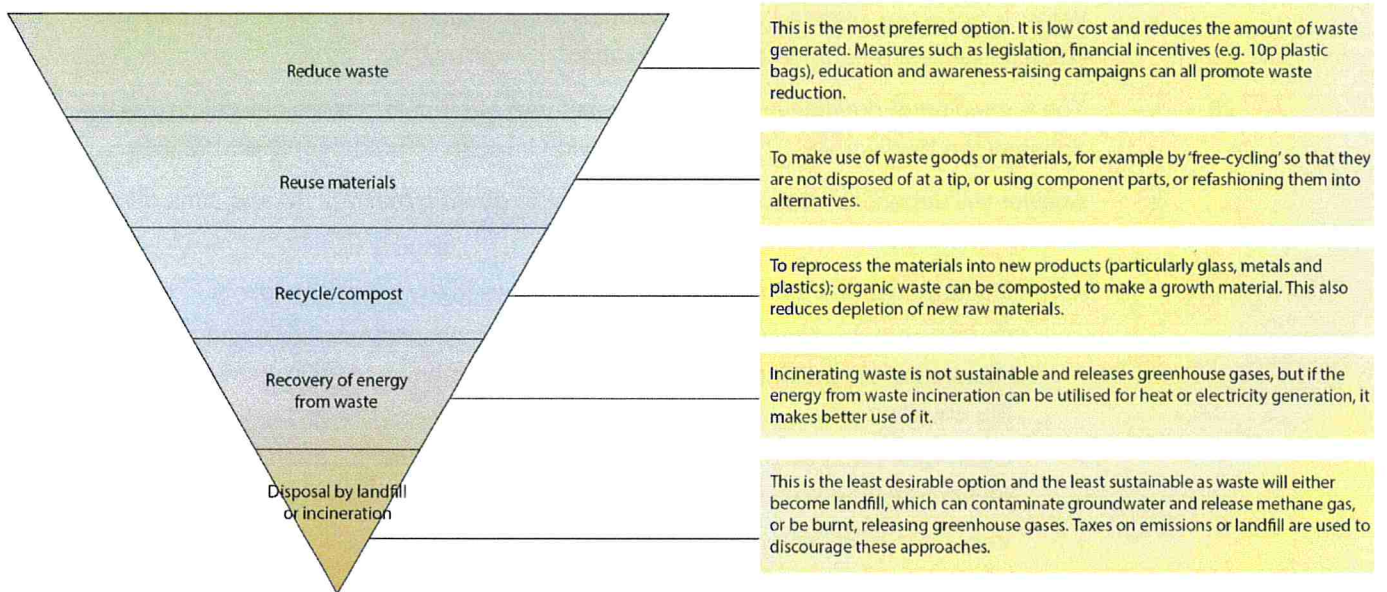
29

- There has been and will continue to be a significant increase in the amount of waste generated by countries in all income groups.
- While HICs generated the highest total amount of waste and produced the highest amount per person in 2016, they are predicted to see the lowest increase in the total amount of waste they produce – a 196 mt/yr increase – the smallest proportional increase.
- LMICs will move from third place to producing the most overall waste by 2050 – an overall increase of 647 mt/yr.

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- UMICs are predicted to increase their overall amount of waste produced, but are predicted to remain in second place across the time period.
- LICs are predicted to remain the lowest overall producers of waste at all times. In 2016 they produced over seven times less waste than the highest producers, HICs; by 2050 they are predicted to produce more waste, but about four and a half times less than the highest producers (LMICs).
- By 2030, UMICs are predicted to have overtaken higher income groups to have the highest levels of waste generation.
- The lowest income groups have the lowest levels of waste in each period but show the highest proportional increase.
- The amount of waste produced per person is predicted to triple in LICs, more than double in LMICs and be over one and a half times higher in UMICs; the rate of increase is lower in HICs. However, the start point for LICs is so low in 2016 that despite the high rate of increase, individuals are still predicted to be producing significantly less waste than those in other countries.
- There is a clear correlation between the size of the urban population and the amount of waste produced – this is true at all income levels.

