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Chapter 1

# Introductory Chapter: Overview of Sustainable Cities, Theory and Practices

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Additional information is available at the end of the chapter

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## 1. Introduction

Human settlements are the result of the dynamic adaptation of the human community operating in a given territory in the conditions of social, economic and historical relations. The areas on which human settlements are located are distinguished by the components of the physical-geographic structure, by the diversity and by the potential natural conditions, as well as by the economic and social factors in which the human settlements appear and develop [1]. Human settlements represent the totality of human communities, villages and towns, regardless of their position, size and functions. Human settlement can be considered a geographic landscape integrated with the natural and social conditions necessary for the existence of housing, work and equipment (power supply, water, transport, communications, sanitation, etc.). Human settlement is a body of land known to be a regular form of property with a hearth on which communal and territorial attributes develop [2]. The term "locality" defines a human, rural or urban settlement, delimited according to the number of inhabitants, the nature of the built-up area, the degree of the social endowment, the technical-public amenities, the function, etc. Hence, human settlements or human habitat refers to some components such as population, construction, markets, streets, industrial platforms, recreation and recreation areas. Human settlements support the unity of natural, social, material, spiritual, cultural and organizational factors, including housing, labor, energy supply, communications, water, sanitation, services, social security, administration systems, cultural facilities, recreation, etc. [1]. The village is the oldest form of human habitation that presents ethnographic, historical, economic, social or urban characteristics. A village is a group of houses and people who are leaving their means of existence of a determined social space.

Defining the sustainable city, the word sustainability has come into such common usage that it sometimes seems ubiquitous. At the outset, this leads to the need to answer two principal

questions with regard to the movement of sustainable cities. First, what is a sustainable city? And secondly, why is it important that cities become sustainable? In answering these questions, it is useful to draw a distinction between sustainability and sustainable development. Sustainability in its broadest sense is the capacity of natural systems to endure and to remain diverse and productive over time. Sustainable development is the practice of humans arriving at a level of economic and social development that does not inevitably alter ecological balance [3]. Many settlements were fair, with trade, crafts and administrative functions. In the renaissance era, when the bourgeoisie grew, the cities experienced a period of flowering (Florence, Venice and Rome). In the modern and contemporary era, besides the European and Asian cities, colonized colonists have developed in the Americas (New York, Quebec, Bogota). A major urban transformation accompanied the industrial revolution. Between 1800 and 1990, global population grew almost six times, while urban population multiplied more than 120 times. The human settlement represented by urban settlements has two basic components:

- Territorial components that are superimposed on the built perimeter, this being what we call the hearth, delimit the space for the living quarters; sometimes overlaps with the city.
- The socioeconomic and environmental component refers to the population and to the work place, which are closely linked to the city's territory.

The commune is a form of territorial administrative organization that includes exclusively rural settlements, namely villages, whose common point is represented by the unitary, social, cultural or ethnographic character. One or more villages may enter it. The city was defined by F. Ratzel by the existence of three elements: professional activity, concentration of dwellings and number of inhabitants. "The city, as an element of the landscape, is a body linked to the geographical space, inside of which it fulfills a precise function: it concentrates, transforms and redistributes material and spiritual assets." [4]. It is necessary to consider the marked urbanization that draws the population and the growth of the cities. About half of all people live today in the big provincial cities. The majority of Western cities possess unique cultural and architectural qualities, strong social inclusion forces and exceptional economic development opportunities. Cities are centers of knowledge and sources of growth and innovation. Still, it faces problems linked to demographic and social inequality as well as social exclusion of specific population groups including a lack of affordable housing and environmental issues. In the long run, cities will not be able to fulfill their function of engines of social progress and economic growth as described in the Lisbon Strategy, if we fail to maintain social balance in cities ensuring cultural diversity and setting high-quality standards in the areas of urban design, architecture and environment. It is necessary to increase the need for integrated strategies and coordinated actions by all individuals and institutions involved in urban development that can have a more general impact than only cities that are taken individually. There must be a responsibility for the future of our cities at every level of government—local, regional and international level. To make this multilevel governance genuinely useful, it will be necessary to improve the coordination of the various sectoral policy areas and develop a new sense of responsibility for integrated urban development. Also, it is necessary to make

sure that those working on developing these policies at all levels learn the skills and knowledge that they need to build sustainable communities in cities. In modern definition, the city should be conceived not only as a packing of houses and people with a certain physiognomy, with an economic and social life limited to a narrow frame, but especially as a complex organism with much wider functions whose area of manifestation goes far beyond that of the city built in other parts.

