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URBAN GREEN AREAS PLANNING AND DEVELOPEMENT: AN ASSESSMENT OF GENERAL URBAN PLANS OF THE CITY OF NIŠ

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Abstract. *Urban green areas have multiple roles in cities and to a large extent they determine the quality and livability of urban space. The process of urbanization has led to an increase in construction in cities and reduction of open public spaces, especially green areas. Planning of urban green areas is an integral part of urban planning, thus changes in planning and development of urban green areas can be observed through urban planning documents. The main question is whether the loss of green areas is a consequence of non-compliance with plans, or the reason for this lies in the method of planning of green areas. In order to answer this question the paper discusses: functions, standards and classification of urban green areas in general, and their use in two successive general urban plans of the city of Niš in the last twenty years, as a prerequisite for the development of green areas in accordance with growing need for green areas in the city.*

Key words: *urban green areas, green areas functions, urban planning, general urban plans*

1. INTRODUCTION

Number of inhabitants in urban areas is constantly increasing, and at this moment more than half the world's population lives in cities. The need for open spaces increases along with the increase of population in cities. The proximity of green areas, especially in large cities plays an important role in the life of its inhabitants. Frederick Law Olmstead, the father of American landscape architecture, believed in the restorative power of nature and saw his work as part of efforts to civilize mankind and improve the lives of people who live in congested, cramped and dirty conditions. When the parks first appeared in their modern form, in the late 19th century industrial Britain, their purpose was to provide open spaces in or near the centre of urban areas and to reconnect residents of the city with

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nature. Urban green areas play a significant role in sustainable urban development and urban ecology by virtue of multiple environmental, social and economic benefits [1,2]. Numerous studies confirmed a significant impact of urban greenery on: reducing stress [3], improving human health and sense of wellbeing [4], enhancing productivity [5], reducing crime [6], boosting property values [7, 8], etc. Urban green space also plays an important role in urban landscapes, providing ecosystem services such as mitigation of flooding and erosion, collection of airborne and waterborne contaminants and provision of wildlife habitat [9, 10]. All this suggests that creation of new green areas and rehabilitation of existing green areas should be an imperative for urban revitalization. The system of urban green areas is usually defined as a set of different categories of urban and suburban greenery deliberately deployed in the city and interconnected by tree-lined boulevards, and through suburban green areas connected with the system of rural greenery. The system of greenery, apparently, becomes really effective only after careful study of ecological and biological conditions of the environment [11].

Development of urban greenery is a topic of interest for many organizations and individuals; it is often elaborated in scientific and professional papers, while the neglect and degradation of existing green areas is more and more present in practice. Loss of public open space, particularly loss of green space in favour of buildings construction, is especially noticeable in the post-socialist cities due to rapid loss of greenery for a short time after the conversion from public to private ownership over land. Law on planning and construction, which is the basis of urban planning, divides land in two categories: "public land" or publicly owned land, and "other land". Urban greenery is not mentioned in the law, but it is understood that urban greenery is a part of public land and it should be treated that way in urban plans. Serbia has a modest tradition in the planning and realization of public space. Public space, and urban greenery as a form of open space (A/N), has no proper place in strategic planning or in urban plans and projects, although it is a part of the large domain of public good and an important element of the urban environment quality [12]. Systematic planning of public open spaces including playgrounds, greenery, and recreation is not even being discussed in planning documents [13], so planning generally involves only preservation of existing green areas.

Since urban plans are binding documents and basis for development of all urban functions including urban greenery, paper focuses on impact of two general urban plans of the City of Niš on development of urban green areas. The paper consists of two parts. The first part is theoretical background – overview of generally accepted classification, standards and functions of urban green areas. The second part analyses these elements in general urban plans of the City of Niš, and consequent changes in development of green areas.