30



31

Type of disposal	Advantages	Disadvantages
Landfill	<ul style="list-style-type: none"> • Facilities are properly sited with necessary controls • Different types of waste accepted and ordered 	<ul style="list-style-type: none"> • Unsightly • Often opposed by neighbouring residents • Potential leaching of chemicals threatens groundwater supply • Decaying matter produces methane, a strong greenhouse gas which is also explosive • High transportation costs
Incineration	<ul style="list-style-type: none"> • Can reduce volume of waste needing disposal by 90% 	<ul style="list-style-type: none"> • Expensive • Not all waste is combustible

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	<ul style="list-style-type: none">• Can inactivate disease agents• Can reduce toxicity of waste• Can be used to produce energy• Incinerator 'bottom ash' can be recycled as a secondary aggregate	<ul style="list-style-type: none">• Poses challenges of air pollution and incinerator 'bottom ash' disposal• Capacity limitations• Unpopular with local residents
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Any specified urban area that you have studied can be used to exemplify this comparison. Well-known examples to consider include Amsterdam, Singapore (www.towardszerowaste.sg/zero-wastemasterplan) or Woking, Surrey.

Other contemporary urban environmental issues

32

- Dereliction is the state of buildings or property becoming abandoned and dilapidated.
- It is associated with former industrial sites, especially after deindustrialisation, often in inner cities. It may affect nearby services such as pubs and shops which also become vacant.
- Negative impacts:
 - Crime and vandalism rates in derelict areas are higher.
 - Nearby house values fall.
 - Leads to out-migration of residents.
 - Can pose risks to health (e.g. contamination from former industrial sites).
- High costs of urban renewal and reversing the fortunes of such areas.

33 Causes and consequences of water pollution can include:

- Surface runoff from streets carrying oil, heavy metals and other contaminants from motor vehicles.
- Industrial waste.
- Untreated or poorly treated sewage, which is low in dissolved oxygen and high in pollutants such as nitrates, phosphorus and bacteria, leading to eutrophication. Treated sewage can still be high in nitrates.
- Rubbish dumps, toxic waste, chemical and fuel storage can all leak pollutants.
- Intentional dumping of hazardous substances.
- Air pollution can lead to acid rain, nitrate deposition and ammonium deposition, which can alter the water chemistry of an area.
- Other consequences include the death of aquatic wildlife, degradation of ecosystems, human health risks and additional water treatment costs.

34

- The line of best fit implies that there is a positive relationship between the proportion of the UK's cars that are registered in a region and the number of times the legal limits of pollution are exceeded.
 - The North East, Wales, Yorkshire and Humberside, West Midlands, and London and the South East, all fit this trend. The North East has 3 per cent of cars and exceeded the pollution levels just over four times, while the North West has about 10 per cent of cars and limits were exceeded over six times.
- It is possible that London and the South East have skewed the data – they have almost a quarter of the cars and pollution limits were exceeded the most in this region.

Workbook answers

If this region was removed from the data the pattern and positive relationship for the remaining regions would be less clear.

- For example, the East has the second highest proportion of the UK's cars, but exceeds the pollution limits on the fewest occasions.
- Scotland has a relatively low proportion of the UK's cars yet pollution limits were exceeded more times than any region outside London and the South East.

35 Strategies for managing air pollution

- Clean air acts – introduction of smoke-free zones.
- Vehicle control and public transport:
 - incentives to reduce vehicle emissions
 - encourage use of public transport, cycling or car sharing
 - congestion charges/low emission zones (e.g. London)
 - road tax linked to vehicle emissions
 - park and ride to reduce urban congestion
- Zoning of industry – to be located downwind of city centres.

Strategies for managing water pollution

- Ideally pollutants are prevented from entering water courses in the first place, but the reality is that potential pollutants are treated before they are discharged.
- Water treatment facilities and wastewater plants.
- Regulations aimed at 'point source' polluters such as industries that discharge water pollution into receiving waters or sewer systems that flow into treatment plants.
- Low-impact development is a management approach that can help to reduce storm water runoff, primarily through the use of vegetation and permeable surfaces to allow infiltration of water into the ground.
- Legislation, regulation and enforcement.
- Education and awareness.
- Use of appropriate technologies.