## 2. Healthy cities and energy efficiency

According to UN programs, we will be 10–12 billion people around the world by 2050. Agenda 21 is an action program adopted at the United Nations Environment and Development Conference in Rio de Janeiro in 1992. The program describes how efforts to counter environmental degradation, poverty and lack of democracy should be developed in order for our societies to achieve sustainable development. Agenda 21 notes that the human way to extract and use the energy inside is permanently sustainable and identifies two ways to change the energy system: energy efficiency and renewable energy sources. In order for everyone to have a reasonable material and healthy standard of living, natural resources must be utilized efficiently. Economic growth is high in Asia, for example, concurrently the population increases. This leads to more cars, more mobile phone and tablets, as well as white goods such as refrigerators, higher power consumption and so on. Pressure on finite resources like oil, coal and gas becomes large. But the most difficult issue is the pressure on biological resources: forests, arable land, fisheries, wetlands and mangrove swamps [5]. The existence of economic activities and investments on the one hand is closely linked to the existence of high-quality urban structures, a properly constructed environment and a modern and efficient infrastructure. For this reason, it is necessary to improve the existing building opportunities in disadvantaged areas, in terms of design, physical conditions and efficiency of energy use. Adaptation of housing standards for new and existing buildings has the greatest potential for increasing energy efficiency within the EU and thus combating climate change. In order to increase the sustainability of investments in improving the physical environment, they must be included in a long-term development strategy that includes, among others, a sustainable public and private investment program. The increasing population growth puts pressure on, among other things, urban areas, resources, housing prices and public services. Additionally, increased traffic volume results in poorer air quality and congestion-related problems. At the same time, there is also an increasing trend towards social divisions between populations in the larger city. The new challenge for authorities and city planners is to transform metropolitan areas into eco-areas, in a form "sustainable cities," which is able to survive only with green energy and reduce pollution as much as possible. More than half of the world's population lives in cities today, according to the United Nations. Given the unprecedented levels of urban migration in recent decades, in conjunction with climate change, it is necessary to recognize that human livelihood in a significant urban agglomeration, had a big impact on nature. For cities to find a place in the green future of the Planet, they have to turn into clean entities. There are already cities in the world where the future is here. Citizens of the capital

of Iceland, Reykjavik and those in Vancouver, Canada, consume energy supplied almost exclusively from renewable sources. Vancouver is somewhat blessed geographically—with mountains, rivers, oceans and valleys—but the citizens have always tried to help them and make the most of what nature has provided [6]. Considering the complexity of the challenges, there is a need for an overall urban policy framework for how they are addressed and the potentials being exploited. Thinking of social conditions, environment and economy together improve the likelihood of implementing coherent solutions. Sustainable settlements must be economically viable while incorporating climate adaptation, energy and resource efficiency, environment, architectural quality and social security. Economy and the environment can thus generate added value when combined with overall considerations. Urbanization can contribute to a more sustainable society, including linking different city functions into urban development strategies. For example, proximity to public transport can reduce resource and energy consumption when planning accommodation, jobs and shopping opportunities so that busses, trains, walking and cycling are preferred. World cities occupy only 4% of the land area, yet they are home to more than half the world's population. Since 2009, the number of inhabitants in these cities has increased by 7.6%. The development of sustainable cities is one of the most significant global challenges right now. The cities face a large number of social, environmental and economic problems that require conversion. As population flow brings new demands to physical structures, to residents and the management of cities, the need arises for thinking across professions and sectors. This conversion can be done through public-private partnerships where administrations and companies benefit from each other's expertise and experience. Today, each year, humanity uses energy equivalent of only a few thousands of a percent of the solar energy that reaches the Earth's surface at the same time. The types of energy used are just over 90% fossil fuels, according to some analysts.

## 3. Innovative sustainable cities and urban policy

A sustainable framework for urban policy should not only focus on the future but also have a strong contemporary focus, as it will quickly become impractical in everyday life. The vision for a new framework for sustainable urban policy can, therefore, deal with methods that make sustainable solutions an attractive and beneficial alternative for all. Sustainable solutions are intended to be based on Dane's daily needs. For example, we are not necessarily exclusively cycling because it is environmentally friendly and healthy, but perhaps because it is easy, fast, cheap and accessible. This principle can be transferred to sustainable urban development. Everyday life cannot be more cumbersome by a sustainable change, so it is likely that the broad favorite anchorage will be left out. In many occasions, we used several new terms in sustainable city field. There have been confusions in the use of some terms such as climate smart, sustainable development, carbon-neutral and not least of all the environmental classifications of goods and services which appear at regular intervals. It is not surprising if different actors may feel uncertain about what actually makes the greatest benefit for the environment. Initially, it may be useful to define the concept of sustainable development, because it has had such a significant impact on sustainable urban development becoming a political and even commercial focus area. In the literature, there are many different definitions of what

sustainable development is. A brief description is to maintain a positive social change process [7]. Thus, it is the whole society to participate in a process in which the aim is that people's needs must be satisfied, without spending too much on the Earth's resources. However, it is necessary to recognize the limits, conversion and the real meaning of sustainable cities, where the conversion to sustainable cities is therefore both an individual and collective project that can support the city's communities. It requires shared ownership for all, and in the process of initiation, it is important that the city's users get involved in the thinking of the solutions. The government's sustainable urban policy is primarily about social and biophilic theory. In cities that are growing rapidly, poverty also increases. The problem with the cities is that it is difficult to develop infrastructure and services in line with population growth. This means that the living conditions and environment deteriorate for lots of people. Many of the developing countries will continue to grow rapidly. But all cities do not grow, and growth in many megacities (with more than 10 million inhabitants) has slowed down in recent decades, for example, in Latin America's largest cities. The same applies to many Asian cities, such as Calcutta, India. Most of the largest cities are in a handful of states: China, India, Brazil, Indonesia, Mexico, Egypt and Pakistan. In more than 50 nations, there is no city that has reached half a million inhabitants. Third World cities, including some of the largest, are not very populous if counting people per hectare [5]. There will be water shortages, environmental degradation, traffic congestion, slums, crime and abuse. Urbanization also has a positive side, partly because it is strongly linked to economic growth. A sense of social and biophilic city can also have a positive effect on growth and employment as well as the framework for the good life.

