



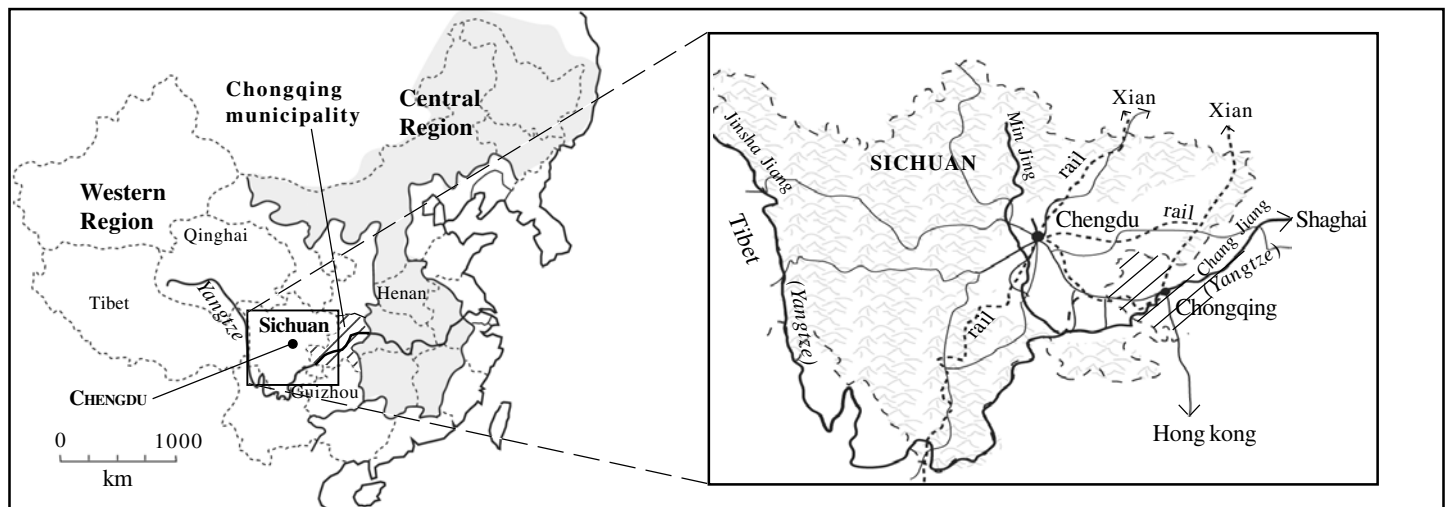
Chengdu: Sustainable Development

Migration and the high rate of economic growth in China are speeding up urbanisation, thus the development of cities has become an important issue. Currently, 30% (400 million) of the population is urban but by 2025 urban population will have exceeded rural. The Government is concerned that cities:

- do not become overcrowded
- have adequate infrastructure and social amenities
- maintain an attractive environment

Rapid growth and the scale of development are placing financial resources under strain, thus the need for support from the private sector and foreign investment. This Factsheet looks at some of the issues facing Chengdu, capital of Sichuan (Fig 1).

