

Sustainable urban development

3.2.3.8 Urban environments

What you need to know
The impact of urban areas on local and global environments & ecological footprint
Sustainability dimensions: natural, physical, social & economic
Nature and features of sustainable cities including the concept of liveability
Strategies for developing more sustainable cities and challenges to overcome.

The impact of urban areas

In 1960 just one third of humanity lived in cities; the planet was predominantly rural. By 2014 this had changed to over half the planet's population living in urban areas (54%) with the figure set to rise rapidly as urbanisation processes continue to draw rural inhabitants into cities, particularly in Asia and Africa.

Urban concentrations are not only responsible for a greater proportion of the world's population but the urban centres growing most rapidly are not small to medium-size cities, but extensive cities of over a million people (millionaire cities) and megacities (over 10m inhabitants). Ten of the twelve largest megacities in the world are located in rapidly developing parts of the world, with only Tokyo (#1) and New York (#6) in the 'developed' world.

Far from being 'separate' from the rural areas surrounding them, urban areas are fully integrated into the environment that exists around them. Cities draw upon local, regional, national and international networks in order to function. They are supplied with essential resources that permits them to operate and which – if disrupted (energy blackouts, contamination of water supplies etc.) can rapidly cause urban systems to fail.

Similarly, urban areas emanate 'outputs' that can, both positively and negatively, affect surrounding areas at a variety of scales from the local to the global. These effects may be classified:

Physical effects: expansion of urban areas consumes land on which they are constructed as well as requiring large quantities of timber, minerals and energy resources. What flows out of cities enters waterways, groundwater, the air and natural systems.

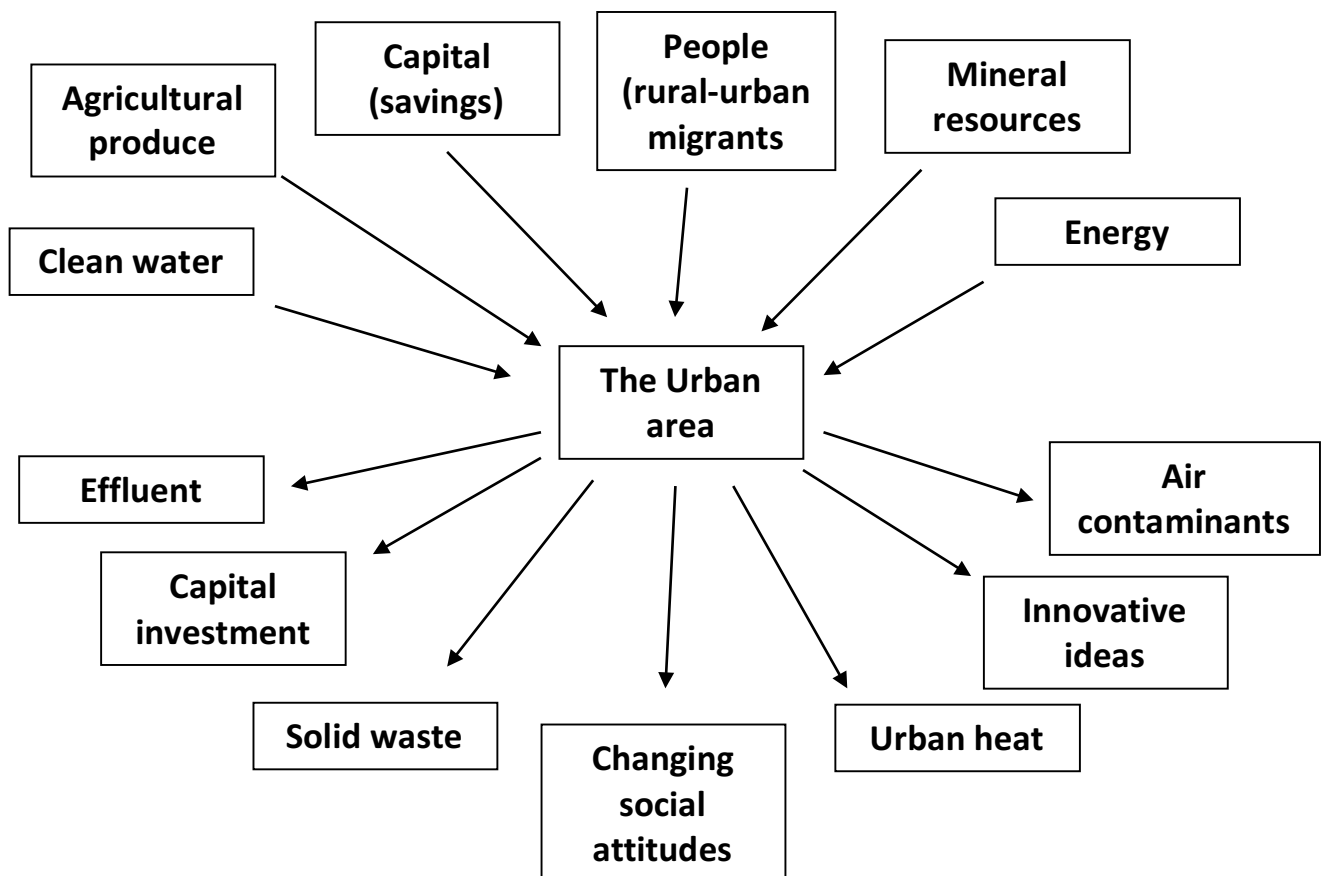
Environmental effects: the supply of key resources to the city can affect the environment from which they are taken, usually in negative ways. Similarly, the outputs from urban areas are rarely positive for the environment. Dealing with urban waste, which is usually a 'local' issue and the air pollution from urban buildings, traffic and energy requirements – which can transfer into an international and even global issue – means the urban impact on the environment can range across spatial scales.

