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# “BARRACKS” PARK AS PART OF THE GREEN SYSTEM OF THE TOWN OF SEVLIEVO

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## ABSTRACT

Many urban areas face pressure from growing populations, limited resources and environmental impacts. Cities need sustainable architecture and sustainable construction. The green cover of Sevlievo (Bulgaria) is 27.49%. Defined as a sustainable town by a number of authors, in 2012 was built a park system on the territory of the old barracks. The park has the following types of value - environmental, economic and social. Increasing the resilience of urban architecture requires improving materials. Since there are buildings and houses and since there are builders and architects. Construction involves maintaining a number of balances: balance between form and function; between design aspirations and financial constraints and between artistic expression (as manifested in the works of architects) and the practical care of the construction sector. This is where the concept of sustainable development responds to the needs of the present, without compromising the capabilities of future generations.

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**Introduction.** The World Commission on Environment and Development (WCED, 1987) has defined sustainability as “*Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.*” When applying this complex concept to architecture, it refers to design that creates a healthy living environment, while striving to minimize negative impacts on the environment, energy consumption and human resource use.

Sustainable architecture is reflected in building materials, construction methods, resource use and design in general. The project should also facilitate sustainable operation during the life cycle of the building, including its final disposal. Although it must be functionally and aesthetically superior, the space must be built with the attitude of achieving long-term energy and resource efficiency (Bennetts et al., 2002).

Sustainable architecture is also called green architecture or ecological architecture. It challenges architects to create smart designs and use available technology to ensure that structures generate minimal harmful effects on ecosystems and the urban environment. The role of green systems in cities is significant because of their ability to provide important ecosystem services for human well-being. Yet the value of urban green systems is still neglected in urban policy and planning (Stoyanova, 2021).

Imagine that you liked a plot of land that you think is conveniently located for you to build a residential building in the center of a big city. The problem, however, is that there are 100 trees planted on it, and they are about 50 years old, ie. they can take an active part in reducing the level of dust particles, heat and noise pollution for another 50 years. These trees are deciduous and belong to the genus *Quercus* (oak). If sustainability is not an issue, you will probably do is cut down all the trees to clear the terrain on which you will build. In this case, you do not care if it will harm future generations and in which way? Do you not think about what kind of ecological gross domestic product (EDP) these 100 trees have for the functioning of the urban ecosystem and human well-being?

This is the opposite of sustainable architecture. Sustainable architecture means taking environmental factors into account:

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- Is there another plot nearby that you can use instead?
- How can you use some of the wood from the trees without completely depleting the entire plantation, so as not to disrupt the functioning of the urban ecosystem?
- Is there a way not to cut down the trees and build the building again?

These are just some of the factors to keep in mind when applying the concept of sustainable development in design and construction. Sustainable architecture must recognize the existing natural resources and environmental conditions at the construction site and how to incorporate them into the structure.

As cities continue to expand, the Earth is not getting bigger. This growth has a huge impact on the environment. The earth is not an unlimited well that can be replenished to keep pace with modernization. According to the UN Global Environment Report 2017, buildings and construction account for more than 35% of global final energy consumption and almost 40% of energy-related CO<sub>2</sub> emissions. Although these figures are lower than in 2010 due to higher sustainability awareness, there is still a long way to go. When using sustainable architecture, whether in new or old buildings, there are accompanying environmental, economic and social benefits.

**Material and Methods.** The town of Sevlievo, Bulgaria (43°01'2" / 25°06'48") is a separate administrative and municipal center with an area of 41.244 km<sup>2</sup>. It consists of 73 streets, 60 of which are forested; 4 quarters: Balabantsa, Mitko Palauzov, Dimitar Blagoev and Dr. Atanas Moskov; 3 town parks: "Barracks", "Chernichkite" and "April Uprising". Its green cover is 27.49%. Sevlievo falls into three types of landscape - foothill, agricultural and riparian valley. The city is known as the "economic pearl" of Northern Bulgaria. Sustainable center, providing a number of ecosystem services for its inhabitants. The first city in the history of the Republic of Bulgaria, which in 2012 turned old barracks into a park system (Peteva & Rangelov, 2017).

*"Barracks" park*

The Sevlievo barracks were built in 1892 and were used as such until 2000. In 2004, the land on which they were built was donated by the Ministry of Defense (MoD) - Sevlievo municipality. Almost immediately, in 2005, the municipality of Sevlievo announced a competition for a conceptual design, which was finalized in 2006 and won by a team led by Prof. Alexander Alexandrov. Later, it was this team that prepared the working projects for the construction of the park.

