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LEED TECHNOLOGY IN URBAN PLANNING

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Abstract: Urban planning is a set of measures, guidelines and suggestions for improvement and unification of economic, social and sustainable development of certain areas. Planning in the modern era, accompanied by a number of bad consequences, has led to a steady rise in consumption of natural resources used to build traffic and utility infrastructure and expansion of settlements. Insufficient care of human race for environment and ecosystems caused the emergence of large-scale climate change and global warming. LEED (Leadership in Energy and Environmental Design) in urban planning represents a new approach to planning, which enables the use of renewable energy sources. The main goal of LEED technology is the protection and improvement of the environment, through the creation of modern and energy-independent urban space. In this paper, using the methods of description and comparison, as well as case studies of some examples, the possibilities offered by green building will be shown.

Keywords: Urban planning, LEED technology, environmental protection, renewable energy sources

INTRODUCTION

Territorial grouping of people under the influence of different historical, sociological and economical factors forms an urban environment. The appearance of urban communities is directly linked to a steadily increasing population, resulting from social and technological revolution. Throughout history, there was an increasing need for better organization of living space in order to provide greater security, better work conditions and better living conditions. Thanks to the continuous development of industry, urban areas undergo great economic and architectural changes.¹

Unfortunately, the impact of settlements on the environment and ecology has not been taken into account. Due to the global climate changes caused by man and his negligence, natural disasters take place: frequent occurrence of storm disasters, extreme heat, increase the risk of extinction of flora and fauna, increased risk of various infections and diseases in humans. Such changes have a lasting impact on the urban environment. Consideration of the environmental dimension and the impact of population on the environment is a very important part of planning, which gets special attention in recent years.

The concept of urban planning refers to the analysis of existing ways of using space, looking at the current problems, future needs and resources, as well as defining development goals. Through the planning process we can determine the further development and protection of the area.

People's awareness of science, technology and new developments are affecting the setting of new standards in construction. Watching from the physical point of view, the most important intervention which requires attention is green building. Green building is a concept that originated in 1990's in America, when planning had a special emphasis on respect for the natural environment. The introduction of a new planning approach provides a number of positive effects, which contribute to the integration of the urban environment and the natural environment, therefore the impact of climate change significantly eases. The area should be kept and used carefully, through the introduction of economic and environmental awareness within the behaviour of the space user. Lack of commitment to sustainable development is a major problem in many developing and developed countries. In recent years, awareness of quality mid planners and users of the area is increased, and the focus is solving economic and social problems

¹ Velimir IJ. Ćerimović, Sustainability, Developed Environment and Climate Change (The 1st National Conference With

Regional Participation Environmental Protection In Energy, Mining And Industry, 2010), p.300.

caused by the destruction of the natural environment and depletion of natural resources.

Proper use of land is fundamental to the preservation of environmental quality, the future of new generations and quality of life.

STRATEGY FOR URBAN PLANNING FOR SUSTAINABLE DEVELOPMENT OF URBAN SPACE

Programs for sustainable development and the appearance of green building is preceded by a long-standing analysis and identification of strengths and weaknesses of potential urban spaces. The aim of the strategy and plan is to promote new forms of technology and their appliance in urban areas. This way of development aims to solve global climate problem. With advancing and innovative ideas we can expect that sustainable urban development becomes a new vehicle of social and economic development of a region.

The concept of sustainable development is related to the conservation of natural resources through recycling, as well as their minimum use of energy. In addition to the recycling of materials and energy sources, the aim is to eliminate pollution and toxic waste that are an integral part of the urban environment.

The process of urban sustainable development is based on the areas that affect the space the most and it is essential to improve their use of natural materials in the construction purposes, the energy that needs to be directed towards renewable energy sources, water that can be used in various applications and troubleshooting harmful emissions coming from traffic.

