

# The SymbioCity Approach

A CONCEPTUAL FRAMEWORK  
FOR SUSTAINABLE URBAN  
DEVELOPMENT



## SUMMARY

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## Turning urban challenges into opportunities

**U**rbanisation is occurring mostly in developing countries, and future population growth will occur almost entirely in cities and towns in less developed countries. Each year, about 50 million people (or 140 000 per day) move to urban areas, and mostly into shanty towns.

Urbanisation is unlikely to stop because cities offer improved educational, social and economic opportunities and services, and are centres of political, cultural and economic development. However, the rapid growth of poor urban areas presents huge challenges, which require integrated technical, financial, social and urban planning and development solutions to create better quality, sustainable urban environments and lifestyles.

The concentration of people in cities creates opportunities for economies of scale in services such as public transport, recycling of water, waste and materials, and efficient energy use. However, the problems of urbanisation often dominate the debate, and the opportunities are seldom realised in cities in developing countries. As economic centres and major contributors to the national GDP, cities should have the capacity and financial resources to address urbanisation challenges, particularly for disadvantaged groups.

Cities have an enormous environmental impact or footprint due to their demographic 'weight' and the volume of natural resources they consume. Every aspect of urban living has a significant impact on the planet, and particularly the energy used by billions of cars on metropolitan highways, to heat or cool buildings, and to provide food and other resources, often from the opposite end of the earth. Fossil fuel based energy and the low energy efficiency of vehicles and buildings are responsible for most of the CO<sub>2</sub> emissions that contribute global warming and climate change.

Poor communities are most affected by environmental degradation and exposure to environmental hazards such as water and air pollution, toxic chemicals, floods, tsunamis, droughts and landslides. The poor inhabitants of informal settlements often lack secure land rights and effective representation in urban development planning and resource allocation decisions. Their human rights to life, health, adequate safe water, food, housing and public services are threatened in a degraded or polluted environment.

**Since the beginning of this century, the majority of the world's population has lived in cities. It is projected that the global population will increase from 7 to 9 billion by 2050, and that 60% of people will live in cities by 2030, and 70% by 2050.**

**»The City is not a problem  
– it is a solution«**

*Jamie Lerner  
former Mayor of Curitiba, Brazil*



PHOTO Ulf Ramhagen



PHOTO Buffalo City Municipality, South Africa

**A sustainable city or eco-city is designed to minimise negative environmental impacts.**

Environmental challenges are largely due to economic activities, underpinned by cultural values, attitudes and behavioural patterns in a consumption-oriented society. The poor aspire to the lifestyle in rich countries, but this would require impossible levels of resource exploitation. This high-consumption lifestyle is unobtainable for all and unsustainable, even in rich countries. A paradigm shift in our vision for future sustainable cities is thus essential.

For the *SymbioCity Approach*, equitable access to basic physical and social services is a central concern. This can be addressed by dense, mixed-use areas with a variety of public and private services, better opportunities for employment and income generation, and improved public spaces. Good urban governance and development planning are essential to improve living standards for the poor and vulnerable groups. Improved access to education, health services and economic opportunities are essential for more equitable social and economic development.

Safety and security are also crucial, and appropriate urban design can provide neighbourhoods, public spaces and structures that enhance surveillance, safety and social interaction. Access to green areas and sport and recreational facilities is vital, as are schools, churches, libraries, etc. A well-designed built environment encourages community interaction and ownership of public areas, which promotes community building.

Socio-cultural aspects and living conditions directly affect the economic and environmental dimensions of urban development. The goal of sustainable urban development should be to create quality urban environments, which are also resilient and sustainable, for all communities. The focus should be on poverty reduction and improving livelihoods, quality of life, well-being and safety.

Urban areas are the 'engines' of cultural, social, political and economic development. While urban planning should encourage economic initiatives and activities, this must be balanced with socio-cultural and environmental needs and resource constraints. Sustainable economic development can be promoted by improved local governance, mixed-use development which supports entrepreneurship, and cooperation between the private sector, academia and the public sector.