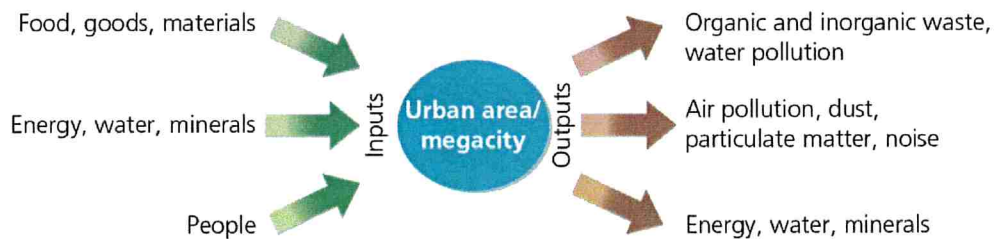
Strategies for managing dereliction

- This is most commonly addressed through urban regeneration schemes.
- In the UK government-led schemes have included:
 - Urban Development Corporations
 - City Challenge
 - New Deal for communities
 - City Deals
- Government focus has been to use brownfield sites rather than greenfield sites for new developments, which has redeveloped much derelict land.
- Where derelict former industrial land is heavily polluted or contaminated the process of land remediation is employed.

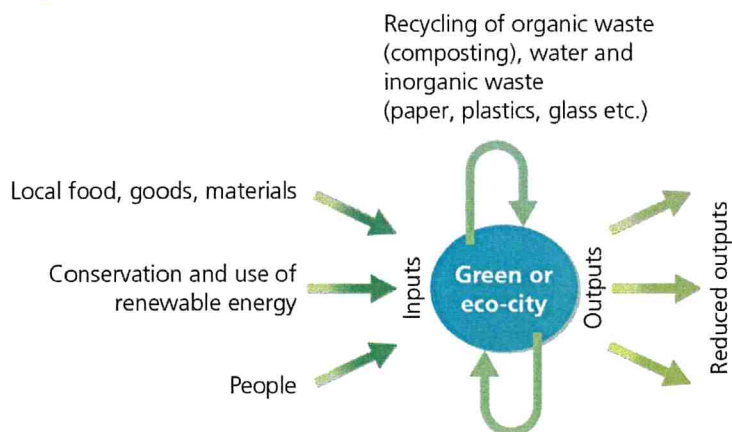
Workbook answers

Sustainable urban development

36 a



b



37 Liveability:

- The characteristics of urban areas which make life more comfortable and endurable for city dwellers.
- Includes amenities such as parks and green space or more socioeconomic features such as job opportunities, political stability and feeling safe/secure.
- Linked to social welfare/wellbeing and measured by the Global Liveability Ranking.

38 Ecological footprint:

- Can be used to measure the environmental impact of cities.
- A measure of the demand placed by humans on Earth's natural ecosystems.
- It refers to the total area of productive land and water required to produce the required resources a population consumes and absorb waste produced.
- Cities tend to have a larger ecological footprint than the surrounding rural area.
- Wealthier urban areas have a higher footprint than poorer ones.

39 Strategies include the following:

- Investment in infrastructure such as:
 - roads, dedicated fast transit public transport lanes (e.g. Curitiba)
 - electricity supply (from renewable sources), water, sewers
 - waste management – better collection and recycling and energy recovery
 - schools and healthcare services
- Provision of green spaces to benefit public health and liveability.

Workbook answers

- More sustainable and affordable housing, e.g. low carbon housing developments such as BEDZED.
- Adopting a local currency – serving local people and keeping money within the local economy (e.g. Bristol pound).
- Participation of a range of city stakeholders including transport, police and other emergency services, healthcare, business groups, residents in local planning decisions.
- Risk evaluation and strategies – measures to evaluate the greatest risks and hazards and install schemes to mitigate them (e.g. flood barriers).

40 Avoid just listing negative environmental impacts of urban areas. This 'link' question needs you to make clear reference to the water and carbon cycles.

- Urban areas can have a significant impact on the water cycle:
 - Higher temperatures of urban areas increase rates of evaporation and increase the amount and rate of water transferred from the surface store to the atmospheric store as water vapour.
 - High levels of particulate pollution and dust produced in urban areas act as condensation nuclei → cloud formation and increased precipitation, the urban heat island effect contributes, causing convectional uplift, transferring water from the atmosphere store to the surface store.
 - Drainage basin level – impermeable surfaces and drainage systems in urban areas increase rates of surface runoff, reducing lag times and rapidly transferring water into rivers.
 - Large amounts of water are consumed in urban areas by extracting water from some sources (lakes/rivers/ground water) and wastewater is then returned to other sources of water, affecting the size and rates of transfer between these stores.
- Urban areas can have a significant impact on the carbon cycle:
 - There are many direct impacts on the carbon cycle: petrol and diesel vehicles burn oil-based fuels transferring CO₂ directly into the atmosphere store.
 - Fossil fuels and wood used as energy sources for heat and light in urban areas around the world directly transfer CO₂ to the atmosphere store.
 - Huge amounts of electricity are required. A large amount of this is produced using fossil fuels – coal, natural gas, oil – reducing the carbon stored in the ground and transferring it to the atmosphere store as CO₂.
 - Urbanisation and the building of cities itself also transfers carbon from the terrestrial store to the atmosphere store through the use of concrete and cement.
 - They rely on food produced in other places, therefore consumption in urban areas causes transfers of carbon to the atmosphere store through agricultural processes involved in producing their food, e.g. methane from pastoral farming and rice production. The processing and transporting of this food into the urban areas also produces CO₂, which is transferred to the atmosphere store.
 - The above point is also true for the goods and services that are consumed in urban areas but produced elsewhere – again the urban area has an indirect impact, with carbon being removed from stores as the raw materials (wood, oil, limestone) to produce the products are then consumed (plastic goods,