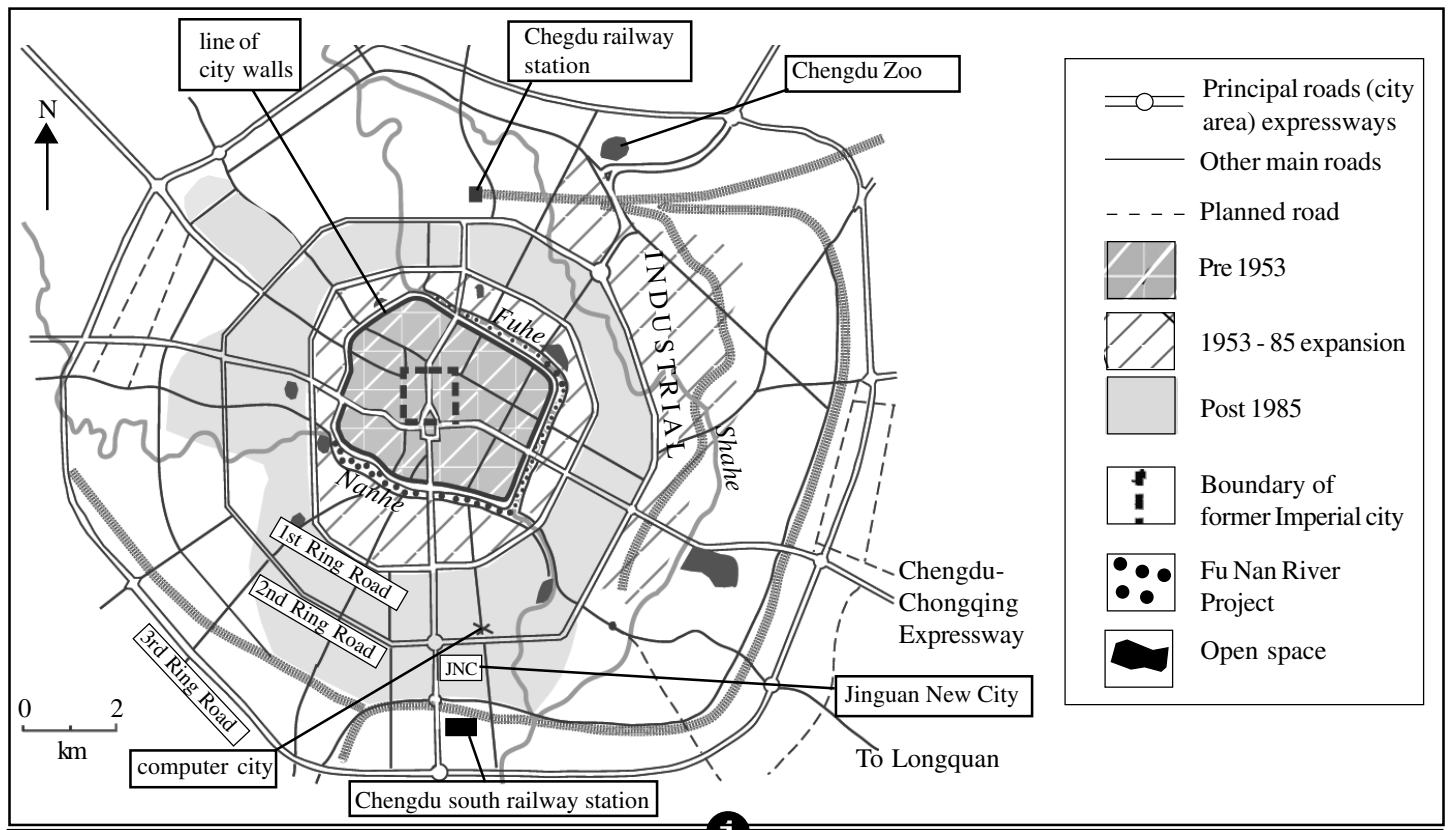
Fig 1 Location of Chengdu



Urban growth in Chengdu

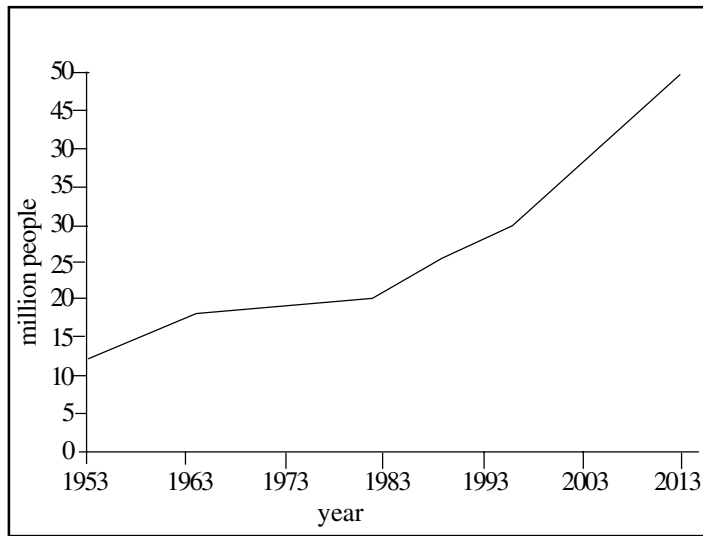
In under 50 years Chengdu has been transformed from a compact walled city of 30 km² with fewer than one million inhabitants, into a modern boom town.