### 3.1. Sustainability and social responsibility (a socially sustainable city)

Social sustainability revolves around the human factor as a prerequisite for a sustainable city and a sustainable society. The government's sustainability strategy thus denotes the notion that everyone should participate in the social development and have equal opportunities, regardless of the background. A focused and sustained social sustainability work helps to ensure diversity, democracy and equality in cities. A sustainable city is socially linked to the fact that there are democratic spaces where people can meet regardless of social, economic and cultural backgrounds and provide opportunities for deployment and accessibility for all the citizens of the city. When a city has many offers for both everyday life and special occasions, it becomes more vibrant and attractive—this can also help to increase the quality of life for urban citizens. A socially sustainable city also opens the possibility for citizens' health to be supported in the form of urban spaces designed for physical activity and intercourse. The population's living patterns have also changed. Now, we live in the age of individualism. More and more people spend periods in their adult lives where they live alone. This affects the demand for housing and transport. At the same time, old-day collective solutions are no longer as relevant as they once were, either in the form of commercial offers or in the form of totally disorganized and spontaneous practice of sports. It is important that the cities also allow for individual sports and physical activity. This can help residents improve health and also the cohesion between people who might not otherwise meet each other. At the same time, a city and the residential area must be experienced attractive enough for a healthy and natural exchange with the surroundings and that different people want to visit, live and settle there. Urban development is crucial for communities—both the large community at the urban level and the closer

communities around the residential areas. An essential element of social sustainability is that there is a varied range of housing types—types of homes, sizes, location and different prices, including a housing that gives everyone, regardless of financial ability, the opportunity to have a reasonable framework for everyday life. The socially sustainable city also ensures that people with social problems get the necessary support to maintain the housing.

The general sector helps to ensure socially sustainable cities that support social and economic balance. In a broad sense, the legitimate resident democracy can be part of a sustainability concept. It is important to ensure social diversity in general housing so that citizens with economic, social or integration challenges are not concentrated in particular areas or neighborhoods. For a number of years, efforts have been made to ensure a better balance in the so-called vulnerable residential areas where such imbalance is a reality. In addition to social efforts, a socially sustainable city is being pursued by building new attractive general housing on a smaller scale and in neighborhoods with mixed ownership and housing forms, which are physically integrated in the surrounding city. This should help to ensure a better social balance in the residential areas, thus avoiding further segregation and division. The office often functions as a gathering place for homeless people, addicts and people with mental difficulties. Social sustainability means creating the necessary framework in the city for vulnerable groups: both in the urban area itself or the form of homes for those groups. The socially sustainable city prevents the exclusion of the city's communities and ensures that the basis for social action for vulnerable citizens is present. Relationships between the physical and social environment are central to social sustainability. Citizens' involvement in the development of cities is essential for social sustainability, involving city citizens and residents in promoting shared ownership and sense of responsibility, which the municipalities are working extensively in connection with area renewal. Citizens' involvement is also practiced in many other contexts, such as center planes, port plans or other. It is therefore necessary to continue developing methods of inclusion, including in terms of activating and engaging citizens who might not otherwise be involved—including using digital engagement platforms. Citizen involvement should always take place on the citizen's grounds irrespective of cultural, economic and social circumstances.

### 3.2. An environmentally sustainable city (biophilic city) and climate change phenomenon

A logically interpretation of a Biophilic model in sustainable cities is oriented to maintain a clean environment, access to nature and climate change management, resource shortages and pollution, which requires the conversion of our cities and homes. This applies, for example, to promoting sustainable modes of transport, reducing energy consumption in buildings, establishing new forms of energy supply and other ways of managing resource streams. A large number of environmental problems and challenges are concentrated in the cities, and at the same time, the solutions must be found. Urban development, housing enrichment and construction will aim at a wide range of solutions that together will be the green and blue city, where pollution and effects thereof are minimized and where nature and water are incorporated into urban solutions and become more visible in the cityscape than today. The cities have a great potential to develop and implement innovative solutions and to reduce

energy and resource consumption. For example, energy consumption and congestion can be reduced by planning a compact urban development with good public transport, making it more attractive to choose public transport, bicycle and corridors. The consequences of climate change can be felt even more clearly in the future—flooded basements and congested sewers are partly results of climate change in combination with the vast fortified areas that prevent rainwater from leaching into the soil. There is a need to think across and to reap the benefits of incorporating social elements and economics into, for example, climate adaptation initiatives. If climate change adaptation is combined with the city's space and life, new opportunities are opened to incorporate environmental solutions in the city. The climate problem is highly relevant for urban development. Reducing carbon emissions by using different policy measures is an important part, in addition to planning new districts in such a way that a changing climate does not provide any unwanted side effects. It is largely the lifestyle that determines whether we live healthy or not. Updating of knowledge about sustainability and climate change is necessary. The basis on which rules and technical specifications were based only 5–10 years ago must be adapted to match this new knowledge. Changes in business and the population's living patterns and the modern understanding of climate change cause all cities to face a series of challenges and opportunities. All cities must work towards greater sustainability. The cities are also different. It will be the challenges and thus the possibilities as well. Today, it is possible to open the ports and islands of the cities to the benefits and enjoyment of the greatest possible extent. The transformation requires careful consideration to make a sensible balance between the many interests of housing, leisure, business and port activities. Otherwise, one kind of shutdown can be quickly replaced by another.

