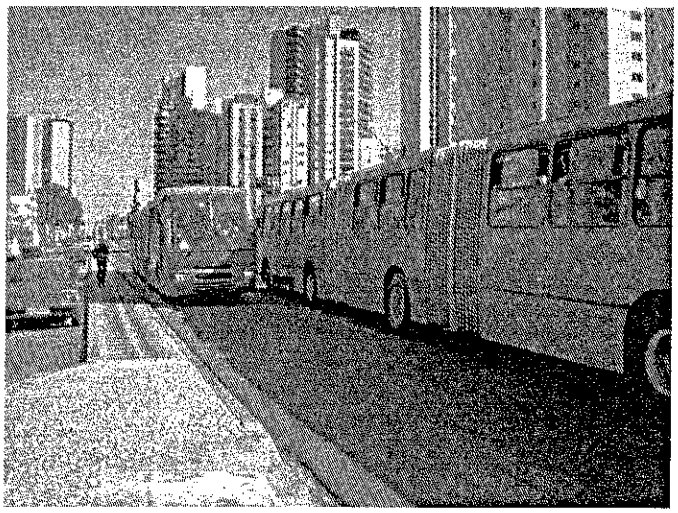
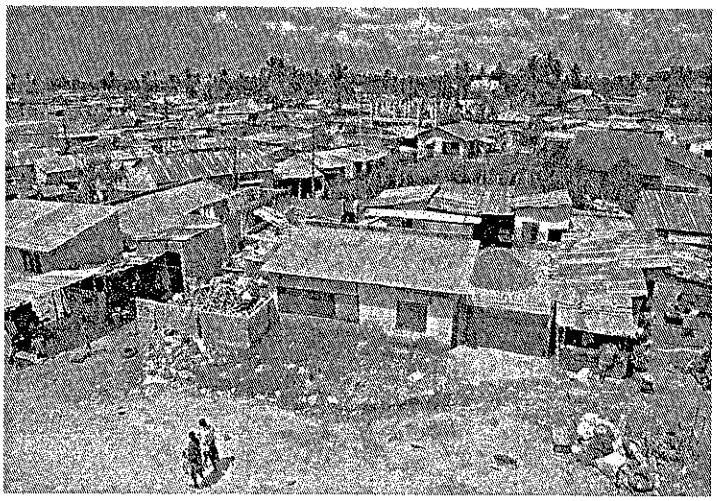
NAME: _____

GEOGRAPHY REVISION WORK BOOK

Unit 1: The Urban Environment





Exam Date:

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ANSWER ALL QUESTIONS!!!

Managing Places in the 21st Century
Unit 1 - Section B - The Urban Environment

Unit progress chart: shade the boxes to show how far you think you have made progress in this topic.

	Red ☹	Amber 😐	Green ☺
Key Question: To what extent are we living in an urban world?			
I can describe how the rate of urban population has changed.			
I know the difference in growth of urban population between the developed and developing world and between continents.			
I know a range of environment hazards (pollution) that are linked to a specific urban area. Case Study: **Mexico City, Mexico or Linfen, China**			
I can describe the challenges that environment hazards pose to the people of an urban area. Case Study: **Mexico City, Mexico or Linfen, China**			

Key question: Responding to the urban challenges in developed countries?			
I can use a range of data to show how inequality exists in an urban area. Case Study: **Calton, Glasgow or Stratford, London**			
I can explain how a range of economic and social initiatives can reduce inequality in a specific area of a city. Case Study: **Calton, Glasgow or Stratford, London**			
I can use example(s) to explain how traffic and the movement of people can be managed in an urban area. Case Study: **Mexico City, Mexico or Curitiba, Brazil, London UK.**			
I can name an example to explain why the area needed to be redeveloped. Case Study: **'Stinky Stratford', East London, UK**			
I can describe the key features of a redevelopment project Case Study: **Stratford, East London, UK**			
I can explain how the redevelopment projects has led to social, economic and environmental improvements Case Study: **Stratford, East London, UK**			
I am able to evaluate how successful the redevelopment project has been by looking at the advantages and disadvantages it has brought to the people living there. Case Study: **Stratford, East London, UK**			

	Red ☹	Amber 😐	Green ☺
Key Question: What are the opportunities and challenges created by urbanisation in the developing countries?			
I can use examples to show how rural to urban migration and natural increase has led to urban growth. Case Study: **Kibera, Nairobi, Kenya and/or Dharavi, Mumbai, India**			
I can describe how urban areas can provide economic and social opportunities to the people there. Case Study: **Dharavi, Mumbai, India**			
I can explain how industrial areas in urban areas provide a stimulus for economic development. Case Study: **Dharavi, Mumbai, India**			
I can identify a range or challenges created by urban growth e.g. housing, environmental issues, demand on public services and squatter developments. Case Study: **Kibera, Nairobi, Kenya**			
I can use examples to show how living conditions in urban areas are being improved from housing schemes to improving health and education. Case Study: **Curitiba, Brazil and/or Kibera, Nairobi, Kenya**			