Sustainable Development of Urban Environment is based on new technologies and developments concerning: solar energy, wind energy, bio-fuels and bio-materials and green architecture.²

GREEN BUILDING CONCEPT IN URBAN PLANNING

Cities play a dominant role in global economic development, due to the constant influx of population, urban areas exceed the planned capacity. The growth of cities and urban centres are faced with major problems that manifest themselves through improper use of natural resources. Urban growth is associated with the pollution of water, air and soil, which is the basis of every ecosystem.

Urban planning is a key role in improving the environmental conditions at the city level as well as on global level. Green building is intended to include all the elements of a space through environmentally sustainable system. Through urban planning we can

define the elements that directly impact on the environment, such as: the exterior of the building (facades, roofs), the yard around the buildings, open spaces, parks, streets and utility infrastructure. Studies dealing with problems of environmental planning and land use patterns show that urban areas have greater potential to create a sustainable system than rural areas. Sustainable Urbanization is a powerful tool for improving living conditions in cities and ecological capacity.

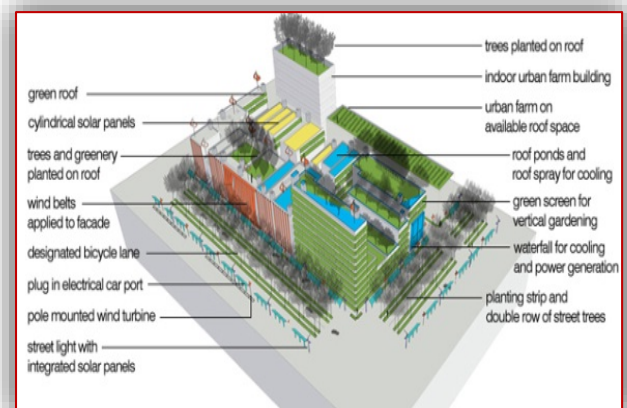


Figure 1. Energy Converting Desing [3]

Modern urban planning concept involves the creation of green spaces in cities to conserve power by promoting self-sustainable buildings and spaces, as well as the development of green building technologies. Using a modern approach to design green architecture we achieve first step in preserving the environment and energy, as if each object achieves economic, energy and social sustainability and creates the conditions for improving the quality of life of the users themselves, and therefore the environment. Conserving energy through the use of alternative energy sources (wind, solar) creates a new direction in design that tends to preserve micro vessels through the use of new technologies: solar panels, wind turbines for propulsion, savings and production of water, disposal and reuse of waste, then the use of new materials and structures that are self-sustaining. The facility aims to produce more energy than it consumes.³

Urban parameters of one location play an important role in creating a sustainable system. Therefore, special attention is paid to the orientation of the object in order to maximize the solar energy and provide natural ventilation. Savings of energy is achieved mainly due to the development of green

² Vera Backović, The Notion Of Sustainability In Contemporary City(Future Development Of Settlement In The Light Of Climate Change, 2011), P. 103.

³ Ljiljana Blagojević, Dragana Ćorović, Environmental Aspects As A Basis Of Curriculum Innovation In Higher Education Of Architects: New Approaches To The Study Of History And

Theory Of Modern And Contemporary Architecture(Future Development Of Settlement In The Light Of Climate Change, 2011), P. 175.

spaces that have multiple roles: collecting water and use the same, creating a favourable microclimate and the creation of green oasis within the urban environment.

The current way of using transport infrastructure has led to an increase in greenhouse gas emissions, which is why cities are becoming unfavourable to the environment. Modern approaches to urbanism address the issue of reducing carbon dioxide emissions through a network of centres that operate independently and allowing space users to suit all daily needs within their centres. Street regulation is down to the formation of incoming and outgoing roads connecting different locations, while within a single urban centre is insisted on formation of pedestrian, bicycle and underground traffic flows. An important segment of transport infrastructure are planned green spaces along the roads that have a protective purpose of noise, noxious gases, oily storm water and separate spaces intended for people of transit routes. Special emphasis is placed on the use of permeable surface, which allows drainage of storm water from roads and thanks to the new technologies, reuse of processed water.

