Urban Issues and Solutions in the Context of Sustainable Development
A review of the literature

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Abstract

Cities are at the heart of Europe. As four of every five European citizens live in urban areas, their quality of life and the quality of their environment depends upon how cities look and how they function. Cities are also places where business is done, investments are made and jobs are created. In Northern Europe, people spend over 90% of their time inside and in the winter months, this can rise to almost 100%. If they are not inside, people are usually travelling from one building to another, using civil infrastructure facilities such as roads, bridges and railways. For most people in the developed world, most of the time, the urban environment is their environment. As cities continue to grow, increasing attention must be given to the quality of their urban environment and to their livability. Improving the urban environment – and city dweller's quality of life – has become a major issue in the global effort to achieve sustainable development.

This literature study focuses on the urban environment issues and solutions in the context of sustainable development. The purpose of this paper is to study the causes and processes of the emergence, formation and development of the city and the urban environment. The field of urban environment comprises a vital area for the application of sustainable development principles, not least because of the scope for conflicts between interpretations of development. As an activity that has clear economic, social and environmental dimensions, urban policy holds considerable potential to make a positive contribution to the practical realization of sustainable development.

Urban environment in this paper is seen as a complex social, economic and biophysical system produced by the interaction between a man-made fabric and the physical characteristics of the landscapes.

Key words: sustainable development, urbanization, city, urban environment, city's metabolism, ecological footprint of city

Contents

1. Introduction

"The city is a subject that is apparently above everything. It is about climate change and racial tolerance, social justice and economic development, culture and personal memory, national identity and civil liberty ..."

Deuan Sudjic
Director of the Design Museum of London

Europe is a fascinating and diverse continent, one of the most urbanised on earth. Today, approximately 75% of the European population lives in urban areas, while still enjoying access to extensive natural or semi-natural landscapes. With its stunning urban landscapes, historical cities and cultural treasures, Europe remains one of the world's desirable and healthy places to live. Moreover, it is the most frequently visited world travel destination. Urban development has a strong European dimension. Cities interact with and influence the surrounding land, thus affecting the environment of a much broader area. Their development is also driven by external factors such as demographic change, the need for mobility, globalization and climate change. Decreasing household sizes and an ageing population are expected to enhance environmental pressures over the next decades. The further development of information, communication services and technology brings new important qualitative changes to urban systems (European Commission, Expert Group on the Urban Environment, 1996).

Cities and towns act as engines for progress, often driving much of our cultural, intellectual, educational and technological achievements and innovations. However, today's trend of new, low-density approaches to urban development results in increased consumption of energy, resources, transport and land, thereby raising greenhouse gas emissions and air and noise pollution to levels that often exceed the legal or recommended human safety limits. Overall consumption, energy use, water use and waste generation go along with a

growing number of urban households. The urban future of Europe, however, is a matter of great concern. More than a quarter of European Union's territory has now been directly affected by urban land use; by 2020, approximately 80% of Europeans will be living in urban areas, while in seven countries the proportion will be 90% or more. As a result, the various demands for land in and around cities are becoming increasingly acute. On a daily basis, we all witness rapid, visible and conflicting changes in land use which are shaping landscapes in cities and around them as never before (European Environment Agency, 2006).

Today, society's collective reliance on land and nature for food, raw materials and waste absorption results in a resource demand without precedent in history. In Europe, people consumption patterns are completely different from what they were twenty years ago. Transport, new types of housing, communication, tourism and leisure have emerged as major components of household consumption. As most of the population lives in urban areas, agricultural land uses and their functions in the countryside have consequently evolved. Today, they ensure both the feeding of the city populations and maintenance of a diminishing rural population. Coasts are being urbanized at an accelerating rate, and resident communities are being transformed in order to accommodate these new economies. As a result, coasts are becoming increasingly intertwined with the hinterland and more dependent on tourism and secondary homes (European Environment Agency, 1996).

The quality of the urban environment and its linkages with regional and global sustainability are essential public goods, and as such, deserve as much attention as possible from national governments, and support from the international community. Urban environmental management, however, is also the business of local governments, which often play a key role in delivering services; of civil society, which promotes citizens health and its rights to a clean, livable environment; and of the private sector, which can increase the efficiency and effectiveness of service delivery. At present, cities are taking on roles that extend far beyond the traditional provision of infrastructure and services. A paradigm shift

may be detected. Cities are seeing themselves as engines of economic growth, providers and managers of land, and suppliers of social services, such as education and health. They rightly understand their role as facilitating – taking care of the investment climate and the externalities that impact decisions of investment and production (European Environment Agency, 1996).

This paper consists of an introduction and thirteen sections. First, Section 2 takes a closer look on sustainable development goals and key components. In relation to this, Section 3 sheds light on the context and dimensions of the concept of sustainable development. Section 4 analyzes the conditions and outcomes of urbanization. Section 5 answers the basic questions about cities: What is the city? How did it come into existence? In relation to this, Section 6 addresses the question: Are there any connections between the city and nature? Section 7 analyzes the origin of urban systems. Section 8 follows to the development of the modern urban environment. Section 9 sheds light on the growing impact of globalization on urban development. Section 10 analyzes city as ecological system. Section 11 describes the concept of an *"Ecological Footprint"* and its measurement principles. Section 12 presents the challenges and opportunities of the sustainable urban development. Section 13 describes urban environmental policy in Europe. Finally, Section 14 concludes the paper.

2. Understanding Sustainable Development

"To sustain" comes from the Latin root *"sustinere"* and literally mean *"to hold up, to support from below"* … But what exactly we are going to sustain? Ask different people and you will get different answers. Some want to sustain their present lifestyle, others the environment or the elimination of poverty and injustice, yet others want to maintain industrial and technological growth. This makes for confusion because some of these programmes are contradictory (Herbert, 2005).

With each year, the usage of the term *"sustainable development"* becomes more widespread. This gradual advancement is impressive in terms of its breadth, comprehensiveness and, above all, its international dimension. Although the moves towards sustainable development in each country vary in character and timeframe, and applications in different contexts are becoming increasingly specialized, there is evidence that these activities are converging at a broad scale and in accordance with European and United Nations initiatives (Clement, 2001).

Sustainable development is a concept of growing popularity aimed at producing long-term global well-being through the wise use and management of economic and natural resources, and through respect for people and other living things. Sustainability is a concept describing mankind's ability to create a world for humans and non-humans that environmentally, socially, and economically provides for a current population's needs without damaging the ability of future generations to take care of themselves. The concept – really a blend of concepts – first emerged in Stockholm during the 1972 United Nations Conference on the Human Environment. There, industrialized and developing nations debated which was more important: environmental protection or economic development. This was a time when the environmental movement was bursting on the scene, 10 years after Rachel Carson published *"Silent Spring"*, a powerful book describing the dangers of pesticides to wildlife and humans. The same year of the Stockholm meeting, the United States passed five major pieces of environmental legislation. Only a year later, India would witness the Chipko citizen uprising against deforestation. Within this setting, the debates at Stockholm gave birth to the notion that both environmental protection and economic development were inextricably linked. That idea was refined through extensive discussions in United Nations circles over the many years that followed (Blackburn, 2007).

In the late 1970s and the decade thereafter, other momentous events sparked public outcries about the need for environmental responsibility. These outcries

were coupled with growing demands for open, transparent communication from industry and government about environmental risks. This was the time of the Love Canal toxic waste debacle in New York and the deadly Bhopal release in India. It was also the period of public anger over the massive Alaskan oil spill from the *Exxon Valdez* oil tanker and the disastrous radiation release at the Chernobyl nuclear power plant in the Soviet Union. In the United States, these headline events inspired a number of laws, including one requiring industry to file annual public reports on their inventories and releases of toxic materials – data that proved shocking to many communities (Blackburn, 2007).

But environmental issues were not the only concern. The Apartheid racial segregation policies of South Africa were coming under attack from Rev. Dr. Leon Sullivan, a Philadelphia clergyman and civil rights leader, and from other religious and student activists as well. The movement gained momentum in 1976 when South African police fired on student demonstrators at Soweto. A burgeoning number of universities, pension funds, and local governments in Europe and the United States began dropping their investments in companies that refused to recognize human rights and equal opportunity in their South African operations. The seeds of Apartheid's demise were being sown, and *"socially responsible investing"* was finding new meaning. Meanwhile, a new disease, acquired immune deficiency syndrome (AIDS), was beginning its devastating rampage. These issues were the backdrop for the Brundtland Commission, a group appointed by the United Nations to propose strategies for improving human well-being without threatening the environment (Blackburn, 2007).

Five years later, the concept was fleshed out in 27 principles in the Rio Declaration on Environment and Development, the work product of the Rio Earth Summit – the United Nations Conference on Environment and Development in Rio de Janeiro. The declaration recited the economic and environmental concerns that had been the main focus of sustainability, but added social topics like peace, poverty, and the role of women and indigenous people. In 1997, Briton John Elkington introduced a definitional term drawn from financial accounting:

the triple bottom line. By this he meant that to reach sustainability, one must achieve not only economic *"bottom-line"* performance but environmental and social performance as well. When the Global Reporting Initiative issued its draft *Sustainability Reporting Guidelines* for organizations in 1999, it, too, assumed sustainability entailed all three triple bottom line elements. The final versions published in 2000 and 2002 continued that assumption (Blackburn, 2007).

In recent years, other developments have refined the dimensions of sustainable development. High-profile incidents involving sweatshops in Asia have given rise to voluntary inspection and certification programs targeted at operations supplying products to transnational companies. Pressures from activists have led to other certification programs on fair trade, lumber, fishing, and agricultural products. Labor and environmental groups have appeared together in front-page photos of demonstrations against global trade policies. Financial scandals at Enron Corporation, Tyco International, Ltd., and WorldCom have highlighted the importance of good corporate governance. Organic food and hybrid cars are no longer novelties but big business. Product and packaging take-back laws have extended the responsibility of producers across Europe. Climate change is now a threat backed by serious science, and an issue of growing investor concern. Rating groups have exploded on the scene to evaluate company social and environmental performance to satisfy growing legions of socially responsible investors. The Global Reporting Initiative, a coalition of investors, activists, business, and other organizations, has helped make sustainability reporting commonplace among major companies. Activist and public interest groups – known as non-governmental organizations – have gained considerable voice and power. With their creative use of coalitions and the Internet, their role continues to expand. All of this has been encircled within the concept of sustainability (Blackburn, 2007). In the literature well-accepted and most commonly are used following definitions of sustainable development:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

Brundtland Report, World Commission on Environment and Development, 1987

"Sustainable development means improving the quality of life while living within the carrying capacity of supporting ecosystems"

World Conservation Union, UN Environment Programme and World Wide Fund for Nature, 1991

"Sustainable development is development that delivers basic environmental, social and economic services to all residents of a community without threatening the viability of the natural, built and social systems upon which the delivery of these services depends"

International Council for Local Environmental Initiatives, 1994

Sustainable development is thus a much broader concept than environmental protection. It implies a concern for future generations and for the long-term health and integrity of the environment. It also implies that further development should only take place as long as it is within the carrying capacity of natural systems. Definitions of the concept of sustainable development mentioned above are obvious fact that sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all made consistent with future as well as present needs (Clement, 2001).

3. Fundamentals of Sustainable Development

Fundamentally, sustainable development is perceived as process-oriented – referring to the process of developing the planet in a sustainable manner – and,

within that process, as progressing towards a specific goal – improving the quality of human life while living within the carrying capacity of supporting ecosystems (Reed, 1996).

Extending beyond economics to encompass ethical, societal, institutional and environmental dimensions, sustainable development is clearly very difficult to encapsulate in simple terms. Its initial appeal has been attributed to both its breadth and its vagueness, judged as *"palatable to everybody ... radical and yet not offensive"* (Skolimowski, 1995). No consensus has yet emerged on a single, practical definition that might bring together philosophers, ecologists, economists and political scientists (Crabbé, 2008), but incremental refinements have drawn useful definitional distinctions. In particular, they have encouraged support for the idea that *"it is both morally and economically wrong to treat the world as if it were a business in liquidation"* (Daly, 1992). Indeed, trends and events ascribed to sustainability, and the scores of definitions of it, have reflected a common theme about its meaning – 2Rs (See Figure 3.1).

Figure 3.1. *Meaning of the concept of sustainable development [Blackburn, 2007]*

RESOURCES **The wise use and management of economic and natural resources**	**+**	**RESPECT** **Respect for people and other living things**	**=**	**SUSTAINABLE** **DEVELOPMENT**

Sustainability elements – resources and respect in the case of the 2Rs or economic, social, and environmental considerations in the case of the triple bottom line – are not independent, isolated concepts but closely related. Certainly tax policy and other economic incentives can have profound effects on how business serves or harms environmental or social interests. Business ethics, union rights, and sweatshop practices pose economic and social concerns. Drought-

caused starvation can bring environmental and social problems together in a disastrous way (Blackburn, 2007).

