BULETINUL INSTITUTULUI POLITEHNIC DIN IAŞI
Publicat de
Universitatea Tehnică „Gheorghe Asachi” din Iaşi
Volumul 62 (66), Numărul 1, 2016
Secţia
CONSTRUCŢII. ARHITECTURĂ

SUSTAINABLE DEVELOPMENT AND ITS MAIN GOALS FROM THE PERSPECTIVE OF AN ARCHITECT

BY

IRINA ŞTEFAN (OANCEA)*

“Gheorghe Asachi” Technical University of Iaşi
Faculty of Civil Engineering and Building Services

Received: January 14, 2016
Accepted for publication: February 22, 2016

Abstract. In a period of intense urban expansion, we see ourselves in the face of an urgent shift from traditional urbanism towards a sustainable one. This fact requires a good understanding of the principles of sustainable urban growth at a global level. This article presents a summary of the most important decisions taken at a global scale, decisions that are combating climate changes and their impact over the quality of life, and also decisions that are designed to stop the uncontrolled urban development. It presents concepts and the evolution of the urban landscaping, urban ecology and ecological urbanism, green urbanism and not least, sustainable urbanism. It focuses on the way in which these principles can influence decisions that are against the negative effects of the high level of urbanization, demographic increase, climate change and the ineffective use of resources.

Keywords: green urbanism; urban ecology; sustainable urbanism.

1. Introduction

The sciences of long lasting development, the technology and innovation have been acknowledged as the basis for socio-economic development.

The new UN Agenda focuses on eradicating poverty, on promoting prosperity and the wellbeing of people, and also on protecting the environment.

*Corresponding author: *e-mail:* irina.oancea@yahoo.com

In 1987, The World Commission of Environment and Development (WCED) published the report "Our Common Future" in which it defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This definition has been used in the following years with a special focus on the challenges that sustainability brings, like global warming, poverty, infant mortality. The main goals for sustainable development that cover issues related to peace, environment and poverty were agreed in September 2000 (United Nations Millennium Summit, 2000).

These goals have been split into 17 SDG (Sustainable Development Goals), detailed in the Agenda 2030 and in the UN report "The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet" from December 2014. In this last report it is highlighted that "New demographic trends are changing our world. We are already a global family of seven billion people and are likely to reach nine billion by 2050. We are an ageing world, as people live longer and healthier lives. We are increasingly an urban world, with more than half the world's population living in towns and cities. And we are a mobile world...", and we need to face massive migrations. "These trends will have direct impacts on our goals and present both challenges and opportunities".

The elements presented in Fig. 1: the planet, the people, dignity, prosperity, justice and partnership are related, interrelated and defining for sustainable growth (United Nations, 2014).

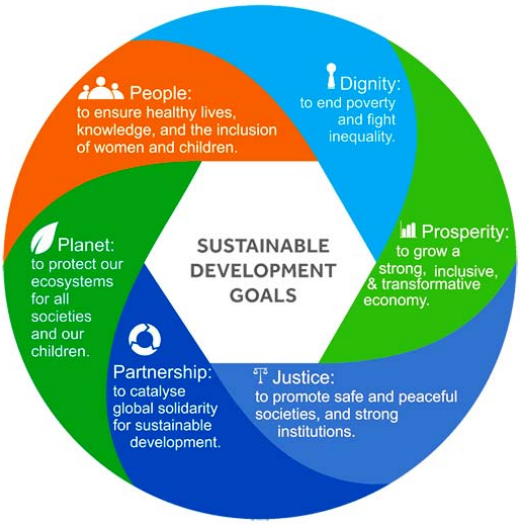

Fig. 1 – Six key elements for achieving sustainability
(sourse: UN report – The Road to Dignity by 2030, http://www.un.org/disabilities/documents/reports/SG_Synthesis_Report_Road_to_Dignity_by_2030.pdf).

The 2030 Agenda for Sustainable Development is an action plan for people, for the planet and for prosperity. This plan includes a set of objectives for a lasting development which will dominate and stimulate the global scale actions for the following 15 years, in fields that are critical for humanity and for the planet. With the 2030 Agenda "Transforming our world: The 2030 Agenda for Sustainable Development", the UN take the following commitment: "We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations." (United Nations, 2015).