PHOTO Mats Ögren Wanger



PHOTO Vera Larsson

# The SymbioCity Approach – its purpose and scope

The conceptual framework is generic and can be applied flexibly to particular regional and local urban contexts. It provides general guidelines and methods to support sustainable urban development processes. The objectives of the *SymbioCity Approach* are to

- > encourage and support multidisciplinary cooperation among stakeholders and an integrated approach
- > contribute to capacity building by mutual sharing of knowledge and experience, primarily at local government level
- > serve as a basis for dialogue and cooperation between stakeholders at local level, but including regional and national institutions
- > guide urban sustainability reviews at different levels, using a combined multidisciplinary and sector approach
- > contribute to city-wide strategies for improvement of urban areas, including all dimensions of sustainability
- > help cities and towns to plan practical and integrated system solutions for sustainable urban development.

Sustainable urban development is a complex field, which includes many systems, services and relationships. The *SymbioCity Approach* provides an overview of the many issues, linkages, interfaces and synergies between various systems, fields and functions which need to be considered in any urban development initiative

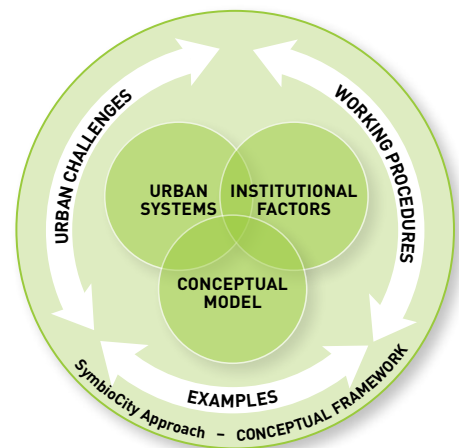
The conceptual framework emphasises healthy development processes and systematic working procedures, which can include a poverty analysis and proposals for poverty alleviation. However, the framework does not go into the socio-cultural or economic dimensions of development in depth. Its primary focus is on the environmental, spatial and systems dimensions of urban sustainability, but with links to other dimensions.

The *SymbioCity Approach* should complement rather than replace existing regulatory frameworks and policies. It aims to provide methods, tools and process-oriented support to sustainable urban development initiatives, to integrate and articulate different needs, perspectives, and intentions. How the approach is applied should depend on the local context and available economic, technical and human resources.

The Approach also acknowledges the many other approaches to and resources on urbanisation, and intends to cooperate and complement rather than compete with others who have similar interests and objectives.

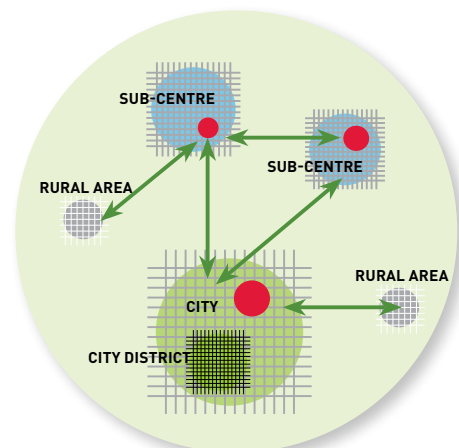
Any urban development analysis or programme needs to consider the situation of poor and disadvantaged groups who lack adequate representation, and are not involved in plans and decisions that affect them. It is outside the scope of this publication to address this need in detail, but governance and participation issues in urban development are addressed in the chapter on institutional factors.

**The SymbioCity Approach promotes an integrated and multidisciplinary approach to urban development, which is relevant in developing, transitional and developed countries.**



**The *SymbioCity Approach* can be used as a conceptual framework and guide for sustainable urban development processes.**

**The *SymbioCity Approach* emphasises urban development according to the local context, and thus the linkages between city centres, sub-centres and rural areas.**



# The SymbioCity Approach as a method

**The SymbioCity Approach provides a conceptual framework and flexible guidelines and methods for sustainable urban development planning.**

The *SymbioCity Approach* is useful for

- > initiating and guiding development planning processes
- > conducting sustainability reviews at different levels
- > elaborating development strategies for existing or new towns, cities and areas
- > analysing urban institutional and governance frameworks.