Sustainable development is an eclectic concept, as a wide array of views fall under its umbrella. The concept has included notions of weak sustainability, strong sustainability and deep ecology:

1) **Weak sustainability** – all forms of capital are more or less substitutes for one another; no regard has to be given to the composition of the stock of capital; Weak sustainability allows for the depletion or degradation of natural resources, so long as such depletion is offset by increase in the stocks of other forms of capitals (for example, by investing royalties from depleting mineral reserves in factories) (United Nations, 1997);

2) **Strong sustainability** – all forms of capital must be maintained intact independent of one another. The implicit assumption is that different forms of capital are mainly complementary; that is, all forms are generally necessary for any form to be of value. Produced capital used in harvesting and processing timber, for example, is of no value in the absence of stocks of timber to harvest. Only by maintaining both natural and produced capital stocks intact can non-declining income be assured (United Nations, 1997);

3) **Deep ecology** – is a holistic approach to the environment that stresses the intrinsic equality of species, including human beings (United Nations, 1997).

Basically, sustainable development has four main pillars (dimensions) – social, economic, environmental and institutional. However, in recognition of the growing importance of information and communication technologies and the role they play in development, a fifth dimension, on information and communication technologies, is added. Following are brief definitions of these dimensions:

- **Social dimension** – development is considered to be sustainable when it achieves social justice via equitable resource allocation, eradicates poverty, and provides social services, such as education, health and others to all members of the society. The social dimension of sustainable development and its prime target who should strive to achieve this notion for both present and future generations (Abolina, 2005);
- **Economic dimension** – economically, sustainability means providing economic welfare at present and in the future, while paying more attention to the "natural capital", which means the natural resources of economic value, considered as the bases for the economic system, such as plants, soil, animals, fish, and bio-environmental system such as air and water purification (Abolina, 2005);
- **Environmental dimension –** an ecologically sustainable system maintains a solid base of natural resources and avoids excessive use of such resources. This involves the conservation of biodiversity, attaining atmospheric balance, productivity of soil as well as other systems of natural environment which are usually classified as noneconomic resources. In tackling sustainable development problems, environmentalists tend to focus on what is known as *"environment borders"*. As a concept it means that each natural environment system has certain limits that should not be exceeded by excessive consumption or else deterioration in irrevocable natural system is inevitable. Therefore, from an environmental point of view, sustainability means setting limits for consumption, population growth and pollution, as well as the faulty of production; including wasting waters, cutting the forests or the soil erosion (Abolina, 2005);
- **Institutional dimension** – the institutional dimension of sustainable development is concerned with the participation of all community members in the decision making process and the acquisition of the information that affect their lives transparently and accurately. It is also concerned with the organizations, such as councils and committees, charged with United Nations Millennium Development Goals (Abolina, 2005);

- **Digital dimension** – information and communication technologies are closely related to the abovementioned four dimensions of sustainable development. The Millennium Development Goals and the recommendations of the international summit for information and communication technology held in Geneva in November 2003 provided a suitable methodological framework on how to make use of information and communication technologies in achieving sustainable development. Therefore, the digital dimension has been added as a fifth dimension of sustainable development (Abolina, 2005).

The problem with planning sustainable development in the long-term is that there is not a simple way to predict the results of the interaction of people, human societies and natural systems, because it is not possible to anticipate/predict human behaviour and, furthermore, people are part of the system being analysed. Therefore, it is not possible to base strategies that promote sustainable development on a specific model (the model cannot represent human behaviour). The approach to the formulation of sustainable development policy must be flexible in two directions – in space and time, therefore, accurate predictions or forecasting are basically impossible. The consequences of this need for flexibility are:

1) Sustainability is a general idea that must be interpreted concretely in specific contexts;
2) Sustainability cannot be achieved by a command and control approach since we have no adequate causal models;
3) Sustainability can only be approached through a practical management process that includes permanent learning.

These conclusions illustrate the diverse approaches that are used for the implementation of sustainable development in various parts of the world and in different cities. Sustainable development is particularly relevant for the developed industrial countries in light of their high consumption level that together with

free market economics and globalization processes is one of the main causes of global environmental and development problems. The concept of dematerialization – decoupling of economic development and material consumption is an important strategic direction for sustainable development (Schleiser-Tappeser & Stratti,1999).

4. The Conditions and Outcomes of Urbanization

The late 20th century was the age of economic globalization. The first part of the 21st century will be the age of the city, the *"Urban Age"*. The world reached an invisible but momentous milestone in 2006 when the United Nations formally acknowledged that for the first time in the history of humanity more than 3.0 billion people, half the global population, lived in urban areas. While the world's urban population grew very rapidly (from 220 million to 2.8 billion) over the 20th century, the next few decades will see an unprecedented scale of urban growth in the developing world. This will be particularly notable in Africa and Asia where the urban population will double between 2000 and 2030. That is, the accumulated urban growth of these two regions during the whole span of history will be duplicated in a single generation. By 2030, the towns and cities of the developing world will make up 80 per cent of urban humanity (United Nations Population Fund, 2007).

A country is said to become more urbanized as its cities grow in number, its urban populations increase in size, and the proportion of its population living in urban areas rises. The degree of urbanization varies across the world but generally reflects the wealth of individual countries. The rich, industrialized countries tend to be the most highly urbanized. In the Netherlands, for example, 89 per cent of the population is urban, compared to only 13 per cent in Ethiopia, a much poorer country (Batten, 1995).

In terms of geographical place, urbanization means increased spatial scale and/or density of settlement and/or business and other activities in the area over

time. The process could occur either as natural expansion of the existing population, the transformation of peripheral population from rural to urban, incoming migration, or a combination of these. In either case, urbanization has profound effects on the ecology of a region and on its economy. Urban sociology also observes that people's psychology and lifestyles change in an urban environment. The increase in spatial scale is often called "urban sprawl". It is frequently as a derogatory term by opponents of large-scale urban peripheral expansion especially for low-density urban development on or beyond the city fringe. Sprawl is considered unsightly and undesirable by those critics, who point also to diseconomies in travel time and service provision and the danger of social polarization through suburbanites' remoteness from inner-city problems (Batten, 1995).

The most striking immediate change accompanying urbanization is the rapid change in the prevailing character of local livelihoods as agriculture or more traditional local services and small-scale industry give way to modern industry and urban and related commerce, with the city drawing on the resources of an ever-widening area for its own sustenance and goods to be traded or processed into manufactures (Dear, 2000).

Research in urban ecology finds that larger cities provide more specialized goods and services to the local market and surrounding areas, function as a transportation and wholesale hub for smaller places, and accumulate more capital, financial service provision, and an educated labor force, as well as often concentrating administrative functions for the area in which they lie. This relation among places of different sizes is called the urban hierarchy (Dear, 2000).

As cities develop, effects can include a dramatic increase in rents, often pricing the local working class out of the market, including such functionaries as employees of the local municipalities. Supermarkets and schools sometimes relocate or close down owing to the same financial pressure. Dramatic increases in land values also encourage further development, and may bring an increased tax

revenue for local government. In order to mitigate the problems of city growth, certain policies such as zoning or growth control or creation of an urban growth boundary are put in place, although the eventual effect of those policies sometimes turn out to be inflated land and housing prices due to a restricted supply (Fischer, 1975).

A major issue facing large cities is the disposal of the ever-growing volume of waste which accompanies increased affluence and reliance on purchased goods. Apart from the unsightliness of disposal sites, harmful synthetic materials in packaging, household appliances or machinery may threaten neighboring rural areas or water sources. Though municipal authorities are trying to address the problem, its rapid growth threatens to outstrip the resources of developing countries. Urbanization can increase the potential for wild land fires as planting and irrigation of landscaping trees and plants occur over the years. Increases in the size of urban areas can have significant impacts on local airsheds and watersheds (Fischer, 1975).

With urban areas sprawling outward from the city core, where the majority of economic activity often occurs, people need to travel greater distances to offices and markets in the core: conversely, people in inner-city areas need to travel further to escape the city. Often new urban areas are built in areas where the natural water cycle once occurred, such as forests, meadows or wetlands. This can harm the recharging of the groundwater table, and can affect local bodies of water. The natural water cycle is disrupted, and often, new pollutants such as pesticides can create problems for the ecology of an area. Conversely, while urban air is often more polluted than suburban or rural air, concentrating a population in a relatively small area can reduce the average amount of travel, and thus reduce transport-related pollution. Similarly, city-dwellers occupy less space per household than suburbanites, and use less fresh water, fertilizer, and herbicides (because they have smaller lawns and gardens, if any) (Garreau, 1991).

In the field of urban sociology, the effect of urbanization on mentality and life style has been a subject of research and debate. The agreement hardly exists, though the differing views are closely related to one another. Following are the three major views. Georg Simmel, one of the pioneers in German sociology and urban sociology, suggests that the increased concentration and diversity of people and ongoing activities in city put urbanites under stress (a cognitive overload). This is considered the major cause of urban mentality - detachment from others, self-centeredness, and rational calculating mind (Simmel, 1971).

This understanding of urban life and urbanites is closely related to the understanding of modern society by Ferdinand Tonnies and Max Weber, two of Simmel's close contemporaries. Louis Wirth, a member of Chicago school, followed Simmel and wrote probably the most frequently-cited paper on urbanism "*Urbanism as a way of life*" in 1938. His writing on the effects of urbanism on mentality and lifestyle remains illustrative, compared to the definition of urbanism, but among those suggested are relaxed moral restrains, increased participation in formal organization pursuing limited goals (as opposed to belonging to a community), increased role of mediated communication. Both are more or less in line with social atomism, the view that modern society disintegrates communities into a soup of individuals (Tonnies, 1988).

The major counter-argument is found in Herbert Gans's work "Urban Villagers", an ethnographical study on how urbanites' lives are enclaved by local ethnic community, taking the case of Italian-American community in Boston. Another well-known view is the subcultural theory of urbanism of Claude Fischer. He asserts that many different subcultural groups are formed in urban areas, and residents tend to choose a limited number of them to participate, as opposed to freely floating one from another. Some of those groups are quite informal and residents may be strongly engaged, having a similar experience to the close relationship found in community (Fischer, 1975).

The urbanization of the world has recently reached a new threshold. Today the majority of the world's population not only lives in cities but in large metropolitan regions of more than one million inhabitants. This concentration of population in 400 or so sprawling city regions, as they are now called, has been accompanied over the past thirty years by many dramatic changes in the form and functioning of cities, in the ways the urban political economy is organized, in the cultural composition of the population, and in the very nature of urbanism as a way of life. These changes have, in turn, stimulated new approaches to studying cities and the urbanization process (Kemeny, 2007).

5. City – Object of Nature and Subject of Culture

What is the city? How did it come into existence? What processes does it further: what functions does it perform: what purposes does it fulfill? No single definition will apply to all its manifestations and no single description will cover all its transformations. The origins of the city are obscure, a large part of its past buried or effaced beyond recovery, and its further prospects are difficult to weigh.

From the beginning of its existence, human society reveals the tendency to create complex multi-layered structures in all spheres of life. In the process of development it aspires to community hierarchy complication, to a branching and expansion of public relations, to creation of new more difficult social institutes and roles. All of these communications, penetrating various social classes and spheres of human activity, urged to strengthen the unity of the human collective, simultaneously giving for its members varied opportunities for the development of essential identity. Such variety in unity is also a place of human existence – city (Saiko, 2001).

The period of existence of traditional agricultural societies with kin-based device is great and in the process of their development new knowledge and technologies in manufacture of various products of human activity had been col-

lected. The volume of requirements increases, extend intergroup communications in this connection. It causes the reorganization of human settlements: their integration and consolidation. Thus, a village with a traditional type of farming is becoming a city, where crafts occupy the basic place, assuming division of manufactures. With the complexity of the manufacturing process and differentiation of its individual industries, division and complexity of the structure of society occurs. The human conscience personalized, developing other areas of life: science, art, literature (Saiko, 2001).

Progress in these areas generates changes in the organization of human settlements. This is particularly evident in the monumental architecture – construction of temples and palaces. Erection of temples testifies not only a science and crafts development but also human society's spiritual life development. It means that in society representing weight of the differentiated forms of human activities is a common basis for the existence of a unified worldview. As it is known, without an ideological basis is extremely problematic healthy livability of the society. Such base is spirituality which is more cultivated with the formation and development of cities (Saiko, 2001).

Every phase of life in the countryside contributes to the existence of cities. What the shepherd, the woodman, and the miner know, becomes transformed and "etherealized" through the city into durable elements in the human heritage: the textiles and butter of one, the moats and dams and wooden pipes and lathes of another, the metals and jewels of the third, are finally converted into the instruments of urban living: underpinning the city's economic existence, contributing art and wisdom to its daily routine. Within the city the essence of each type of soil and labor and economic goal is concentrated: thus arise greater possibilities for interchange and for new combinations not given in the isolation of their original habitats (Mumford, 1938).