According to a report from Elsevier, the majority of studies in the field of sustainable science, published at a global scale, focus on issues related to the planet and people, with a significant increase in the last years, which shows the growing concern of scientists in this regard.

The relationship between planet and people, ie between the natural environment and the built environment is felt in urban level of comfort, interconnecting these elements leading to increased quality of life in contemporary urban space.

2. Architects Manifesto for the City of Future

Urban sustainable development is the most desirable approach for now and for the future, being crucial for the increase of the quality of life. We must focus on mitigating the impact of cities over global climate, by reducing greenhouse gas emissions, by being more responsible in the use of natural resources, by protecting biodiversity, by reducing the negative impact of urban activities, and also by estimating and guiding the lines of urban development.

According to leading climate scientists, it is estimated that due to the high level of greenhouse gas emissions, if we maintain the same pollution rhythm, the average temperature will rise with approximately 4°C by 2100, which would create unmanageable environmental challenges (The Earth Statement, 2015).

Architects' Council of Europe (ACE), The International Union of Architects (UIA), the National Council of the Order of French Architects (CNOA), and the International Council of French Architects (CIAF) have signed a manifesto expressing architects commitment to address climate change challenges.

The manifesto was officially presented and discussed at the international conference "Architecture, the climate of the future", held at the Cité de l'Architecture et du patrimoine in Paris, on November 30th 2015 on the opening day for the UN Conference on Climate Change (COP21).

In this manifesto the architects expressed their confidence in a better future if measures are taken to promote clear and innovative solutions for a built

environment with lower carbon emissions, adapted to new climate conditions. The main measures on both sustainable buildings and the development of sustainable and resilient cities that the architects are committed to promote are shown schematically in Fig. 2.

Architects from around the world "call for the implementation of decisive policies to stop the uncontrolled growth of cities, to eradicate the injustice related to the allocation of resources, to slow down climate exodus, to anticipate exposure to natural or industrial risks and to put an end to the depletion of natural resources across the planet" (Architects' Council of Europe, 2015).

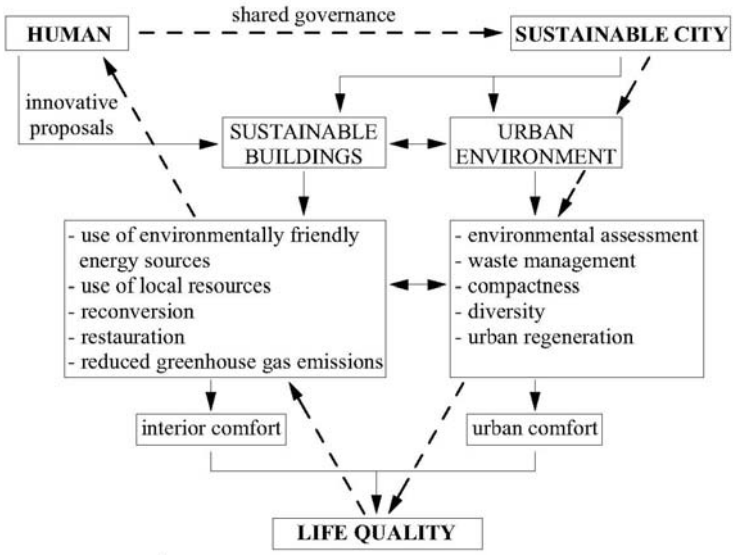

Fig. 2 – Connections between human, sustainable cities and life quality.

Thus, **the sustainable development moves from the study of objects (green buildings) to the applicability of the principles of sustainability in large urban areas**. From this point of view, the target is to limit the uncontrolled development of urban areas, and to reuse what we already have within cities.

3. The Need for Urban Regeneration

In the past 25 years, Romania, like other post-communist countries, has undergone a period of multiple social, political and lifestyle transformations that lead to changes in how land is used. The changes in the economy have reduced industries and have changed farming practices, thus affecting the use of railways by reducing their usage, while increasing the importance of road networks.

The lifestyle transformations like the demographic growth and population migration to urban areas have created a baseline for the consumption of undeveloped land. It thus reached a vast suburbanization, while within the cities, large portions of land have remained deserted or underused (Brownfields – Manual, 2013).