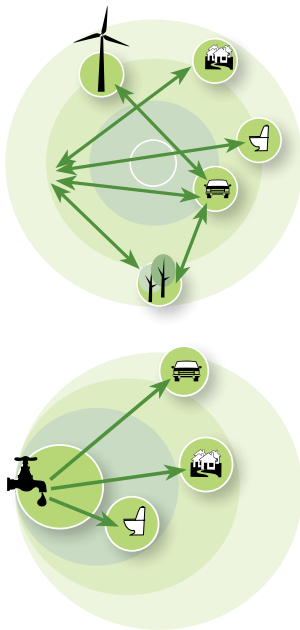
The approach includes the interface and relationships between urban and rural development, as well as with the national and international context.

*SymbioCity Approach* is built on three interconnected core areas – the Conceptual Model, Institutional Factors and Urban Systems. Each area can be approached independently, depending on the context, objectives and focus of an activity. However, it is often useful to combine the three areas, which can be done in different ways.

For example, when planning for a specific system such as water, waste or energy, institutional factors such as governance are often vital to the success of the project. The Conceptual Model can be used to define sustainability in the local context, identify potential synergies between urban systems, and links to economic and socio-cultural dimensions.

The *SymbioCity Approach* emphasises a multidisciplinary approach, but two entry-points are possible.

1. *A multidisciplinary approach* that analyses an area from various perspectives, to identify synergies between different systems in an integrated planning framework. This requires an open and transparent process from the start, to manage possible institutional barriers or conflicting interests.
2. *A sectoral approach* that addresses a specific urban system, e.g. water, but then broadens its scope to identify potential synergies with related systems. A sectoral approach can develop over time into a multidisciplinary approach.



Principle of a multidisciplinary approach (top) and a sectoral approach (bottom).



PHOTO: Ulf Ramnagren

# A conceptual model for urban sustainability

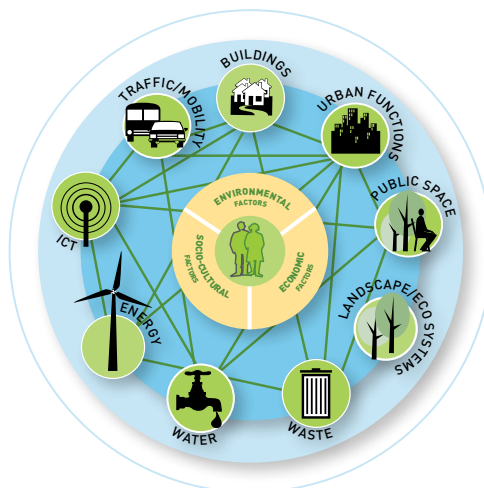
However, as every city or town has a particular character, context and development challenges, the model should be adjusted to local conditions and for particular purposes.

The model can be used to support urban sustainability reviews and urban development planning at different levels, and various methods and tools are provided for analysis and development of solutions. The conceptual model emphasises the relationships between the environmental, economic, socio-cultural and spatial dimensions of urban sustainability. It also provides a framework for describing the relations between different functions and systems in urban areas, in order to identify and develop potential synergies between them.

