

Naturalistic forest landscape in urban areas: challenges and solutions

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Abstract: - Growing urbanization and rapid development of the cities create conflict situations between development of building areas and natural areas. A built environment represents a high level of intervention in the ecosystem, altering the landscape and disturbing the natural processes. In an urbanized society, urban green areas are important as a place for contact with nature. The main purpose of the presented study were to review the present situation concerning the management and condition of naturalistic forest landscapes in urban areas and to study the attitude of professionals towards naturalistic forest landscapes in the urban area of Riga city, Latvia. The survey includes the opinions of representatives of different fields from Riga municipality and other institutions related to ecological, practical, planning and conservation activities, and also private working landscape architects. The statistical analysis and data's empirical distribution showed that professionals in Riga city recognize the values and benefits of naturalistic forest landscape. However, environmental preferences may depend more on affective reactions than on ecologically-based logical operations.

Key-Words: - Landscape perception, naturalistic forest landscape, formal landscape, Riga city

1 Introduction

The process of urbanization and metropolitan growth in 20th century was a consequence of rapid technological evolution, rising living standards, increased motorization as well as general well being [14]. Compact city policies has resulted in an increasing demand for land within city limits and demands to build on land allocated to green spaces [16]. This decreased the amount of green spaces as well as increased environmental degradation and land use change pressure on the remaining green areas.

The outcomes of the rising standard of living and changing employment and lifestyle patterns – were accompanied by an ever-growing demand for outdoor recreation. Most of this demand is met by the open spaces, particularly of the ‘natural’ environment type [14]. For urban dwellers the main aspects that determine the amount of urban forest visits to satisfy the demand for contact with nature and recreation, are quantity and quality of these areas as well as their accessibility [16].

This study evaluates the aspects of the landscape approach in urban landscape planning, the necessity of sufficient ecological knowledge, resources, and skills for maintaining the functional green

infrastructure and landscape, as well as the attitude of professionals to the naturalistic forest landscapes in urban area of Riga city, in contrast to a more traditional – formal landscape.

2 Landscape approach in urban planning

The role of urban green spaces differs widely between European cities and towns due their different environmental and socio-cultural background. In Latvia, as in other countries of North Europe, the decline of nature throughout the twentieth century and the alienation between people and natural world were not so significant [16]. The region of northern European forest culture covering the Baltic States, Finland, Norway, and most of Sweden has certain similarities [8]. The forest is the significant element of everyday lives and a major element of the landscape and the recreational and aesthetic benefits of urban forest are traditionally important [17].

The last years the interest about design of naturalistic landscapes in urban area becomes more and more popular especially in countries of northern Europe, and the importance of ecological management has

increased [15]. The new types of recreational activities are developed in European countries: 'landscape experience' and 'nature experience' are among the most important [13]. The evidence in environmental psychology indicates that attitude towards the environment is a multi – dimensional construct, however, humans emotionally relate to natural elements mostly in positive ways and the people prefer landscapes that they perceive as natural [1].

Landscapes as dynamic and characteristic expressions of the interaction between the natural environment and human societies can be considered in very different ways [11]. The meaning of 'landscape' mostly emphasizes a limited area of land surface, and focuses on view/scenes or other sensory aspects of nature, artifacts and their mixtures [3,7]. Very often the studies focus on individual ecosystem components rather than taking the whole landscape into account [18]. However, the urban landscapes are dynamic and continuously changing as a city grows in temporal and spatial scale. Extending the meaning of 'landscape' to the vast array of biological and ecological processes and conditions as well as considering the spatial- temporal changes of landscape, makes it essentially synonymous with environment or ecosystem [3].

Often the aesthetic experience and desires of people against the visual quality of natural landscape are inconsistent to ecological value of landscape. The scale at which humans as organisms perceive landscapes, is particularly important because this is the scale at which humans intentionally change landscapes, and these changes affect environmental processes [6]. The preferences should be strongly influenced by ecological knowledge. People with a greater knowledge of ecosystems should more likely prefer ecologically sustainable landscapes [5].