Workbook answers

chemicals, paper, concrete) which transfers carbon to the atmosphere store as CO₂.

- People in urban areas produce a large amount of organic waste (food waste and sewage) – this decomposes releasing methane, transferring carbon to the atmosphere store.

Exam-style questions

Exam-style set 1

1

Allow 1 mark for each valid point with additional marks for developed points. (AO1) (4 marks)

- Government-led regeneration schemes promote urban resurgence (1).
- Redevelopment by private companies attracts investment into central areas (1).
- City living can be more attractive (1); people live closer to work; proximity of entertainment and leisure facilities (1d).
- Gentrification – areas become more fashionable (1) with independent shops, bars etc.
- Major festivals or sporting events can act as a catalyst (1) for regeneration and investment.
- Any of the above may have a positive multiplier effect on the area (1d).

2

AO3: Level 2 (4–6 marks); Level 1 (1–3 marks)

- A significant increase in the number of megacities is predicted – by around three times.
- All continents/regions, with the exception of Oceania, are projected to have ‘grown’ new megacities over the 35-year period.
- On a global scale there is predicted to be a general shift in distribution eastwards and southwards.
- There will be a greater proportion of megacities in south and east Asia, from 8 to around 30 – accounting for about 50 per cent of megacities in 2000 to 61 per cent in 2035.
- Africa is projected to gain four new megacities and South America will gain two, which more than doubles the amount overall for these two continents.
- Europe also gains two new megacities in the west (London and Paris) and a further one in the east, if metropolitan Istanbul is regarded as being in Europe rather than Asia.

3

AO1, AO2: Level 3 (7–9 marks); Level 2 (4–6 marks); Level 1 (1–3 marks)

- There are very significant differences in the methods of waste management employed in the different groups of countries.
- The most obvious trend is the relationship between income and the amount of waste sent to open dumps – accounting for 93 per cent of waste in LICs, about two-thirds of waste in LMICs, less than one-third in HMICs, but only 2 per cent in HICs. Open dumps dominate in LICs – they cannot afford to employ more sophisticated approaches, and waste management may be less of a priority for their limited budgets.

Workbook answers

- Landfill increases from 3 per cent in LICs to just over half of waste in UMICs, but then accounts for less than 40 per cent in HICs. Landfill has a little less environmental impact than open dumping, but more environmentally friendly waste management techniques are often expensive and so it is often only in HICs where reducing the use of landfill has become a policy.
- Incineration accounts for 10 per cent of waste in LMICs and UMICs and more than double this in HICs. This is a relatively expensive strategy. It may be employed in HICs to deal with harmful waste such as hospital waste, or as an alternative source of energy in electricity or heat generation, often involving expensive technology.
- Recycling is used in all income groups – in LICs this is to avoid the expense of producing new products, while in HICs expensive collection and processing systems are in place in efforts to reduce the amount of waste going to landfill.
- Only the richest countries can afford to employ more advanced methods.

4

AO1, AO2: Level 3 (7–9 marks); Level 2 (4–6 marks); Level 1 (1–3 marks)

Economic impacts:

- unemployment; reduced job opportunities
- closure of businesses/industries
- increased population receiving state and council tax benefits
- loss of income to the local authority — inability to provide services
- de-multiplier effect – service sector declines as local population has less disposable income – sets off a spiral of decline; failure to attract investment
- fall in property prices

Social impacts:

- higher levels of poverty and deprivation
- out-migration
- higher crime levels
- increased health problems due to poor diet, alcoholism, drug abuse etc.