### *3.2.1. Environment and climate change*

Climate change and overweight are major threats to health. A major and growing environmental problem being discussed much is climate change. Scientific evidence has shown that the levels of greenhouse gases have increased in the atmosphere and that human fossil fuel combustion has increased the emissions of these gases [8]. This in turn leads to an increase of the annual average temperature on the Earth, which can contribute to droughts, floods and other serious problems against human survival around the world. A city can become a healthier city if it is obvious to go to combat the negative act of climate change, if the city is clean and air quality is good, if the use of hazardous substances both outdoors and indoors can be avoided and if, at the same time, it is easy to find quiet areas where there are green areas and where we can rest, cycle or go for a walk. Increased density must be combined with green, blue and healthy living; however, successfully combining these poses a challenge. This applies to the planning of the cities, town's buildings and to the technical solutions for transport, water, energy and waste. The cities are different—the solutions become different. The starting points for meeting the challenges are not the same. The size, location and possibilities of the towns are different. The same are planning traditions and attitudes. The solutions should suit local conditions. Therefore, the Intergovernmental Panel on Climate Change (IPCC) and most researchers consider it important that research methods continue to develop, which can safely measure these changes, improve the climate models and disseminate the information available to decision makers, so that they can make decisions regarding climate-adapted and

risk-reducing measures [8]. Gardens, parks, green boreholes, forest and nature give the city quality. People are happier, less ill and less stressed when they can watch and move in the green. The green is the city's lungs, creates fresh air and provides shade and space for animal and plant life. Ample green city areas mean lower temperatures in the summer in the cities. The green provides opportunities for relaxation, to keep track of the season's shift and for play and movement [9]. We must think blue water is important quality in the city. Lakes, streams, canals, fjords and seas provide experiences and activities. The city will help ensure clean and abundant groundwater. Climate change means more water from above. It provides opportunities for more planned wetlands in the city. Our way of building a city is developing in a way where the energy consumption of cities is far greater than in the closer cities. We must return to the closer cities, thus creating less distance between the city's functions. Bike and public transport will be better alternatives to the car. It also offers better opportunities for collective solutions in other areas. It creates greater intensity and peace of mind, more life and more space for diversity. Therefore, we should think in greater density, no matter how large or small a city or district is. Higher density should not have negative consequences. Light, air and health are a natural part of the modern, sustainable city. The same are effective solutions for energy, water and waste. The "technology" must be alright—also in the city's buildings, where it is important to avoid dangerous substances affecting the environment and a health risk to humans. Climate change must be utilized positively. We should not only think close but also green and healthy. The EU countries' carbon dioxide emissions have fallen in all sectors in the first half of 1990s, except for one: the transport sector. But it is not from road traffic, as carbon dioxide has increased the most, but from air traffic, although flying still account for a lion share of total emissions from traffic. In total, EU countries' carbon dioxide emissions fell by almost 3% during this period. The decrease is partly due to the recession and the decrease in energy consumption in Germany when the DDR joined the Federal Republic. In addition, the British began using more natural gas and less coal [10]. Lack of water, polluted rivers, poorly functioning drainage systems or none at all have been so bad in many of the world's growing metropolitan areas.

- The rivers of Buenos Aires are clean sewers.
- In Karachi, southern Pakistan, 30,000 people die annually of polluted water.
- In Basra, southern Iraq, more than 4 million residences used frequently polluted water. More than 100 thousand residences are infected from polluted water.
- Shanghai faces threatening water shortage and saltwater penetrates the Yangtze River.

It shows a recent report from the World Nature Fund [11].

A couple of 100 million city residents lack access to a nearby source of safe drinking water. Chronic water shortages affect many more including rural residents. Approximately 50 countries of the world have too little water or are on the verge of a water shortage. In many countries, water shortages are already acute, such as in North Africa, the Middle East and parts of Asia [12].

Several European countries are also approaching a situation where clean water is insufficient. This applies to countries such as Poland, Belgium, Great Britain, Germany, Denmark and

Spain. Freshwater resources in the Third World are believed to be a central issue in international cooperation in the twenty-first century. Conflicts around water can be difficult to handle. It may be relevant to export water from countries with abundant supplies [11, 12]. The traditional way of managing water and sewage in the big cities is to get water further and further away and expand the pipelines. Then, the wastewater is pumped far away from the city. Mexico City is an example. Due to the over-extraction of groundwater, the city has fallen and had problems with flooding [11]. However, it is not certain that our Western system to manage water and sanitation is the best. It is in its place outdated with spent infrastructure, expensive and not adapted to today's needs and climate change.

### 3.3. An economically sustainable city

The cities are essential to the world economy. They are growth centers in a globalized economy, bringing economic development to the hinterland. The potential of the cities for attracting foreign tourists can also contribute to creating economic sustainability. The long-term development of cities must therefore also take into account tourism, which significantly contributes to growth and employment. Measures to ensure the economic stability of disadvantaged areas must also exploit endogenous economic forces within those areas. In this context, the labor market and economic policies specifically designed to meet the needs of disadvantaged areas will be the right instruments. The aim is to create and secure jobs and facilitate the creation of new businesses. In particular, opportunities to access the local labor market need to be improved by providing training that is tailored to market requirements. Also, in the context of the ethnic economy (generated by cultural diversity), employment and training opportunities need to be used to a greater extent. The European Union, Member States and cities are called upon to create better conditions and instruments for strengthening local economies and, at the same time, local labor markets, in particular by promoting social economy and by providing quality services to their citizens. It is useful in working with the concept of sustainability to understand and work with economics in a broader perspective that crosses social and green sustainability, as social and green sustainability costs play a role. By establishing a life-cycle perspective, you look at prices for both establishments, operation and settlements. For example, it is about how a better environment addresses the costs of cleaning or maintenance or how socially well-functioning urban areas give rise to fewer costs for repair, oversight and so on. If municipal politicians continuously focus on thinking public and private investments together, they can support each other and create added value in the investments. That way, high-quality service can be delivered in the most cost-effective way. In a long-term economic focus that embraces social and environmental factors, there are often much more significant gains to be anticipated for the benefit of both business and society in general. In other words, there may be growth and jobs in social and green sustainability as well as an export potential in sustainable urban solutions.