So the human civilization passes a way from chaos to an order – to space. Since ancient times, characterized by the domination of mythological consciousness

in society, the man understands the vital importance of the establishing and maintaining order in his existence. These purposes were served by rituals of an annual solar cycle of holidays, having order strengthening nature. Laying order in space has begun with an understanding of symbolical value of the center, around which the environment of human existence had been organized. Thus the center is a sacral place, marked by signs of holiness, by election. This is a symbolic place of creation of the world. All the other buildings around it have the subordinate importance (Saiko, 2001).

The city is the point of maximum concentration for the power and culture of a community. The city is the form and symbol of an integrated social relationship: it is the seat of the temple, the market, the hall of justice, the academy of learning. Here in the city the goods of civilization are multiplied and developed; here is where human experience transformed into viable signs, symbols, patterns of conduct, system of order. Here is where the issues of civilization are focused: here, too, ritual passes on occasion into the active drama of a fully differentiated and self-conscious society (Mumford, 1938).

Cities are a product of time. They are the molds in which men's lifetimes have cooled and congealed, giving lasting shape, by way of art, to moments that would otherwise vanish with the living and leave no means of renewal or wider participation behind them. In the city, time become visible: buildings and monuments and public ways, more open than the written record, more subject to the gaze of many men than the scattered artifacts of the countryside, leave an imprint upon the minds even of the ignorant or the indifferent. Through the material fact of preservation, time challenges time, time clashes with time: habits and values carry over beyond the living group, streaking with different strata of time the character of any single generation. Layer upon layer, past times preserve themselves in the city until life itself is finally threatened with suffocation: then, in sheer defense, modern man invents the museum (Mumford, 1938).

Cities arise out of man's social needs and multiply both their modes and their methods of expression. In the city remote forces and influences intermingle with the local: their conflicts are no less significant than their harmonies. And here, through the concentration of the means of intercourse in the market and the meeting place, alternative modes of living present themselves: the deeply rutted ways of the village cease to be coercive and the ancestral goals cease to be all-sufficient: strange men and women, strange interests, and stranger gods loosen the traditional ties of blood and neighborhood … (Mumford, 1938).

The emergence of the city is a necessary stage in the development of human culture. So the city represents not just the amount of different types of human activity but it is always something more. In addition to the cumulative (memory) and integrating (uniting) functions it performs more extensive and complex actions. Since some moment of historical development, the city, created and changed by a man, begins to change it himself. As a complex mechanism, the city creates new values that can not create all set of its elements without close interaction within the city. This uniqueness of its functioning promotes still bigger city sacralization, not simply as a place of existence organized in space but as ontological center of life (Saiko, 2001).

The organism of the city, fastened by unshakable spiritual communications, becomes stronger driving force of a society development. All major events and significant changes of the society's live occur in the city. With some delay, these processes come to human settlements, which preserve traditional ways of farming. So there is a discrepancy of the city and village: the city in the historical process is a dynamic, transforming force but the village – inert and conservative. Each of these environments of human dwelling has its own advantages (Saiko, 2001).

The city is a fact in nature, like a cave, a run of mackerel or an ant-heap. But it is also a conscious work of art, and it holds within its communal framework many simpler and more personal forms of art. Mind *takes form* in the city; and

in turn, urban forms condition mind. For space, no less than time, is artfully re-organized in cities: in boundary lines and silhouettes, in the fixing of horizontal planes and vertical peaks, in utilizing or denying the natural site, the city records the attitude of a culture and an epoch to the fundamental facts of its existence. The dome and the spire, the open avenue and the closed court, tell the story, not merely of different physical accommodations, but of essentially different conceptions of man's destiny. The city is both a physical utility for collective purposes and unanimities that arise under such favoring circumstance. With language itself, it remains man's greatest work of art … (Mumford, 1938). Today a great many things stand in the way of grasping the role of the city and of transforming this basic means of communal existence.

6. Urban Environment as a Natural Phenomenon

Cities provide an inevitable contrast to the *"natural"*. A consistent strand of thought has sought to place the city as a human invention in opposition to the "natural", the "pristine", and the *"wilderness"*. Protecting the environment has usually meant halting the encroachment into pristine areas such as rainforests and tundra. Most often, environmental protection has been defined as meaning something outside of, and mostly unrelated to, the concerns and interests of our cities. Cities have been described and understood as somehow separate from the so-called *"natural world"*. This has been reinforced by the appearance of an increased separation of life in the city from the wider environmental context. When food is more available in a supermarket aisle instead of in the fields outside our homes and when we can turn up the heating to keep out the cold or turn on the air conditioning to keep out the oppressive heat there is a tendency to see the city as somehow removed and independent from the physical world (Benton-Short, 2008).

Urban theorizing has for a long time been conducted as if a city was on a flat, featureless plain. Urban studies have long ignored the physical nature of cities; instead, the emphasis has been on the social, political and economic rather than

the ecological. And yet cities are ecological systems, they are predicated upon the physical world as mediated through the complex prism of social and economic power. In recent years there has been a renewal of interest in the city as an ecological system with emphasis on the complex relationships between environmental issues and urban concerns, and between social networks and ecosystem flows. In this new exciting body of urban ecological work, cities are now seen as much natural as wilderness and the environment as much social as the city. The city is implicated in the *"natural"* world in connections that embody and reflect social, economic and political power. The city is an integral part of nature and nature is intimately interwoven into the social life of cities. Physical geographer Ian Douglas suggested that the city itself can be seen as an ecosystem with inputs of energy and water and outputs of noise, climate change, sewage, waste and air pollutants (Douglas, 1983). Another way to consider relationship between the city and nature is to consider the city as an ecological system with a measurable amount of environmental inputs and outputs (Benton-Short, 2008).

Human activity in the city is dependent on large and consistent inputs of energy. When we leave heated buildings to drive in cars, to purchase goods we use energy. The commercial activities we pursue and the microclimates we create (heating in winter, cooling in summer) all use energy. In seeking to overthrow the tyranny of nature, cities use prodigious amounts of energy. Cities are deeply dependent on energy sources. In the United States, since the beginning of the twentieth century, petroleum has traditionally been very cheap and cities now sprawl across the landscape. In countries where energy is more expensive, cities tend to be higher in density and more reliant on public transport. Large-scale suburban sprawl is a function of cheap energy (Wheeler, 2004). It is tempting to theorize the impact of a long-term, sustained increase in energy prices on suburban sprawl and urban structure.

Water is an essential ingredient of life. The people and commerce of cities are utterly dependent upon water. One of the largest urban differences in the world

is between cities with clean, easily accessible water and others with expensive, inaccessible and polluted water supplies. In order to provide inexpensive and clean water immense engineering projects have been undertaken. And as cities have grown the catchments areas have extended outwards and the engineering sophistication of piping in water has grown and deepened. In poorer cities polluted urban water remains a major source of disease and illness especially for children. Even in rich countries the availability of fresh water is a determinant of the limits of urban growth (Benton-Short, 2008).

Cities also modify the environment. The most obvious example of this is the urban heat island. Cities tend to be warmer because of the amount of extra heat produced in the city and the heat absorption of man-made materials such as tarmac, asphalt and concrete. Heat is absorbed by these surfaces during the day and released at night. The net result is that the air around cities to be warmer than surrounding rural areas. One side effect is to reduce the need for heating in the winter but to increase the need for air-conditioning in the summer. The heat island means you can turn the heating down in London in December but need to increase the air conditioning in Washington, DC in August. The extra heat causes a thermally induced upward movement of air, and an increase in cloud and raindrop formation. Cities are often cloudier, more prone to thunder and slightly warmer than surrounding rural areas. Human activity in the city also produces pollutants. Industrial processes and auto engines emit substances that include carbon oxides, sulfur oxides, hydrocarbons, dust, soot and lead. The air in cities has traditionally been very unhealthy, which is part of the reason for the higher urban death rate throughout most of human history. The pall of smog that hangs over many cities is a visible reminder of the effects of concentrated human activity on the environment. The pollutants of cities are not only injurious to the health of individuals, but also cause more general damage; cities are in part a major cause of global warming and ozone depletion (Benton-Short, 2008).

A major output of cities is waste. High mass consumption in association with elaborate packaging has created a rising amount of waste in cities. Burning it causes air pollution, while hiding it leads to massive landfills. The environmental justice literature shows that many environmentally hazardous facilities are generally located in poor, minority and more weakly organized communities. Issues of environmental management are tied in to wider issues of equity and social justice. Patterns of environmental racism are clear when we note that most noxious facilities are located in lower income, more marginal communities (Wheeler, 2004).

Cities also emit noise. Cities are noisy places and households who inhabit busy urban streets for more than 15 years are on average likely to experience a 50 per cent reduction in hearing capacity. The effects of noise pollution vary from annoyance to deterioration in hearing. A high backroom noise level leads to a general increase in stress and the lessening of the quality of urban life (Benton-Short, 2008).

Cities are an integral part of the hydrological cycle. Cities impact the daily and seasonal flows of water. The large amount of impermeable surfaces, for example, means that when it rains run off levels spike dramatically. Cities thus need to create modified flows through channels and conduits that can cope with the irregular high flow rates. But the large amount of impermeable surfaces in association with the channelization of water courses can lead to distinct surges in water flow after rain and in many cases patterns of flooding. As urbanization increases so to does the overloading of the hydrological cycle. Cities also modify the flow and direction of rivers in order to increase commercial activity. Cities also tend to pollute water systems, thus reducing the amount of fresh water and in some case posing major health hazards (Benton-Short, 2008).

To theorize the city as an ecological unit is to open new possibilities for understanding the environment inputs necessary for urban growth and the environmental impacts of urban growth. Nature is present in cities in often unforeseen
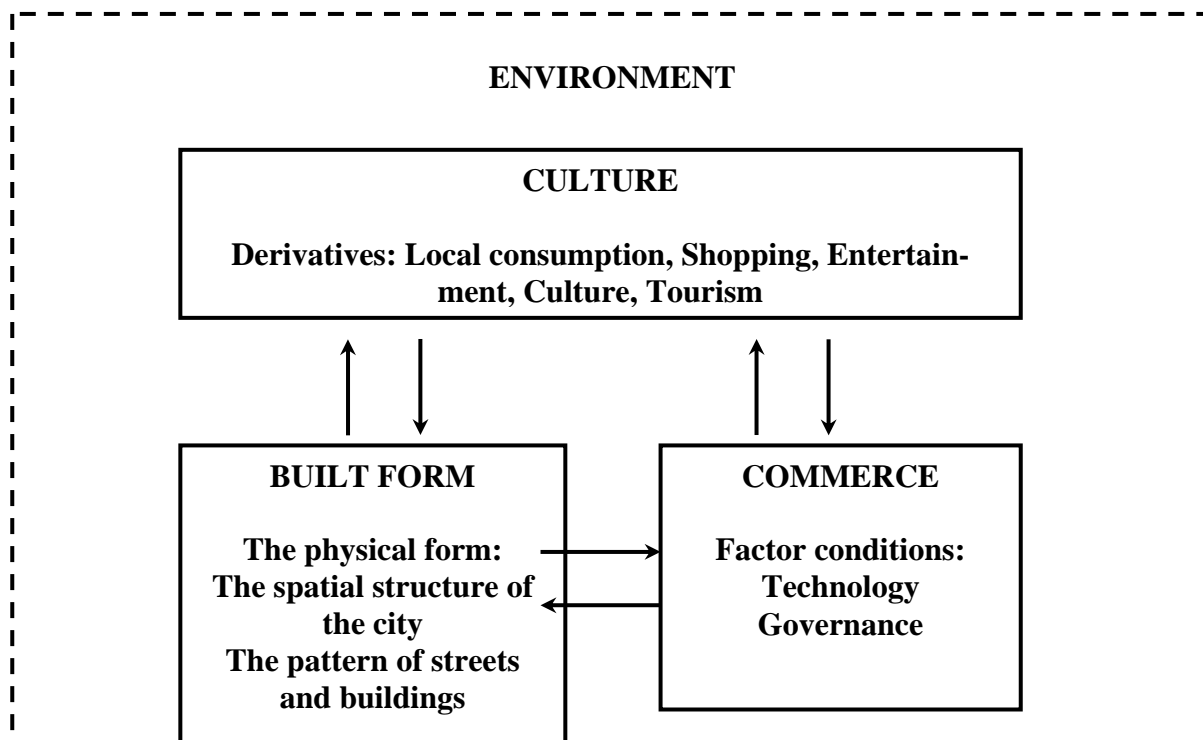
and unplanned ways. Wildlife in a variety of forms continues to find ecological niches in the city. Urban tensions can be written through the narration of the relationship between cities and wildlife. Urban animal geographies can tell us a great deal about the city – nature dialectic, whether it is in the stories of rats in cities or the story of hawks in the city. There is also a more self-conscious referencing of nature in cities. Consider urban parks. It is difficult to imagine London without Hyde Park, New York without Central Park or Washington, DC without the National Mall. Landscape architects such as Frederick Law Olmsted have left a permanent legacy in cities. The modern park movement is more closely tied into active participation than the environmental contemplation so beloved of the early park movement. City parks are now developed as much for their recreational opportunities as their aesthetic appeal. Urban planners realize that the successful referencing of nature is an important element in creating the right atmosphere, and it is often linked with the promise of economic redevelopment. Whether it is in the beaches of southern California, the lakeside shore of Chicago, or the parks of London and Paris, a commonly accepted attractive feature of urban life is the successful (re)incorporation of nature into the urban lifestyle, the city's image and the metropolitan experience (Benton-Short, 2008).