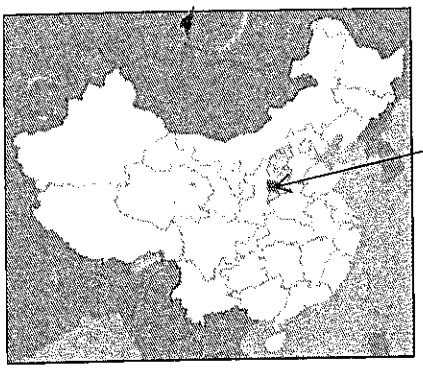
Key Question: How can urban areas be increasingly sustainable?			
I can define the term 'urban sustainability'.			
I can describe the key elements that an urban area needs to have in order for them to be considered sustainable. Case Study: **The Egan Wheel and/or Salisbury, Wiltshire, UK**			
I can describe a range of sustainable initiatives: • Carbon neutral housing, • Greening cities initiatives, • Holistic sustainable urban planning initiatives. Case Studies: **BEDZED, South London and/or The Palace Hotel, London and/or Dongtan, China and/or Masdar UAE, New York Bee Keeping USA.**			
I can define the term 'eco-settlement'.			
I can describe and explain how new urban areas in the UK are being developed so they become 'eco towns'. Case Study: **BEDZED, South London, UK**			
I can explain how cities are being developed so they can be considered as 'eco-cities' Case Study: **Dongtan, China or Masdar UAE.**			

You will need to use the notes in your books and your own independent research to complete this booklet.

KEY WORDS

Biofuel	Burning wood and other vegetation to produce energy/heat/electricity
Brownfield site	Land that has previously been built upon.
Bronchitis	Inflammation of the tubes (Bronchioles) leading to the lungs
Carbon zero	Does not create carbon dioxide.
Commuters	People who travel daily between their place of work and home
Developed World	Countries with a very high level of development – economy, education etc
Developing World	Countries with a low level of development
Deprivation	Where a person's quality of life falls below a level that is considered acceptable by the government.
Deprived areas	Places where social, economic and environmental conditions are poor.
Dereliction	Previously used land and buildings that are no longer used and are decaying.
Eco-homes	Homes that have a minimum impact on the environment.
Ecological footprint	The impact of an individual on the Earth (measured in hectares per person).
Eco-settlements	Settlements that do not harm the environment because they meet the needs of the people without damaging the environment.
Green Space	Parkland and vegetated walkways in urban areas
Greenfield site	Land that has not been built upon.
Greening	Adding green areas to cities.
Integrated transport system	All parts of the transport system fitting and working together to make a city efficient.
Megacity	A city of 10 million people or more
Multi use	Has a mixture of land uses such as leisure, commercial and residential.
Non governmental organisation (NGO)	Organisation that is independent of government control, usually charitable organisations such us WaterAid, Oxfam, Save the Children.
Photochemical smog	Where smog combines with sunlight to form ozone. It can lead to health problems such as breathing issues and eye irritation.
Pull factors	Reasons why people choose to move to an area. Its attractions.
Push factors	Reasons why people choose to leave an area.
Quality of life	The general living conditions of a person.
Redevelopment	Renovation and improvement of areas that were previously run-down.
Self-help scheme	People taking responsibility for improving their own living conditions.
Slums/ shanty town/ favelas	A poor quality area of housing found in LEDCs. These are often on the edge of cities.
Smog	A mixture of smoke and fog.
Squatter settlements	Where people have no legal right to the land they live on.
Suburbs	The outer areas of a city or town. Usually consists of housing.
Sustainable	Meeting the needs of the people without damaging the environment or exploiting resources.
Urban regeneration	Improving social and/or economic conditions in run-down urban areas
Urban sustainability	Meeting the needs of the urban population without the endangering the needs of future generations
Urban sprawl	The outward growth of urban areas.
Urbanisation	The growth of urban areas.
Vandalism	Intentional damage of property.

Linfen

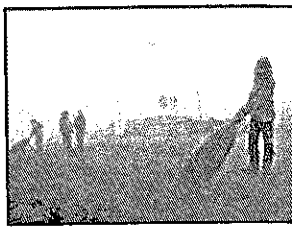


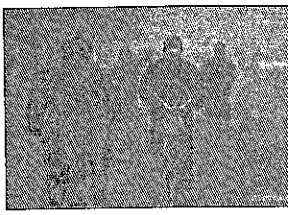
Location:

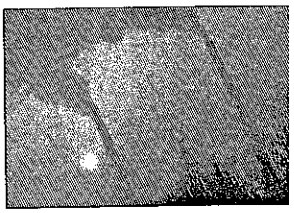
- City in Shanxi Province
- East of China
- Situated in a river basin, meaning air pollution struggles to escape over the valley sides.
- Situated on top of one of China's richest sources of coal.