## 4. Recommendation

For a future arrangement of sustainable cities, the new urban agenda, adopted in Quito (Ecuador) on October 17, 2016, complements the 17 sustainable development goals assumed

by world leaders at the end of 2015 through Agenda 2030 for Sustainable Development. The Strategic Vision of Sustainable Urbanization, negotiated for more than 3 years and presented at the Conference on Housing and Sustainable Urban Development (Habitat III), provides for a comprehensive approach to urbanization for the next 20 years. Thus, the sustainable urban development agenda proposed by UNDP is focused on concrete actions and sets global standards for sustainable urban development. It also includes a series of recommendations centered on rethinking how people will build, manage and live in cities by 2036 [5]. The economic and environmental footprint of urban centers is very high, despite the fact that they only cover a small part of the globe (0.51% of total land area globally). In terms of percentages, cities accounted for over 80% of world GDP in 2014, producing more than 70% of global greenhouse gas emissions and 80% overall energy consumption. At the same time, experts estimate that in 20–30 years the development of urban centers will be significant, tripling in size and reaching about 1.2 million square kilometers in 2030. Consequently, authorities are encouraged to use renewable energy sources (by 2040, the global energy system should meet the demand of 9 billion people), improve public transport, eliminate pollution and sustainably manage natural resources. According to the 11th sustainable development objective, focusing on the sustainability of cities and urban communities, two-thirds of mankind (around 6.5 billion people) will live in urban areas by 2050. That is why the way we build and manage our urban spaces becomes essential for our sustainable development policy. If 26 years ago mankind numbered 10 megalopolis, with more than 10 million inhabitants, in 2014 the number of these urban centers reached 28, totaling 453 million inhabitants. Thus, UNDP's goal in the next 20 years is to create safe and sustainable urban centers, which also aim to tackle challenges such as eradicating poverty, social inequalities and reducing climate change. The new urban agenda also addresses current issues such as urban poverty, unemployment, climate change, pollution, exclusion of marginalization of vulnerable groups (migrants and refugees), reduction of natural disasters and gender disparities. Even if the new agenda for urban development remains just a recommendation, UNDP recognizes that it needs to support national governments and local communities to meet the proposed objectives, the only ones that would favor the creation of more resilient and secure urban centers for citizens [5].

### 4.1. Back to the human scale interpretations

Quite large streets intersect many cities. It was considered 30–40 years ago to be the best answer to the challenge of rising car traffic. The roads lead, among other things, to large parking spaces in the city centers, which were built to ensure that people still wanted to shop on the city's main street when compared to pedestrian streets. Therefore, higher density is a significant challenge for many cities. Where city centers in the big cities are often characterized by high frequency, high versatility and a complicated life, many medium-sized cities have hollowed urban corridors that are quite desolate and insecure for much of the time. Paradoxically, the center in many cities is often the characteristics that characterize the periphery of the big city. These problems can be solved in many places by building closer. In some places, underground parking facilities or parking garages can be built. This gives new opportunities to looped parking spaces. Here, it is essential to mix housing, non-polluting professions, institutions, new activities and recreational green areas. This also creates a "green density" and stimulates health. Elsewhere, it may be better to think of public transport, so the

need to park in the city centers is reduced. In this connection, attractive walking and cycling paths should be established, which connect the city center with its inner periphery. If people can go and cycle between houses, work, institutions and leisure facilities on beautiful and safe trails, more people will want to choose an excellent transport to the short distances. The edges of the city can be of great importance to health. One would think it was the most natural thing in the world to run or cycle the trip in green surroundings, at least for those living in a smaller city. But much of the land surrounding the cities is used for agriculture or other business purposes. When planning new housing quarters, it is essential from the start to think of healthy and recreational path systems into plans for the benefit of the entire city.

### 4.2. Applying for sustainable model theories in planning and design city processes

This requires an active application of the "Integrated Approach" idea into urban development processes, where integrated urban development policy is a simultaneous and fair consideration of all issues and concerns relevant to urban development. Integrated urban development policy is a process that coordinates critical spatial, sectoral and temporal matters. The involvement of economic factors, stakeholders and public opinion is essential. Integrated urban development policy is a vital status for implementing the UN's Sustainable Development Strategy. Its implementation of a requirement of a holistic world dimension, however, must take into account local conditions and needs based on the principles of subsidiarity.

Establishing a balance between the various interests of urban actors, supported by integrated urban development policy, is a viable basis for a consensus between the state, regions, cities, citizens and economic actors. Putting together knowledge and financial resources, public funds that are always insufficient can be used more efficiently.

Integrated Urban Development Policy involves actors outside the administration and enables citizens to play an active role in shaping their living environment. At the same time, these measures can provide more certainty regarding planning and investment. We recommend cities from all over the world to develop integrated urban development programs for cities as a whole. These implementation-oriented planning tools must have the following roles:

- describe the qualities and defects of cities and neighborhoods, based on an analysis of the existing situation;
- define realistic development objectives for the urban area and develop a coherent vision of the city;
- to coordinate technical and sectoral plans and policies related to the various regions of the city and to ensure that planned investments will help to promote a balanced development of the city and the surrounding area;
- to coordinate and to focus from space the use of funds by public and private sector;
- be organized at the local and regional level and involve citizens and other partners who can make a substantial contribution to the qualitative modeling of the economic, social, cultural and environmental future of each area.