7. The Origin of Urban System

The model of city dynamics (See Figure 7.1), offered by urban researcher John Montgomery, holds in his opinion for most of city development since the emergence of Florence during the Renaissance of the early fifteenth century (Montgomery, 2007). It applies to the growth of cities in the middle ages, during the Enlightenment, for the industrial, and the post-industrial city, and for the city of the foreseeable future. The model has had a lengthy gestation. It draws heavily on the works of other theorists, writers and thinkers: David Canter for the basic structure (Canter, 1975); Jane Jacobs on the economy of cities (Jacobs, 1969), Michael Porter on industry clusters (Porter, 1998), Charles Sabel on flexible specialization (Sabel, 1989); Kevin Lynch (Lynch, 1990), Christopher Alexander (Alexander, 2004), Jan Gehl (Gehl, 1987) and Peter Buchanan (Buchanan,

2000) on built form; Ken Worpole (Worpole, 2004), Franco Bianchini (Bianchini, 2004) and Raymond Williams (Williams, 1977) on culture, Charles Handy on the knowledge economy (Handy, 1999), Nick Garnham on the cultural industries (Garnham, 1990); Adam Smith on governance (Smith, 1759).

Figure 7.1.   City dynamics and its elements [Montgomery, 2007]

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│                    ENVIRONMENT                        │
│   ┌───────────────────────────────────────────────┐  │
│   │                  CULTURE                        │  │
│   │  Derivatives: Local consumption, Shopping,      │  │
│   │     Entertainment, Culture, Tourism             │  │
│   └───────────────────────────────────────────────┘  │
│                                                       │
│   ┌─────────────────────┐   ┌─────────────────────┐  │
│   │    BUILT FORM        │   │     COMMERCE         │  │
│   │  The physical form:  │   │  Factor conditions:  │  │
│   │ The spatial structure│   │     Technology       │  │
│   │     of the city      │   │     Governance       │  │
│   │ The pattern of streets│  │                      │  │
│   │    and buildings     │   │                      │  │
│   └─────────────────────┘   └─────────────────────┘  │
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The basic preposition is that for all cities, across many time-frames, it is essential to retain in balance a creative and dynamic economy, an innovative cultural life and a *"good fit"* of the built to activity. These conditions will be found in any study of successful cities at a given point in time. Some cities are successful and flexible enough to adjust to changing economic conditions; others, historically, have not been. London enjoyed a golden age –period of its prosperity and harmonious development – in the sixteenth century, another in the 1840s and one in the 1960s. Paris's golden age was in the late nineteenth century, Edinburgh's in the 1770s, Vienna for most of the nineteenth century, New York in the 1920s and 1950s, Los Angeles in the 1930s and 1990s. Some cities only

manage episodes of rapid growth and cultural pre-eminence once in a lifetime. In the 1870s Buenos Aires and Adelaide were the two fastest growing cities of the time, but since then have stagnated and/or declined (Ellinger, 1994).

Each individual city, moreover, is created in an unique place, that is to say a particular environment with individual topographical and fertility characteristics. In most cases, some element of physical property – deep water for a sea port, a river, raw materials, particular soil characteristics – have given rise to the city's initial development. As time and technologies progress, this originally fundamental relationship will very often become less dominant. Yet the local landscape will always retain a set of cultural associations and remain part of the city identity (Montgomery, 2007).

Over time, the balance of commerce, culture and built form will change and adapt, particularly in relation to changes in patterns of trade. But two other *"factor conditions"* are at play: technology and governance. Each of these can and do impact on city economies, built types and form and cultural life generally. For example, a policy of increasing local taxation will usually lead to business closures, relocation and economic stagnation. Changes in the built form can also be brought about by governance as well as by technology in the form of new building techniques. Culture will also change with variations in regulation. One thinks here of the Theatre Acts in Victorian London or the Chicago speak-easies. Technology also affects culture in the means of producing and circulating images, texts and sounds – the rise of the cinema for example or broadcast radio and popular music, or sound recording. Jazz, photography and film were the art forms of the twentieth century; literature and fine art of the nineteenth century, classical music in the eighteenth century and theatre before that. In the twenty-first century it will be digital media and designed objects (Montgomery, 2007).

Cities, then must have commerce to earn their living, cities would be dull uninteresting and lacking in innovation without culture; the built form should give

identity to a city but also provide a good *"fit"* for its unique blend of activities. Changes in technology will alter the balance of commerce/culture/form almost continually, although to varying degrees. Governments can either help maintain this beneficial balance by policies on taxation and regulation – and by investment in key economic and social infrastructure – or by over-regulating, killing the goose that lays the egg. Meanwhile, cities will maintain a separate relationship with their local hinterland or environment, perhaps through economic transplants, the seeding of new industries (winemaking in South Australia for example) or simply in terms of meaningful natural features – the Sydney Harbour, the London green-belt Edinburgh's crag and tail … And when all of these processes are operating in relative balance, local citizens will tend to have greater levels of income to spend on items of personal consumption: dresses and hats, cakes and hairdressing, nightclubs and restaurants. A city which offers all of these goods and services might then find itself a key destination for tourists and other visitors. To some degree, the new economic geography is linked to choices and preferences in personal consumption (Montgomery, 2007).

However, while every town and city has an individual character, urban places also exhibit common features that vary only in degree of incidence or importance within the particular urban fabric. All cities contain areas of residential space, transportation lines, economic activities, service infrastructure, commercial areas and public buildings. In different world regions the historical process of urban evolution may have followed a similar trajectory. Increasingly, similar processes, such as those of suburbanization, gentrification and socio-spatial segregation, are operating within cities in the developed world, in former communist states and in countries of the Third World to effect a degree of convergence in the nature of urban landscapes (Pacione, 2004).

Cities also exhibit common problems to varying degrees, including inadequate housing, economic decline, poverty, ill health, social polarization, traffic congestion and environmental pollution. In brief, many characteristics and concerns are shared by urban places. These shared characteristics and concerns rep-

resent the foundations for the study of urban environment. Most fundamentally, the character of urban environments throughout the world is the outcome of interactions among a host of environmental, economic, technological, social, demographic, cultural and political forces operating at a variety of geographic scales ranging from the global to the local (Jenks & Kozak, 2008).

8. Milestones of the Modern Urban Development

The eminent author Lewis Mumford wrote 50 years ago: *"If we would lay a new foundation for urban life, we must understand the historic nature of the city".* (Mumford, 1938). This statement is highly significant, particularly at a time when many cities across the world are growing at an unprecedented scale. Many historic cities continue to thrive after thousands of years. But many others have dissolved into heaps of rubble and dust. In this urban age, it is important to know what is likely to assure the long-term existence of cities and what contributes to their decline. To understand the fundamentals of urban development, a question that needs to be answered is why and where urban settlements developed and whether there is chronology in the process (Pacione, 2004).

There is evidence of the existence of Homo sapiens dates dating back to the Upper Paleolithic period, about 50,000 years ago. In this synopsis of early human settlement Hauser maintains that there could have been between five and ten million people in the world by the end of the Neolithic period, increasing to between 200 and 300 million by the beginning of the Christian era. By the beginning of the modern era in 1650 the population increased to approximately 500 million. It took all the millennia up to the 1850 for the world population to reach the first billion mark. The second billion took only seventy-five years, the third, thirty-seven years, and, increasing faster and faster all the time, the six billionth baby was born at the turn of the third millennium (Geyer, 2007).

Three major transformations have altered the course of human life. The first was the revolution that led to the development of agriculture around 7000 B.C. and the growth of Neolitic farming settlements such as Jarmo in Iraq and Jericho in modern Israel. The second was the pre-industrial revolution that brought cities into being. The third was the industrial forerunners of our present cities (Pacione, 2004).

Preconditions for urban growth. With reference to the pre-industrial city, Wheatley (Wheatley, 1971) defined urbanism as "that particular set of functionally integrated institutions which were first devised some 5,000 years ago to mediate the transformation of relatively egalitarian, ascriptive, kin-structured groups into socially stratified politically organized, territorially based societies". The emphasis on institutional change relates the growth of cities to a major socio-political restructuring of society, which he regards as a key element in the development of civilization. In similar vein, Childe (Childe, 1951) provides a listing of ten characteristics of an urban civilization. These may be separated into five primary characteristics referring to fundamental changes in the organization of society and five secondary features indicative of the presence of the primary factors (See Table 8.1).

Table 8.1.   ***Childe's ten characteristics of an urban civilization [Pacione, 2004]***

PRIMARY CHARACTERISTICS				
1. Size and density of cities	**2. Full-time specialization of labour**	**3. Concentration of surplus**	**4. Class-structured society**	**5. State organization**
The great enlargement of an organized population meant a much wider level of social integration	Specialization of production among workers was institutionalized, as were systems of distribution and exchange	There were social means for the collection and management of the surplus production of farmers and artisans	A privileged ruling class of reliqious, political and military functionaries organized and directed the society	There was a well-structured political organization with membership based on residence. This replaced political identification based on kinship
SECONDARY CHARACTERISTICS				
6. Monumental public works	**7. Long-distance trade**	**8. Standardized, monumental artwork**	**9. Writing**	**10. Arithmetic, geometry and astronomy**
There were collective enterprises in the form of temples, palaces, storehouses and irrigation systems	Specialization and exchange were expanded beyond the city in the development of trade	Highly developed art forms gave expression to symbolic identification and aesthetic enjoyment	The art of writing facilitated the processes of social organization and management	Exact, predictive science and engineering were initiated

Thus, for example, a community that was capable of building monumental public works probably had not only the craft specialists to undertake the task but also sufficient surplus to support the work. It is important to recognize that these advances in social organization occurred in particular environmental settings. The combination of environmental and social forces underlying early urban development is encapsulated in Duncan's (Duncan's, 1961) ecological per-

spective, which emphasizes how external (environmental) stimuli and internal (social) interrelationships operated together to promote the growth of cities in the pre-industrial era (See Table 8.2).

Table 8.2.   Pre-conditions for pre-industrial urban growth [Pacione, 2004]

1. Population	The presence of a population of certain size residing permanently in one place is a fundamental requirement. The environment, level of technology and social organization all set limits on how large such a population would grow. Particularly important was the extent to which the agricultural base created a food surplus to sustain an urban population. The earliest cities were relatively small in modern terms, with few exceeding 25,000 inhabitants
2. Environment	The key influence of the environment, including topography, climate, social conditions and natural resources on early urban growth is illustrated by the location of the earliest Middle Eastern cities on the Rivers Tigris and Euphrates, which provided a water supply, fish and fertile soils that could be cultivated with simple technology
3. Technology	In addition to the development of agricultural skills, a major challenge for the early urban societies of the Middle East was to develop a technology for river management to exploit the benefits of water and minimize the risk of flooding
4. Social organization	The growth of population and trade demanded a more complex organizational structure including a political, economic and social infrastructure, a bureaucracy and leadership, accompanied by social stratification

With these preliminary observations in mind, we can consider a number of different theories advanced to explain the origins of urban society. In doing so we should note that, as in much social science, it is not a question of whether one hypothesis is correct and the others wrong. Rather, each contributes some insight on the rise of cities:

1) **Hydraulic theory** – the importance of irrigation for urban development, especially in the semi-arid climates of the Middle East where the agricultural revolution took place, was identified by Wittfogel (Wittfogel, 1994), who argued that the need for large-scale water man-

agement required centralized co-ordination and direction, which in turn required concentrated settlement. The principal characteristics of a *"hydraulic society"* are that it:
a) Permits an intensification of agriculture;
b) Involves a particular division of labour;
c) Necessitates co-operation on a large scale (Pomeroy, 2008).