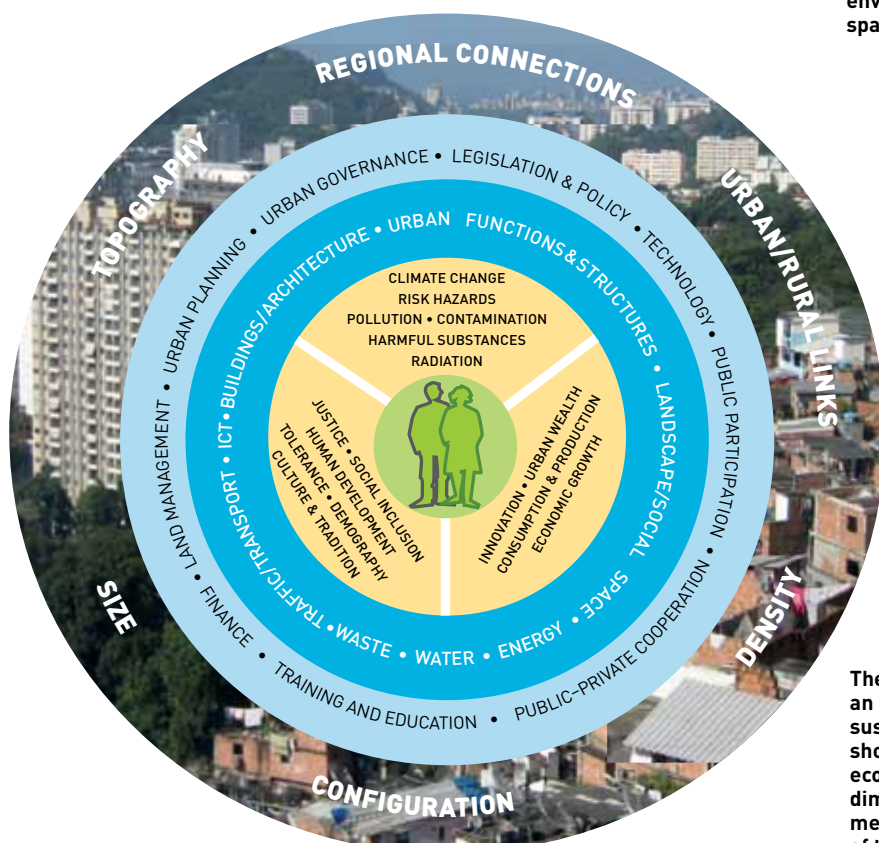
The ultimate development goal of quality of life, including health, comfort and safety for all, is at the centre of the model. The *first circle* represents the environmental, economic and socio-cultural dimensions and challenges of urban sustainability. The *second circle* represents urban systems for water, energy, transport and traffic, waste management, communications, and green and other public spaces. All urban functions and structures that we use in everyday life are defined as urban systems (e.g. housing, work places, social service and commercial buildings, etc.).

The *third circle* represents institutional and governance systems and factors that support and influence urban functions and their sustainable development. The *fourth dimension* of the model represents the built and natural environment, as the spatial context for any intervention to promote urban sustainability.

**The Symbio City Approach conceptual model is generic and encompasses the many complex urban development issues and relationships that need to be addressed.**



The *SymbioCity Approach* promotes urban review and planning processes that consider potential synergies that can add value to the environmental, economic, socio-cultural and spatial dimensions of development.



The conceptual model for an integrated and holistic approach to sustainable urban development. The model shows the environmental, socio-cultural, economic, spatial, institutional and systems dimensions of sustainable urban development, and examples of key factors in each of the main dimensions.

# Institutional factors

**An effective institutional framework is essential to promote sustainable urban development and improve the urban environment.**

In the *SymbioCity Approach*, this includes the following key aspects.

## Urban governance and capacity building

Good urban governance is extremely important as it includes the management of financial, economic, technical, organisational, human and other resources needed to improve the urban environment. The World Bank defines good governance as »Predictable, open and enlightened policy making, a bureaucracy imbued with professional ethos acting for the public good, the rule of law, transparent processes, and a strong civil society participating in public affairs.«

## Legislation and policies

Legislation and policies regarding the urban environment are powerful means for ensuring improvements, in general and for the urban poor. National and regional legislation and policy objectives regarding the urban environment should be the starting-point for local policies, planning regulations and building codes.

## Spatial planning and land management

Spatial planning involves coordination of all types of land use in urban and rural areas. The interplay between urban and rural areas is important for sustainable urban development. Urban planning processes should include all stakeholders and balance different interests in public consultation, participation and transparent decision making processes. Land management systems should be aligned with urban planning objectives. Legislation and policies can improve the situation of the poor by promoting small plots, mixed land use and affordable land and infrastructure for housing.

## Participatory processes

Public participation in efforts to improve the environment is crucial for both short and long-term success. It is important to inform residents from the start and to establish mechanisms for public participation and input in review, planning, implementation and follow-up processes. It is not possible to involve everybody, but representative structures and community organisations should be consulted and involved.