Key Issues:

- Shanxi Province provides China with two thirds of its energy through the burning of coal and Linfen plays a major part in this.
- Linfen is in the top 10 most polluted cities in the world (16 out of 20 of the world's most polluted cities are in China!)
- **Coal fired power stations** – release Sulphur Dioxide, Nitrogen Oxide and soot into the air.
- **Transport of Coal** – Linfen's roads are constantly clogged with trucks carrying Coal from nearby mines to the rest of China
- **Illegal Coal Mines** – These are totally unregulated and they release large quantities of carcinogenic chemicals, such as arsenic, used in the mining process, into surrounding land and water sources.
- 3,000,000 people are affected by the air pollution created.
- Local residents suffer from serious health problems e.g. bronchitis, pneumonia and lung cancer.
- The children also suffer with high rates of lead poisoning.
- A growing number of local deaths in recent years have been linked to these overwhelming pollution levels.
- Children must sweep the playground to remove the ash and soot that has settled, before they can go outside to play.







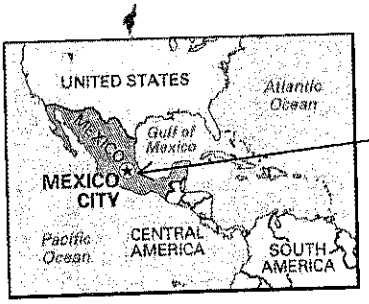
Solutions:

- Chinese government have set up a series of **5-year plans**, which include plans to:
  - Close down coal mines
  - Raise awareness about the air and water pollution through billboard advertising
  - Move towards more sustainable, renewable sources of energy e.g. wind power.
  - NGOs like Greenpeace are campaigning to reduce coal consumption in Shanxi Province

Key Terms/Concepts:

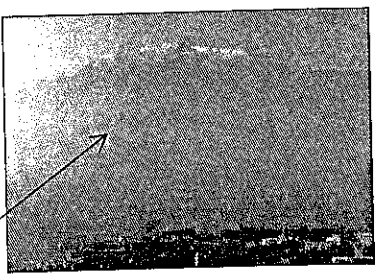
- **Smog**
- **Air pollution**
- **Health implications**
- **Environmental hazards in urban areas**
- **Impacts of industrialisation and the need for economic development (at what cost??!!)**

Mexico City



Location:

- Capital city of Mexico in Central America.
- Located in an extinct volcanic crater, surrounded by mountains: this traps the thick layer of smog that hangs over the city.

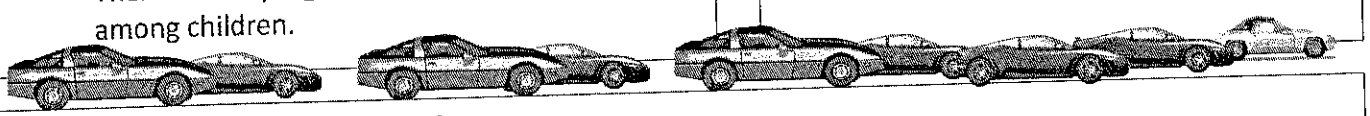


Key Issues:

- Mexico City is surrounded by mountains – it is impossible for the air pollution to escape.
- 80% of air pollution comes from 3.5 million cars.
- 30% of those cars are more than 20 years old – not very clean.
- In 1991 the air was considered 'unsafe' on 355 days out of 365 in a year.
- In 1992, the United Nations described Mexico City's air as the most polluted on the planet.
- In 1998, that air earned Mexico the reputation of "the most dangerous city in the world for children".
- Tens of thousands of people are thought to have died prematurely as a result of respiratory illnesses and cancers relating to the pollution.
- There are very high rates of chronic asthma among children.

How does urban growth increase environmental pressures?

- A growing demand for transport increases vehicle emissions.
- Increasing demand for energy leads to the building of power stations, which increases air pollution.
- Air pollution is caused by burning firewood and coal in the growing urban slums in developing countries.
- Water systems become increasingly polluted by industrial and human waste.
- Waste is often burnt, creating additional toxic pollution, or it is left in waste dumps where it may pollute water systems.
- As urban areas grow the rate of building increases, reducing the amount of green space.



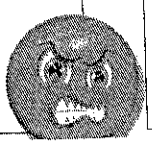
Solution: Plan Verde (The Green Plan)

Features of the plan include:

- *Hoy No Circula (Today don't drive)* -Car owners have to leave their car at home at least one day a week depending on the last number of their licence plate (newer cars that run more cleanly are exempt).
- *Public Transport-* Huge improvements made to public transport with more buses, new bus lanes and the introduction of Hybrid buses. The metro system (which is the cheapest in the world) has also been expanded.
- *Lead Free Petrol-* Only lead-free petrol is allowed to be sold in Mexico City now. This is far cleaner than leaded petrol.
- *Bicycle Rental-* Ecobici was introduced to Mexico City. This was the first bike rental scheme in Latin America.
- *Roof Gardens 'Urban Greening'-* Gardens on the tops of buildings in densely packed areas have been introduced.