The concept of protection and improvement of the environment is based on the establishment of sustainable management of natural values, prevention, reduction and control of all forms of pollution through greening and landscaping large green space. The new model of planning involves reserving a large percentage of space for parks and green spaces in urban areas within themselves and around them.

Green infrastructure⁴ is an important concept of protection of the natural environment. It covers all public spaces (parks, forests, open spaces, natural resources) and public roads, systems for wastewater drainage, objects and parts such as roofs and facades. The biggest problem is disposal the city water wastes from highways, parking lots, roofs and other surfaces into natural water areas. New technology allows collection and treatment of contaminated water, prevention of pollution and creating natural processes in urban areas. Modern technology promotes green roofs, protective vegetation along roads, rain gardens, permeable paving, the use of facade as vertical gardens and provides water treatment and its reuse.

GREEN BUILDING SYSTEM – LEED

LEED system (Leadership in Energy and Environmental Design) of urban areas combines the principles of sustainable development, urban planning and green building, which shows the level of responsibility of sustainable urban development.

The main criteria of evaluation areas are: energy efficiency, emissions, water consumption, the choice of building materials and construction and transport efficiency. LEED protocol has a major impact on the strategy of urban planning, dealing with the basic parameters of urban space. The first and most important parameter is the choice of the location intended for construction, taking into account the proximity of waterways and the impact of proposed development on the environment and land. Special attention is paid to the necessary consumption of water, energy and air pollution. Also, great importance is the choice of materials and raw materials. They choose materials that are sustainable and recyclable. Location must possess a quality physical environment in order to create the conditions with clean air, good isolation and low noise level. For the sustainability of an important area's closeness of transportation and utility infrastructure, which is based on good transportation connections, reducing vehicle use and connect; on with green infrastructure is essential.

LEED urban space is a system which is focused on sustainable construction and focuses on education and raising awareness of space users through its programs and categorization. Spaces that meet the requirements of sustainable, green building, could enter the classification system LEED-ND (Neighbourhood Development).

Urban development areas that have the economy, sustainability, functionality and comfort are representatives of modern urbanism and are part of the LEED green building standards. LEED standards are the beginning of a new era of building regulations, which aims at solving the problem of energy consumption and pollution emissions by promoting the principles of green building and energy efficiency.

CONCLUSIONS

Urban plans for sustainable development represent a set of measures, guidelines and recommendations for the protection, development and improvement of urban areas. Plans are national and local character regardless that government in their implementation has a large number of individuals involved - residents and organizations. Based on the evaluation of previously implemented plans, it is necessary to create strategies for new plans whose main goal is the revival and development of urban areas. Plans are comprehensive, they have a long-term character and through them it is necessary to consider all the potentials and limitations in terms of energy saving and urban ecology, as well as economic and

⁴ Jasminka Cvejić, Aleksandar Bobić, Andreja Tutundžić, Stojanka Radulović, Cities Adaptation To Climate Changes – The Role Of

Green Insfrasturcture (Future Development Of Settlement In The Light Of Climate Change, 2011), P. 27.

sociological sense. According to the program, a key factor for urban development is sustainability in the construction and use of alternative forms of energy in order to prevent the devastation of land and impact on reducing consumption of natural resources.

Urban planning in developing countries and developed countries is represented by programs that are incurred as a result of long-term analysis of the situation in the country and the implementation of previous plans. Plans are given guidelines for troubleshooting energy conservation that are not based only on resources already taken into account but also the limit that needs to be considered in order to obtain high-quality solution.

Strategies and concepts of sustainable development incurred in developed countries with much lower natural potential in comparison with Serbia, can serve as a good example and it is possible to convey the positive experience with us. Serbia has a diverse structure of land from south to north, but it is possible to promote sustainable development and overcome the discrepancies. Applying experience in the way to treat the area with different positions and taking in account the manner of their connection, in Serbia, it is possible to achieve a more balanced and successful urban development. The analysis and comparison of urban planning in Serbia and planning in other countries would be possible to integrate into existing plans and implement innovations that are already having a positive impact on urban development around the world.

Note

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