The human's desire for aesthetic environment reflects the landscape policy and management, furthermore, the landscape management may affect where people choose to locate their home and outdoor activities, and their involvement in landscape stewardship [4]. Such a landscape perspective is critical to effective natural resource policy and management amid the changing distribution of the population across the urban landscape. The questionnaire (year 2002), realized among specialists in establishment of Latvia State Forest, only 70% of respondents agreed that they need a special knowledge of landscape, for instance, about planning and creating of landscape, for economic and social value of landscape in their daily work [10].

The evaluation of nature is an inseparable part of the process of environmental/landscape planning,

management, and decision making. In recent decades, its importance has reached the global level. At local and regional levels, landscape assessment for planning and decision-making processes is a key issue in sustainable landscape management. Landscape analysis involves the evaluation of geographical, ecological and social elements of landscape which create the comprehensive multilevel hierarchical system, a landscape program, regional landscape plan, and open space master plan will be elaborated [11]. Although, until today, Riga city development plan does not contain the strategy for development of green structure and landscape planning. The role of the local authority in Riga city has been limited in elementary rehabilitation actions and maintenance concepts.

3 Professionals attitude to naturalistic forest landscape in the case of Riga, Latvia

The literature review suggests that there are many opportunities for the use of naturalistic landscape design and many benefits to be derived. Still there are a little data on professional attitudes to urban naturalistic landscapes available. The research strategy used for the present study based on the idea that professionals are able to recognize most of the values attached to 'naturalistic forest landscape' (hereafter also NFL) in urban area. The goal of this study is to clarify and measure attitudes of towards NFL in urban area of Riga city thus to highlight the potential advantages and problems associated with the concept. The research also discerns whether a difference in attitude exists between some professional groups, and to clarify what style they prefer in their designs.

The case of Riga city was chosen because Riga is the most urbanized area in Latvia and it has significant resources of NFL (5676 ha of woodland) in the inner city. In order to obtain a representative sample of professionals, a stratified sampling method was used. The total amount of respondents was 63 divided in 3 groups – territorial planners (24 respondents), landscape architects (19 respondents) and managers (20 respondents). The individual questionnaires were conducted in a period 25/01/2010 – 22/02/2010.

To investigate the professionals' attitude to NFL, the questionnaire containing 20 statements was prepared. The questionnaire was designed based on the research of Özgüner et al. (2007) [12].

For the better understanding in the beginning of the questionnaire definitions of formal landscape (hereafter also FL) and NFL and the corresponding

pictures were included. The valuation scale of 3-points (1- strongly agree, 2 – partly-agree, 3 - disagree) was used for assessing these statements in order to determine the extent to which the respondents agree or disagree. Direct verbal interaction allowed the interviewer to target specific data collection, to measure the perception of the respondents and to elicit motives behind the answers. The Statistical Package for Social Science (SPSS V.10) and Microsoft Excel.2007 were used to analyze the collected data. A series of Chi – square (χ^2) tests were applied to determine differences at a 0.1 – 0.01 significance level on attitude statement variables in order to find out the possible differences or similarities between the answers of different groups of respondents. Cronbach’s alpha (α) test, used in this survey, revealed that the total scale reliability was high ($\alpha = 0.78$) for the attitude measurement frameworks examined, which indicates that the statements were reliable and performed well in capturing the measured construct. The table and charts were used to present descriptive results of Chi – square (χ^2) test (Table 1) and empirical distribution of data (Fig. 1).

The results of data’ empirical distribution and statistic analyze on the perception of professionals on the value and benefits of NFL are shown that majority of professionals agreed with most of the statements (Table 1, Fig. 1).

Sixty two % of respondents agreed and 23.8% partly-agreed with the first statement that NFL has a place in urban area. The analysis of the respondents’ comments made it clear that they have a different point of view to this statement. The majority of respondents from both groups (70%) agreed with the formulation that NFL is more suitable for environmental education than formal landscapes. Although 10% disagreed with this formulation and as one respondent answered: ‘Both kinds of landscapes have appropriate elements for environmental education’ (M-10).