Coordination between local and regional levels needs to be strengthened [13]. The aim is to establish at a regional and metropolitan level a balanced partnership between cities and rural areas as well as between small, medium and large cities. Urban policy issues and decisions can no longer be viewed in isolation at the level of each city. Our cities must be focal points for the development of the regions and take responsibility for territorial cohesion. That is why it would be useful if our cities were to work more closely in the network globally. Integrated Urban Development Policy provides a set of tools that have already proven their worth in many cities, which it can offer an efficient and cooperative management structures. These are indispensable for increasing the competitiveness of cities from the devolved countries. They facilitate early and timely coordination between economic, infrastructure, real estate and service development, taking into account, among other things, the impact of existing social trends on seasonal and population aging trends and energy policy conditions. To achieve the planned objectives and policy, it is important to consider that the following action strategies to be of crucial importance for improving the competitiveness of devoted world cities.

*4.2.1. Greater sustainability requires both cultural and technical conversion*

It is necessary to continue to safeguard the conservative buildings and cultural environments in the cities and promote new beautiful architecture. We must also create urban spaces that are strange and exciting to live in. Here, climate change can help us. More rainfall and warmer rainfall mean that more massive amounts of rainwater will be wasted when the large, fortified areas characteristic of the towns prevent rainwater from slipping into the soil [13]. Rain can be collected in artificial lakes or ponds that can prevent flooding. The reduction can be increased with more green areas, plantings and coatings that allow rainwater to sip down to groundwater. In this way, we can mitigate the effects of climate change while strengthening both the blue and the green flair of the cities. The city's buildings can also be used in the fight against climate change. It is technically possible to build houses, with sound building materials and houses that do not use energy but produce it. This is primarily about spreading knowledge about the type of construction.

*4.2.2. Integrity and innovation in planning*

Applying positive criteria of sustainability means creating sustainable cities is about reconciling and balancing many interests. The municipal reform has meant larger municipalities with many different urban communities. It can contribute to the fact that the cities increasingly have different roles, can complement each other instead of neighboring two former municipalities to compete and should be able to do the same. It requires holistic orientation, innovation and attitude changes.

**4.3. Creating and securing respectable quality of public spaces**

It is all the places in the community where there is access and where people are allowed to move freely outside the four walls of the home. There may be streets and alleys, educational institutions or meetings that may be more or less public. However, it is also the rooms that are carried by media of all kinds, which contain public debate and other expressions and where there is public access. Here, people may more or less be involved, and so it can be

controversial. A prominent area is the public institutions where schools, kindergartens and jobs are found. The quality of public spaces, urban anthropic landscapes, architecture and urban development play an important role in the living conditions of city citizens. These local characteristics are important for attracting businesses in the knowledge industry, a creative and skilled workforce and for tourism.

### 4.4. Applying for green and healthy urban transformations

Trees and green areas have many advantages; they relax the stressed eyes. Trees and plants not only purify the air but also lower temperatures in the big cities in the summer months. Plants help to drain rainwater, thus reducing the need for other and perhaps more expensive solutions. Therefore, it does not play just a role in the urban transformation that should have a green dimension. Also, the existing city can be developed to make it greener and greener—for example, thinking of green roofs and green facades. Contrarily, changes in business structures create a natural need to transform past, often centrally located industrial areas into new types of jobs, for private and public services or for housing [14]. At the same time, there is also the need for a useful framework for the companies that remain in the city. When the major cities are transformed, it is essential to think about both the green and the health and to adapt the solutions to modern people. When laying parks and green fields on former industrial areas, it is essential that they are designed in such a way that the city's users and residents can quickly get a run or organize a ball game.

#### *4.4.1. Objectives of using recycling materials model*

Growing mountains of waste and eutrophication of the garden are two of the environmental problems that life in metropolitan areas can cause if politicians and civil servants do not work deliberately to end the cycle in the city. Working to make all residents easily sort their waste and leave it at places near the home is an important part of the material cycle. Well-functioning water treatment plants that take care of and clean the water from different chemicals and nutrients before it flows into the sea are also important. The sludge from the purification plants can partly be used in the production of biogas, and if it is sufficiently clean from poison, it is possible to return to farmland as manure.

These tasks require special attention in cities:

- Water and drainage
- Transport and communications
- Energy

### 4.5. Modernizing infrastructure networks and increasing energy efficiency

An essential contribution to improving living conditions, environmental quality and the creation of favorable factors for commercial locations can be ensured through sustainable, accessible and affordable urban transport with coordinated links to urban and regional transport networks [14]. Particular attention should be paid to traffic management and interconnection of modes of transport, including cyclists and pedestrians. Urban transport needs to

be adapted to different housing, work, environment and public space requirements. Technical infrastructure, especially water supply, sewerage network and other urban networks, needs to be improved and adapted to changing needs in order to meet future demands and ensure quality in urban living. The key requirements for the sustainability of public utilities are energy efficiency, rational use of natural resources and economic efficiency in operation.

Analysis of possibilities for 2020 indicates that the developed countries can reduce their energy use by about 50%, while the developing countries with largely unchanged energy consumption per capita could reach a tangible standard equivalent to the one we had in Western Europe in the 1970s. The condition is that energy efficient technologies must be used in both developed and developing countries [15].