Problems with 'The Green Plan':

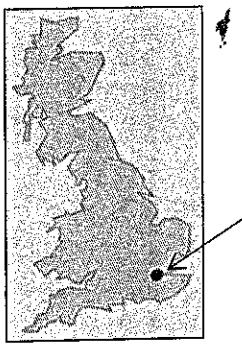
- The environmental problems in Mexico City were so severe in the first place that the Green Plan is having little effect.
- Local residents and business owners were frustrated with the 'Hoy No Circula' scheme and have avoided the rule by owning two cars!



Key Terms:

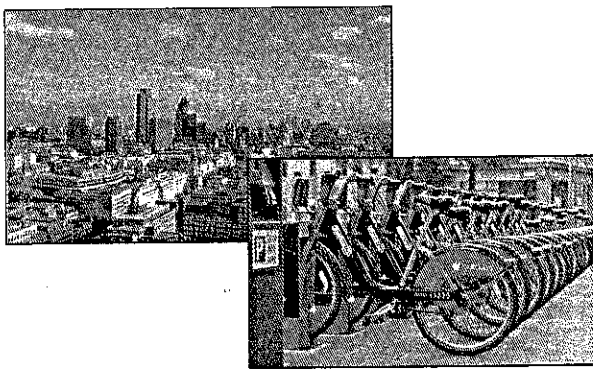
- Photochemical smog
- Air pollution
- Respiratory illnesses
- Urban greening

London



Location:

- Capital city of England
- Located in the south east
- River Thames runs through the centre of the city



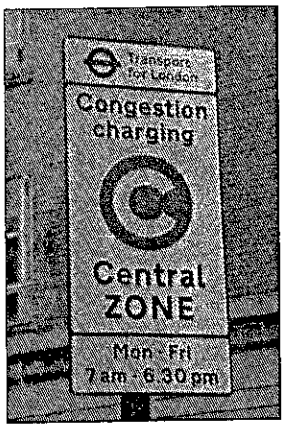
Key Features:

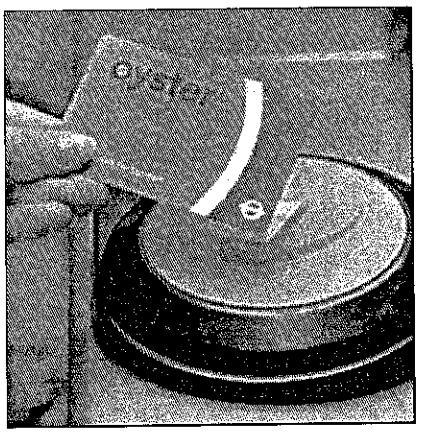
- Integrated public transport system: buses, London Underground and trains.
- Bus and bicycle lanes on most roads in central London.
- Oyster card payment system to allow efficient use of public transport system.
- Barclays cycle hire scheme: self-service, bike sharing scheme for short journeys. People can hire a cycle, ride it and return it to any docking station for the next person to hire.
- Congestion charge implemented to reduce the number of vehicles travelling into central London.
- Cost of parking is very high to dissuade people from driving into central London.

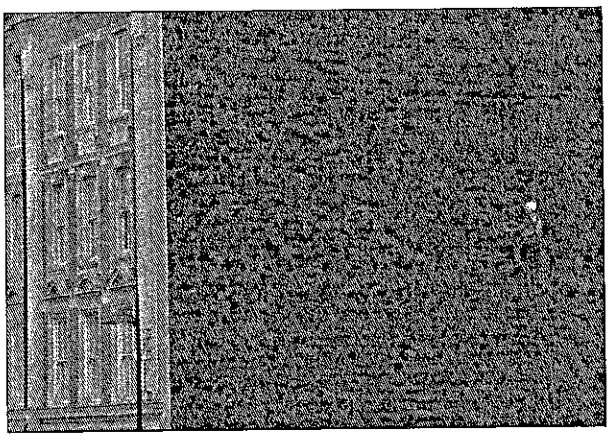
Urban greening:

'Living wall' on The Palace Hotel, Victoria

- An example of sustainability in the city.
- 21 metres tall.
- Made up of 10,000 plants.
- Provides a habitat for a variety of different wildlife e.g. bees, butterflies and birds.
- Keeps the hotel cooler in summer and warmer in winter so reduces need for air conditioning and heating.
- Could reduce localised flooding by absorbing rainfall as it can hold 10,000 litres of water.







Key Terms/Concepts:

- **Urban greening**
- **Reducing traffic congestion in urban areas**
- **Integrated public transport systems**
- **Reducing air pollution in urban areas**

Also, don't forget:

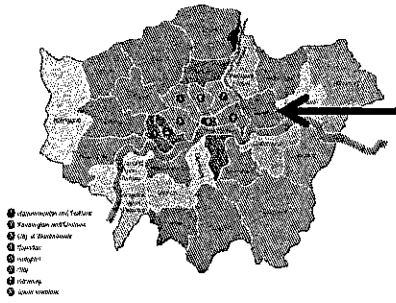
- Deprivation in Newham, East London
- Regeneration/redevelopment in Stratford, Newham, East London
- BEDZED, Beddington, South London

Key Terms:

- Regeneration
- Brownfield site
- Multiplier effect
- Socio-economic conditions

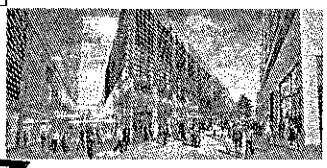
Unit 1: The Urban Environment Case Study Sheets

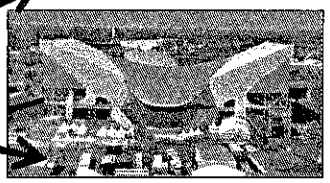
Stratford



Location:

- Stratford is located in the East End of London.
- It is in the borough of Newham.
- It is very close to the confluence (meeting point) of the River Lea and the River Thames.
- It is now home to the Olympic Park and Westfield Shopping Centre.