2. FUNCTIONS OF URBAN GREEN AREAS

Green areas connect urban areas (parks, squares, greenery of residential blocks etc.) with suburban greenery (forest parks, protective green belts, etc.) and are important elements of each city. Built as a system, green areas improve the microclimate of settlements: reduce the impact of strong winds, protect from the noise, contribute to the aesthetic quality of buildings, play important role in urban planning and the organization the city territory, etc. Green areas can be classified in different ways, for example Maričić distinguishes the following features of

greenery: eco-protective, medical, emotional and psychological, aesthetic, architectural and urbanistic, engineering and technical, educational, sociological and cultural, economic function and specific functions - recreational function and function in war and disasters, etc. [14]

The simplest and most general classification of functions of green areas in cities includes:

- Social-healthcare and utilitarian function
- Ecological function
- Aesthetic and decorative function

Social - healthcare and utilitarian function

Urban green areas create comfortable living conditions in cities by improving the microclimate; they act as air ionizers and have bactericidal properties. In addition, vegetation has a significant emotional and psychological role in life of city residents. City residents often experience the city as dirty, dangerous, noisy, stuffy and lonely place to live. Vegetation affects all the senses, by calming tension and reducing mental fatigue. Green spaces have an important role in promoting healthy living and disease prevention because they provide a place for physical activities, and affect the reduction of stress-related illnesses [4, 15] and provide emotional warmth [16]. The connection between people and nature is important for everyday enjoyment, work productivity and general mental health [5, 17]. Utilitarian function of green areas is reflected in prevention of soil erosion, traffic control, i.e. separation of vehicular and pedestrian traffic, protection from snow drifts, reflex control of nearby facilities, strengthening landslides, protection against fire increasing water catchment and floodplain surfaces, and stabilizing soils and other functions [10, 18].

Ecological function

Urban green spaces play very important ecological role in the city. They supply cities with ecosystem services ranging from maintenance of biodiversity to the regulation of urban climate [19]. Urban green areas impact on the microclimate of a settlement through air cooling and humidity preserving regime. The study of temperatures of different pavement materials showed that surface temperature of green area in summer period is up to 20°C lower than the surface temperature of paving materials [20]. Tree canopies and shrubs absorb part of the solar radiation, and in addition create shadow, so the air above the green surface is cooler.

The impact on environment and ecology lies in protection against wind, reduction of air pollution, protection against radiation, noise reduction, air oxygen enrichment [19], reduction of surface water runoff. Drainage of water from green area is around 10-20% compared to 60-70% from paved urban areas, which reduces the risk of flooding in urban areas [10].Green areas are also very important for biodiversity since parks are habitats of a large number of plants and animals and facilitate human contact with nature [9].

Architectonic and urbanistic (aesthetic and decorative) function

The oldest remains of gardens date back to ancient Egypt and Mesopotamia when the gardens had a purely decorative function. The utilitarian function of parks occurred later, but the decorative function still remains. Today, there are decorative green areas in front of important public buildings, serving to complement the form of the structure they surround. Green spaces create spatial shape and silhouette of the city, they are an important element in

shaping urban landscape, revive urban space and give a completely new look to some parts of the city and city as a whole [14].

In addition to these functions, economic function should be noted as well. The economic value of green areas is interpreted as the overall positive effect of all functions of urban vegetation resulting in an increase in real estate prices near green areas, increase in quality of tourist offer and the like [16, 21]. Functions of green spaces are, to some extent, defined by their size, shape and distribution. These attributes play a decisive role in defining their ecological and landscape functions [22, 23], and shape characteristics of green spaces play an important role in urban life, meaning that connected green network has higher amenity value than smaller and fragmented ones [24].

Considering dependence of function on form, paper analyses the size of green areas in general urban plans of the City of Niš, in order to estimate their possibility to fulfil planned function.

3. CLASSIFICATION OF URBAN GREENERY

Classification of green areas in cities can be performed according to different criteria, for example: by size, by purpose and accessibility, according to the position in relation to the settlement and the like. Maričić [14] proposes the division of urban green spaces in two groups:

1. Green areas within the settlement – urban greenery
2. Green areas outside the settlement – rural countryside.

Figure 1 shows classification of green areas within settlements (urban greenery).