## Financial resources and incentives

Proper financing is essential for planning and implementing urban environmental improvement measures. Financial expertise is needed from the start to provide a comprehensive and objective overview of the financial requirements and risks, and to develop a realistic and optimum financing plan.

## Private sector participation

Ongoing cooperation between planning authorities and the private sector is essential in planning sustainable cities and towns. There should be incentives for businesses of different sizes to become involved in urban transformation. Different fields of consultancy and manufacturing can also provide expertise and innovative, sustainable products and systems.



PHOTO Ulf Ramhagen



PHOTO Peter Engström



# Sustainable urban systems and synergies

Urban areas include various functions, systems and services that are spatially distributed and interconnected, either systematically or randomly. In order to promote sustainability and address environmental, socio-cultural and economic challenges, the SymbioCity Approach focuses on the interfaces and synergies between urban systems, including technical systems, eco-systems and educational, socio-cultural and economic systems.

Urban systems and infrastructure that provide basic services include water, waste and energy, the urban green environment and eco-systems, transportation, the built environment, etc. Urban functions are intimately related to everyday life and have various links to and implications for environmental, economic and socio-cultural dimensions of urban development. Urban functions include housing and residential development, industrial production, commercial services, culture and recreation, education, health and social services.

All these urban systems are crucial for sustainable urban development. They relate differently to the four dimensions of sustainability, which suggests an integrated and inter-sectoral approach to development. Urban functions, services and infrastructure systems should be available to all at affordable costs, and as urban development requires significant investments, adequate financing mechanisms are essential. Good governance and institutional capacity are also crucial, and the needs of citizens, and particularly poor and disadvantaged groups should be prioritised.

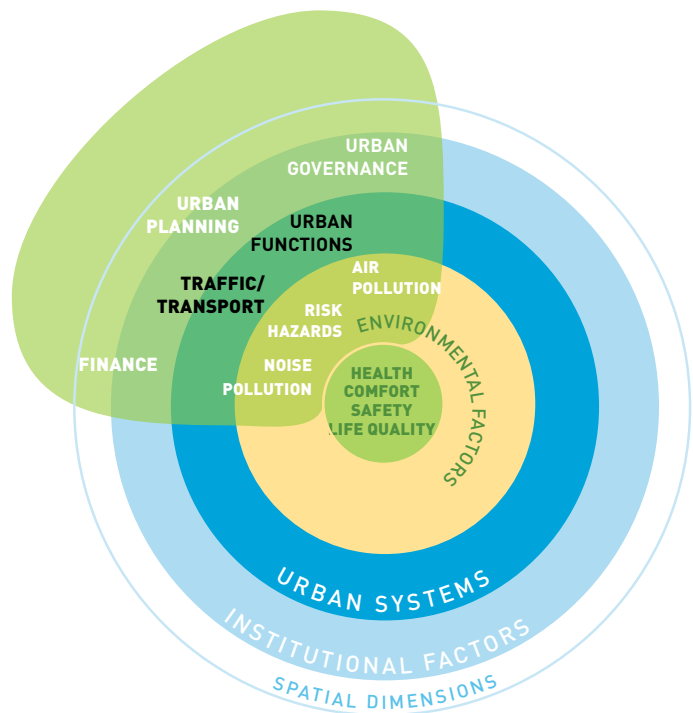
The *SymbioCity Approach* focuses on the interfaces and synergies between systems to avoid sub-optimisation and achieve optimal solutions and efficient use of resources. However, synergies can only be identified and achieved by involving stakeholders in an integrated approach to development, which includes economic, environmental and socio-cultural aspects and needs.

**SymbioCity Approach focuses on the interfaces and synergies between urban systems, including institutional factors, in a spatial context.**



PHOTO Nelson Mandela Bay Municipality, South Africa

**EXAMPLE**  
**Synergies between transport and land-use planning**  
 Integrated land-use planning for different urban functions should be coordinated with planning of an integrated transport system. This can reduce the need for transport, which reduces energy use and greenhouse gas emissions. Urban density and proper configuration of different urban functions has a significant effect on mobility patterns. Higher urban density at nodes and along transportation corridors is an efficient way to promote the use of public transport and reduce urban sprawl.