As Table 8.2 indicates, these are reflected in Duncan's (Duncan's, 1961) preconditions for urban growth. Agricultural intensification allows a concentration of population, while co-operation leads to a need for managers and bureaucrats. Those who control the water resources (whether a temple elite or secular state) exert power over others (e.g. farmers). The division of labour, centralization of power and administrative structure all promote concentrated settlement, and hence the emergence of a town. As well as in the Middle East, evidence of a relationship between the adoption of irrigation and rapid population growth, nucleation, monument construction, intense social stratification and expansionist warfare has also been found at Teotihuacan in Mexico, which was the site of a pre-industrial city of 70,000 – 125,000 inhabitants. There is now little doubt that irrigation was a key factor in the growth of pre-industrial cities in the ancient world. The problem lies in disentangling cause and effect. This is particularly difficult if one is seeking to support the belief that urbanization followed upon the development of irrigation. A more likely scenario is that the institutions of centralized urban government and large-scale irrigation grew side by side. At first, small-scale irrigation schemes would have required a certain amount of administration, which would have expanded the irrigation system. This in turn would have required greater administration and so on, eventually leading to large-scale irrigation works and an urban political organization with a monopoly of power (Pomeroy, 2008).

2) **Economic theory** – several theorists have suggested that the development of complex large-scale trading networks stimulated the growth of

urban society. Certainly, the fact that southern Mesopotamia did not have many raw materials such as metallic ores, timber, building stone or stone for tools made trade essential. This required an administrative organization to control the procurement, production and distribution of goods. Such an organization would have been a powerful agent in the community, and its power may well have extended beyond trade into other aspects of society. The need to increase production for trade purposes as well as to feed an expanding population would have led to continued specialization and intensification, and the growing sedentary population would itself constitute a market for local produce and trade goods. Once again, however, it is unclear whether trade was a cause of city growth or the product of already existing urban administrative elite (Pomeroy, 2008);

3) **Military theories** – some theorists suggest that the origin of cities lay in the need for people to gather together for protection against an external threat, the initial agglomeration leading to subsequent urban expansion. The excavation of a massive defensive wall built on bedrock would appear to indicate the defensive origins of Jericho, but not all early towns have such defences. Wheatley (Wheatley, 1971) believed that warfare may have contributed to the intensification of urban development in some places by inducing a concentration of population for defensive purposes and by stimulating craft specialization.

Theoretical consensus? It is doubtful if a single autonomous, causative factor will ever be identified in the nexus of social, economic and political transformations that resulted in the emergence of urban forms of living. A more realistic interpretation is generated if the concept of an *"urban revolution"* is replaced by the idea of urban transformation involving a host of factors operating over a long period of time (Pomeroy, 2008). As Redman (Redman, 1978) explained:

"Urbanization was not a linear arrangement in which one factor caused a change in a second factor, which then caused in a third, and so on. Rather,

the rise of civilization should be conceptualized as a series of interacting incremental processes that were triggered by favourable ecological and cultural conditions and that continued to develop through mutually reinforcing interactions".

This approach represents a significant departure from mono-causal views on the origin of cities. Its value lies in exposing the key roles of social stratification and individual and group decision-making underlying the complex reality of the transformation from nomadic life to settled urban life in the ancient world (Pacione, 2004).

9. The Growing Impact of Globalization upon Urban Development

It is no secret that the rise of the modern city can be attributed in large part to the market mechanism. It seems clear that the profit motive provides much of the momentum driving population expansion in the large metropolitan areas of modern nations. Beyond or parallel to profit opportunities, people come to the modern urban complex in search of employment, not to mention to take advantage of modern conveniences. In another context, it was suggested that the removal of the market mechanism from such agglomerations would cause their economies to grind to a halt. In that same context, it was conceded that there have been cases where completely planned communities have been established. In such cases where private interests are involved, *"the market mechanism is directly responsible for their existence"*. It was felt that even in cases where such communities were established by the government, they would *"still be forced to rely upon the market mechanism to insure their continued success"* (McKee, 2004).

The thinking was that the city, in an economy governed by the market mechanism, is dependent upon that mechanism for its continued economic viability. Of course, this view would have to be modified to accommodate the circum-

stances of urban centers geared to governmental functions and/or nonprofit services. There appears to be little question that cities, particularly large metropolitan areas, play very important roles in modern economies. It is such agglomerations that provide the climate for the successful continuance of the wide range of economic activities that ensure the ongoing vitality of such economies. By positioning themselves in and around urban areas, economic activities take part in shaping the physical structure of such areas. The urban agglomerations thus configured retain their roles in national economies in proportion to the continuing success of the mix of economic activities that they house. Unfortunately, the physical configuring of urban areas brings with it certain structural inflexibilities. It is quite possible that an urban environment that was molded to suit the needs of the economic activities which it housed in the past may no longer be suitable to take a strong, ongoing role in the national economy. In such cases the city in question may develop serious economic problems. In other words, inflexibilities in urban structures and capital configurations inherited from the past may seriously damage local economies. Structural rigidities may signal serious sunk costs as well as physical obstacles to growth and change (McKee, 2004).

Globalization determines the city's place in the new hierarchy of cities. Globalization is also linked to convergence among cities in culture and appearance. Local culture and variation are replaced by global products, culture, and experiences leading to cities that are bland and undistinguishable. Urban economists point to globalization as a primary factor to explain redevelopment, reterritorialization, political and economical decentralization in cities and metropolises dominated by corporate capital and multinationals and their top tier managers (Tsuhamoto & Vogel, 2004). Globalization is a term used to describe a complex of related processes that has served to increase the interconnectedness of social life in the (post) modern world. For Robertson (Robertson, 1992), the concept refers *"both to the compression of the world and the intensification of consciousness of the world as a whole"*. Globalization is evident in three forms (See Figure 9.1):

Figure 9.1.   Globalization forms and its relationship [Pacione, 2004]
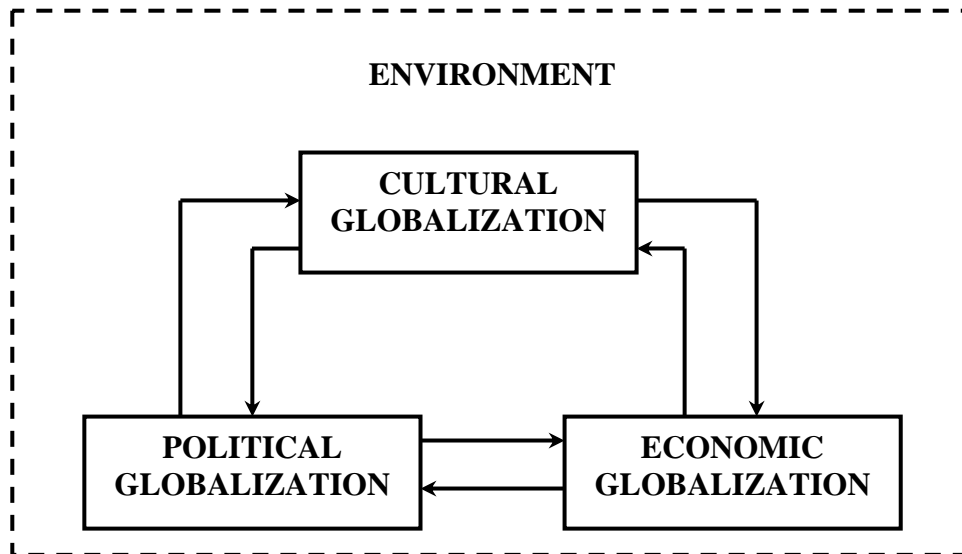
1) **Economic globalization:** seen in arrangements for the production, exchange, distribution and consumption of goods and services (such as the rise of transnational corporations, the new international division of labour, increases in foreign direct investment, flexible forms of production and a global financial system) (Pacione, 2004);

2) **Political globalization:** seen in arrangements for the concentration and application of power (such as the growth of multi-state political-economic groupings, and consideration of local issues within global context) (Pacione, 2004);

3) **Cultural globalization**: seen in arrangements for the production, exchange and expression of symbols that represent facts, meanings, beliefs, preferences, tastes and values (such as the global distribution of images and information, and the emergent cosmopolitanism of urban life) (Pacione, 2004).

Globalization is leading to new challenges for urban and regional development. There are many indications that cities are playing an ever/increasing role in the global economy. At the same time, the identity and quality of cities have be-

come central competition parameters. However, the dynamics of the global economy often comes into conflict with this local quality and identity, resulting in, for example, cultural and architectural uniformity between cities, social polarization between various urban districts and great environmental impact. In order to counter the negative consequences of globalization, it is important that development be founded in the local identity. Maintaining growth and sustainable development, while also preserving local identity and diversity, are some of the challenges we face today (Pacione, 2004). There are several characteristics of really existing globalization, as they affect urban development:

- A concentration of ownership and control in the hands of a decreasing number of overwhelmingly multi-national corporations (Jenks & Kozak, 2008);
- A financialization of capital in which financial firms are increasingly the owners of, and control, the major large manufacturing and services firms, making key decisions for them whether or not they mange their day-to-day operations (Foster, 2007);
- A shift in power relations between firms and their workers, with business profits and executive pay rising at a much faster rate than worker's wages (Jenks & Kozak, 2008);
- A shift in power relations between firms and government, leading to the adoption of neo-liberal policies by most governments in developed countries (Harvey, 2005; Brenner and Theodor, 2002);
- Commitment of local governments to competition among cities for economically profitable businesses (Jenks & Kozak, 2008);
- A rapid development of technology, particularly in communications and transportation and information processing, enabling much wider spans of control and networking among firms (Castells, 1998; Marcuse, 2002);
- A rise in the extent of the services sector of the major economies, and in the most developed economies a decline in the presence of manufacturing; not to be confused with an absolute decline of manufacturing world-wide, but representing rather a relative decline of

manufacturing in some cities resulting from their relocation rather than decline (Jenks & Kozak, 2008);

- Most recently, a formal concern with security against the threat of terrorism (Jenks & Kozak, 2008);
- Again recently, especially after the collapse of the Soviet Union , the domination of the United States militarily, economically, financially, and culturally, throughout most of the world (Harvey, 2005);
- The set of social, economic, and political policies, and their attendant ideological grounding, generally subsumed under the name of neo-liberalism (Jenks & Kozak, 2008).

The impact of these forces on cities can be divided between the impact on cities as a whole, that is to say, on the process of urbanization, and the impact on specific aspects of the built environment within cities (Jenks & Kozak, 2008).

10. The Metabolism of the City Life

The vast environmental impacts of global urbanization, encapsulated in the ecological footprint concept, need to be met with a wide range of creative responses. Can we transform cities into much less environmentally demanding and damaging places? Can we establish a sustainable relationship between cities and the planet, while improving the quality of urban life at the same time? Can modern cities reduce their discharge of wastes by enlightened self-regulation and self-limitation?

The growing understanding developed by the natural sciences of the way ecosystems function has a major contribution to make solving the problems of urban sustainability. Cities, like other assemblies of organisms, have a definable metabolism, consisting of the flow of resources and products through the urban system for the benefit of urban populations. The term *metabolism* can be defined as: *"the sum of all the biological, chemical and physical processes that occur within an organism or ecosystem to enable it to exist indefinitely"* (Gi-

rardet, 2004). A modern city is a place of residence for organisms, human and otherwise, and it can be itself described as the sum of the metabolism of its inhabitants. This idea of investigating a city as an organism which can be studied by modeling the flows entering and going out is quite new and falls within the purview of the emerging specialty of industrial ecology. To be regarded as sustainable, the city's metabolism has to fulfill certain criteria, which cover social, economic and environmental impacts, and which avoid reducing the abilities of future generations to serve their needs as we presently serve ours (Chevre, 2006).

Given the vast scale of urbanization cities would be well advised to model themselves on the functioning of natural ecosystems, such as forests, to assure their long-term viability. Nature's own ecosystems have an essentially circular metabolism in which every output which is discharged by an organism also becomes an input which renews and sustains the continuity of the whole living environment of which it is a part. The whole web of life hangs together in a *"chain of mutual benefit"*, through the flow of nutrients that pass from one organism to another. The metabolism of most modern cities in contrast, is essentially linear, with resources being *"pumped"* through the urban system without much concern about their origin or about the destination of waste products incompatible with natural systems (See Figure 10.1). In urban management, inputs and outputs are considered as largely unconnected. Food is imported into cities, consumed, and discharged as sewage into rivers and coastal waters. Raw materials are extracted from nature, combined and processed into consumer goods that ultimately end up as rubbish which can't be beneficially reabsorbed into the natural world (Girardet, 2008).