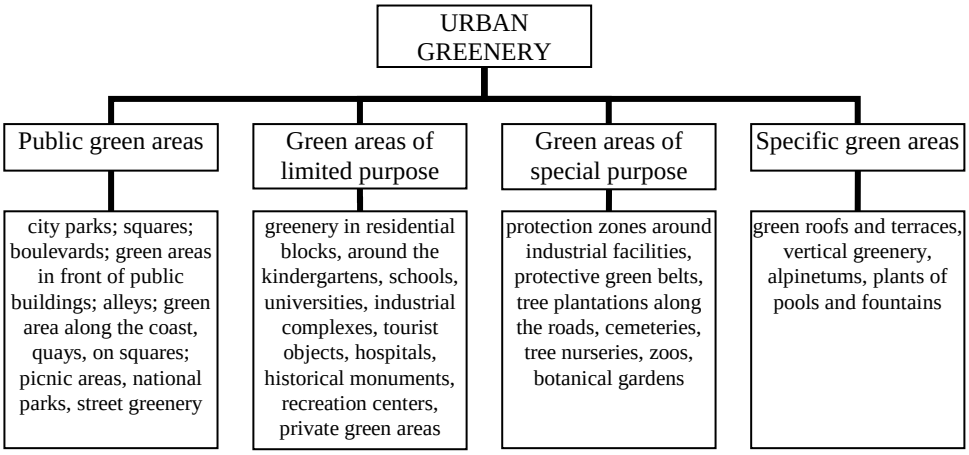

Fig. 1 Classification of green areas within settlements (urban greenery), combined from Lunc, Teodoronski and Anastasijevic [14]

Green areas outside the settlement (rural countryside) are divided into:

- Green areas of protective character
- Park forests and forest parks
- Green areas along roads outside the settlement

Using this classification, paper aims to identify certain types of green areas and to determine their share in the total urban greenery in general urban plans of the City of Niš.

4. STANDARDS FOR URBAN GREEN AREAS

In the same way as there is no clear and generally accepted classification of green areas, there are no generally accepted norms of green areas in cities. In addition, ways of expressing norms differ. Russian authors proposed three quantitative indicators which would serve for a complex assessment of the effectiveness of the greenery [25]:

1. level of greening in percentage – the ratio between the total area of green surfaces in the city and the total area of the city;
2. degree of greening in m^2 per inhabitant - the relationship between the total surface of green plantations and the number of city residents.
3. degree of adequacy in m^2 per inhabitant - the ratio between the area of public green space and the number of city residents

According to the World Health Organization [26] each inhabitant of the city should be provided with 50 m^2 of urban green space and 300 m^2 of suburban green areas. This norm is based on the fact that one hectare of forest during the day consumes the amount of carbon dioxide equal to amount that around 200 people exhale by breathing, which means one man needs 50 m^2 of greenery. In urban conditions, this norm is much lower, variable and depends on the size and structure of the city and natural conditions. The planned norm applied in European cities includes public green area of the city and ranges from min 15 m^2 to 25 m^2 per capita. Increasing norm value to up to 35 m^2 per capita and more is generally associated with agglomeration of forest parks in immediate surroundings [27].

Table 1 Green area norms in some European countries [26]

	Great Britain	France	Netherlands	Switzerland
			m^2 per capita	
Sports	4	4	5	4
Children's playground	1.5	1.5	3	1.5
Parks and public parks	4	4.5	5	6
Private gardens	7	-	5	3
WHO recommendation			9	

International minimum standard suggested by World Health Organization (WHO) and adopted by the publications of United Nations Food and Agriculture Organization (FAO) is a minimum availability of 9 m^2 green open space per city dweller [28] and no dwelling should be at a distance of more than 500 metres from a green area of at least 6,000 m^2 [29].