Key Issues (why did Stratford need regenerating?):

- Most of Stratford was a **brownfield site** (an old industrial or housing area that has become derelict.) The land was contaminated with disused machinery, rubbish, industrial waste and empty factory buildings.
- Poor socio-economic conditions.
- Local people felt there was no sense of community and very few of them knew their neighbours.
- Local residents had few qualifications and were poorly educated.
- Highest unemployment rate in the whole of London in 2009.
- Those who were employed worked in very low income jobs.
- High percentage of people living in temporary housing.
- Poor maintenance of homes, gardens and buildings in the area.
- High crime rate.
- Healthcare provision was low and over 15% of adults who live in Newham suffered from ill health.
- Lack of investment.
- Spiral of decline: **negative multiplier effect**.
- The River Lea was severely polluted from surface run off and people throwing their waste into the water. Poor biodiversity- even the eels were seen to crawl out of the water due to its poor quality!!!
- Lack of green space.

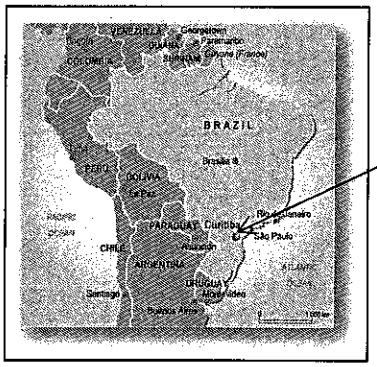
Solutions (how did they regenerate Stratford?):

- Huge investment in the area as part of the London Olympic Games 2012.
- Improvements to public transport: 2 London Underground lines, a high speed javelin train to Kings Cross and the DLR. Stratford International Station will soon be a stop off on the Eurostar to Paris.
- 9,000 new homes created in the Olympic Park e.g. The Athletes Village. New schools e.g. Chobham Academy and health and community facilities have been built.
- The Olympic Games promoted social cohesion in one of the most culturally diverse communities in the UK. It also improved the image of both East London and the country as a whole.
- The Lea River has been cleaned, dredged and new walkways have been put in to improve access.
- Jobs created for local people. Many were advertised as apprenticeships which aimed to get young locals working.
- State-of-the-art facilities have been built in the area for a wide range of sports e.g. The Aquatics Centre and The Copper Box. It will encourage sport and healthy lifestyles across all ages and communities.
- The 150 km2 Media and Broadcast Centre will encourage creative businesses to the area.
- Westfield Shopping Centre is one of the largest in Europe with over 300 shops and 60 different restaurants.
- 300,000 plants were planted in the Olympic Park's wetlands area and over 1,000 new trees were planted in East London. The former Olympic Park has been reopened as a public park for all to enjoy.

Was the regeneration a success?

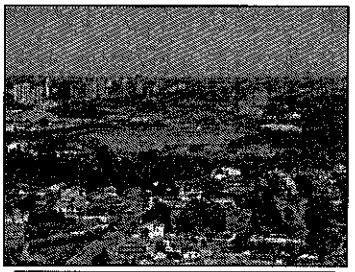
Yes and no- local business owners suffered with the opening of Westfield Shopping Centre. Local people could not afford much of the new housing that was created. However, there have been huge improvements with this added investment.

Curitiba



Location:

- Largest city in the Brazilian state of Parana.
- Located in southern Brazil.
- Population of 1.7 million.
- There is 51.5m² of green space per person in Curitiba, compared to 20m² in London



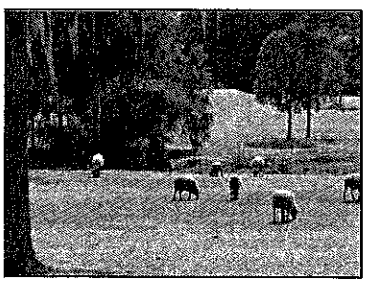
New parks have been created

Curitiba- a sustainable city

- Curitiba has a 'Green Plan'
- 99% of residents in Curitiba would not live anywhere else.
- 70% of people in Sao Paulo would rather live in Curitiba.