*4.5.1. Energy efficiency in combater of climate change*

The energy efficiency of buildings needs to be improved. This concerns both existing and new buildings. Renovating existing dwellings can have a significant impact on energy efficiency and on the quality of life of residents. Increased attention should be paid to prefabricated buildings, old buildings or lower quality buildings. Optimized and efficient infrastructure networks and energy-efficient buildings will reduce costs for both businesses and citizens. A basis for the efficient and sustainable use of resources is a compact structure of human settlements. This can be achieved through territorial and urban planning that prevents uncontrolled urban expansion through strong land supply and speculative development. Urban planning strategy to achieve a functional mix between housing, jobs, education and recreational use of urban areas has proven to be sustainable. Cities need to help ensure and improve the quality of life of their inhabitants and business attractiveness by providing sophisticated information and communication technologies in the fields of education, employment, social services, health and safety. Technical infrastructure, especially water supply, sewerage network and other urban networks, needs to be improved and adapted to changing needs in order to meet future demands and ensure quality urban living. The key requirements for the sustainability of public utilities are energy efficiency, rational use of natural resources and economic efficiency in operation.

*4.5.2. Efficient use of renewable energy systems*

The utilization of bioenergy, water and wind power can increase significantly. In the case of biofuels, it may be difficult to make the land sufficient for increased energy supplies, while the production of food and industrial raw materials must also increase and reach for about 10 billion people. Solar cells in desert areas could be an opportunity to produce electricity. Major and urgent efforts are needed to develop the technology needed for renewable energy laws. Various global scenarios for energy supply in 2050 have been made by, among others, the World Energy Council (WEC), the World Watch Institute and the Intergovernmental Panel on Climate Change (IPCC). In all scenarios, fossil and renewable fuels are used. Most of the scenarios still have nuclear power in the energy balance of 50 years, but the share of nuclear power of total energy supply is less than today. Much of fossil fuels will still be used. The natural gas dominates coal and oil in all future images and, according to the World

Watch Institute, is by far the only fossil fuel remaining in 2050. The energy scenarios do not determine whether they are compatible with sustainable development or not [16]. In general, the vision of a multifaceted architecture shows that it is necessary to design and work cooperatively with an architectural theory to transform the lateral conceptual viewer of the multilateral design process [17].

#### *4.5.3. Efficient use of local energy systems*

Local energy systems can be used in many places. Energy system means the recovery and storage of energy in the form of heat from the ground. The design of the building may be controlled by any local energy system. For faced the future energy shortage, it is required to recognize all survived opportunities. In this context, it is necessary to consider all existent possibilities [15, 16].

#### *4.5.4. Efficient uses of geothermal energy*

Geothermal energy is the heat energy stored in the Earth's crust and flows out to the ground. The heat comes mainly from radioactive decomposition. The geothermal gradient varies from place to place. In Nordic countries, such as Sweden or Denmark, the sedimentary bedrock has the best conditions, and heat can be recovered using deep drilled wells [15, 16].

Soil heat utilizes heat energy from the sun and rain stored passively in the ground. The heat is absorbed through plastic hoses laid down at 1–2 m depth in which a freeze-dried liquid circulates. The heat is then recycled using a heat pump. To heat a small house, a surface area of 400–600 $m^2$ is required. If the hoses are laid above the groundwater surface, fine-grained soils that hold the moisture are well suited. Silt should be avoided due to the risk of fire. If the hoses are laid under the groundwater, water is important, so that coarse grains are preferable [15].

### 4.6. Proactive innovation and educational policies

Cities are places where knowledge is created and shared. Exploiting the full potential of knowledge in a city depends on the quality of day care and school education, the transfer of opportunities offered by education and training systems, social and cultural networks, opportunities for lifelong training, the excellence of university education and research institutes and the existing transfer network between industry, the business sector and the scientific community. Integrated urban development policy can help improve these factors, for example, bringing together all stakeholders, supporting networks and optimizing infrastructure. Integrated urban development promotes social and intercultural dialog [18]. Integrated urban development strategies, participatory urban management and good governance can help to make effective use of the potential of European cities, particularly in terms of competitiveness and growth, and to reduce disparities between and within neighborhoods. These integrated urban development strategies bring citizens the opportunity of social and democratic participation.

### 4.7. Applying for new business for new opportunities

Business development in the last two to three decades has been of major importance for urban development. Retail trade is an important factor in urban life. Wherever shops are placed, they dramatically affect traffic and trade patterns. Large sections of the industry have moved or disappeared, more may follow in the coming years. The abandoned industrial areas at the ports, in the city center or in their periphery open up opportunities for building closer and greener for the benefit of both city life and sustainability. Shipping and fishing have also changed; therefore, in many port cities, it is necessary to consider how the areas can be recycled. Even though many jobs have been closed, even population of people has increased. It is typical in industries that do not pollute or disrupt. There are industries that can be more easily mixed with, for example, housing, and can contribute to a good urban environment. This makes it necessary to consider whether existing rules and planning traditions to regulate coexistence between businesses and housing are still appropriate [19]. There are also professions that necessarily have to be in the cities and in the ports. Many of these companies are venture companies that cannot be instantly integrated with homes and other common urban activities. It is essential to ensure that these companies can continue to function and develop, and it must be ensured that there are sufficient safety distances around these companies—for the sake of both the companies themselves and their neighbors. It also means that the ports should not only be emptied for business and converted into, for example residential areas [20]. There is still a need for ports and shipping.