## Working procedure

**The SymbioCity Approach working procedure includes six steps related to a variety of methods and tools in a cyclical and iterative manner.**

The *SymbioCity Approach* includes a generic process which should be adapted to the particular project and local context. The process has six steps with a variety of methods and tools for applying the SymbioCity conceptual model in a cyclical and iterative manner. This process can be applied in different planning contexts, e.g. conducting sustainability reviews, redeveloping existing areas, or planning new areas on different urban scales. An overall political vision and goals should be the starting-point for an integrated and interdisciplinary approach to urban development planning.

### **STEP 1. Define and organise the planning or review process**

Good planning and organisation of a planning activity is crucial to its success. An organisational plan and time schedule should define all planning activities and their interrelationships. The organisational plan should identify and include all relevant stakeholders, as it is essential to involve citizens, and particularly poor and marginalised groups, in a development planning process.

### **STEP 2. Diagnose the current situation**

The challenges and problems in the area should be mapped in order to identify conditions, needs, problems, opportunities and characteristics. The situation of the poorest and most disadvantaged groups should be a particular focus, as they are most vulnerable to the impacts of urban environmental problems. It is also extremely important to identify assets and positive features, e.g. related to socio-cultural and other aspects.

The causes of problems should be identified, as a basis for developing effective and integrated solutions. When conducting a situation analysis and diagnosis, the following methods can be combined:

1. Mapping and graphic documentation of the area
2. Documentation of negative and positive features
3. Analysis of the urban topology and cityscape
4. Detailed analysis of environmental conditions
5. Analysis of causes, sources and effects of problems and assets.

### **STEP 3. Specify objectives, indicators and targets**

Key objectives, indicators and targets are now developed for the intervention, which specify the future character and performance of the area in the short, medium and long term. The objectives should be based on the preliminary diagnosis and definition of urban sustainability.

Objectives can be both quantitative and qualitative, and are more specific than goals. The following generic steps are suggested:

1. Define urban sustainability in the local context
2. Identify key issues for further planning and review
3. Formulate main objectives
4. Formulate indicators and targets.

**The SymbioCity Approach promotes an inclusive and transparent working procedure.**



PHOTO Anna Backmann

#### STEP 4. Develop alternative proposals

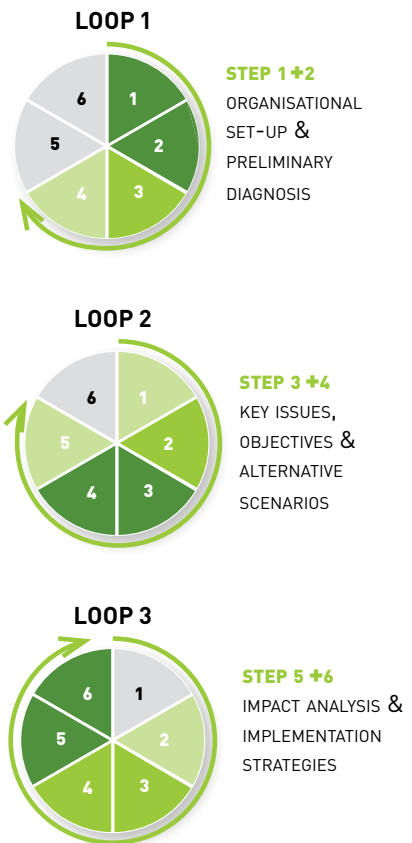
Alternatives are now identified, as urban challenges are complex, and there are often alternative solutions. For any solution or investment to be relevant in both the short and long term, it is essential that alternatives are flexible and focus on synergies between different urban systems. Solutions should prevent environmental problems, or at least mitigate them. Backcasting is a planning method for developing existing and new urban areas, which starts with developing a vision of the desired future situation, and then considers how to work towards it.