Fig 2 . Chengdu urban spatial growth



The fastest demographic growth and most extensive expansion have occurred in the last 17 years (Fig 3)

Fig 3 Pattern of urbanisation during the Communist regime



Under Communist rule we can identify three phases of growth

1. 1950s-early 1960s: substantial growth and modernisation

- growth linked with **industrialisation** of the first Five Year Plan 1953-7
- government planned and funded
- rural-urban **migration**, drawn by jobs in factories, accounted for nearly half of population increase

2. 1960s and 1970s: government restricted urban growth

- the principal instrument was the **household registration system (hukou)** introduced in 1958. This designated people as either rural or urban and made it impossible for them to live and work in places other than their permanent residence. This dramatically slowed urban growth.

3. 1980s onwards: rapid and accelerating urban growth

- the **economic reforms** introduced in 1979 by Deng resulted in very fast **economic growth** creating:
 - i) employment opportunities - especially in construction and services (domestic and retail)
 - ii) surplus rural labour as rural migrants were drawn in.
- relaxations in the **hukou** system (1984) permitted freer movement from countryside to town. Thus, **migration** became a significant factor in Chengdu's growth
- administrative boundary changes in 1984 resulted overnight in the creation of a municipality of 12 390 km² with a population of over 4 million (urban population 1.4m)
- Today the municipality contains 10.3 m inhabitants of whom 3.7 m live in the urban area.

Sustainable development

Sustainable development provides for the present needs without compromising the needs of future generations. It must be:

- Socially sustainable: providing healthcare, education and housing
- Economically sustainable: affording secure and varied employment
- Environmentally sustainable: showing concern for:
 - health: water supply, sanitation, waste water removal, solid waste collection, air pollution (traffic, domestic fuels, industrial toxic waste
 - loss of life from natural hazards
 - resource management – water, power
 - green spaces / loss of ecological sites
 - the quality of the built environment
 - traffic congestion and accidents
- Involving participation in decision-making at local level

Sustainability issues in Chengdu

Many issues are really a legacy of the past e.g. during the period 1961-77 the provision of housing, utilities and infrastructure was neglected. (*As you work through this section note the links with past development strategies*) 1984 saw the introduction of the Urban Planning Law. Its strict observation is evident in the improved layout of new development beyond the first ring road and in zoning, separating industrial and residential land uses. This latter is in contrast with the mixed workers' housing and small factory development of the 1950s and 1960s on the then urban periphery in the east. Note also the role of private investment without which development, especially infrastructure, would be curtailed.

Socio-economic sustainability

1. Housing

Issues: old stock and shortage

- Within the city centre there still remains some of the overcrowded, dilapidated, flimsy, wood and plaster stock with leaking roofs and no piped water and sanitation, a legacy of pre Communist days.
- Overcrowded six or seven storey tenements built in the 1950s and 1960s, interspersed with industrial development. These dwellings are now in poor condition.
- In some areas high-rise development has taken place, overshadowing remaining older housing
- More housing needed

Current strategies : construction of housing at both ends of the market

- Change to a market economy in the late seventies has meant that with the rise of a more affluent class, up-market housing developments are increasing in the both the downtown area and in the newer suburbs, especially on the west side.
- High rise apartment blocks (**densification**) are a feature of the newer suburbs. More attention is paid to planning since the 1984 Urban Planning Law which has to be strictly adhered to.
- Renting accommodation is now a feature of the housing market. Low cost rooms and flats provide affordable housing for some migrants
- Building continues apace.

Warning! It is difficult to get an accurate picture of urban growth and urbanisation in China as data are not consistent

- i) In the early 1980s figures of urbanisation were inflated by the Government as it was felt that urbanisation was essential to economic growth.
 - ii) Criteria by which settlements are designated towns and cities have been changed.
 - iii) Data does not take into account the so called 'floating population', that is, temporary residents, mainly rural migrants
- Overall, migrants account for 35% of urban growth, natural increase 25% and administrative boundary changes 40%

Case study: Jinguan New City- development for the affluent**Location**

- about 7 km due south of the city centre
- Green field site of 69 ha of which 59% will be left as parkland with attractive water features. Started in 1999, completed end 2001
- Designed with the very wealthy in mind: 2000 spacious apartments in 10-storey blocks forming a circle around villas

Services

- piped water, gas, electricity and refuse collection
- Amenities include kindergarten, shopping mall, swimming pool, and tennis courts
- Behind this lies (at present) a small area of modern sub-standard single-storey housing

Note that in China, poor housing is generally found in the inner city. Edge-of-city shanty developments are not the norm, largely as the result of the household registration policy. However, as these restrictions are eased, there is evidence of such development now taking place around the urban fringe of Chengdu and along the railway line going out to Kunming. The so called floating population, most of whom are migrants is increasing.