In addition to the norms relating to the required surface area of green space per capita, there are norms relating to the maximum distance from the green space. The norms of use relating to the distance of some types of green areas from place of residence are as follows: greenery of squares should be set on every 300-400 m; parks with playgrounds should be at a maximum 10-15 minutes' of walking distance, district parks at 1-1.5 km, city park at 2.5 km and forest park at 5-10 km from place of residence [30].

In Serbia, values for quantitative indicators (level of greening in percentage degree of adequacy in m^2 per inhabitant and degree of greening in m^2 per inhabitant) are not clearly defined. Recommended value for degree of greening is $25m^2$ and for degree of adequacy it is 12-15 m^2 per capita.

According to data from the General Plan of the city of Novi Sad, norms for certain categories of green areas are (green area - size - maximum distance) [27]:

- central city park – 100 ha and more – 4 km;
- residential area park – 10-30 ha – 1.5 km;
- residential area greenery (park of the local community) - 1 ha – 0.5 km;
- recreational area – 100 ha and more – 6 km.

In General Plan of Belgrade 2021, the term „park" includes green areas that are: located in the built urban fabric, larger than 1 ha and used for rest, walk and play.

5. URBAN GREEN AREAS IN GENERAL URBAN PLANS OF THE CITY OF NIŠ

Urban planning in Serbia consists of three levels according to the Law on Planning and Construction (2009):

- General Urban Plan,
- General Regulation Plan,
- Detailed Regulation Plan.

General Urban Plan is drawn up as a strategic developmental plan, with general elements of spatial development. General Urban Plan includes coverage of the construction area and general urban planning solutions with land uses mainly planned in the construction area; general directions and corridors for traffic, energy, and other infrastructure and division of the planning area to parts for further elaboration. General solutions defined in the general urban plans are elaborated in more detail through the lower order plans - general regulation plans and detailed regulation plans.

General Regulation Plan is mandatory for a populated settlement which is the seat of local government units, but it can also be adopted for other settlements on the territory of the municipality. The General Regulation Plan particularly includes: the catchment area of the buildable land; division of the space into separate wholes and zones with their predominant use, street regulation lines, areas of public use, and construction lines; routes, corridors and capacities for municipal infrastructure; rules of landscaping and rules of construction; measures of protection of cultural and historic monuments and heritage; measures of energy efficiency in construction, etc. It also includes zones for which the drawing up of a Detailed Regulation Plan is mandatory.

A Detailed Regulation Plan is drawn up for undeveloped parts of a populated locality, arrangement of informal settlements, zones of urban renewal, infrastructural corridors and facilities, construction on plots outside of populated localities, as well as in protected surroundings of immobile cultural heritage. It has almost the same content as the General Regulation Plan except it is detailed and contains locations for which the drawing up of an Urban Design Project is foreseen.

In this paper, the development of green areas in the city of Niš is analysed through the two latest plans: the General Plan of 1995 (GP1995) and the General Urban Plan of 2010 (GUP2010). The general plan shows the current status at the moment when the preparation of the plan started, and planning solutions for planning period of 15-20 years. The

existing situation at the beginning of planning period serves as starting point for tracking changes in land use and treatment of urban greenery. Comparing the situation at the beginning and at the end of planning period, we can conclude about realization of planning solutions and about changes of urban green areas. Analysis includes the following: the ratio of green areas and the total area of the plan, the division of green areas by purpose and meeting the norms of urban greenery in the city of Niš. In these urban plans greenery occurs in two forms: as a separate land use (city greenery) and as a complement to other land uses (greenery within housing, industry, etc.), and it is analysed in such a way.

5.1. General Plan of 1995 (GP1995)

GP1995 covers an area of 15,036 ha. The existing state in the plan area in 1991 shows that urban greenery was represented with 358.29 ha which is 2.38% of the total area of the plan, while planning solutions for the period from 1995-2010 anticipated increase in green areas up to 852.77 ha, i.e. 5.67% of the plan area.