Key features of the 'Green Plan' include:

- **The BRT (Bus Rapid Transit system)**
- Creating and retaining **parks** and green space beside the rivers.
- The green spaces that have been created have been dedicated to different ethnic and immigrant groups.
- Over 1.5 million **trees** have been planted in Curitiba
- **Urban shepherds-** sheep are used to cut the grass rather than lawnmowers!
- **Recycling of buildings** – Old buildings are refitted rather than knocked down which saves money and maintains the original character of the city.
- **"Lighthouses of Knowledge"** have been built. These are free educational and internet centres.
- **Environmental education** is taught in all schools in Curitiba.
- **COHAB**, the public housing programme, is providing 50,000 homes for previous slum dwellers.
- **Self-help schemes e.g. A green exchange programme**: Slum dwellers bring their waste to neighbourhood centres. They can exchange their waste for bus tickets and food. This has many advantages, for example the urban poor areas are kept clean, despite waste trucks not being able to reach them easily.



The BRT (Bus Rapid Transit system)

- There are special docking tubes where people can board and get off the bus very quickly. Means disabled passengers can also use buses much easier!
- The long, bendy buses can carry up to 270 people.
- Buses have their own lanes so don't get stuck in traffic.
- Hybrid buses which release 25% fewer harmful gases are used.
- Some employers subsidise their employees who use it. 80% of travellers use it.
- It is as efficient, but much cheaper, than building a metro system. The cost of a new subway system was estimated at over $90 million per kilometre, versus just $200,000 per kilometre for construction of new BRT routes.
- There is a standard fare for any journey so that poorer people on the edge of the city aren't disadvantaged
- There are many stops and residential developments have been planned around these – nobody lives more than 400m away from a stop.

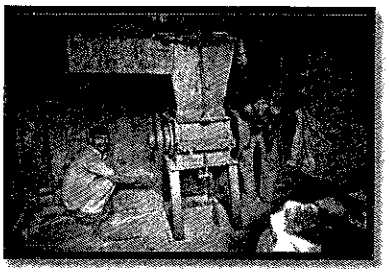
Key terms/concepts:

- Sustainability
- Slums
- Self-help schemes
- Integrated transport system

Dharavi

Location:

- Dharavi slum is located in Mumbai, India.
- Mumbai is a thriving megacity.
- Slumdog Millionaire was filmed in Mumbai.
- High population density- 1 million people live in one square mile in Dharavi.



Reasons for rural-urban migration in India:

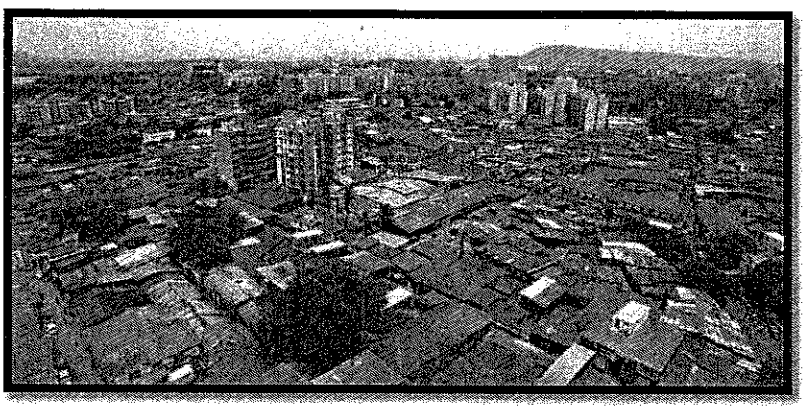
Push factors	Pull factors
Natural disasters e.g. drought or flooding	Job opportunities, especially jobs that are better paid e.g. in the secondary and tertiary sectors
Poor quality housing	Access to better public services e.g. medical care and clean drinking water
Lack of infrastructure	Good infrastructure and connections to other cities and countries
Limited access to public services e.g. education, medical care and clean water	Reputation and prestige of the city
Mechanisation on farms has led to high unemployment rates for primary workers	Range of entertainment
	Access to better education facilities

Watch- Kevin McCloud's 'Slum in grief' insight into Dharavi slum:
http://www.youtube.com/watch?v=Im0tHRs9Bng&safe=active

Is it a 'slum of despair' or a 'slum of hope'?

Socio-economic opportunities:

- **People migrant from rural India to megacities like Mumbai for better employment opportunities.**
- On arrival, migrants usually live in squatter settlements as they arrive with little money and housing prices in Mumbai are high.
- **'Cottage industry'** workshops have been set up within Dharavi slum as a way for its residents to gain a source of income.
- Workshops in the Slum have an economic output of over $600 million per year.
- Workshops produce everything from sweets to briefcases – many leather goods.
- Workers earn an average of $120 per month – 4 times as much as rural workers.
- Much of these earnings are sent back to rural areas or used for schooling.
- **Informal** factory work doesn't require education or many skills.
- Rents in Dharavi as low as £2 per month –the rest of Mumbai has some of the highest rents in the developing world.
- Railway line running through Dharavi means that people can get to jobs in other areas easily.
- 85% of people in Dharavi have a job and this means that they can afford to send their children to school and invest in their accommodation.
- Many houses in Dharavi now have electricity and internet connection.