2. Employment**Issues: rising unemployment with many social implications**

- Unemployment is a major issue. The advent of the market economy triggered the closure of inefficient SOEs of which there were many in Chengdu. Since 1994, many workers have been dismissed. Companies provided subsidized housing, social and welfare benefits.
- Chengdu, surrounded by a densely populated agricultural region with surplus rural labour, has become the focus of rural migrants since the relaxing of household registration
- In the eastern industrial zone where most of the SOEs were located and which has received most of the rural influx, unemployment has reached 13%.
- Some rural migrants now residing and not just coming in each day for informal work, put pressure on transport, utilities and social services
- Poverty is becoming more of an issue as increasing affluence raises the threshold level for living standards. The official Chinese poverty line is less than a dollar per day per person. The loss of social welfare benefits, mentioned above, is another contributory factor.

Strategies

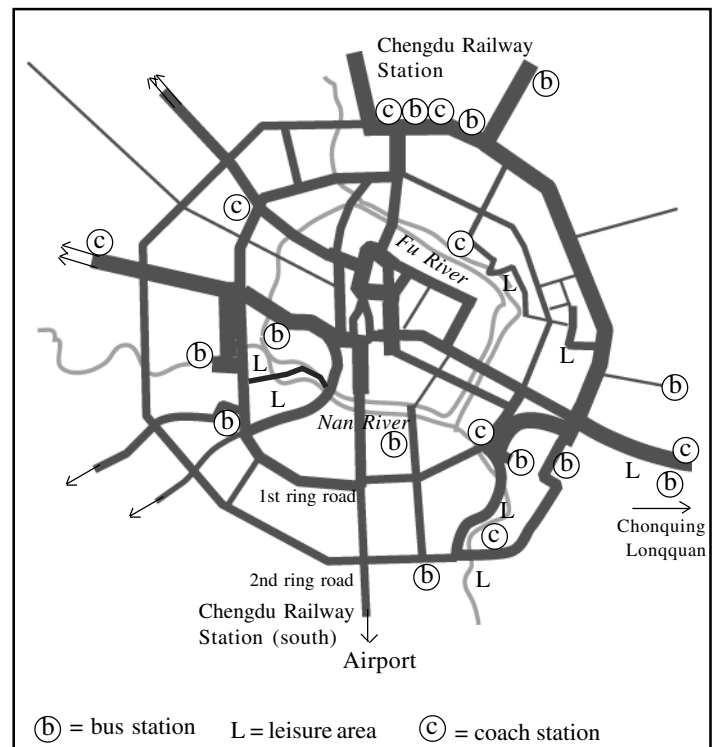
- Chengdu has two labour markets: informal (low status employment requiring few skills and formerly for migrants) and formal. Redundant female urban workers are now seeking domestic service jobs but the knock-on effect is that they compete with rural migrants for the same jobs.
- Services and labouring on building sites are major sources of employment for migrants who do essential but undesirable jobs for low wages.
- High-tech Industrial development : new industrial zones are expanding
 - * A computer city has been established in the urban area (see Fig 2)
 - * A high-tech zone is spreading along the expressway heading NW from Chengdu. Motorola, Alcatel and Siemens for example have located here.
 - * In the eastern industrial zone, SOEs are being sold off and are being replaced by bio-tech industries
 - * The Economic and Technological Development Zone in Longquan, 16 kilometres from the city centre, has been upgraded to state level
 - * Such employment is not accessible to rural migrants who lack the necessary skills

3. Transport:**Issues: bicycles (and cycle rickshaws)are the main mode of transport but changes in travel demands will have to be taken into account**

- With the growth of a more affluent social element in the population, car ownership is increasing. Chengdu now ranks as third city in China in car ownership
- Population growth means that the sheer numbers of people travelling is increasing
- Increase in the urban area involves longer journeys
- Changes in urban land use patterns, for example separating housing from employment areas, necessitate travelling to work
- Changes in life style e.g. increase leisure- related travel
- Conflict between cyclists and motorised traffic at road junctions slows down movement
- Increasing air and noise pollution
- Provision of adequate public transport to reduce congestion

Strategies (Fig 4)