Environmental impacts:

- dereliction of buildings and land
- residue pollution from 'dirty' industries – may last
- deterioration of infrastructure and reduced maintenance of social housing and public buildings due to lack of funds
- may be some positive impacts such as reduced noise, pollution and congestion

5

AO1, AO2: Level 4 (16–20 marks); Level 3 (11–15 marks); Level 2 (6–10 marks); Level 1 (1–5 marks)

Named example: e.g. Cheonggyecheon River Project in Seoul, South Korea

Indicative content:

- Reasons – what issues/problems exist with the urban catchment? For example, lack of sustainability, dereliction, pollution etc.
- Aims – what was the purpose? For example, to improve conservation, recreation, sustainability, environmental quality, improving drainage, flood control.

Workbook answers

- Describe the work carried out to restore the river and its surrounding area, e.g. bridging points, zoning etc. – include costs and impacts of project if available; was relocation of residents or businesses necessary? (Temporary or permanent?)
- Evaluate by discussing the positive and negative outcomes of the project:
 - economic costs and benefits – incomes for local businesses; residential values etc.
 - social costs and benefits of project – popularity with residents; increased use of area
 - changes in liveability index; consideration for all groups (e.g. disabled)
- Environmental costs and benefits – habitat change, loss during project work; gains on completion; changes in pollution levels (water and air) as a result of the project.

Conclude with evaluation of overall success or otherwise of project.

Exam-style set 2

1

Allow 1 mark per valid point with extra mark(s) for developed points. (AO1) (4 marks)

- The movement of people from large urban areas into smaller urban areas or into rural areas (1), leap-frogging the rural urban fringes (1d).
- It does not lead to suburban growth, but to growth in the rural areas beyond the main city (1).
- It can lead to an increase in commuting to and from the city and changes in lifestyle and increased use of ICT (especially in the rural area) (1).
- It reduces the differences in character between the rural and urban area due to the increased interaction (1).

2

AO3: Level 2 (4–6 marks); Level 1 (1–3 marks)

- All regions of the world have increased their levels of urbanisation since 1950 – this trend is projected to continue until 2050.
- Rates of change have varied between the regions and continents.
- Africa and Asia show the most rapid urbanisation over the 100-year period.
- Africa has mirrored the world average rate of urban growth but has stayed below it, starting at 15 per cent in 1950 and projected to rise to 58 per cent by 2050.
- Asia's rate of urbanisation was very similar to Africa but has accelerated at a slightly higher rate since the turn of the millennium and is predicted to reach 63 per cent, just lower than the global average by 2050.
- Oceania shows the least change over the whole period, starting with just over 60 per cent of its population living in urban areas, rising to about 70 per cent by the end of the twentieth century and is projected to be at around 72 per cent by 2050.
- North America and Europe both show a constant steady growth in urbanisation, running almost parallel with each other; North America starting and finishing at a higher point (65 per cent to 88 per cent) than Europe (52 per cent to 82 per cent).
- Latin America and the Caribbean has always had the highest rates of urbanisation of the developing regions and this accelerated further until recently, reaching around 80 per cent by 2015 (higher than Europe) but the rate is projected to slow a little, reaching 86 per cent by 2050.

Workbook answers

3

AO1, AO2: Level 3 (7–9 marks); Level 2 (4–6 marks); Level 1 (1–3 marks)

- Urban areas often have the most high-skilled and high-paid employment opportunities, but also have the majority of the lowest-skilled and lowest-paid jobs. There is often huge economic inequality between the relatively small number of extremely affluent residents and the large numbers of those in poverty.
- Large urban areas often attract investment in the most expensive and high quality housing for affluent residents – which will be concentrated in the most attractive parts of the city. The poorer population is automatically segregated as people can only afford to live in the cheapest poorest-quality housing, which will often be concentrated in the least attractive locations.
- Often the best health, education and other services are available in urban areas, but may well be prohibitively expensive for the majority of residents, who may only have access to oversubscribed and underfunded poor quality services, therefore widening inequalities.
- Large urban areas are often the point of entry for immigrants. Owing to discrimination in employment and housing markets they are forced to find accommodation in the poorest parts of the city. These patterns can remain for several generations. Segregation occurs along lines of ethnicity, and inequalities exist as outlined above.