### 4.8. Paying attention to underground construction concept

In many countries such as Japan, Malaysia and China, planning to take advantage of surfaces of the inner parts more effectively have begun in these countries. A solution for creating a sustainable future for the Earth's growing population is building on several floors, that is, to use surfaces above and below ground level. The compact city is seen as a model for future low-energy society. Japan, for instance, are looking at building whole cities down the mountain. The most important subject which required a clear answer is a way to cope with the transport problems in the largest cities. In order to accommodate all the facilities needed in the metropolitan areas, underground construction is being increasingly used for warehouses, business centers, shelters and facilities for work, leisure and cultural activities [21]. There are obvious environmental benefits. When an underground project is to be evaluated in an environmental impact assessment way, the aforementioned option should also be evaluated environmentally.

### 4.9. Paying particular attention to "negative areas" in the context of the city as a whole

Cities face major challenges, particularly in connection with changes in economic and social structures and globalization. Specific issues, among others, are a high unemployment rate and social exclusion phenomena. Within a city, there may be considerable differences not only in terms of economic and social opportunities but also in terms of the quality of the

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environment between the different areas of the city. In addition, social inequalities and differences in levels of economic development of the areas continue to increase, which contributes to the imbalance. A policy of social integration that contributes to reducing inequalities and preventing social exclusion will be the best guarantee for maintaining security in our cities. In order to achieve the objectives of social cohesion and integration within cities and urban areas, a good conception of housing policies is needed [22]. It is better to heed early warning signals and to take immediate and effective measures to remedy the situation as this approach saves resources. If an area has begun decaying, the cost and difficulties of returning that area to the waterline may often be higher. The government must provide the general framework and rehabilitation incentives for the inhabitants of the affected areas. Active involvement from residents and a better dialog between politicians, residents and economic actors are essential to finding the best solution for each disadvantaged urban area. It is believed that the following action strategies, included in an integrated urban development policy, are crucial for deprived urban areas.

### 4.10. Remarkable attention on sustainable solution of "Transport in the city"

The world's largest cities have very bad air quality. Traffic jams are common in cities worldwide, including the majority of the in some countries. In big cities, it is common that people travel several hours daily in order to access the workplace. The level of motoring has in many places reached a point where the problems are no longer possible to accept. Today, there are hundreds of millions of motor vehicles in the world, and many hundred thousands of people are killed on the roads each year [23]. In some countries, the goal is for every household to get a car. The trend in many countries is that the number of cars increases as income increases, households are divided and cities are expanding. Another problem is the poor connectivity between human settlements due to the poor quality of road infrastructure. Agenda 2030 addresses these issues by upgrading the transport system so that it can better connect cities and settlements and make it affordable, including financially and durable, to ensure that all world citizens benefit from the urbanization process. The focus is also on increasing access to green and public spaces, reducing the negative impact of cities on the environment per capita and reducing direct economic losses caused by disasters.

#### *4.10.1. Suburbans have to connect with the cities objectively*

The oldest suburbs were based on modes such as trams, city busses and trains. The newer suburbs are often based on the car as the dominant mode of transport. The vehicle is a minimal sustainable mode of transportation—especially if it only has the driver on board. The most of the crowds on the landing roads and in the big cities come from the suburbs. The suburb of the future must also be based on modes other than the car. Suburbs can be connected to the city center with light railways or modern trams that can transport a lot of passengers with a modest width. In other places, frequent and fast buses can reduce the need for driving. Attractive bicycle parking at stations and stops can encourage more to use bus or train.

*4.10.2. Local stations in the suburbs*

However, the vehicle cannot be avoided. On the other hand, it can be used more appropriately. Municipalities with suburbs can build larger parking spaces at the local stations in the suburbs, thus encouraging the drive not to go all the way to work or to the city center. They can promote partial arrangements and intercourse, resulting in fewer cars on the streets.

*4.10.3. Using of subways as environmental solutions*

The interest in concealing road traffic is increasing in the century with environmental requirements. One way is to build tunnels. Many of the world's most complex tunnel projects are conducted in Asia's fast-growing metropolitan areas. There are many examples of traffic tunnels in several floors, subways, tunnels for district heating, telephone lines and so on. Subways are expected to be very important in the future. In many areas, there are also plans for car traffic in tunnels, including in Stockholm. All technical systems that utilize pipes or pipelines are built underground for its distribution network: telecommunications, electricity, district heating, gas, water and sewage [24].

*4.10.4. Promote efficient and cheap urban transport*

Many disadvantaged neighborhoods also lead to the lack of transport links and environmental influences, which are likely to reduce their attractiveness. The development of an efficient and inexpensive transport system will provide residents of these neighborhoods with opportunities for mobility and equal access to those of other citizens. To achieve this, transport planning and traffic management in these areas must progressively reduce the negative impact of transport on the environment and organize transport in a manner that integrates these neighborhoods into the city and region as a whole. Suitable networks for pedestrian traffic and cyclists will be useful for this purpose. The better we manage to economically stabilize disadvantaged areas, integrate them socially and improve the physical environment and transport infrastructure, the greater our chances are that our cities will remain points of social progress, growth and innovation [25].

**4.11. Activation of training education policies for children's and young's residences**

A crucial starting point for improving the situation of disadvantaged areas in cities is to improve the situation of education and training in local communities in line with proactive policies focused on children and young people. More opportunities for education and training should be provided for disadvantaged areas, and they must be tailored to the needs and deficiencies of children and young people in those areas. Through a policy focused on children and young people built to the requirements of the social area in which they live, we must contribute to increasing the chances of children and young people living in deprived areas to achieve and provide equal opportunities in the long run.

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