The statement about NFL embodies natural renewal more strongly than can be achieved by a formal landscape, 80% of respondents confirmed, but commented that ‘The evidence of invasive species is very successful example of natural renewal, but it is not appropriate for NFL in urban area’ (P-14). Although, the majority recognized that NFL embodies natural renewal more strongly, the results of the statistical test, presented in Table 1, suggest a significant difference for this statement between the respondent groups ($p < 0.01$).

Surprisingly low agreement in both groups of the respondents (52%) is about the statement that it is easier to formulate a sustainable development

strategy with a NFL. The results of the statistical test, presented in Table 1, suggest difference for this statement between the respondent groups ($p < 0.1$). The answers show a high rate of partial-agreement – 35%. The analysis of the professionals’ comments on the statement revealed the recognition of advantage in FL for targets of sustainable development. The analyses showed that 64% of the respondents from both groups agreed that it is cheaper to manage a NFL than a traditional FL in most cases. Although the results of the statistical test, presented in Table 1, suggests a difference for this statement between respondent groups ($p < 0.1$). To the next statement that it is easier to gain direct participation from the local community in the formation of a NFL, there is not a common consensus between professionals (55%) on the value. As stated one respondent, ‘In Riga there is not experience about forming of FL with community support’ (P-8). However, the statistical test suggests a significant difference ($p < 0.1$) for this statement between managers and territorial planners. The answers to the next statement that seasonal changes are more pronounced in NFL than FL shows the similar situation – agreed 47% and partly-agreed – 27% of respondents. Quite low agreement (50%) is shown by the answers to the statement that to maintain NFL is easier than FL, because: ‘NFL occupies wider areas as FL and the maintenance needs special knowledge’ (M-16). The minority of the respondents (28%) agreed that NFL offers a more positive experience than FL. Forty three % of the respondents from both groups disagreed that NFL are more prone to vandalism than FL and answered in the following way: ‘In NFL there is a lack of recreational facilities, flowerbeds and other artificial elements and there are less opportunities for vandalism’ (P-23). The following part of the questionnaire about benefits of NFL included 9 statements. Although, the majority of the respondents (88%) recognized that NFL allow people to have more contact with nature than do FL, the results of the statistical test, presented in Table 1, suggests a significant difference for this statement between respondent groups ($p < 0.05$). Majority of respondents (90%) agreed with statement that NFL allow to more easily observing how nature works. The vast majority of the respondents – 82 % agreed that NFL allow a greater expression of feeling of freedom especially for teenagers. Only 50% of the respondents in both groups agreed and 40% of respondents’ partially – agreed to the statement that NFL are more calming than FL. The research of the respondents’ comments on the statement revealed that professionals think that it depends on the individual preferences and the perception and desires of people are very different.