- the road pattern is basically one of ring roads and radials



- wide multi-lane principal roads and lanes for cyclists physically separated from motorised traffic.
- efficient traffic control system with digital display of countdown to change in traffic priorities.
- expressways lead out from the city e.g. the expressway due south to the airport. Others serve distant cities e.g. Shanghai
- several bus and coach stations serve to link Chengdu with its rural hinterland.
- the outer ring road (too far out to be indicated on Fig 4) was completed in 2001 and the third ring road is scheduled for completion in 2002

Future plans

- metro and light rail system planned to serve suburbs as distance from city centre increase

4. Environmental sustainability

Environmental sustainability is not usually addressed in the early stages of development. It is only possible if society and the economy are sustainable. Funding is the big issue. As China's economy has grown, so attempts towards environmental sustainability have increased. Enforcement of environmental laws only began in the early 1980s. Chengdu has been to the fore with greening the urban environment

- tree lined principal roads and managing the Brown Agenda
- addressing river pollution :
 - i) Fu and Nan (The Fu and Nan are distributaries of the River Min which flows into the Yangtze at Yibin)rehabilitation Project

- ii) In July 2001 approval was given for a comprehensive clean-up project for Shahe which has also become heavily polluted by sewage and industrial waste, thus improving the environment of the old industrial region in the east. Launched in November 2001 with a budget of 4 billion yuan RMB, this scheme is scheduled for completion in three years time.

- Upgrading the water supply- Vivendi completed a project in March 2002 to supply the city with tap water as the existing system was no longer able to meet demands
- Citizens are being encouraged to switch from low-quality domestic cooking fuel (charcoal briquettes) which add to air pollution, to electricity from the new HEP plant at Ertan. Solar panels are being introduced slowly.

Brown Agenda Case study:**The Fu Nan Environmental Rehabilitation Project**

A local initiative involving people participation

In common with nearly all chinese cities Chengdu has experienced a range of environmental problems resulting from rapid growth and industrialisation. These inherited pollution problems are known as the Brown Agenda

Background

- *In the 1950s the water in the Fu Nan rivers flowing through the city was clean enough to support fish. People washed their vegetables and swam in it.*
- *By 1970 the river had become muddy and heavily polluted as a result of the release of effluent from industries such as paper, paint, and soap and urban growth had resulted in an increase of untreated sewage. Modern agricultural methods in the Chengdu plain also contributed to the pollution. The river bed was covered with thick silt .*
- *Riverside housing substandard*
- *Poverty, poor health, illiteracy, serious social issues*
- *Living by the river was a health risk and frequent flooding was a hazard*
- *In 1985 a ten -year old schoolgirl decided that action must be taken. A letter drawing attention to the state of the river signed by all her class was submitted to the Governor of the Chengdu Municipality*
 - *That same year an environmental pollution study was commenced. It was completed by 1987. (Remember the date of the Bruntland Report, 1987). Rehabilitation of the rivers and riverbanks which were lined by overcrowded, flimsy and dilapidated buildings prone to flooding, became the number one priority*
 - *In 1993 work on this project costing RMB 2.7B, commenced.*
 - *The project was finished in 1997*

Achievements**(i) flood control**

- *14 km of river dikes were built or reinforced*
- *the flood discharge upgraded by dredging and widening 18 bridges were redesigned*
- *flooding is now a 1 in 200 year event; formerly 1 in 10 years*

(ii) improved water quality

- *over 1000 polluting industries were relocated in new industrial zones*
- *improved sewage system:*
 - *26 km sewers laid*
 - *wastewater outlets into the river were blocked*
 - *all the city's wastewater discharged to water treatment plants*
 - *treated water discharged into the lower reaches of the river*

(iii) upgrading of the riverside

- *removal of slum housing – overcrowded, flimsy, dilapidated, single-storey dwellings lacking indoor tap, sanitation and electricity*
- *replacement by green belt (trees and grass) and riverside walkways. In 2001, lighting installed to enhance the attractiveness of the riverside at night*
- *25ha green space created in downtown Chengdu*

(iv) relocation of displaced residents and businesses

- *100 000 residents were relocated to 24 newly-built complexes scattered in different places outside the first ring road*
- *concrete-built apartments have increased living space (20m² per person instead of 6m²)*
- *piped water, sanitation, electricity introduced resulting in improved health .*
- *complexes have shops, schools and other social services*

(v) new infrastructure:

- *36 km roads laid with pipes carrying water, electricity, gas and telephone lines*
- *26 km of sewers take sewage to treatment plants. Treated wastewater is discharged into the river lower down*

Required

(i) Finance : *cost US\$ 330M. Much money had to be raised*

(ii) People participation

- *large number of residents –3 million- involved at all levels and donated either labour or money*

(ii) Educating people in environmental awareness.