#### STEP 5. Analyse impacts

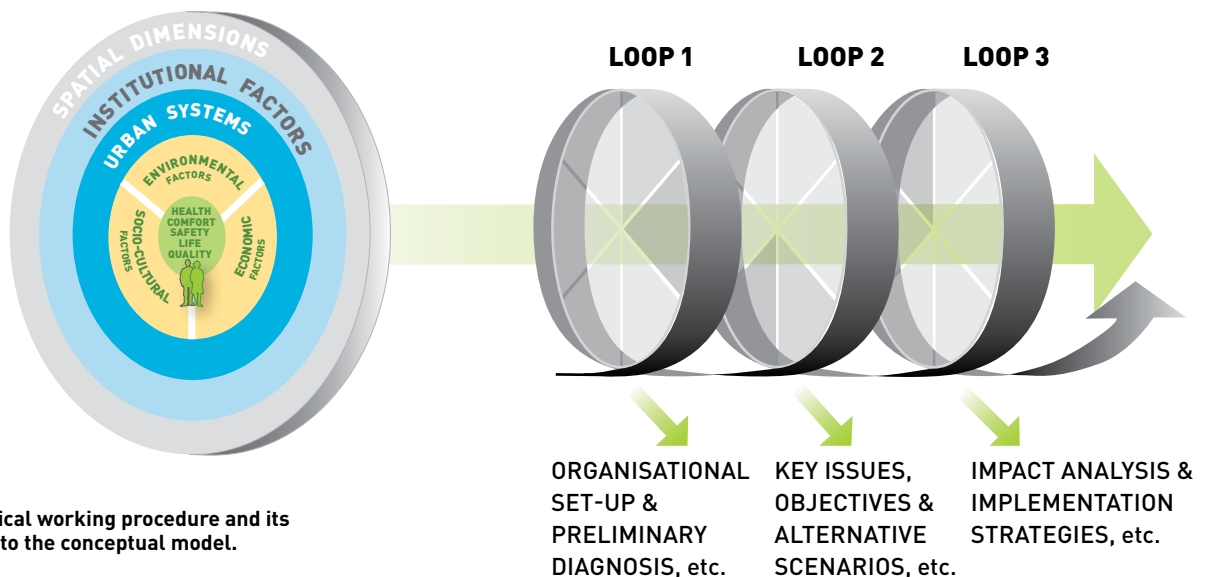
The economic, social, environmental and spatial impacts of alternative proposals or combined solutions should be studied and evaluated as a basis for informed decision-making. Impact analysis is an important step in developing integrated and innovative proposals, and also a core aspect of sustainability reviews. Environmental Impact Assessments (EIAs) are a proven method for evaluating the environmental risks and opportunities of proposed projects, and EIAs can include socio-cultural and economic impacts.

#### STEP 6. Develop a strategy for implementation and follow-up

A final proposal must include an implementation and follow-up plan. The proposal may present a preferred alternative, or combine several alternatives. Synergies between different subsystems are important to optimise the final result of the planning process in terms of the quality the built environment. Aspects such as spatial and transport planning, building design, service provision, public space and landscape planning, etc. must be integrated in all phases of the planning and implementation process to achieve socio-cultural, economic and ecological sustainability.



### APPLICATION OF THE MODEL – PLANNING PROCESS/WORKING PROCEDURES



The cyclical working procedure and its relation to the conceptual model.

**The SymbioCity Approach (SUMMARY) is written by Ulf Ranhagen** (main author) **and Klas Groth** (co-author), in cooperation with **Paul Dixelius and Lena Nilsson on behalf of SKL International and SALAR** (The Swedish Association of Local Authorities and Regions).

**Contributions have been made by a wide range of experts within the field of sustainable urban development via workshops and seminars. Experts from UN-Habitat, Mistra Urban Futures, the Swedish Ministry of Environment, the Swedish Trade Council, u-PLAN Tor Eriksson AB and Ulricehamns Kommun, have contributed by providing valuable comments and input on various aspects of the publication.**

**This version of the SymbioCity Approach is based on »The Sustainable City Approach – Sida Manual for Support to Environmentally Sustainable Urban Development in Developing Countries« (2007), published by Sida INEC/Urban, as well as on earlier versions of the SymbioCity Approach. The 2010 edition has also been translated into Chinese.**