Table 1 Results of contingency tables analysis

| Statement | Quality | χ^2 | Significance |
|--|----------------|----------|--------------|
| Values | | | |
| In urban landscape there is a place for naturalistic design | Place | 0.182 | 0,913 |
| NFL are more beneficial to wildlife than FL | Wildlife | 2.361 | 0,307 |
| NFL are more suitable for environmental education than FL | Education | 1.601 | 0,449 |
| Naturalistic style embodies natural renewal more strongly than can be achieved by a FL | Renewal | 10.626 | 0,004*** |
| In most cases, it is easier to formulate a sustainable development strategy with a NFL | Sustainability | 4.842 | 0,088* |
| In most cases, it is cheaper to manage a NFL than a traditional FL | Costs | 4.907 | 0,085* |
| It is easier to gain direct participation from the local community in the formation of a NFL | Community | 5.127 | 0,077* |
| Seasonal changes are more pronounced in NFL than FL | Season | 3.689 | 0,158 |
| In most cases, it is easier to maintain a NFL than a FL | Maintenance | 3.219 | 0,199 |
| NFL offer a more positive experience than FL | Experience | 0.007 | 0,996 |
| NFL are more prone to vandalism than FL | Vandalism | 0.173 | 0,917 |
| Benefits | | | |
| NFL allow people to have more contact with nature than FL | Contact | 7.436 | 0,024** |
| NFL allow people to more easily observe how nature works | Process | 0.460 | 0,794 |
| NFL allow a greater expression of feeling of freedom especially for teenagers | Teenagers | 0.659 | 0,719 |
| NFL are more calming than are FL | Calming | 4.439 | 0,108 |
| NFL allow greater freedom of thought than do FL | Freedom | 7.288 | 0,026** |
| NFL are more exciting/interesting than are FL | Exciting | 1.649 | 0,438 |
| The general public easily differentiate between FL and NFL | Differentiate | 3.193 | 0,202 |
| The public often prefer a naturalistic site to a formal traditional park | Preference | 3.327 | 0,189 |
| A being in NFL is not safe than are in FL | Safety | 0.451 | 0,798 |

Designations: * - p < 0.1; ** - p < 0,05; *** - p < 0.01

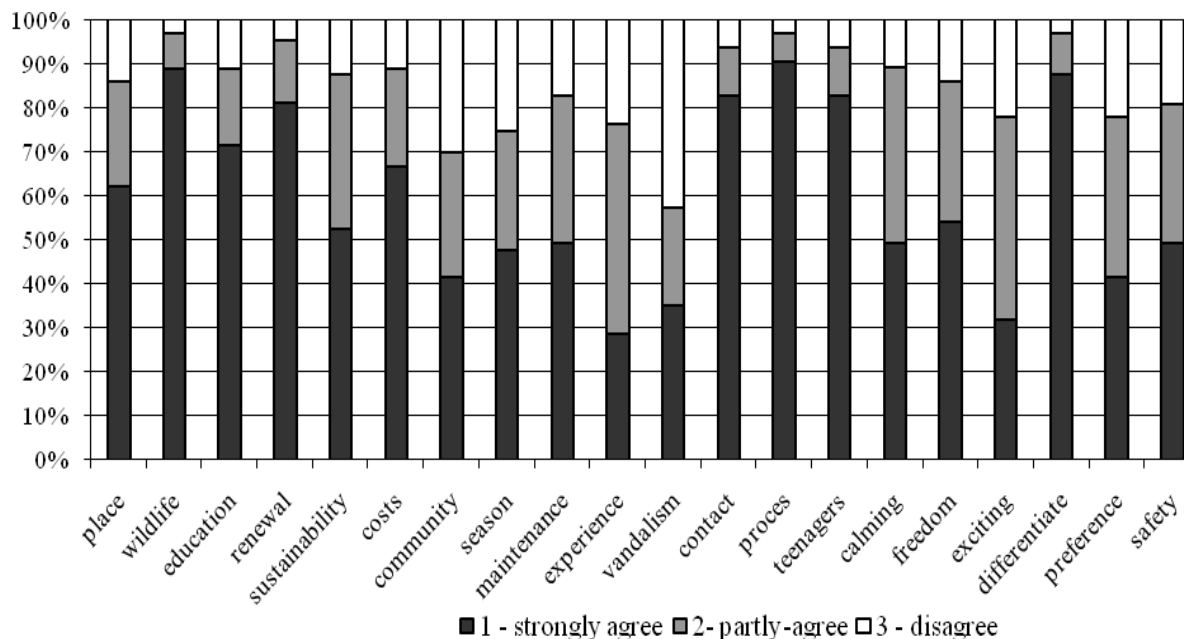


Fig. 1. Professionals' perceptions on values and benefits of urban naturalistic forest landscapes.

Quite similar situation is shown by the answers to the next statement about freedom of thought in NFL – agreed with the statement 54% and partially – agreed – 32%. The results of the statistical test, presented in Table 1, suggest a significant difference for this statement between respondent groups ($p < 0.05$).