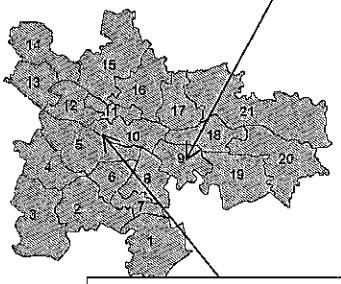
Key Terms:

- **Slum**
- **Squatter settlement**
- **Cottage industries**
- **Push factors**
- **Pull factors**
- **Rural**
- **Urban**
- **Migration**

Glasgow

Location:

- Glasgow is a city located in the west of Scotland.
- Calton is a ward/district close to the centre of the city.
- Living conditions are very different in Calton when compared with the rest of the city.



Key Issues:

- Socio-economic inequality between different parts of Glasgow city.
- Life expectancy in Calton is only 54, compared to 76 in other, more affluent parts of the city.
- Calton suffers from deprivation.
- **Deprivation** is when a person's quality of life falls below a level that is regarded as the acceptable minimum by the government of that country.
- The average baby born in the Calton District is:
  - 3 times more likely to suffer heart disease.
  - 4 times more likely to be hospitalised.
  - 10 times more likely to grow up in a workless household than a child in the city's prosperous western suburbs.
- High rates of alcohol and tobacco consumption (15% of average income on cigarettes alone on average).
- High rates of drug abuse.
- Youth gangs e.g. The Calton Tongs and high crime rate.
- Sectarian violence (large Catholic population).
- High levels of unemployment.
- Poor diets also leading to high rates of heart disease and other health issues.

Reasons for this socio-economic inequality:

- Decline of the textiles industry of the area resulted in large numbers of the population without jobs.
- High levels of unemployment and low levels of education. GCSE pass rates lowest in Glasgow area.
- Railway lines and the railway bridges act as barriers to the area and cuts of Calton from the centre of Glasgow.
- Lack of community facilities such as libraries and post offices. Limited access to public transport. No train station and few bus routes.
- Lack of maintenance to buildings both residential and industrial gives a negative perception of the area and poor living conditions.
- Surrounding areas are more prosperous and have better retail and service facilities so there is a decline in visitors to Calton.
- There are a number of historic but vacant buildings in the area due to the loss of services such as schools and police stations.

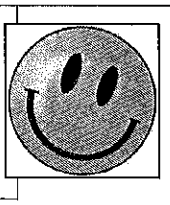
Solution:

- The Scottish Government have implemented a regeneration project called **'The Calton Area Development Framework.'**
- 3 main focus areas:
  - Making 'Places'
  - Improving infrastructure
  - Urban Design

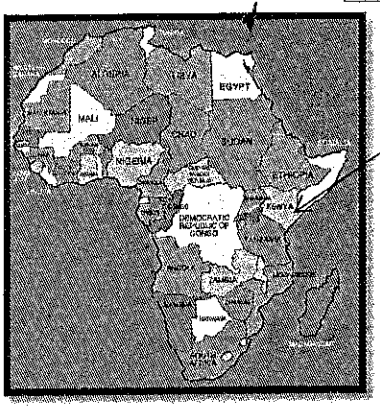
Key ideas include: making the market a 7 day historic tourist attraction, creating cycle paths, pedestrianising the streets, putting up art work, building a new train station, increasing the number of buses that serve the area, urban greening, providing seating areas, ensuring the area is well lit at night, developing the vacant land by building a new supermarket, training facilities and public services e.g. a library.

Key Terms:

- Socio-economic inequality
- Life expectancy
- Deprivation
- Regeneration



Kibera



Location:

- Kibera is an illegal slum settlement in Nairobi, the capital city of Kenya.
- Kenya is in Eastern Africa.
- Kibera is the largest squatter settlement in Africa.
- 60% of the people that live in Nairobi live in slums.
- Between 800,000 and 1 million people live in Kibera.
- It covers 255 hectares (around the size of 255 football pitches).

Living conditions:

- Poorly paid jobs
- Work/ money is unreliable
- Most jobs are in the **informal sector**- that means that the jobs are usually illegal, irregular or not very reliable and people do not pay taxes!
- Quality of life is poor (due to poor quality housing and environment)
- High crime rate- vigilante groups offer protection but at a high cost, Nairobi police are reluctant to enter the slum.
- Children do not go to school
- No privacy
- Diseases spread quickly
- There are around 100,000 orphans – this partly due to the AIDS epidemic in Kibera.

Housing in Kibera:

- Extremely high population density.
- 1 metre of floor space per person.
- Limited sanitation so people forced to use 'flying toilets'.
- No piped water.
- No road access.
- No electricity (legally).
- The houses are built from any available material e.g. corrugated iron and cardboard.
- Paths between houses are irregular, narrow and often have ditches running down the middle that contain sewage.
- Smell: charcoal and human waste.
- Private companies own hosepipes- they then charge double than the standard rate for water.
- One pipe may provide water for 40 inhabitants.
- Individuals homes are kept very clean and residents welcome visitors.