In September 2012, the first stage of the project was opened with a total value of BGN 3 609 616, funded by OP "Regional Development" and co-financed by the municipal budget worth BGN 191 180. At the moment, about 25 000 square meters of alleys have been built and parking lots, 1 decare of playgrounds, 15 new sets of children's facilities, over 1 decare of water attractions, 109 flower beds, 170 benches. About 10 decares are grassed. 300 lighting fixtures and 250 rubbish bins have been installed.

The high role of the cultural aspect in the doctrine of "sustainable development" raises the need to compare the degree and manner of implementation of the proclaimed, examining what is the understanding of industrial heritage abroad and what it is in our country (Asparuhov et al., 2016).



Fig. 1. Development plan of "Barracks" park (www.sevlievo.bg)



The concept of the park is to combine the memory of the barracks and to be an attractive place for recreation and entertainment – fig. 1. The project envisages people starting from the city center to cross the park and reach the river. In the beginning, a chess field was built, called the "battlefield". This is actually the central square where city events will be organized. Next are entertainment venues, water attractions, a geographical center in the middle of a spiral of alleys. The next stage envisages the construction of a military museum, the equipment of the geographical center, which will house an interactive globe, the sun and the moon, the construction of a sports complex with playgrounds, an extreme bike lane, etc.

**Results.** Today, the “Barracks” park with an area of 120 770 m<sup>2</sup> and 6% green cover is a positive example of a site with sustainable development. The town of Sevlievo is the first with a site of this nature, followed later by Kardzhali, Stara Zagora, etc. – fig. 2 and 3.



Fig. 2. “Barracks” park – view of Sevlievo town

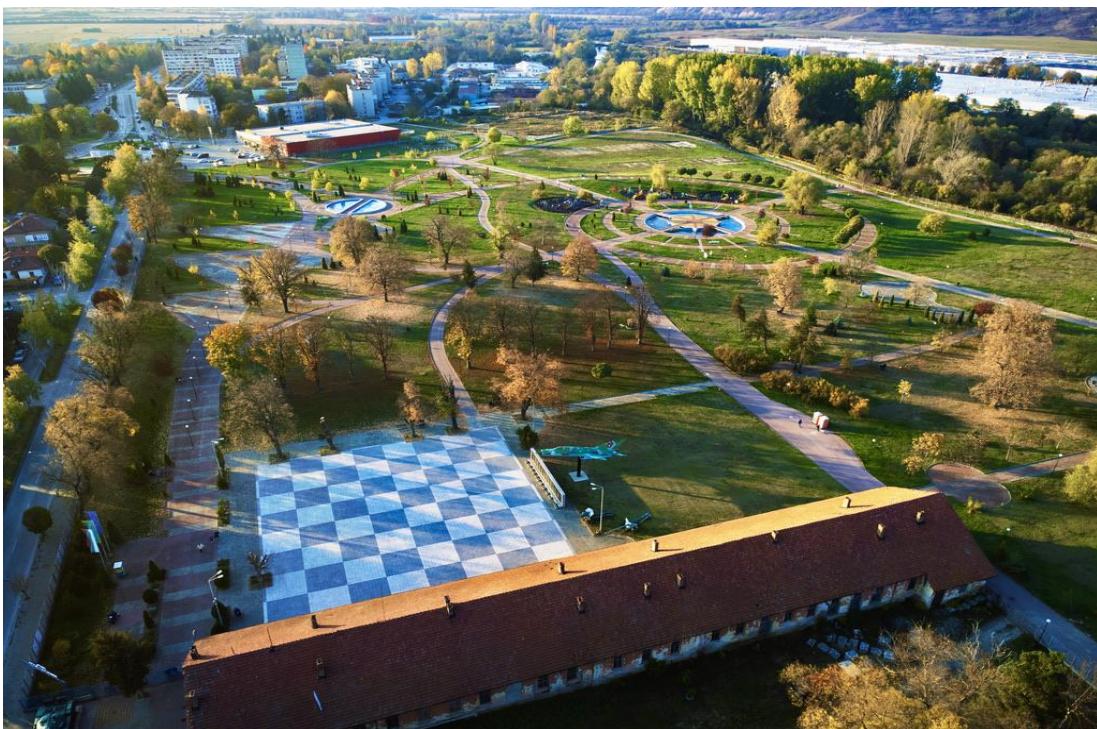


Fig. 3. “Barracks” park – view from the sky

Total tree number on the territory of the park is 54 from 21 species belonging to 13 families – table 1.