A big difference in answers appears to the next statement that NFL is more exciting/interesting than FL. Agreed with the statement – 30%, partially – agreed – 46% and disagreed – 22%. The analysis of the answers shows that on the one hand, there is opinion that NFL is something inappropriate for urban dwellers and that is the main reason to be excited, but on the other hand, FL are created with the main target to get more exciting feelings by colors, different plants and elements of art. Majority of the respondents - 87% agreed that the general public can easily differentiate between FL and NFL. A low level of agreement is shown by the answers to the next statement that people often prefer a naturalistic site to a formal traditional park: 41% of the respondents agreed, 36% - partially – agreed and 22% disagreed. The analysis of the last statement that being in NFL is safe shows the equal balance between agreement and partial – agreement (together – 48%) and disagreement (52%).

The distribution of the population in Latvia shows a significant monocentric situation in and around Riga city. The choice of Riga city case was connected with consideration about the concentration of intellectual, financial, educational and living standards in Latvia. The restriction of professional' number in this case leads to considerations to prepare the similar questionnaire in the whole country.

Urban forest landscape preferences have probably regional differences and landscape preferences in a capital city do not comprehensively represent preferences in other cities or municipalities [15]. The results of the research showed that professionals from groups of managers, planners and landscape architects in Riga city recognize the values and benefits of NFL and confirm the common expectation in literature review [12].

This approach suggests that preferences should be strongly influenced by ecological knowledge. People with a greater knowledge of ecosystems should more likely prefer ecologically sustainable landscapes [5]. Through the series of statistical analyze it became clear that there is no big difference between opinions of two target groups. The greatest significance ($p < 0.01$) shows the answer to the statement about natural renewal, the significance $p < 0,05$ shows the answers to the statement about freedom of thoughts and about contact with nature. Less-essential significance ($p < 0.1$) shows the opinions of

representatives in both groups about sustainable development strategy, about costs to manage a NFL and direct participation from the local community (Table 1). The results of the analysis of the data' empirical distribution show that to the statements which are connected with psychological perception (about experience, calming, feelings of freedom and exciting, preferences and feelings of safety), the answers show very small differences.

The research has confirmed that landscape evaluation has a close link to important emotion-related psycho-physiological responses and environmental preferences may depend more on affective reactions than on any knowledge-based logical operations [15]. To the open-ended question for landscape architects what style they prefer in their designs, the common opinion was that design of naturalistic landscape is not actual in Riga. The comments showed that landscape architects mostly work in a formal style. The design of urban green space in Riga, as in other European countries, is influenced mostly by the 18th century English landscape movement, and a Victorian view of nature as something to be contained, conquered and controlled [2,9]. However, the significance of naturalistic forest landscape is recognized, but some time will be necessary for changes in perception, supported by political decisions and educational programs.

4 Conclusion

The concept of landscape is very wide, there are several definitions and the attitude to landscape mostly is shaped by individual environmental perception and partly – with ecological knowledge. The decision makers in Riga municipality have different backgrounds and their knowledge about landscape as an ecological state is very distinctive.

Riga city development plan does not contain the strategy for development of green structure and landscape planning. This is very important to work out the normative for landscape protection corresponding to The Europe Landscape Convention, and to develop the landscape ecological approach for evaluating and management of urban green space.

The results of the research show that professionals from both target groups – managers and planners in Riga city recognize the values and benefits of naturalistic forest landscape. There exists a significant difference in attitudes between professional groups of managers and planners to the statements about natural renewal, freedom of thoughts, contact with nature, sustainable development strategy, costs to manage a NFL and direct participation from the local community.

In practice the landscape evaluation has a close link to important emotion-related psycho-physiological responses and environmental preferences may depend more on affective reactions than on any knowledge-based logical operations. In design of landscape in Riga city the formal style is dominated over the naturalistic style and some time is necessary for changes in perception, supported by political decisions and educational programs.

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