Figure 10.1. The metabolism of cities [Girardet, 2004]

1. LINEAR METABOLISM
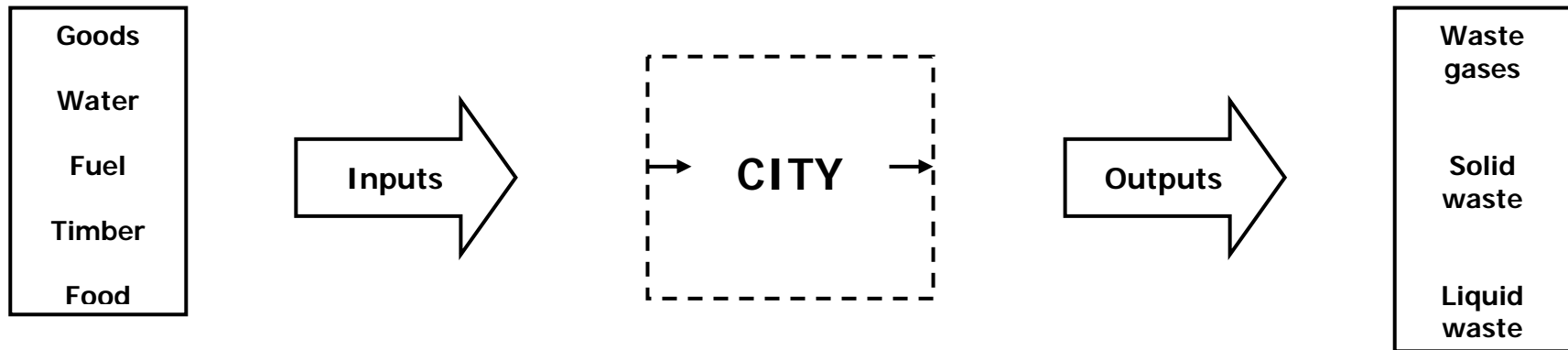
2. CIRCULAR METABOLISM
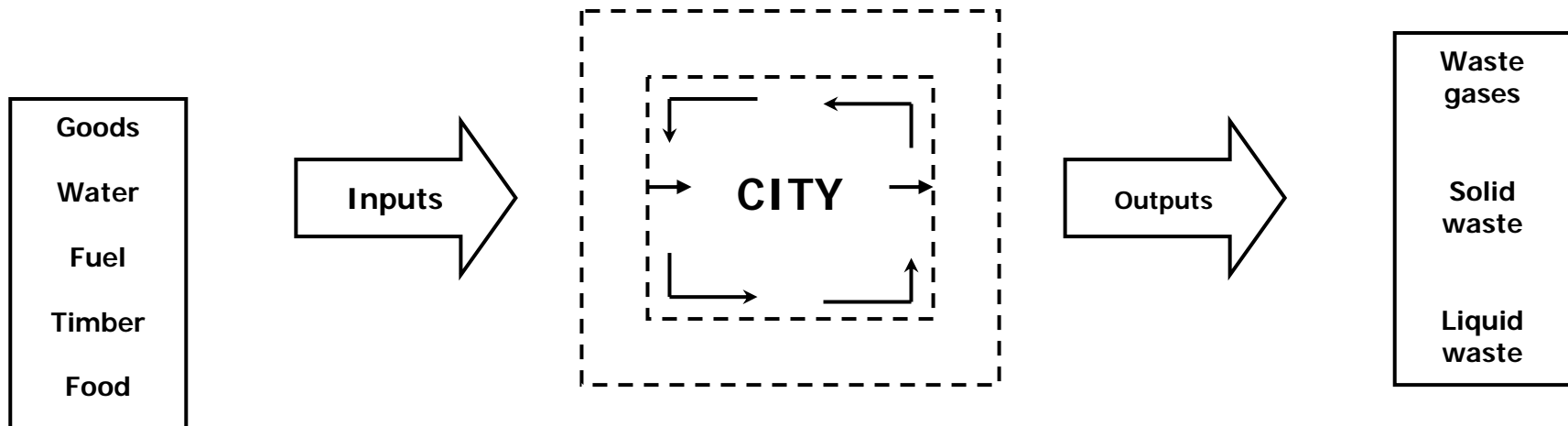
More often than not, wastes end up in some landfill site where organic materials are mixed indiscriminately with metals, plastics, glass, and poisonous residues. The linear model of urban production, consumption, and disposal is unsustainable and undermines the overall ecological viability of urban systems, for it has the tendency to disrupt natural cycles. In the future, cities need to function quite differently. On a predominantly urban planet, cities will need to adopt circular metabolic systems to assure their own long-term viability and that of the rural environments on whose sustained productivity they depend. To improve the urban metabolism, and to reduce the ecological footprint of cities, the application of ecological systems thinking needs to become prominent on the urban agenda. Outputs will also need to be inputs into the production system, with routine recycling of paper, metals, plastic and glass, and the conversion of organic materials, including sewage, into compost, returning plant nutrients back to the farmland that feeds the cities (Girardet, 2004).

The local effects of the resource use of cities also need to be better understood. Urban systems accumulate vast quantities of materials. Vienna, for instance, with 1.6 million inhabitants, every day increases its actual weight by some 25,000 tons. Much of these is relatively inert materials, such as lead, cadmium metals, nitrates, phosphates, or chlorinated hydrocarbons, build up and leach into the local environment in small, even minute quantities, with discernible environmental effects: they accumulate in water and in soil over time, with potential consequences for the health of present and future inhabitants. The water table under large parts of London, for instance, has become unusable for drinking water because of accumulations of toxins over the last 200 years. Much of its soil is polluted by the accumulation of heavy metals during the last 50 years (Wheeler, 2004).

The critical question today, as humanity moves to *"full scale"* urbanization, is whether living standards in our cities can be maintained whilst curbing their local and global environmental impacts. To answer this question we need balance sheets to compare the resource use and environmental impacts of different cities

across the world. Information is becoming available indicating that similar-sized cities supply their needs with a greatly varying throughput of resources and local pollution levels. The critical point is that cities and their people could massively reduce their throughput of resources, maintaining a high standard of living while creating much-needed local jobs in the process. Local governments succeed by helping all their residents live fulfilling lives, both today and in the future. The availability of natural capital, nature's ability to renew and provide resources and services, is not the only ingredient in this vision. However, without natural capital – without healthy food, energy for mobility and heat, fibre for paper, clothing and shelter, fresh air and clean water – such a vision is impossible. Thus, providing current and future human well-being depends on protecting natural capital from systematic overuse; otherwise, nature will no longer be able to secure society with these basic services (Wackernagel & Kitzes, 2006).

11. Ecological Footprint of Modern Cities

How well do we use Earth's natural capital? Without measurements, we cannot effectively manage these essential natural resources. To take care of our natural capital, we must know how much we have and how much we use. This is no different from financially responsible households, businesses or governments using accounts to keep track of their income and spending. To protect our natural assets, we need similar accounts that keep track of the supply of natural resources available to us, and our demand on this resource supply. Canadian ecologist William Rees developed the concept of an *"Ecological Footprint"* to refer to the environmental impact of modern cities and industrial areas. The Ecological Footprint of a city is the surface area required to supply a city with food and other resources and to absorb its wastes. However, the Ecological Footprint of a city no longer coincides with its geographic Footprint (Wackernagel & Kitzes, 2006).

"Twenty first century cities are dependent for survival and growth on a vast and increasingly global hinterland of ecologically productive landscapes," – explains Rees (Rees, 1992). Life in a modern city may require wheat from Russia or soy from Paraguay or American steel reprocessed in India. *"Cities necessarily appropriate the ecological output and life support functions of distant regions all over the world through commercial trade,"* – according to Rees (Rees, 1992).

Calculating a city's ecological footprint provides a rough measure of its natural resource requirements compared to available supply. Using Ree's formulation, the Ecological Footprint of London is approximately 19.7 million hectares, or about 125 times its geographic area. Rees estimates that the Ecological Footprint per capita is three hectares in Europe and four to five hectares in North America – but, worldwide, only one-and-a-half hectares of productive land are available per person. At the other end of the intellectual spectrum, researchers note that societies have never collapsed due to population growth but in fact increased their carrying capacity through birth control, high-yield agriculture, alternative energy, and other technologies. What is not debatable is that more people now live in bigger cities. In 1950, there were 83 cities with population exceeding 1 million. Today, there are nearly 500. Within ten years, 90 per cent of Americans and 80 per cent of Chinese will live in cities, joining their counterparts in Europe as the world's most urban societies (Citymayors, 2007). Ecological Footprint accounts allow governments to track a city or region's demand on natural capital, and to compare this demand with the amount of natural capital actually available. The accounts also give governments the ability to answer more specific questions about the distribution of these demands within their economy. In other words, it gives them information about their resource metabolism (Wackernagel & Kitzes, 2006).

For example, Ecological Footprint accounts reveal the ecological demand associated with residential consumption, the production of value-added products, and the generation of exports. They also help assess the ecological capacity

embodied in the imports upon which a region depends. This can shed light on the region's constraints or future liabilities in comparison with other regions of the world, and identify opportunities to defend or improve the local quality of life. Ecological Footprint accounts help governments become more specific about sustainability in a number of ways. The accounts provide a common language and a clearly defined methodology that can be used to support staff training and to communicate about sustainability issues with other levels of government or with the public. Ecological Footprint accounts add value to existing data sets on production, trade and environmental performance by providing a comprehensive way to interpret them. For instance, the accounts can help guide "environmental management systems" by offering a framework for gathering and organizing data, setting targets and tracking progress. The accounts can also serve as environmental reporting requirements, and inform strategic decision-making for regional economic development (Wackernagel & Kitzes, 2006).

Figure 11.1. The Ecological Footprint [Footprint network, 2008]
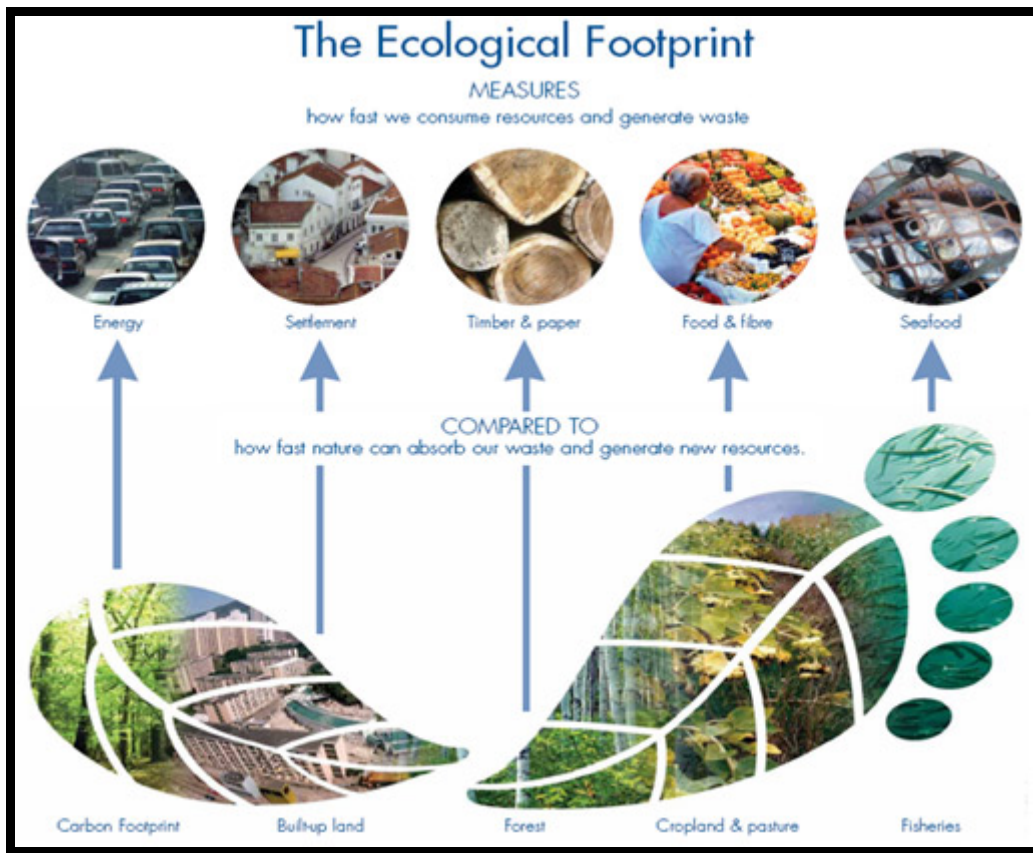
Ecological Footprint accounts act as balance sheets by documenting for a given population – a household, a district, a city, a region or humanity as a whole – the area of biologically productive land and sea required to produce the renewable resources this population consumes and assimilate the waste it generates, using prevailing technology. In other words, Ecological Footprints document the extent to which human economies stay within the regenerative capacity of the biosphere. Such biophysical resource accounting is possible because resources and waste flows can be tracked, and because most of these flows can be associated with the biologically productive area required to maintain them. Since people use resources from all over the world and pollute far away places with their wastes, the Ecological Footprint accounts for these areas, wherever they happen to be located on the planet (See Figure 11.1) (Wackernagel & Kitzes, 2006).

Footprint can be analyzed from a consumption perspective, or at any stage of the production process. They can also be applied at all scales, from global down to any activity of organization and populations, or for urban development projects, services and products. The Ecological Footprint uses a common, standardized measurement unit to make results comparable, similar to financial assessments that use one currency such as dollars or Euros to compare economics. The measurements units for Footprint accounts are global hectares. They are adjusted hectares that represent the average yield of all bioproductive areas on Earth. More precisely, a global hectare is one hectare of biologically productive space with world average productivity for the given year. When weighting each area in proportion of usable resource productivity (that is, its annual production of usable resources and services), the different areas can be converted from hectares and expressed in a (different) number of global hectares of average productivity. *"Usable"* refers to the proportion of biomass used by humans, reflecting the anthropocentric assumptions of the Ecological Footprint measurement (Citymayors, 2007).