Table 1. Species composition, number and measurements of trees for “Barracks” park

Tree species	Family	Total Number	Height, m	DBH*, sm	Age, years	Crown, D <sub>max</sub> , m	Crown D <sub>min</sub> , m
<i>Abies alba</i> Mill	Pinaceae	4	16	33	50	3	1
			10	60	70	8	3
			13	77	70	6	3
<i>Acer campestre</i> L	Sapindaceae	4	16	40	40	4	1
			8,5	55	30	3	2
			9	55	30	3	2
			14	70	60	6	2
<i>Acer negundo</i> L	Sapindaceae	1	8	55	30	3	2
			8,5	55	30	3	2
<i>Acer saccharinum</i> L	Sapindaceae	2	9	55	30	3	2
			9	55	30	3	2
<i>Aesculus Hippocastanum</i> L.	Sapindaceae	5	11	48	60	4	2
			10	41	60	4	2
			12	42	60	4	2
			9	43	60	4	2
<i>Ailanthus altissima</i> Mill	Simaroubaceae	4	4	8	5	1	0,5
			2	13	5	1	0,5
			3	10	5	1	0,5
			2	10	5	1	0,5
<i>Betula pendula</i> Roth	Betulaceae	3	2	5	5	1	0,5
			2	5	5	1	0,5
			14,5	90	60	5	2
<i>Elaeagnus angustifolia</i> L	Elaeagnaceae	2	4	12	5	1	0,5
			4	12	5	1	0,5
<i>Juglans regia</i> L	Juglandaceae	2	14	70	60	4	2
			12	59	60	4	2
<i>Malus baccata</i> L	Rosaceae	1	10	66	60	8	4
<i>Morus alba</i> L	Moraceae	1	14	70	60	6	2
<i>Picea abies</i> L	Pinaceae	4	16	40	40	4	1
			10	44	60	4	2
			9	43	60	4	2
			9	43	60	4	2
<i>Pinus nigra</i> L	Pinaceae	4	9	35	15	2	1
			14	44	60	4	2
			10	44	60	4	2
			12	48	60	4	2
<i>Plananus orientalis</i> L	Platanaceae	1	2	13	5	1	0,5
			12	53	45	7	3
			12	52	45	7	3
			12	53	45	7	3
			12	55	45	6,5	2,5
<i>Robinia pseudoacacia</i> L	Fabaceae	1	14	70	60	6	2
<i>Salix babyloniva</i> L	Salicaceae	1	4	30	15	3	2
<i>Sophora japonica</i> L	Fabaceae	4	4	13	5	2	1
			2	10	5	2	1
			2	10	5	2	1
			4	13	5	2	1
<i>Thuja orientalis</i> L	Cupressaceae	2	4	8	5	1	0,5
			2	13	5	1	0,5
<i>Thuja acidentalis</i> L	Cupressaceae	2	2	13	5	1	0,5
			3	10	5	1	0,5
<i>Tilia cordata</i> Mill	Malvaceae	4	12	59	60	6	3
			16	66	60	6	3
			12	64	60	6	3
			12	59	60	6	3
<i>Tilia tomentosa</i> Moench	Malvaceae	2	10	60	70	8	3
			13	77	70	6	3

\* Diameter at breast height, or DBH, is the standard for measuring trees. DBH refers to the tree diameter measured at 4.5 feet above the ground.

The transformation of the territory of the former barracks of the city into a park is an example of revitalization of abandoned and dilapidated urban spaces. According to this model, many



abandoned sites from the recent past could be revived and renovated - be they military or industrial. In this way, environmental, economic and aesthetic benefits for cities are added, namely these are the three basic principles of sustainable development – to create conditions for economic, social and environmental impact.

**Discussion.** Today, in functional terms, the territory has a rich and diverse content. In the park, in addition to the typical park elements, we can also find sports, cultural, educational and thematic infrastructure, as the site provides ecosystem services in various directions. On the one hand, it creates conditions for daily recreation and sports of the residents of the town of Sevlievo; holding a number of cultural events, etc., and on the other hand is a solid object of the green system of the city.

From what has been said so far, we can summarize that the park "Barracks" has a significant contribution to the volume of the urban green system (6%) and is undoubtedly a powerful generator of urban development, expressed in increasing investment interest in the surrounding areas - fig. 4 a and b.