Housing Solutions:

- **NGOs** e.g. Comic Relief, the government and private loans have funded the creation of new blocks of flats.
- 770 families have been rehoused.
- Local people involved in the planning of the new accommodation.
- Running water, toilets and electricity.
- Small, but bigger than the shanty town shelters.
- Less crime.
- Gives people pride in themselves and their community.

Solutions by Practical Action:

- **Practical Action** (a British NGO) have implemented **self-help schemes** e.g. using **appropriate technology** to teach local people how to make bricks out of mud and how to build roof tiles made from sand and clay.
- Practical Action also implemented the Salinga Sanitation Project where they built new toilet blocks, employed local people to lay down a new water pipe system, built shower blocks and provided water to Kibera School for Girls.
- This meant that women and children did not have to walk long distances to collect water, it has improved people's quality of life, reduced the spread of disease, reduced the number of people having to use 'flying toilets' and improved community cohesion.

Education Solutions:

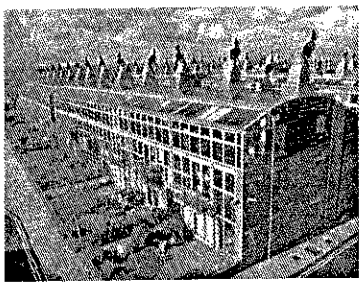
Kibera School for Girls:

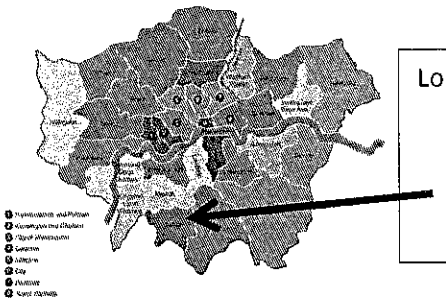
- Funded by a religious group.
- 13 classrooms built by local people.
- Female teachers from the local community e.g. parents.
- Tuition is free.
- Currently providing an education to 140 girls from nursery to 14 years of age.
- 70% of children in Kibera have no formal education.
- 85% of girls in Kibera have no formal education – toilets and preference for sending boys to school
- 50% unemployment in Kibera – jobs are often informal and low paid.
- Girls are taught life skills which can help them avoid contracting HIV (life expectancy in Kibera is 30)
- Some students provided with scholarships to attend fee-paying schools after they leave.

Key Terms:

- **NGO**
- **Slum**
- **Squatter settlement**
- **Sanitation**
- **Self-help schemes**
- **Appropriate technology**

Sustainable Communities- BEDZED



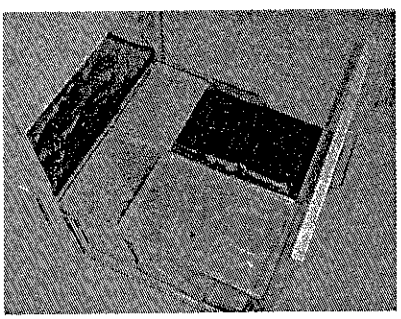


Location:

- Beddington Zero Energy Development
- Located in Beddington, in the borough of Sutton, south west London.

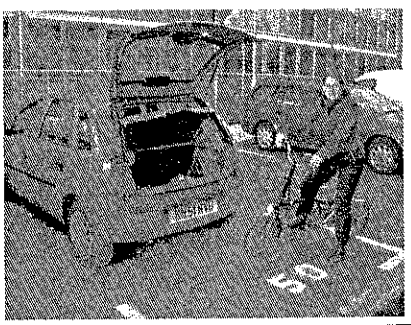
Sustainable features:

- BedZED claims to be the UK's largest sustainable community. Built in 2002, it has 100 homes designed to provide ordinary people with a high quality of life while living within their share of the earth's resources.
- Built on a brownfield site on previously industrial land.
- 50% of houses are for private sale or rent, 25% for shared ownership and 25% social housing for rent so it is possible for people from all different income households to have a flat here.
- In a BedZED home energy use for heating and hot water is reduced 81% by simple things like south-facing windows and triple glazing.
- Electricity consumption is reduced by 45% by low-energy lighting and appliances.
- BedZED walls are thicker than average, with insulation between the bricks to prevent energy loss.
- The building materials have used less energy to make and, where possible, are locally produced.
- A combined heat and power plant was designed to burn BedZED waste to produce hot water and electricity. Effluent from the buildings is treated on site and the water is used for flushing toilets.
- Wind cowls on the roofs which ventilate the houses and recover heat from the air coming out.
- The roofs are covered by solar panels (to generate electricity) and plants (for insulation and a habitat for wildlife).
- People separate their waste in their kitchens to make recycling and composting easier. 60% of waste is recycled, three times the UK average.
- Residents encourage each other to recycle.
- BedZED has a green transport plan to reduce car mileage. There is a car-sharing club and electric car charging points.
- Good public transport links and cycle storage spaces are also provided.



Recycling compartments

Wind cowls and solar panels



Car sharing club and bicycle use

Key Terms:

brownfield site sustainability insulation solar panels living roof
animal habitats energy efficient triple glazing green transport plan