The reuse of "wasted" land can contribute to the sustainable development of cities. Designed correctly, this reuse can bring advantages both in terms of social cohesion, reduction of environmental pollution problems, and also in increasing the quality of life; influences of these types of developments are going to reflect on the adjacent areas.

The advantages of sustainable development in large areas within cities are numerous, starting from the existing capabilities of the infrastructure (networks of energy, sanitation, transportation facilities) to the opportunity of creating an area that can have an influence on how we perceive the city with all its issues.

It can open the door to a change in attitudes in the perception of urban, from a closed, sealed area to a space of coexistence between man-man and man-nature.

The way these lands can reintegrate in the city must follow sustainable urbanism trends.

4. Sustainable Urbanism

In the mid 90's two ideas have emerged with implications in the way of thinking and urban design: ***landscape urbanism*** and ***urban ecology***.

The premise for *landscape urbanism* is that landscape is the starting point for building the cities. In traditional urbanism, development was based on the structure (walls, buildings, streets). Green areas were the ones without constructions (the leftovers) or those used as decorations. The naming "landscape urbanism" is promoted by Charles Waldheim (2006), which identified common parts between the ecological vision of Ian McHarg and design vision of James Corner, two different perspectives on urbanism from architects with great influence over landscape urbanism.

Landscape urbanism is relatively new, with only few projects done. One is the High Line Project in Manhattan, New York. Designers (James Corner Field Operations and Diller Scofidio + Renfro) have proposed that an abandoned railway, crossing a part of New York to be turned into a park of 2.7 ha., with the purpose of recreational facilities, tourist attraction and economic development generator (Figs. 3 and 4).

The project consists in a promenade where boundaries between the planted and paved areas are intertwining, leading to the creation of an

ecosystem within the urban area. It is a successful model for how abandoned urban territories can be transformed for community interest.

Fig. 3 – Aerial View, High Line, New York
Source: http://i.dailymail.co.uk/i/pix/2012/05/05/article-2139899-12EF2F80000005DC-992_964x1437.jpg.

Fig. 4 – Promenade, High Line, New York
Source: https://static.dezeen.com/uploads/2013/06/dezeen_stephen-burks-new-york-the-high-line_02.jpg.

Urban ecology studies complex interactions between built environment and the natural one, and also ecological, social, economic and hydrological processes. Studies conducted in universities contributed to the understanding of urban ecosystems' adaptability. Adaptability means stability and equilibrium. UN defines resilience (adaptability) as the ability to absorb disturbances while retaining the same basic structure and ways of functioning, self - organizing competence and also the ability to adapt to stress and change. Urban ecology is presented as an interdisciplinary field that helps us understand the landscape urbanism. Alberti (2008) says that urban ecosystems are complex systems designed for connections between human and nature.

Combining the two ideas, the urban landscape and urban ecology, Mohsen Mostafavi (2010) proposed the concept of ***ecological urbanism***. The researches in urban ecology express what should be obvious: people interact with other people and with other species and also with the natural and built environment. The city is an ecosystem dominated by humans. The goal of ecological urbanism is to plan cities that emphasize the benefits of ecosystems, meaning the benefits we receive from nature, including: resources (food, water, energy), service control systems (water purification, storing dioxide carbon, climate balance), cultural services (recreational experiences, ecotourism and scientific research).

Taking forward this relationship between the urban environment and ecosystems, ***the green urbanism*** is trying to create communities that both humans and the natural environment can benefit from. Green urbanism is a model for urban spaces with zero greenhouse emissions and zero waste. This concept promotes compact urban development, energy efficient, seeking to regenerate post-industrial areas, and promote social and environmental sustainable development (Beatley, 2000).

The city of future, seen by Steffen Lehmann, must provide an overlap of different activities, housing and work spaces, infrastructure systems for renewable energy, public transportation and energy - efficient buildings. He defines green urbanism as a process that requires interdisciplinary cooperation between landscape architects, engineers, urban planners, ecologists, physicists, sociologists, economists, etc. Steffen Lehmann (2010), shows a list of 15 principles to follow in urban design, principles based mainly on three schemes "zero"- namely: zero - fossil fuel energy use, zero - waste and zero - emissions. The principles developed by Lehmann that include: renewable energy to reduce CO_2 emissions, saving water, collecting rainwater, introducing biodiversity in urban areas, development of clean public transportation, encouraging the use of bicycles and walking, use of local building materials, urban regeneration, lead to a lasting development, towards compact towns, communities with a high quality of life. Lehmann (2010), refers to green urbanism as being a "common sense" urbanism.