Conceptualisation and structure of green areas

Land use functions in GP1995 are divided into functions within the buildable area and functions outside the buildable area. According to the primacy of their function, green areas are divided into: green areas as dominant land use – public green areas; and green areas as compatible (additional) use to other dominant land uses such as residential, commercial, industrial, etc.

Table 2 provides a comparative review of data from the GP1995 and GUP2010 - total area of the plan, the number of inhabitants (projected population) classification of green areas, distribution of green area in percentages and green areas per capita. The table shows the state of green areas in the city in 1991, green areas planned in GP1995 and green areas planned in GUP2010.

Table 2 Comparative review of urban greenery in GP1995 and GUP2010

GP 1995						**GUP 2010**			
Plan area: 15,036.00 ha						Plan area: 26,676.91ha			
Existing			Planed			Planed			
Numb.of inh. 214,673			Numb.of inh. 259,000			Numb.of inh. 253,642			
Land use	Area (ha)	m^2 per inh.	Area (ha)	% Pa	m2 per inh.	Land use	area (ha)	% Pa	m^2 per inh.
GREENERY IN THE BUILDABLE AREA									
City greenery	**358.29**	**16.69**	**852.77**	**5.67**	**39.93**	**Green and open spaces**	**2,536.36**	**9.51**	**100.0**
						Recreational area	79.85	0.30	3.15
Parks	67.49	3.14	165.9	1.10	6.40	Park greenery	318.70	1.19	12.56
Park forests	116.0	5.40	136.0	0.90	5.25	Forest Park	73.61	0.28	2.90
Protective greenery in buildable area	41.80	1.95	450.87	3.00	17.41	Protective greenery (mainly other land)	2,064.2	7.74	81.38
Other greenery	68.0	3.17	100.0	0.67	3.86				
GREENERY OUTSIDE THE BUILDABLE AREA									
Protective greenery outside the buildable area	65.0	3.03	200.8	0.43	7.75	Forests and forest land	2,234.2	8.38	88.08

Pa – Plan area

Greenery within the buildable area of GP1995 includes [31]:

- parks,
- park forest,
- protective greenery,
- other greenery.

Outside the buildable area, greenery appears as protective greenery.

Greenery within buildable area, according to classification shown in Fig. 1, includes public green areas, green areas of limited purpose and green areas of special purpose. It is unclear which areas belong to the "other greenery", which occupies 100 ha according to the plan.

As previously mentioned, besides areas with primary function “green area”, greenery occurs within other land use functions, as compatible function with the mandatory percentage of representation. These green areas of limited purpose, according to the classification given by Anastasijevic, are planned with 20-60% of free (unbuilt) area depending on the primary function. Table 3 shows the proportion of green areas within the housing.

In GP1995, for multi-storey housing, open (unbuilt) space is defined precisely in relation to the area surface of the apartment (0.4-0.5 m^2 of open space per m^2 of apartment) and green area is expressed in percentage of open area. For housing density of 250-450 inhabitants per ha, the percentage of green area is min 30% of the open area, while for housing density of 200-250 inhabitants per ha, the share of green areas is min 50%.

Table 3 Urban greenery within the housing function – GP1995

Land use	Population density (inhabitants per hectare)	Number of storeys	Open space	Landscaped greenery
Collective residential development with business functions, in the area of reconstruction of the city center	250-450	GF+4 – GF+6 (GF+10)	0.4 -0.5 m^2 per m2 of app	min 30% of free (unbuilt) area
Collective residential development – city and spa high density housing	200-250	GF+4 - GF+6	0.4 -0.5 m^2 per m^2 of app	min. 50% of free (unbuilt) area
Individual residential development - city and spa low density housing	100-200	Max GF+2+L	Open and green areas: min.50%	
Individual residential development – rural housing	50-100	GF+2	min 70%	
Rural residential housing	up to 50	GF+1+L	Free area of landscaped courtyard: 20%	The surface of greenery or agricultural cultures: min 60%