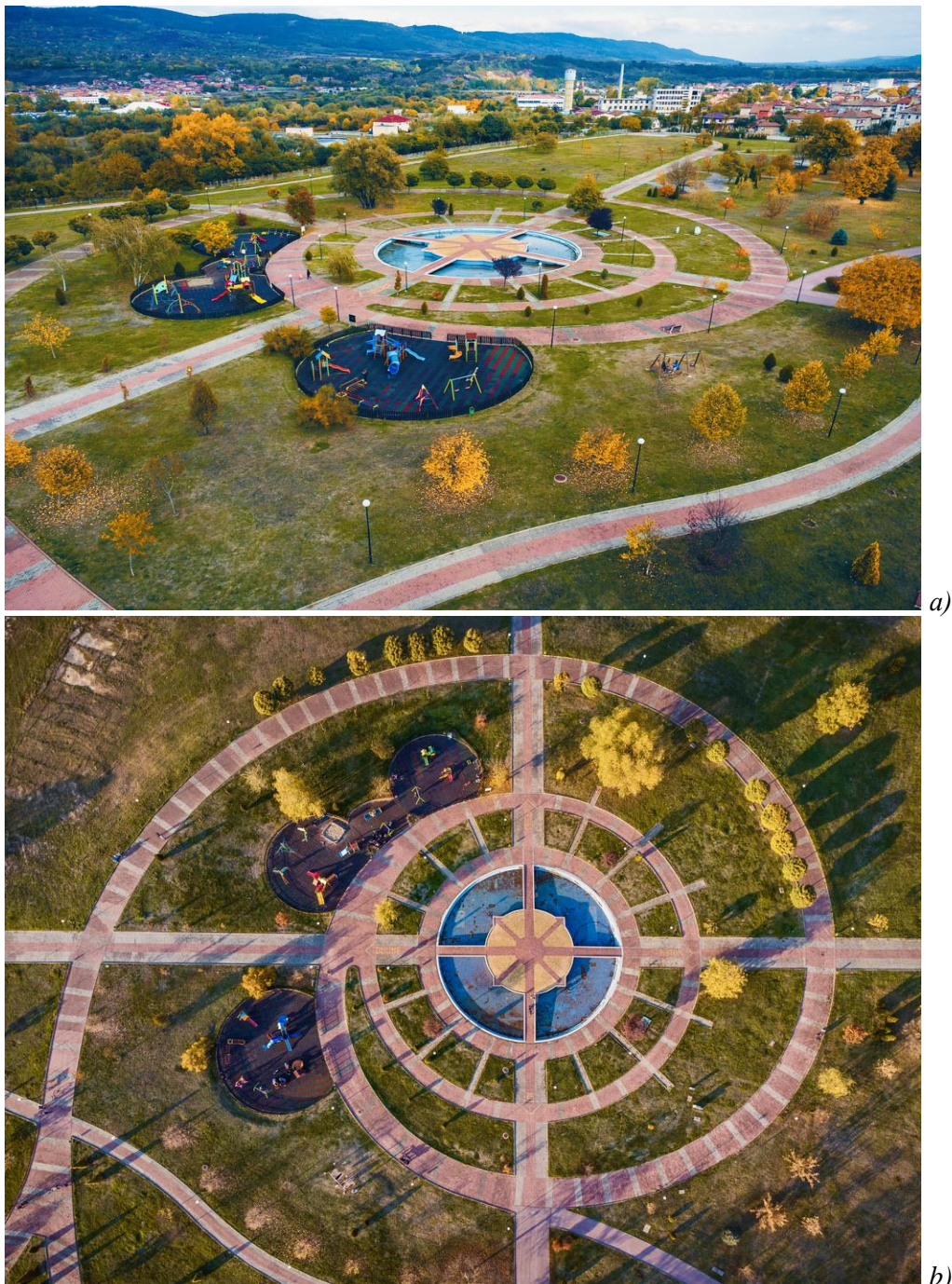


Fig. 4. a) "Barracks" park with a view of The Krushevski Bair area. b) Central part

**Conclusions.** Despite innovation, progress and growing public awareness of the need for greener construction practices – sustainable architecture is still a small part of overall global construction. In addition, many experts believe that the concept of sustainable development is outdated given the current state of the planet. Instead, they insist that the way forward lies in regenerative architecture and design, a much more progressive holistic approach that focuses on using the world's natural resources to create buildings and systems capable of regenerating and destroying completely when have fulfilled their goal.

Sustainable architecture benefits everyone - individuals, businesses, communities, the economy and the environment. It is true that more and more countries are moving towards sustainability, but the progress made is still not able to cope with the constant demand for resources. Man is a consumer and this requires a new way of thinking, namely "Act locally - think globally".

In Bulgaria, the "Barracks" park is an excellent example of a sustainable architectural project. "Green Pearl" among the industrial jungle, which has ecological, economic and social value for the local population. Thanks to sustainable local thinking, instead of a building for a few, a park has been created for everyone. Sustainable urbanism takes action outside of sustainable architecture and takes a broader view of sustainability. Typical solutions include such eco-industrial parks (EIP), urban agriculture and others.

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