A wide range of studies have been conducted in recent years focusing on the Ecological Footprints of cities. The Swedish academic Carl Folke and his colleagues make this important point: *"The capacity of ecosystems to sustain city development is becoming increasingly scarce as a consequence of rapid human population growth, intensified globalization of human activities, and human overexploitation and simplification of the natural resource base. The web of connections linking one ecosystem and one country with the next is escalating across all scales in both space and time. Everyone is now in everyone else's backyard."* (Folke, 2006).

The global effort for sustainability will be won, or lost, in the world's cities, where urban design may influence over 70 per cent of people's Ecological Footprint. High-Footprint cities can reduce this demand on nature greatly with existing technology. Many of these savings also cut costs and make cities more liveable. Without regional resource accounting, governments can easily over-

look or fail to realize the extent of these kinds of opportunities and threats. The Ecological Footprint, a comprehensive, science-based resource accounting system that compares people's use of nature with nature's ability to regenerate, helps eliminate this blind spot (Wackernagel & Kitzes, 2006).

12. The Challenges and Opportunities of the Sustainable Urban Development

Each city is individual and unique and its future is impacted by the myriad of decisions taken by people and enterprises within it. There is no single model or single reference. They are all endowed by a unique culture. However, they all crystallize a certain number of common problems and worries and they share a great number of common expectations. They all want to recreate a dynamic harmony between their hardware and their software, to reconcile their body (forms, colours, odours, sounds) and their soil (culture, history, energy, magnetism) (Purkiss & Verborgh, 1996).

Sustainability is a key promotional strategy for many cities – because, after all, who could imagine a *"modern city"* that was not aspiring to be *"sustainable"*? Sustainability with its emphasis on the social, economic and environmental dimensions of development is presented as an antidote to many of the less desirable impacts of globalization on various localities (both urban and rural) across the world. Sustainability in rhetoric at least provides frameworks that suggest that these, and other, inequitable impacts can be addressed or *"solved"* while ensuring economic growth without neglecting environmental care. The centrality of *"environment"* in sustainability discourse is also identified as holding out the possibility of addressing *"… the un-ecological conduct and anti-environmental practice of living in modern cities"* (Rogers, 2007).
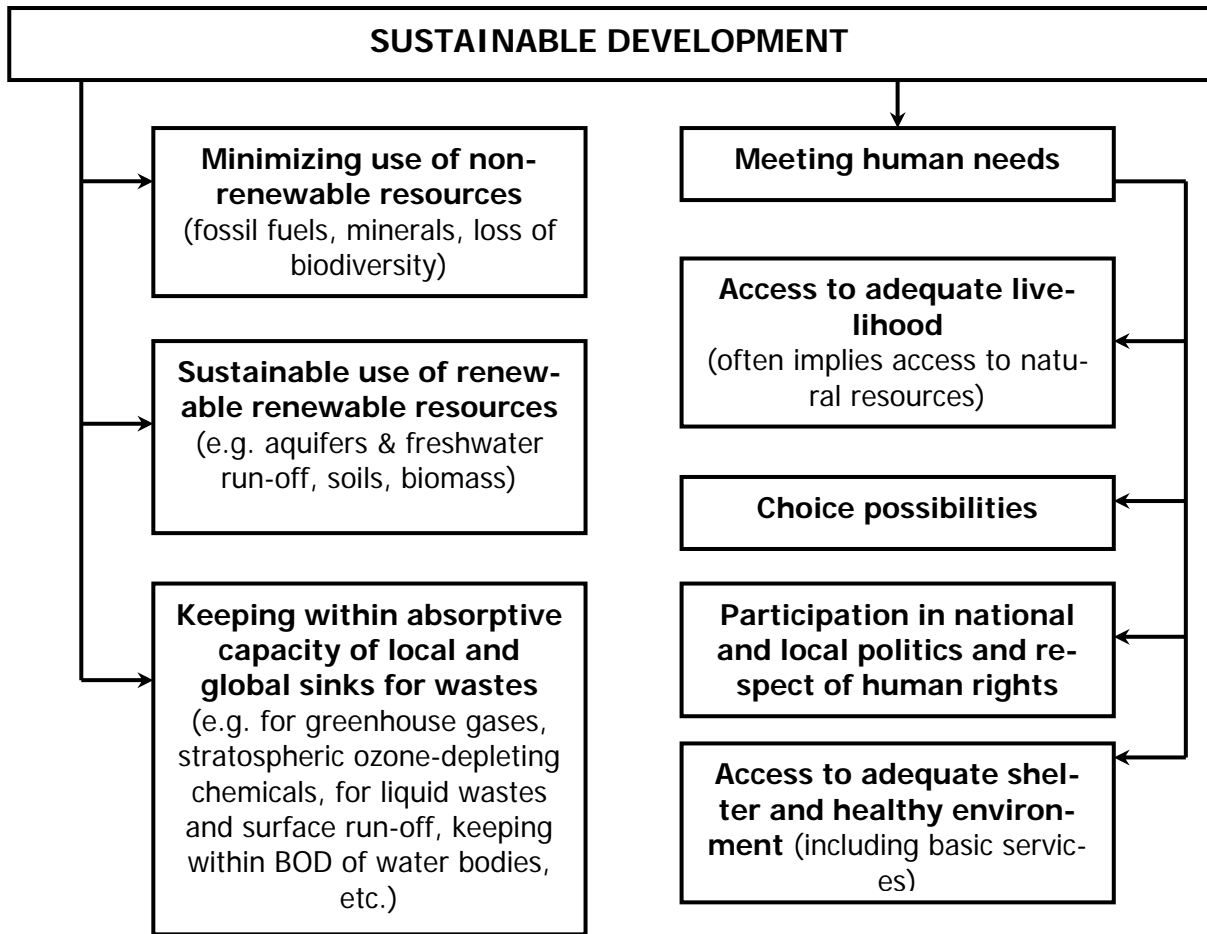
While the concept of modern city has been used in a variety of ways and is itself contested, the three most important criteria for such status as outlined by Simon (Simon, 2006) arguably could be:

1) The existence of a sophisticated financial and service complex serving a global clientele of international agencies, transnational corporations, governments and national corporations, and non-governmental organizations;
2) The development of a hub of international networks of capital and information and communication flows embracing transnational corporations and non-governmental organizations; and
3) A quality of life conductive to attracting and retaining skilled international migrants i.e. professionals, managers, bureaucrats, and diplomats. In this sense, quality of life embraces not only physical and aesthetic aspects of the environment but also broader considerations such as perceived economic and political stability, cosmopolitanism, and cultural life.

Sustainability potentially adds two dimensions to *"modern city"* criteria – social equity and environmental responsibility. Sustainability is a shared responsibility. Cooperation and partnership between different levels, organizations and interests is therefore crucial. Sustainable management is a learning process, within which *"learning by doing"*, sharing experiences, professional education and training, cross-disciplinary working, partnerships and networks, community consultation and participation, innovative educational mechanisms and awareness raising are key elements (Jenk & Kozak, 2008).

The world envisaged at the Rio Earth Summit in 1992 was one in which the objectives of sustainable development would be fulfilled at all levels of spatial organization (See Figure 12.1).

Figure 12.1. Goals of sustainable development [Pacione, 2004]

SUSTAINABLE DEVELOPMENT		
Minimizing use of non-renewable resources (fossil fuels, minerals, loss of biodiversity)		**Meeting human needs**
Sustainable use of renewable renewable resources (e.g. aquifers & freshwater run-off, soils, biomass)		**Access to adequate livelihood** (often implies access to natural resources)
Keeping within absorptive capacity of local and global sinks for wastes (e.g. for greenhouse gases, stratospheric ozone-depleting chemicals, for liquid wastes and surface run-off, keeping within BOD of water bodies, etc.)		**Choice possibilities**
		Participation in national and local politics and respect of human rights
		Access to adequate shelter and healthy environment (including basic services)

Agenda 21 of the Earth Summit focused particular attention on the challenge of sustainable development at the urban scale. In this concern for the sustainability of cities is expressed at two levels. The first is global and involves a range of issues concerning the long-term sustainability of the Earth's environment and the implications for urban life. The world's cities cannot continue to prosper if the aggregate impact of their economies' production and their inhabitant's consumption draws on global resources at unsustainable rates and deposits waste in global sinks at levels that lead to detrimental climatic change. The second is local and involves the possibility that urban life may be undermined from within because of congestion, pollution and waste generation and their

accompanying social and economic consequences (See Table 12.1) (Pacione, 2004).

Table 12.1.   Main urban dimensions of Agenda 21 of the Rio Earth Summit [Pacione, 2004]

MAIN URBAN DIMENSIONS OF AGENDA 21 OF THE RIO EARTH SUMMIT
❖ **Provision of adequate shelter for all** – adopt/strengthen national shelter strategies, including legal protection against unfair eviction from homes or land; provide shelter for the homeless and the urban poor; introduce resettlement programmes for displaced persons; develop multinational co-operation to support the efforts of developing countries etc.
❖ **Improve human settlement management** – improve urban management; strengthen urban data systems; encourage intermediate city development
❖ **Promote sustainable land-use planning and management** – develop national land inventory and classification systems; create efficient and accessible land markets etc.; encourage public-private partnerships in managing the land resource; establish appropriate forms of land tenure; develop fiscal and land-use planning solutions for a more rational and environmentally sound use of the land resource etc.
❖ **Ensure integrated provision of environmental infrastructure: water, sanitation, drainage and solid-waste management** – introduce policies to minimize environmental impact assessments; promote policies to recover infrastructure costs, while extending services to all households; seek joint solutions where issues cross localities
❖ **Develop sustainable energy and transport system in human settlements –** develop and transfer technologies which are more energy-efficient and involve renewable resources; improve urban transport systems
❖ **Encourage human settlement planning and management in disaster-prone areas** – promote a culture of safety; develop pre-disaster planning; initiate post-disaster reconstruction and rehabilitation planning
❖ **Promote sustainable construction-industry activities** – encourage greater use of local natural materials and greater energy efficiency in design and materials; strengthen land-use controls in sensitive areas; encourage self-help schemes
❖ **Meet the urban health challenge** – develop municipal health plans; promote awareness of primary health care; strengthen environmental health services; establish city collaboration networks; improve training; adopt health impact and EIA procedures

The concept of urban sustainability may be viewed as comprising five dimensions (Pacione, 2004):

1) **Economic sustainability,** the ability of the local economy to sustain itself without causing irreversible damage to the natural resource base on which it depends;
2) **Social sustainability,** a set of actions and policies aimed at the improvement of quality of life and at fair access to and distribution of rights over the use and appropriation of the natural and built environment;
3) **Natural sustainability,** the rational management of natural resources and of the pressures exerted by the waste produced by every society;
4) **Physical sustainability,** the capacity of the urban built environment to support human life and productive activities;
5) **Political sustainability,** the democratization and participation of the local civil society in urban governance.