The developing premises of the "common sense" urbanism lie in de-industrialization, a phenomenon that has emerged in the United States in the 60's. Jane Jacobs (1961), a disputed journalist without studies in urbanism, had an important contribution in the way of looking at the city. In her book "The death and life of great American cities", Jacobs sensed that each of the basic functions of city: transportation, housing, economy, culture, environment, etc. are interconnected, fighting for mixing urban functions in all districts of a city. She pleaded for cities for people, being also one of the promoters of participatory urbanism. Jan Gehl (1987), continues this theory and says that, in his opinion, the most important element of a city is the human, and the priority of an architect or urban planner is how to make people feel their best in a built environment. In Gehl's vision, the city must have the following characteristics: be lively, safe, lasting and healthy, the same as of a sustainable city.

Different ways of understanding urbanism shows a limited applicability in terms of urban areas. ***Sustainable urbanism*** must pass ideal vision presented by the "new urbanism" thinking, that can be applied only to new suburban developments and witch excludes economic diversity. It also needs to promote the ideas sustained by "smart development", which militates for compact urban developments, focused on the pedestrian and protection of rural areas. To meet the requirements of sustainability, urban areas must turn their attention to people, the core of urban developments. Human relationships must be reconsidered and spaces that encourage social cohesion must be created. The current trend is to design buildings that interact with the environment, both built and natural, giving rise to communities where outdoor public spaces are connected with the buildings in such a manner, that it is hard to set boundaries between them.

Urban designer and architect Douglas Farr (2007), discussing about sustainable urbanism, pleads for pedestrian cities, combining elements of ecological urbanism, sustainable urban infrastructure, efficient use of resources and satisfying all needs within cities, leading to an increase in the quality of life.

The defining elements for sustainable urbanism, some of them being found in other urbanism visions are:

1º Compactness – with benefits in:

a) reducing the use of resources, including the use of permeable surfaces that lowers the amount of water that needs purification;

b) development of public transport and pedestrian communities, reducing the need to use private cars.

2º Biophilia – a concept that refers to interactions between humans and other living systems, based on the connection between people and nature, represented at urban level by parks and recreational areas.

3º Sustainable corridors – which make possible the link between residential areas without using cars, allowing sustainability of biodiversity.

4º Promoting efficient buildings – the use of clean energy sources and passive design principles, which leads both to a high quality of indoor and urban environment.

5º Implementation of efficient infrastructure – to promote good management of the relationship between street elements (sidewalks, streets, parking lots, green spaces) and underground (underground utilities, rainwater infrastructure) and the street that has green space in the middle, intended primarily for pedestrians, which improves pedestrian safety, absorption of rainwater, air quality and decreases urban noise.

The ideas and principles of sustainable development, whether we speak of a building or a city, will not reach their targets without a coherent strategy. If we want a society with a high standard of living, in a clean and healthy city, the objectives of sustainable development and how we can correct the mistakes of our cities, must be implemented in collective thinking through strategies and decisions taken in our interest.

At the heart of Seoul lies one of the world's greatest urban design projects: the Cheonggyecheon River linear park, a perfect ***example of urban sustainable renewal***. The river passed through dramatic transformation over the years: after becoming an open sewer, the river was paved with concrete; after that, an elevated freeway was built above it. By doing so, the river was removed from the public life, people avoiding the area beneath the highway. From 2002 to 2005, the elevated highway was removed, and the river was transformed into a green oasis in a concrete jungle, a multifunctional linear park (Fig. 5). Although the project uses some unsustainable water management

Fig. 5 – Cheonggyecheon River, Seoul
Source: http://assets.inhabitat.com/wp-content/blogs.dir/1/files/2014/11/Cheonggyecheon-River-18.jpg.

(it uses treated water from another river nearby, and not recycled waste-water), and also it required heavy investments in public transportation, the project has many benefits in: increasing biodiversity, reducing the urban heat island effect and air pollution (by replacing paved roads with vegetation), catalysing economic development, improving pedestrian mobility and the quality of life by becoming an attractive public place.

5. Conclusions

A sustainable city is not just a gathering of green buildings with zero energy consumption. It is a whole and should be designed accordingly.