GF – ground floor, L – loft, app – apartment

Standards

Standard for green areas in GP1995, defined for new settlements, is 14m^2 of greenery per capita, of which 5m^2 of park area and 9m^2 of greenery in residential blocks. These standards are not applicable to existing built areas. Considering total city area and population,

anticipated urban greenery in 2010 is around 100 m^2 per capita (counting the total green and sports and recreation area with greenery in apartment blocks and parcels) and 40 m^2 per capita (including only city greenery and protective greenery). According to plan, greenery covers 852.77 ha (5.67% of the total area of the plan), of which 19.45% are parks, 15.95% are forest park, 52.87% protective vegetation and 11.73% other greenery (see Tab. 2)

Increase in green areas for the most part was achieved by increasing protective greenery. Planned surface area of protective greenery for 2010 is 10 times larger than the existing protective greenery in 1991. The surface of protective greenery outside the construction area in GP1995 is tripled in comparison to 1991 (an increase from 65 ha to 200.8 ha).

Functions

When it comes to functions of greenery, the emphasis is on ecological function, which should be achieved through bringing existing green spaces to their purpose and function; and through the formation of new green areas within the existing built tissue and the newly planned building zones. Extension of functions and surfaces of protective greenery should enable the overall environmental protection of all city functions and linking of protection zone with greenery around the city [31].

5.2. General Urban Plan of 2010 (GUP2010)

GUP2010 covers an area of 26,676.90ha. Particular problem stated in the GUP2010 is that there is only 5 m^2 of landscaped green area per capita in the city, while the normative need is min 12 m^2 per capita. This indicates a distinct lack of green areas in the city, and the fact that planning solutions from GP1995 were not achieved. Expansion and development of public green areas is listed as one of the priority objectives in the field of environmental protection. In this context, the plan emphasizes the necessity of protection of existing green areas and provision of appropriate percentage of new parks and recreational areas (forest parks). New protection green belts along roads, industrial areas, etc.; and greenery within family housing plots are also stressed out as important for overall increase and improvement of green areas.

Conceptualisation and structure of green areas

According to the plan, green and open areas occupy 2,536.36ha, or 9.51% of the total area of the plan. Green areas include park areas, greenery inside the apartment blocks and individual plots, greenery within the social functions complexes, medical rehabilitation centers, sports and recreation, protective greenery, forests and agricultural areas. Green and open areas in the city are treated together, so the concept of development is planned through the following purposes (see Tab.2):

- recreational areas
- park greenery
- park forest
- protective greenery.

In GUP2010, like in the previous GP1995, greenery within other land uses is shown as a percentage of the building lot. For areas of public use, greenery is provided with 10% - 40% of the building plot depending on the specific land use (housing, industry, health care, etc.). The highest percentage of greenery (40% of building plot) is foreseen for child

care facilities (kindergartens). Within the industry, business and trade complex for green and open area it is necessary to provide min 10% of building plot, and for tourism it is min 20%. The greenery in residential areas can be divided in two categories: 1) Individual green area (garden) - important because of its location close to the house and residents, and 2) green area of apartment blocks, which is provided as part of the expanded housing. Urban design itself conditions the utilization of the block greenery and provides residents an everyday intimate contact with greenery. Landscape treatment of open space, besides aesthetic and decorative character, has to fulfil a functional character, too.

In the GUP2010 green and open areas are expressed jointly and for all types of housing is applied a percentage of 10% of the building lot (table 4). This way of (non)expression of green areas, leaves the possibility of complete loss of greenery within the housing, because there is no minimum defined by plan which must be provided.