Figure 12.2. Major dimensions of urban sustainability [Pacione, 2004]
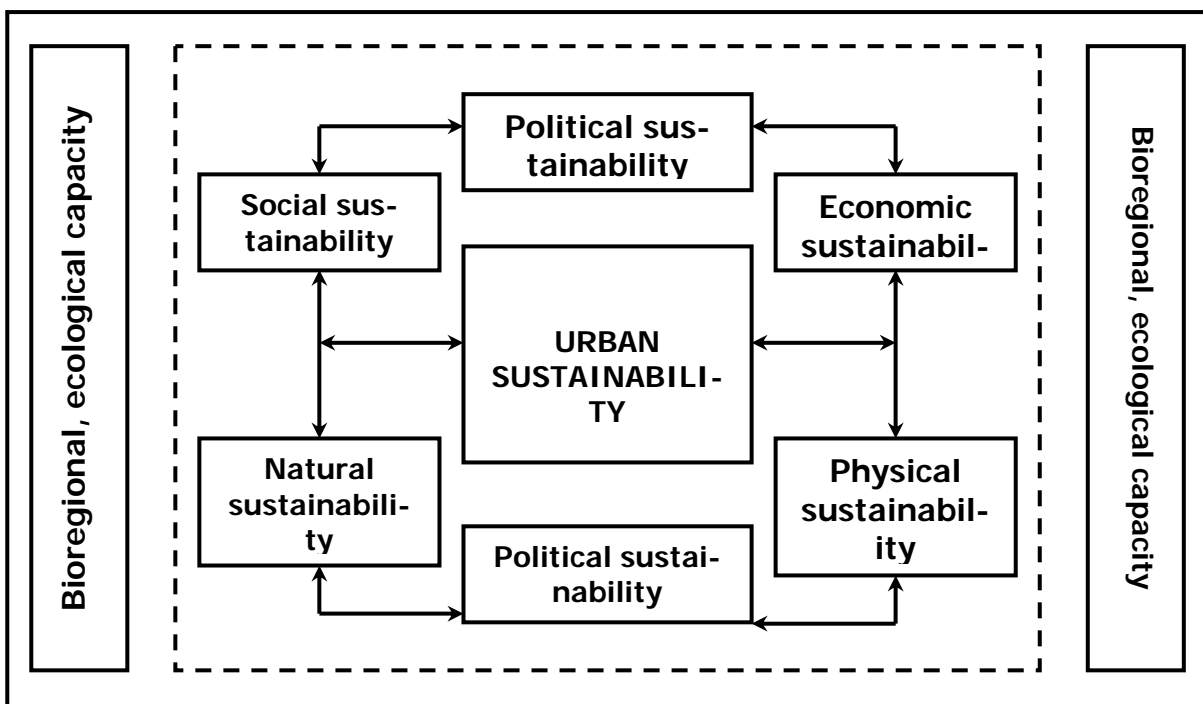
Figure 12.2 illustrates the relationship among the five main dimensions of urban sustainability. In this, political sustainability is represented as the governance framework regulating the performance of the other four dimensions. The extent to which social, economic, natural and physical performance is sustainable depends on whether these activities can be kept within the ecological capacity of the urban regional ecosystem. In practice, conflicts may arise between the particular goals of each of the major dimensions of urban sustainable development (Pacione, 2004).

13. Urban Environmental Policy in Europe: An Outline

Four out of five Europeans currently live in urban areas, which in turn account for around one-quarter of the European Union's total land area. In some ways, this concentration of population may be seen as positive in that land use and energy costs per person are potentially lower, whilst there are economies of scale in the provision of basic services such as waste water treatment. However, it is equally the case that cities are the locus of environmental problems. For example, the Ecological Footprint of London – the ecological impact that the city has – is enormous. It is calculated that London needs twice the land area of the United Kingdom in order to support its activities (Geyer, 2007).

Londoners are not unusual. Although there are significant variations between the living standards experienced in European cities, in general, European citizens have a high consumption lifestyle and as a consequence of this, high levels of consumption of energy, raw material and resources. This in turn is translated into urban environmental problems such as poor air quality, high levels of ambient noise, greenhouse gas emissions, urban sprawl, waste generation and traffic congestion. AS from January 2007, there are 27 Member States comprising the European Union, with a number of countries currently negotiating for membership. There is clearly a high level of diversity in the quality of urban life experienced by the citizens of these countries and by the same token, differing levels and kinds of environmental problems, not least determined by differing

climatic conditions, cultural contexts and levels of economic development. Nevertheless, as new countries have joined the European Union, the tendency has been for them to experience uplifts in economic activity, which has in turn tended to produce the urban environmental condition experienced elsewhere in Europe (Geyer, 2007).

Until comparatively recently, it was widely assumed that the environmental problems of cities could be understood as the inevitable consequence of economic growth. The publication of the *Brundtland Report* in 1987 and the outputs from the 1992 Rio de Janeiro *"Earth Summit"*, notably Agenda 21, marked the beginnings of a focus upon sustainable development, and a recognition that first, unrestrained consumption of resources and attendant environmental damage cannot continue and second, that environmental questions cannot be addressed outside of their social and economic context. This renewed focus upon urban environmental problems through the lens *"sustainable urban development"* has increasingly characterized urban policy initiatives in Europe at all levels of government. It is clear that although there will undoubtedly be further development in our scientific knowledge the technical solutions to most urban environmental problems are already largely present. However, the political conditions for their implementation are often less promising. The key to securing high-quality urban environments across Europe lies in the development of effective governing relationships involving citizens and all levels of European government. The term *"governance"* has been utilized in a variety of ways. In general, within the sustainable development discourse there has been a tendency to conflate government and governance, sometimes using the terms interchangeably. Moreover, it is often implied that top-down, *"government"* is intrinsically undesirable, whereas more bottom-up *"governance"* is in contrast to be encouraged and supported. However, as has been argued elsewhere it is necessary to be clear that these two processes have distinct identities and attributes, and *"good"* government is as necessary as *"good"* governance (Geyer, 2007).

Figure 13.1 illustrates these contrasting interpretations. Government may be regarded as the sphere of governmental activity, the internal organization of governmental organizations, and the legal, financial and political processes therein. Governance, on the other hand, is the sphere of public debate, partnership, interaction, dialogue and conflict entered into by local citizens and organizations and by government itself. Governing is the term that can be applied to describe the interaction between these two processes.

Figure 13.1. Contrasting interpretation of governance [Geyer, 2007]
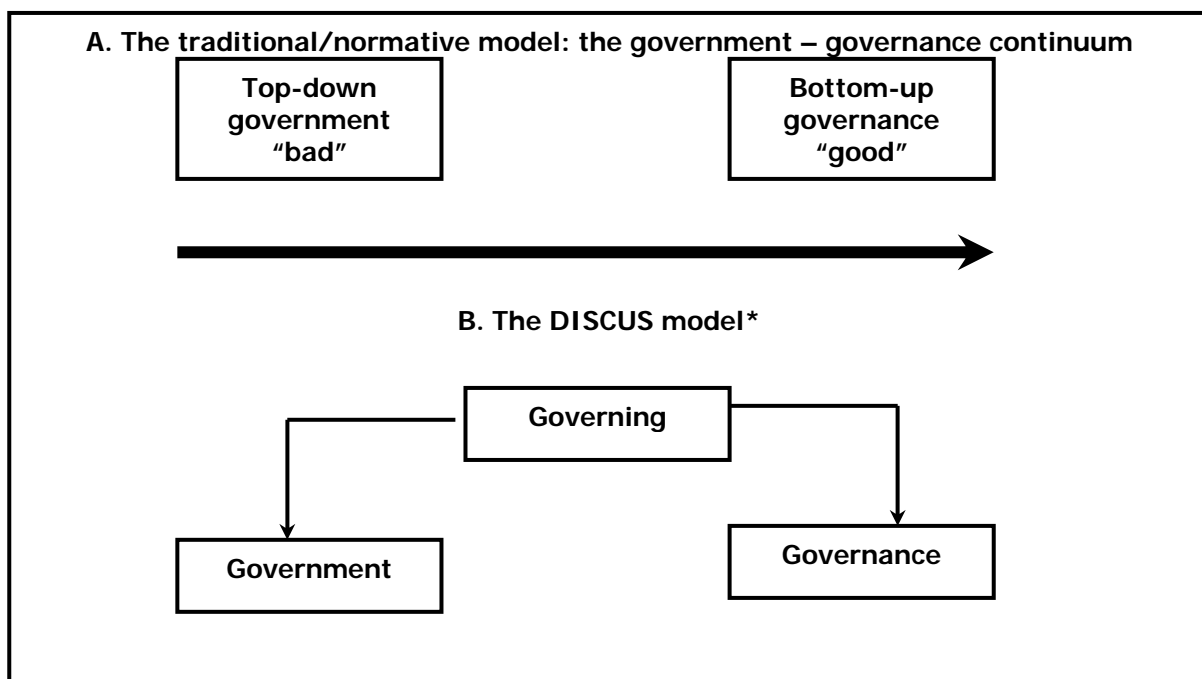
Note: * The DISCUS project – "Developing Institutional and Social Capacity for Urban Sustainability" – co-funded by the European Commissions, was a 3 year study of 40 European cities researching governance processes for urban sustainable development.

The European Union is responsible for around 80 per cent of all environmental legislation in the 27 Member States. The European Commission issues Directives, with which the M ember States are required to comply, ranging from air and water quality through to the prevention and recycling of waste. The Member States remain responsible for passing national legislation, which in turn im-

plements these Directives. Most environmental Directives emanate from the European Commission's Environment Directorate, including the regular Environmental Action Programmes. In addition, the European Union has approved a range of initiatives that together constitute a policy framework that it wishes to see adopted by all Member States. The EU has adopted a *"Strategy for Sustainable Development"* that seeks to embed the principle of sustainability into all areas of policy development and implementation: *"All policies must have sustainable development as their core concern. In particular, forthcoming reviews of Common Policies must look at how they can contribute more positively to sustainable development."* (Purkiss & Verborgh, 1996).

Sustainable development is clearly defined by the European Union as being more than environmental sustainability, important though that is. The Presidency Conclusions of the Gothenburg Summit stated: *"The Union's Sustainable Development Strategy is based on the principle that the economic, social and environmental effects of all policies should be examined in a coordinated way and taken into account in decision making."* This commitment to a broadly based sustainable development is closely linked to an emerging European policy on governance as presented in European Governance – A White Paper. In this paper, the modernization of European governance is seen as a necessary precondition for European integration through a process of decentralization, combating the impact of globalization and a restoration of faith in the democracy through wider involvement in decision-making. The White Paper identifies five principles that underpin good governance – openness, participation, accountability, effectiveness and coherence – which should apply to all levels of government from local to global. The White Paper recognizes that the creation of the European Union and the challenges of policy in a globalized world necessitate new ways of working that are not possible within a traditional framework of top-down government (Geyer, 2007).

It remains to be seen how the proposals contained in the White Paper will develop and be implemented. By implication, the proposals demand a degree of power transference both between levels of government (through the principles of proportionality and subsidiarity) and from government to civil society interest organizations. Such transfers of power, responsibility and influence have historically met with opposition from the current holders. The emphasis on improving democratic mechanisms for decision-making is linked to calls for human equity and environmental justice, more effective environmental governance, and greater environmental democracy (Geyer, 2007).

14. Discussion and Conclusion

The aim of this paper was to study the causes and processes of the emergence, formation and development of the urban environment in the context of sustainable development. Urban environment in this paper is seen as a complex social, economic and biophysical system produced by the interaction between a man-made fabric and the physical characteristics of the landscapes.

This literature study focuses on the urban environment issues and solutions in the context of sustainable development. The purpose of this paper is to study the causes and processes of the emergence, formation and development of the city and the urban environment. Urban environment in this paper is seen as a complex social, economic and biophysical system produced by the interaction between a man-made fabric and the physical characteristics of the landscapes.

The contemporary world is an urban world. This is apparent in the expansion of urban areas and the extension of urban influences across much of the habitable surface of the planet. Today, for the first time in history of humankind, urban dwellers outnumber rural residents. Urban places – towns and cities – are of fundamental importance: for the distribution of population within countries; in the organization of economic production, distribution and exchange; in the structuring of social reproduction and cultural life; and in the allocation and ex-

ercise of power. Urbanization – the increase in the urban share of total population – is inevitable, but it can also be positive. If cities create environmental problems, they also contain the solutions. The potential benefits of urbanization far outweigh the disadvantages: The challenge is in learning how to exploit its possibilities.

The more populous the city the greater its "ecological footprint", which may be defined as the land area and natural resource capital on which the city draws to sustain its population and production structure. In the past, the size and economic base of any city was constrained by the size and quality of the resource endowments of its surrounding region, and a city's Ecological Footprint remained relatively local. Today city-based consumers and industries based in wealthy nations have the capacity to draw resources from far beyond their immediate regions and have increasingly appropriated the carrying capacity of rural regions in other nations, with little apparent regard for the environmental impact of their actions.

The Ecological Footprint concept is most useful for analyzing the spatial impact of cities, and for implementing key changes in how urban system work. One way of both reducing Urban Footprints and improving local environmental conditions is to introduce changes to the urban metabolism.

Although the character of cities and towns varies enormously the world, many urban sustainability issues are similar. Communities almost everywhere these days must decide how to limit or reduce automobile congestion, clean up pollution and contaminated lands, ensure decent, affordable housing for residents, provide infrastructure that enhances rather than degrades natural environments, foster steady local sources of jobs, and promote equity and quality of life.

Urban systems with millions of inhabitants are unique to the current age and they are the most complex products of shared human creativity. They are both organisms dependent on biological re-production, as well as mechanisms utiliz-

ing mechanical production processes. Cities, and particularly large modern cities, are uniquely "multilayered" systems, developing extraordinary degrees of economic and social interaction. The larger a city, the more complex its system of commerce and services and the huge variety of professions associated with these.

Understanding the connections between urban structures, systems and processes, at large and small scale, is essential for the development of a new paradigm for our cities. With Asia, Latin America and Africa now joining Europe, North America and Australia in the global urban experiment, it is of paramount importance to apply the principles of sustainability to urban development on a worldwide scale.

The future of our urban environment will not ultimately depend on technological innovation or on the global economy. It will be the outcome of what we, urban dwellers, do about it, through our projects and through our activities. The missing link between environmental sustainability and social organization, in theory as in practice, is the relationship of urban communities to the environment where they live.

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