UN Report, The Road to Dignity by 2030, sets the goals regarding sustainable development. The Architects' Council of Europe has endorsed architects Manifesto, in which are emphasized directions to achieve sustainable development goals for both sustainable buildings and for sustainable and resilient cities.

The transition from traditional to sustainable urbanism has passed through several stages such as landscape urbanism, urban ecology, green urbanism etc.

The common principles of different visions on urbanism and the development of these ideas towards sustainable urbanism promote the compact city, the use of renewable energy, a proper resource management, pedestrian city and reintroducing biodiversity in urban environment.

Sustainable urban renaissance consists in increasing the quality of life and making a desirable urban living. The compact city is a sustainable way of living in an urbanized world, and cities should become desirable places to live, work and socialize.

We will really get to live in a sustainable society, when the sustainable way of life and thinking will be so well assimilated in our culture, that we will stop using this term, because it will be something "natural".

REFERENCES

Alberti M., *Advances in Urban Ecology, Integrating Humans and Ecological processes in Urban Ecosystems*, Springer Science, 2008.

Beatley T., *Green Urbanism: Learning from European Cities*, Island Press, Washington D.C., 2000.

Douglas F., Sustainable Urbanism: Urban Design With Nature, Hoboken, Wiley, 2007.

Gehl J., *Life Between Buildings, Using Public Space*, New York, Van Nostrand Reinhold, 1987.

Jacobs J., *The Death and Life of Great American Cities*, New York, Random House, 1961.

Lehmann S., *Green Urbanism: Formulating a Series of Holistic Principles*, SAPIENS (online), 3,2, 2010.

Lehmann S., *the Principles of Green Urbanism – Transforming the City for Sustainability*, London, Earthscan, 2010.
Mostafavi M., Doherty G., *Ecological Urbanism*, Lars Müller Publishers, Basel, Switzerland, 2010.
Waldheim C., *The Landscape Urbanism Reader*, Princeton Architectural Press, New York, 2006.
* * * *Manifesto for Responsible Architecture*, Architects' Council of Europe, 2015.
* * * Brownfields – Manual, VSB – Technical University of Ostrava, 2013
* * * http://assets.inhabitat.com/wp-content/blogs.dir/1/files/2014/11/Cheonggyecheon-River-18.jpg.
* * * http://i.dailymail.co.uk/i/pix/2012/05/05/article-2139899-12EF2F80000005DC-992_964x1437.jpg.
* * * http://inhabitat.com.
* * * http://www.archdaily.com.
* * * https://en.wikipedia.org
* * * https://static.dezeen.com/uploads/2013/06/dezeen_stephen-burks-new-york-the-high-line_02.jpg.
* * * *Sustainability Science in a Global Landscape*, a report conducted by Elsevier and SciDev.Net, 2015.
* * * The Earth Statement, 2015, http://earthstatement.org/static/earth-statement.pdf
* * * *United Nations Millennium Declaration*, United Nations Millennium Summit, New York, 2000.
* * * *The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet*, United Nations, 2014.
* * * *Transforming Our World, The 2030 Agenda for Sustainable Development*, United Nations, 2015.
* * * WCED World Commission of Environment and Development, Our Common Future, Oxford University Press, 1987.

DEZVOLTAREA SUSTENABILĂ ŞI ŢINTELE ACESTEIA DIN PERSPECTIVA ARHITECTULUI

(Rezumat)

Într-un moment de intensă extindere urbană apare necesitatea urgentă de trecere de la urbanismul tradiţional, către urbanismul sustenabil. Acest fapt solicită o înţelegere a principiilor dezvoltării urbane sustenabile, la nivel global. Acestă lucrare prezintă o trecere în revistă a celor mai importante decizii luate la nivel mondial, atât pentru a combate schimbările climatice şi impactul lor asupra calităţii vieţii, cât şi pentru a stopa dezvoltarea necontrolată a mediilor urbane. Sunt prezentate conceptele şi evoluţia urbanismului peisagistic, a ecologiei urbane, ale urbanismului verde, şi urbanismului sustenabil, şi modul în care aceste principii pot influenţa decizii pentru combaterea efectelor negative ale nivelului ridicat de urbanizare, creşterii demografice, schimbărilor climatice, utilizarea ineficientă a resurselor.