Table 4 Urban greenery within the housing function – GUP2010

Land use	Number of storeys	Greenery and open space
High density housing in urban area	GF+6	min 10%
Medium density housing in urban area	GF+4	min 10%
Moderate density housing in urban area	GF+2+L	min 10%
Moderate density housing in suburban area	GF+2+L	min 10%
Low density housing in suburban area – weekend area	GF+1+L	min 10%
office-residential zone	GF+6	min 10%
City centers		min 10%

GF – ground floor, L – loft

Standards

Green areas in GUP2010 are planned with general norm of 25 m^2 of urban greenery per capita, where active recreation should participate with 18% or 4.5 m^2 per capita. The active recreation value is divided into three age groups of users, different in number, namely: playgrounds for preschool children up to 6 years makes up to 1% of the total norms, playground for children 6-14 years 5% and to courts for youth and adults 12% of the total rate. Passive recreation is planned within residential communities by the norm of 1 m^2 per capita [32].

Functions

The importance of greenery reflects in its health role, i.e. improvement of sanitary – hygienic – recreational conditions. Plan underlines repeatedly protective (ecological) function of green areas in the city. Protection of space in the General Plan of Nis and the preservation and enhancement of environmental quality largely depends on the organization, planning and the level of representation of green areas [32]. The emphasis is on creating a network of urban green spaces and their connecting with rural greenery, which should contribute to a better ventilation of the city and improvement of environmental conditions in the city.

5.3. Discussion

Comparing the planning of green areas in GP1995 and GUP2010, some similarities and differences can be observed. Method of conceptualization of green areas is similar in both plans – greenery is divided according to position (inside buildable area, or outside the buildable area) and according to the primacy of their function (green areas as dominant land use and green areas as compatible use to other dominant land uses), but the classification within these categories and interpretation of standards in GP1995 and GUP2010 differ substantially.

The norms of green areas used in GP1995 are 40 m^2 per capita (city greenery and protective greenery) and 100 m^2 per capita (total green, sports and recreation area with greenery in housing blocks and parcels). GUP2010 used general norm of 25 m^2 of urban greenery per capita, where active recreation should participate with 4.5 m^2 per capita, which means required green area is 20 m^2 per capita. In GP1995 the norm is fulfilled by increasing protective greenery more than ten times – from 41.8 ha up to 450.87 ha (see Tab.2)

In GUP2010, instead of land use "park" used in GP 1995, appears "park greenery". It seems that park areas in GUP2010 are doubled in comparison to GP1995, but the term "park greenery" remains unclear. Park greenery includes green spaces with a size ranging from 0.05 ha to 23 ha, which in sum gives an area of 318 ha, or 12.56 m^2 of park greenery per capita. This way a norm of at least 12m^2 of landscaped green area per capita, which was set up as a goal when developing the plan, is fulfilled, but the question of their function occurs. Which activities can be planned within the area of 0.05 ha? According to standards, park must have at least area of 1 ha. Thus green areas with size of 0.05 ha cannot be considered parks neither by size, nor by functions do they fulfil. The term "park greenery", thus, probably refers to a manner of greenery arrangement.

The surface of urban greenery in 1991 was around 360 ha. According to GUP2010, by 2025, the surface of green and open areas should occupy 2,500 ha, which is seven times the size of that in 1991. The abrupt increase is mostly due to increase in protective greenery which occupies 2,064.20ha of 2,536.36 ha (or 81%) of planned green and open areas. The increase of the protective greenery, forests and forest land in the planning area is a direct result of enlargement of coverage of the General Urban Plan, which is almost doubled. The boundary of the plan includes large areas of sparsely populated arable and forest land, so the total population of the planning area is just slightly increased. This way, enlargement of coverage of the plan with almost unchanged number of inhabitants, obtains more greenery per capita. Although both plans meet set standards, there is no real increase in green areas in the city, but only apparent increase as a result of application of different norms and changed boundaries of plans.