4

AO1, AO2: Level 3 (7–9 marks); Level 2 (4–6 marks); Level 1 (1–3 marks)

Avoid just listing features of the urban heat island effect. This 'link' question needs you to make clear reference to people's lived experience.

- Climate change is expected to result in an increase in the intensity of the UHI effect therefore enhancing any of the impacts on people's lives outlined below.
- Health – during extreme UHI events, cases of heat stroke, asthma and organ damage increase; can cause an increase in deaths.
- Vulnerable groups such as the elderly and infants are most at risk from health-related impacts.
- Liveability – in summer months, conditions on transport systems and in buildings can become uncomfortable.
- Higher pollution levels result from the hot, anticyclonic weather conditions.
- Increased water consumption by households and businesses places extra strain on the water supply and may lead to restrictions in water use.
- Higher temperatures can mean:
 - earlier flowering time for plants and prolonged growing season, which can affect people with allergies
 - prolonged survival and higher reproduction rates of insect pests
- Increased risk of chemical weathering on historical buildings and monuments.
- Overall impact of the above may be to create a more negative sense of place, reduce the liveability there and give people a more negative perception of their local place.

Workbook answers

5

AO1, AO2: Level 4 (16–20) marks; Level 3 (11–15 marks); Level 2 (6–10 marks); Level 1 (1–5 marks)

This is an opinion-based answer, which means you must form and express a view as to the validity of the statement after examining the evidence on all sides.

Indicative content:

- Managing social and economic issues focuses on the reduction of poverty, inequality, segregation and social exclusion.
- Strategies for managing economic and social issues include:
 - supporting low-skilled workers with education and training to extend their abilities and develop employment potential
 - giving access to more affordable housing
 - providing more and better quality public transport so people can access all parts of the city/urban area – employment, recreation etc.
 - enforcing a living wage or providing a subsidy (e.g. China, London)
 - providing good quality inner city schools that are well funded and supported by government
 - introducing the idea of a 'Fairness Commission' to reduce inequality (e.g. Sheffield)
- Environmental problems include air and water pollution, waste management, drainage, environmental health and in some cases dereliction.
- Managing these problems can involve a combination of measures, including:
 - legislation such as clean air acts
 - controls such as congestion charges
 - zoning of industry
 - SUDS
 - river restoration
 - water treatment facilities
 - regulating point source pollution
 - more sustainable waste management
- Indirectly, managing environmental problems and enforcing minimum environmental standards can also contribute to solving social issues such as poor health.
- Establishing environment standards might be suggested as the forefront of an 'integrated approach' where a focus on improving the built and natural environment in urban areas reaps social and economic benefits for all citizens.
- Need to assess the relative difficulty in applying the two sets of measures discussed to urban areas studied.
- Come to a conclusion:
 - links between the two sets of strategies
 - management of social and economic issues is or is not more successful in some urban areas – with reference to the evidence provided in the preceding discussion

Workbook answers

- management of environmental sustainability issues is or is not more successful in some urban areas – with reference to the evidence provided in the preceding discussion

Additional essay question

AO1, AO2: Level 4 (16–20) marks; Level 3 (11–15 marks); Level 2 (6–10 marks); Level 1 (1–5 marks)

This is an opinion-based answer, which means you must form and express a view as to the validity of the statement after examining the evidence.

Indicative content:

- Gentrification involves the arrival of new individuals to an area, who will usually have different socioeconomic and demographic characteristics to the local population, and they are generally:
 - more affluent than the resident population
 - well educated
 - employed in professional jobs
 - younger adults with few children
- Gentrification involves:
 - The purchase of neglected, run-down, poor quality, but either characterful or larger houses by wealthy individuals at low prices.
 - Significant investment in renovating the above properties.
 - As the area increases in popularity among other wealthy individuals, property prices begin to rise.
 - Increasingly poorer residents will begin to be priced out of the area as property prices increase; landlords increase rent or sell their properties thus reducing the availability of cheaper housing.
 - The nature of the shops, services and leisure facilities begin to change in the area to cater for the demands of the new wealthier population.
- Some could argue that this process will indeed increase social segregation.
- Others may argue that eventually if the demographic and socioeconomic character of the area changes completely, then within the gentrified area there may be increased social cohesion.
- Some may argue that there may be increased social segregation between the gentrified area and neighbouring areas that have not been gentrified.
- The above is likely to be supported with illustrative material from case study examples.
- Come to a conclusion:
 - Give an overall view on the extent to which social segregation has changed following gentrification.