Economic effects: urban areas can be both a drain on the economy of surrounding regions as well as a source of investment. Rural savings that are invested in urban-

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based banks and financial institutions are often re-invested in urban activities as generating the greatest return. This siphons capital from rural enterprises to urban-based ones. On the other hand, the capital surplus of cities may well be invested in rural business opportunities that would not have been forthcoming from the regions themselves. The demand for resources by urban areas generates a flow of revenue to rural providers of food, water, and other resources and services. Additionally, migrants to urban centres – particularly in the developing world – may send savings back to families in rural areas, creating a redistribution of wealth from the city to the regions.



Social effects: Not only do urban areas attract migrants from rural areas, the demographic structure of those who move are more likely to be young adults, of child-rearing age, with ambition, more education and potential talent. This removes them from directly contributing to rural economies and places their qualities to benefit urban areas. There may be a reverse flow of qualified, highly educated young adults from urban institutions into rural provinces, but this often has to be directly encouraged with inducements or conditions of employment for it to be significant. However, it is in cities that attitudes may be most progressive and these may ultimately transfer into rural communities through family contact, producing innovative ideas or more liberal attitudes. Attitudes to desirable family size is for smaller families in urban areas, and this can transfer to rural areas where large families are seen as traditional.

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Ecological footprint of urban areas

The concept of an ecological footprint was developed in 1992 to consider the area required to sustain a population of given size with the necessary resources to function and absorb waste outputs. It is dependent upon the level of consumption of the population, which varies with economic development and lifestyle. Urban areas are seen to have a larger ecological footprint than rural communities, with London requiring an area 120 times the size of the urban area itself to sustain its inputs and outputs.

For comparison, a US city of 650 000 would cast an ecological footprint of 30 000 km², whereas the inhabitants of a city in India of similar size would produce a footprint of only 2 800 km². The calculation of an Ecological Footprint involves estimating the amount of biologically productive land and sea area the inhabitants of an area require to produce the resources they consume and absorb the carbon dioxide emissions they produce – and compares this value to how much land and sea is available. The measurement involves the concept of the **global hectare**, which is the average productivity of all the biologically productive land and sea area in the world in a given year. In 2007 the ecological footprint of the average global citizen was 2.7 global hectares.

The Canadian city of Calgary (pop. 1.2m) was the first to adopt Ecological Footprint reduction targets in 2005. Starting from a footprint of 9.8 global hectares per person at that time, its intention is to reduce this to 7.25 by 2036. Its programme to achieve this includes:

- Moving transport from personal units (cars) to mass public transport
- Powering its public light rail transit system with emission-free wind energy
- Reducing its corporate greenhouse gas emission by 80% from its 2005 level by 2050

The key concerns are that urban areas involve a significantly larger ecological footprint than rural areas, and certainly greater than the biological capacity to support. For urban areas to become sustainable their ecological footprint needs to be reduced substantially, and to match more closely the biological capacity of the planet to support them: a growing challenge given the rapid increase in global urban population.