One of the most significant negative changes in GUP2010 in comparison with GP1995, is treatment of green areas within the housing. As opposed to GP1995, where landscaped greenery is expressed separately and in relation to number of inhabitants (see Tab. 3), in GUP2010 open and green spaces are expressed jointly as 10% of building plot area (see Tab.4). Greenery within the housing is not dimensioned in relation to population or to the apartment surface area and there is no binding percentage of greenery, so the entire open space around the building can be paved. Building plots for new multi-storey residential buildings are privately owned, often fenced (enclosed), small in size with high

percentage of occupancy and minimal percentage of plot area (10%) left unbilt for open/green area. Green areas formed on this plots are small sized, without continuity, interrupted by fences and with questionable utility value. In addition, parking space is often organized in basement below the whole plot area preventing the planting of trees, which means greening is limited on grass and shrubs. Having in mind spatial features (size, shape, discontinuity) and limitations in greening, even ecological function of these areas is questioned, and their function remains only decorative.

6. CONCLUSIONS

Urban greenery has a special role in improving the quality of life through its environmental, social, medical, aesthetic and other functions. Despite the importance, insufficient attention is paid to planning of green areas and their shrinking, fragmentation and neglect are more and more present in cities. Reasons for such situation lie primarily in the lack of legislation referring to urban greenery. Green areas are partially covered by few laws (law on environmental protection, law on forests, law on water, etc.), and treated from various aspects (ecological, protective, etc.) but none of laws treats green areas integrally. Law on planning and construction, which is the basis for urban planning doesn't recognize green areas as separate land use. Thus, planners are given freedom and responsibility to determine the proportion of green areas in plans.

Analyses of two general plans of the City of Niš showed the lack of established standards and incoherent planning of urban green areas as a result. The only standard which occurs in plans is green area surface per capita, but with various values and referring to different types of greenery. Size and distance from green areas are not considered at all. Lack of new public green areas in plans and low percentages of greenery within other land use functions, especially housing, are apparent deficiencies of both plans. Plans still do not treat green areas an essential element of livability of city, but as a secondary function that fills the spaces that have no other purpose.

Considering all previously mentioned, the conclusion is that reduction of green space is not only caused by non-compliance with the plans and regulations, but also by lack of standards and inappropriate treatment of green areas in urban plans. Besides, the lack of harmonized standards and classification makes monitoring of green areas difficult and unreliable.

The paper made a relation between generally accepted standards and classification of green areas and their use in planning documents. Since there are no unique and binding standards of green areas in Serbia, further research should be directed towards defining standards, having in mind the growing demand for improved quality of life in cities. Considering city level further research should examine possibilities for increase of green areas and formation of functional network of green areas through future plans and practice.

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PLANIRANJE I RAZVOJ ZELENIH POVRŠINA U GRADOVIMA: ANALIZA GENERALNIH URBANISTIČKIH PLANOVA GRADA NIŠA

Zelene površine u gradovima imaju višestruku ulogu i u velikoj meri određuju kvalitet gradskog prostora i prijatnost za život. Proces urbanizacije doveo je do povećanja izgrađenosti u gradovima i smanjenja otvorenih javnih površina, naročito zelenih površina. Planiranje zelenih površina je sastavni deo urbanističkog planiranja, tako da se promene u planiranju zelenih površina i razvoj zelenih površina mogu platiti kroz urbanističke planove. Osnovno pitanje je da li je smanjivanje zelenih površina u gradovima posledica nepoštovanja urbanističkih planova ili razlog leži u samom načinu planiranja zelenih površina. Da bi se odgovorilo na to pitanje, rad se bavi funkcijama, normativima i klasifikacijom zelenih površina u gradovma i primenom ovih elemenata u dva generalna urbanistička plana grada Niša u poslednjih dvadeset godina, kao preduslovom za razvoj zelenih površina u skladu sa rastućom potrebom za zelenilom u gradovima.

Ključne reči: *gradske zelene površine, funkcije zelenih površina, urbanističko planiranje, generalni urbanistički planovi*