Success evident

- *It has brought about social and economic benefits as well as restoring the environment.*
- *It has become a role model / flagship project for other Chinese cities*
- *The project was awarded World Heritage status in 2000 'For mobilizing resources to create a sustainable urban environment and for promoting adequate shelter and social services for all'*

The future

The change from a situation where Central government strictly controlled urban development, its growth and planning and financing of projects, to the current situation where market forces are playing an important role, leads us to consider several key questions.

Can Chengdu raise the necessary financial capital?

- Chengdu has tackled many issues with bold plans. Large scale schemes are swiftly completed but urban development is costly. Remember that money is not only required to finance the building of a project but also for its operation and maintenance.
- Foreign firms are increasingly being involved in projects as we have seen with Vivendi. Chengdu has also attracted foreign investment in the form of joint ventures.
- Risks are involved: the Hong Kong financial crash in 1998 not only left many buildings under construction unfinished but also resulted in the loss of many construction jobs
- Remember also that finance depends on economic growth. How will China's entry into the WTO impact on economic growth?

How might central government policy affect growth?

- Chengdu has been selected by central government to play a leading role in the development of China's West and should benefit from this.
- How will the breakdown of the hukou system impact on sustainable growth?
 - a) its social impact for the currently marginalized migrant workers
 - b) the impact on economic development as migrant workers become consumers
 - c) the problem of providing adequate infrastructure to cope with demographic increase

How strong is local governance and people participation?

- The recently elected mayor is dedicated to sustainable development. Slogans painted on walls encourage citizen participation in improving quality of life, increasing economic prosperity and rehabilitating the environment.
- Action taken by the mayor includes his instruction that all buildings abandoned as a result of the Hong Kong crisis must be completed over the next two years.

Further reading

Geping and Jinchang: Population and the Environment in China, Paul Chapman Publishing 1994

Leeming: The Changing Geography of China Blackwell 1993

Benyon: Urban conflict, China Review Spring 2000 (Further information on the hukou system)

Hussain: Living in the city, China Review Spring 2000

McLeod and Zhang : One Country, Two systems . China Review Spring 2002

New Internationalist December 2002 'How the children saved the rivers in Chengdu

Web sites

Chengdu urban development:

www.enviroinfo.org.cn/Urban_Development/index3_en.html

Bus transport: info.gov.hk/go_west/ebook_4b.htm

Extension

Think more deeply about this whole issue. To start you off

- Just how sustainable is growth? The Chengdu Weekly, 27.7.01, painted a rosy picture of economic growth by quoting several yardsticks.
 - GNP for example was up 11.5% on the same period for last year.
 - Improvements to living standards were reflected in the increased spending of citizens. Spending on home appliances and services was up by 39% over the same period last year. The number of personal computers per hundred families has increased by over five times since 1997.
 - Can economic sustainability be combined with environmental sustainability?

Exam Question

For a named LEDC city and a named scheme

- (a) Evaluate the impact of the scheme on the environment and the people
- (b) Assess the success of the scheme

Answer Guidelines**Named city and scheme:**

Chengdu: The Fu and Nan Rivers Environmental Rehabilitation Project

- Use Fig 2 to draw a sketch map showing these two rivers and the area where the banks have been turned into public open space.
- Also mark on the first and second ring roads, shading the area between them to indicate the generalised area where the new apartments for the relocates have been built.

Introduction:

a comprehensive scheme with social, economic and environmental benefits focused on two of the rivers flowing through the town.

Explain why the scheme was implemented

- (a) Impact on the environment: points (i) to (iii) } NB you will need to develop these points
Impact on the people (i) to (v)
- (b) Use (iv) and (v) to show health benefits and improved quality of life. Note that all citizens benefit from the environmental improvements: the riverside is a public open space for all to enjoy. It has made the city centre a more attractive area and could therefore attract investors

Acknowledgements;

This Geo Factsheet was researched and written by Carole Goddard as a result of study trips to China 2000 and 2002

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