Sustainable cities movement

The move towards 'ecocities', the early terminology for what are now referred to as 'sustainable cities', occurred in the late 1980s in North America. They now take various forms with different priorities, but some common features are that urban development:

- considers the impact of the urban area on the ecology, economics, politics and social dimensions of built-up area
- pursues sustainable reliance on rural areas for essential resources (including food and water)
- increases use of renewable energy sources to power itself and manage energy consumption with a view to reducing the rise in demand

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- manages waste and pollution sustainably to generate fewest outputs
- contributes a declining input into climate change systems
- reduces the ecological footprint of the urban area

Cities can potentially achieve more efficiency in the use, distribution and management of inputs and outputs due to the concentration of people. Mass transport systems (such as the London, New York, Paris, Moscow ... Underground), waste collection and recycling, water distribution and re-use, building energy efficiency – all can be operated at lower costs (and often commercially) where people and buildings are massed in urban centres.

Liveability

A measure of the quality of life for urban residents ranks cities on a range of criteria. Known as the Global Liveability Ranking, it can be used to compare different urban areas around the world (useful for globalised companies searching for suitable operation bases) and identify improvement/decline of a particular city over time. The Economist Intelligence Unit's liveability rating calculates a city score using over 30 qualitative and quantitative factors across five broad and weighted categories:

- Stability (safety): **25%**
- Healthcare (not just provision – but access by all social groups): **20%**
- Education: (availability, access and quality): **10%**
- Infrastructure (including power, water, housing & communications): **20%**
- Culture and environment (including entertainment and public open space): **25%**

The calculation uses the weightings to produce a score of 1-100 where 1 is 'intolerable' and 100 'ideal'.

Four most improved liveability scores over five years (EIU 2016)

City	Country	Overall Rating	Rank (out of 140)	Five year change %
Tehran	Iran	50.8	126	+5.0
Dubai	UAE	74.7	74	+4.6
Harare	Zimbabwe	42.6	133	+4.4
Abidjan	Cote d'Ivoire	49.7	128	+3.8

Four biggest declines in liveability scores over five years (EIU 2016)

City	Country	Overall Rating	Rank (out of 140)	Five year change %
Damascus	Syria	30.2	140	-26.1
Kiev	Ukraine	44.1	131	-25.1
Detroit	USA	85	57	-5.7
Moscow	Russia	72.8	80	-5.6

(source: [The Economist Intelligence Unit Summary of the Liveability Ranking Overview 2016](#))

While there is no direct relationship between the concepts of urban 'liveability' and 'sustainability' they can be brought together to inform and support each other:

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- Liveability is the 'here and now' while sustainability is about not compromising future generations. By managing cities for both, the long term benefits can be consciously made applicable to current urban residents in the shorter term.
- Liveability is concerned with equity and social coherence between different urban stakeholders. Sustainability policies should be designed that encourage cities to become more socially equal (or, at least, don't increase social inequality).
- In attempting to improve liveability ratings, urban authorities and planners are looking to change aspects of urban systems and functioning. This creates an opening for dynamic and creative thinking that can involve more sustainable operations.

Strategies for developing more sustainable cities and challenges to be overcome

The two biggest challenges to overcome in adopting sustainable urban programmes are:

- **Cost:** it has been cheaper to export the cost of urban externalities into the regional (or international, or global) contexts rather than take full responsibility for them. Who pays for urban waste recycling or mass transit systems: urban authorities? (through taxation of residents, or cutting spending on other urban services); commercial companies? (what if a profit is difficult to extract?); or voluntary action?
- **Sense of will:** the dilemmas facing urban authorities and planners are often larger and more complex than can be tackled on all fronts. It is the easier, short-term, achievable solutions that frequently appeal to elected officials concerned with winning a quick-fix to show to voters at the next round of elections. Constraining the (unsustainable) actions of current stakeholders for the benefit of other (global?) citizens or future generations requires a long-term perspective and a willingness for persistent policy to remain consistent from one administration to the next.

However, the sustainable city concept is becoming more widely accepted in all continents as a desirable imperative for urban development. In the EU the European Sustainable Cities Movement shares good practice and a common platform for extending good practice in urban management. It is built on 4 key principles:

- **Holistic thinking:** considering the global and local, urban and rural, political and social, physical and human contexts which constitute the urban environment – and how they all interact.
- **Sustainability skills:** learning and teaching people of all ages that enable them to understand the issues facing the city-region and planet so they can make responsible choices.
- **Partnerships:** co-ordinated action and sharing of effective practice between different cities across national borders. Developing strong links between business and urban planners. Involving all stakeholders in the decision-making process.
- **Research:** basing decisions on sound data and evaluating the success of initiatives so that the most effective measures can be communicated and replicated elsewhere.